Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

INTRODUCTORY MEMORANDUM TO THE WRITTEN REBUTTAL STATEMENT OF SIRIUS XM RADIO INC.

In its Written Direct Statement, Sirius XM demonstrated that neither changed market conditions in the time period since statutory rates were last set by the Judges nor any of the § 801(b) policy factors warrant an increase, during the 2018-2022 license period, from the current 11 percent rate paid to the record industry by Sirius XM. To the contrary, a number of indicia point in favor of a reduction. In sharp contrast, SoundExchange and the other copyright owner participants (collectively, "SoundExchange") propose a more than *doubling* of the current rate, to the greater of 23% of revenue or a roughly equivalent monthly per-subscriber fee and other changes designed solely to push that rate higher on an effective basis. When the changes SoundExchange proposes to the Gross Revenues definition and other terms are taken into account, the economic impact of SoundExchange's rate proposal would be to increase Sirius XM's payments from their projected 2017 level of roughly [redacted] million to nearly [redacted] million in 2018, even without any increases in earnings or subscribers.

The sole changed circumstance cited by SoundExchange to support this radical rate increase is the fact that Sirius XM has continued to build a successful and increasingly profitable

business. As Sirius XM's expert economist Carl Shapiro explains in his rebuttal testimony, Sirius XM's improved financial performance does not form a legitimate basis for increasing the percentage-of-revenue royalty rate for satellite radio services. Under the existing rate structure, SoundExchange's members already automatically benefit in direct relation to Sirius XM's revenue growth. That Sirius XM allegedly "can afford" to pay more to the record industry is irrelevant. As Professor Shapiro further elucidates, in effectively competitive markets (which all economists appear to agree is a marketplace consistent with the first three 801(b) policy objectives), Sirius XM's overall profitability simply does not come into play. Furthermore, the prevailing rate that SoundExchange seeks to more than double was *not* reduced below the market level in *SDARS II* on account of the fourth – disruption – factor under 801(b). Any suggestion on the part of SoundExchange or its supporting experts that there is somehow a "subsidy" in place that needs to be eliminated going forward is therefore completely wide of the mark.

What is left of SoundExchange's case is essentially a recycling of the discredited benchmarking analysis offered by its expert, Professor Ordover, in the *SDARS II* proceeding. Slightly different packaging by Mr. Orszag, its expert here, to one side, that benchmarking effort was recognized by the Judges in *SDARS II* as yielding rates so far beyond the then-prevailing statutory rate as to be "outside the zone of reasonableness" and as failing to "offer[] a foundation to support a comparable benchmark from which to begin an analysis of reasonable rates for SDARS for the upcoming license period." *SDARS II* at 23065-66.

Nothing in regard to those benchmarks has changed. If anything, resort to that benchmark – implicating the license fees payable to the record industry by interactive subscription services – has been further undermined by the record developed in the succeeding *Web IV* proceeding. There, the Judges fully credited evidence demonstrating the complete

absence of price competition between and among individual record companies to license plays of their sound recordings to such on-demand services. As in *Web IV*, the record here plainly demonstrates that there remains a complete absence of price competition between record labels when licensing on-demand services. That recognition further renders SoundExchange's proposed benchmark of little if any value to the Judges in this proceeding in fashioning rates for an SDARS licensing market that must be workably competitive.

Undaunted by these high – in Sirius XM's estimation, insuperable – hurdles, SoundExchange, through Mr. Orszag, once again proposes that the Judges adopt rates for Sirius XM based on the interactive services benchmark. It does so without a single plausible argument as to what has changed in relation to the disabling non-competitive characteristics of those benchmark agreements or to any other potentially relevant changes in market circumstance. Unsurprisingly, Mr. Orszag's analysis, like that of Dr. Ordover's preceding him, generates astronomical proposed rates completely untethered to the existing rate level.

Mr. Orszag purports to model his own benchmarking analysis on that adopted by the Judges in *Web IV* in setting rates for non-interactive subscription services. In fact, as Professor Shapiro methodically demonstrates, he does nothing of the kind. In their *Web IV* Determination, the Judges framed a narrow application of the interactive service agreements as one input among others in fashioning per-play rates for non-interactive subscription webcasters. As Professor Shapiro explains, Mr. Orszag derives a sweepingly overbroad, and economically improper, "ratio equivalency" principle from the Judges' carefully circumscribed prior jurisprudence and, in so doing, lands exactly back in the analytic framework that was rejected by the Judges in *SDARS*

II.[1] To accept Mr. Orszag' benchmarking approach would require the Judges to repudiate the rationales, and economic outcomes, of *both* the *SDARS II* and *Web IV* proceedings.

SoundExchange supports its economic case with the testimony of Robert Willig, who purports to identify the opportunity cost of Sirius XM subscriptions for the record industry and corroborate the fee range derived by Mr. Orszag. Professor Willig's opportunity-cost model is premised on a survey conducted by another SoundExchange witness, Ravi Dhar. Sirius XM rebuttal witness John Hauser, the Kirin Professor of Marketing at MIT's Sloan School of Management, identifies various key flaws in Professor Dhar's survey methodology that render his results unreliable. Professor Hauser's testimony shows that Professor Dhar's survey dramatically overstates the degree of substitution between Sirius XM and interactive subscription services. When Professor Hauser corrects just one of the myriad errors that significantly biased Professor Dhar's results – questions that presented incomplete and suggestive switching choices to survey respondents who say they would cancel their Sirius XM Select subscriptions at certain price points – he demonstrates that the percentages of respondents who report they would shift listening to a new paid interactive subscription service drop dramatically. This fundamental survey error in itself renders Professor Willig's opportunity cost analysis deeply flawed.

Another Sirius XM rebuttal expert, Professor Joseph Farrell, Professor of Economics at the University of California, Berkeley, exposes (as does Professor Shapiro) an even more fundamental flaw in Professor Willig's analysis: it is built on the premise of a single, monopoly

[1] Among other crippling misassumptions, Mr. Orszag's modeling fails to satisfy an expressly delineated limiting condition set by the Judges for resort to the interactive services benchmark, namely, establishing a 1:1 ratio of opportunity costs between the interactive services and the services operating in the target market. As Professor Shapiro demonstrates, those threshold conditions are not satisfied in the distinct satellite radio market setting, Mr. Orszag's conclusory suggestions to the contrary notwithstanding.

supplier of music that can deprive Sirius XM of music altogether. That approach, Professor Farrell explains, simply asks the wrong question; what is relevant is the opportunity cost of an individual label operating in an effectively competitive environment, not that of a monopolist that controls the rights to all sound recordings. Correcting for that fundamental flaw lowers the opportunity cost figure to levels well below those derived by Professor Willig.

Professor Shapiro further exposes as fundamentally flawed Professor Willig's claims that Sirius XM is responsible for cannibalizing record company revenue as well as displacing subscriptions to interactive services. Rerunning Professor Willig's faulty regression analyses said to support these conclusions reveals, instead, that Sirius XM is highly promotional of record company revenue and puts as much as an additional $890 million a year (beyond its already sizeable royalty payments) into the record industry's coffers.

Professor Shapiro also reviews Professor Lys's lengthy analysis of Sirius XM's recent financial success, explaining why it is irrelevant to the question of what rates would prevail in a competitive market for music licensing. Professor Shapiro also addresses Professor Lys's attack on Sirius XM direct licenses, which constitute one of Sirius XM's benchmarks in this proceeding. As Professor Shapiro explains, those attacks do not undermine the invaluable competitive information provided by those licenses: the rates at which record companies will undercut the statutory rate in hopes of gaining highly sought-after airplay on Sirius XM.

Finally, Professor Shapiro addresses SoundExchange's proposal that Sirius XM pay "full freight" on all of its trial subscriptions, other than those limited to 30 days. Professor Shapiro demonstrates, first, that where automakers pay Sirius XM for the trial subscriptions, such revenue (even if discounted) is *already accounted for* in his proposed model, requiring no further adjustment (much less the "gross up" proposed by Mr. Orszag) to ensure SoundExchange is

properly compensated for such trial users. With respect to unpaid trial subscriptions, Professor Shapiro demonstrates mathematically that in a negotiation between a record company and Sirius XM, the record company would be willing to grant Sirius XM royalty-free trials for whatever period Sirius XM deemed optimal for maximizing conversions to self-pay subscriptions and long-term profits. Professor Shapiro is supported in this analysis by the testimony of Sirius XM Chief Financial Officer David Frear, who describes the vast resources Sirius XM invests in trial subscribers and the many ways Sirius XM trials differ from those offered by on-demand streaming services, which SoundExchange takes as its benchmark for its 30-day trial subscription proposal.

In response to Professor Lys, Mr. Frear also discusses Sirius XM's recent agreement with owners of pre-1972 recordings to pay them 3.5% of revenue for performances of such recordings – an agreement that belies the suggestion that Sirius XM's direct licenses for pre-72 recordings are somehow additional consideration that must be factored into Sirius XM's use of record companies' *post*-72 recordings.

In turn, Sirius XM Controller Tom Barry addresses various other aspects of SoundExchange's proposed rates and terms: the punitive requirement that revenue for non-statutory content (non-music programming, data services) cannot be excluded when part of a bundled offering (i.e., only when sold on a "standalone" basis), and various other changes SoundExchange proposes to the Gross Revenues definition, Direct License Share credit, and audit provisions.

The following paragraphs provide additional detail on the contents of the testimony of each of Sirius XM's rebuttal witnesses.

Sirius XM Expert Witnesses

Carl Shapiro

Professor Carl Shapiro, Transamerica Professor of Business Strategy at the Haas School of Business at the University of California at Berkeley, presented testimony in the first phase of this proceeding establishing the economic basis for Sirius XM's rate proposal. In his rebuttal testimony, Professor Shapiro responds to SoundExchange's rate proposal and the justifications presented in support thereof – focusing primarily on the written direct testimonies of Mr. Orszag, Professor Willig, and Professor Lys. With respect to Mr. Orszag, Professor Shapiro explains that his analysis is entirely premised on a flawed (mis)conception of "ratio equivalency" as that concept was employed by the Judges in *Web IV*. As Professor Shapiro discusses, because Sirius XM is not highly substitutional for interactive services (among other reasons), the very limited circumstances in which ratio equivalency has rate-setting applicability clearly do not hold, even approximately, when applied here.

Professor Shapiro goes on to detail several of the other more egregious errors made by Mr. Orszag in attempting to derive rates for Sirius XM from SoundExchange's preferred interactive services benchmark. Most notably, in Mr. Orszag's primary approach for establishing rates for Sirius XM, he fails to account for the fact that Sirius XM's service offering provides far more than just content – it also includes a complete distribution network, something that the interactive services unquestionably do not provide. Rather than account for this fundamental difference between the two services offerings, Mr. Orszag ignores it entirely. In addition, Mr. Orszag makes no effort to account for the significantly different intensity of use of sound recordings as between Sirius XM and interactive services. As Professor Shapiro demonstrates, when one properly accounts for these critical differences (and others), and

faithfully adheres to the conception of ratio equivalency employed by the Judges in *Web IV*, the resulting rates, rather than supporting SoundExchange's rate proposal, in fact fully support the rates derived by Professor Shapiro in his Written Direct Testimony.

With respect to Professor Willig, Professor Shapiro explains that his analysis starts off on the wrong foot, and never recovers. Professor Willig's opening analysis, which he asserts demonstrates that Sirius XM has cannibalized download sales, and, more generally, that by licensing Sirius XM, the record labels have lost substantial revenues from other revenue-generating sources, is based on faulty regressions. When basic errors in those regressions are corrected, they demonstrate precisely the opposite of what Professor Willig claims. Indeed, Professor Willig's analysis, as corrected, demonstrates that Sirius XM has had a significant promotional impact on both download sales and on the use of subscription interactive services.

With respect to the remainder of Professor Willig's analysis, in which he purports to derive reasonable rates for Sirius XM based on his estimate of the opportunity cost to the record industry of licensing Sirius XM, Professor Shapiro demonstrates that this analysis is similarly fundamentally flawed. That entire analysis is predicated on Professor Willig asking the wrong question. Rather than seeking to estimate the opportunity cost of an *individual* label of licensing Sirius XM under workably competitive conditions, Professor Willig estimates the opportunity cost to a *monopolist* that not only controls the rights to all sound recordings, but also has the ability to shut down Sirius XM entirely. As a result, Professor Willig's results are entirely irrelevant to the rate-setting task at hand. Professor Shapiro goes on to demonstrate that, when Professor Willig's opportunity cost calculations are corrected, the results are dramatically different. When properly analyzed, the opportunity cost to a label of licensing Sirius XM is not

only well below the opportunity cost calculated by Professor Willig, but is also well below the rates that Professor Shapiro concludes are reasonable.

Finally, Professor Shapiro discusses two aspects of Professor Lys's analysis – his discussion of Sirius XM's profitability and his discussion of the Sirius XM direct licenses. As Professor Shapiro demonstrates, Professor Lys's discussion of Sirius XM's overall profitability, despite its length, is entirely irrelevant to the rate-setting task at hand. The one metric that Professor Lys discusses that is of any relevance – Sirius XM's contribution margin – has, as Professor Lys notes, been remarkably constant over time.

As for Professor Lys's discussion of the Sirius XM direct licenses, Professor Shapiro demonstrates that Professor Lys's ultimate conclusion – that the direct licenses are entirely uninformative for rate-setting here – is a direct result of Professor Lys's highly incomplete economic model, which fails to distinguish between a record company discounting below the statutory rate to have its music played more, in which case the royalty rate in the direct license rate is highly informative, as opposed to offering a discount so as to receive other benefits. Professor Shapiro also addresses Professor Lys's other concerns with the direct licenses, demonstrating that these claims fail to undermine the probative value of the direct licenses.

Joseph Farrell

Professor Joseph Farrell, Professor of Economics at the University of California, Berkley, presents rebuttal testimony that addresses the critical flaws in the two approaches used by Professor Willig in his written direct testimony to approximate royalty rates for Sirius XM. As Professor Farrell explains, both of Professor Willig's approaches for rate setting – the use of a Nash Bargaining Model and the application of Ramsey pricing principles – use a fundamentally flawed conception of opportunity cost as a critical input. Not only is this opportunity cost

arrived at by assuming that there is either a single monopolist record label or a fully functioning cartel, but also by assuming that the licensing entity has so much market power that it can shut down Sirius XM entirely by withholding its content. As a result, Professor Willig's opportunity cost calculations – which form the basis for his fee calculations – are inherently unhelpful as a guide to workably competitive royalties, are dramatically inflated, and utterly fail to satisfy the 801(b)(1) policy objectives.

In addition to this fundamental flaw, Professor Farrell addresses a number of other critical failings in Professor Willig's opportunity cost calculations. First, Professor Willig's opportunity cost calculation is driven in large part by the royalties paid by interactive services – royalties that the Judges have previously found are set in a market that is not workably competitive. In a nutshell, Professor Willig is importing the supra-competitive royalties that the record labels are able to secure from interactive services into the rates that he calculates for Sirius XM. Second, Professor Willig's approach entirely ignores the promotional benefits of Sirius XM. As Professor Farrell explains, a properly calculated opportunity cost must consider both substitution and promotional effects. Professor Willig embraces the former, but entirely ignores the latter – further inflating his opportunity cost estimate. Finally, Professor Willig relies on estimated diversion ratios – estimates of what sources of music Sirius XM subscribers would turn to were they to cancel their subscriptions – that are inconsistent with basic economic logic, and are inconsistent with all other estimates of diversion ratios. Each of these flaws artificially inflates the opportunity cost calculated by Professor Willig.

Professor Farrell then goes on to address the modes of analysis used by Professor Willig to mark-up his inflated opportunity cost estimates to derive a royalty rate for Sirius XM. As an initial matter, as Professor Farrell discusses, it is not even clear that it is economically

appropriate to mark up opportunity cost when it is calculated using a methodology like that employed by Professor Willig. In fact, there is good reason to conclude that there is no basis for such a mark-up. But even were there an economically valid reason for marking up the opportunity cost arrived at by Professor Willig, the approaches he takes in doing so are fundamentally flawed.

With respect to Professor Willig's Nash Bargaining Model, he makes a number of faulty assumptions, including that each label is "must have" and that there is no possibility of "steering." As a result, Professor Willig's Nash Bargaining Model yields royalty rates that are dramatically inflated. Professor Willig's second approach – that which utilizes so-called Ramsey pricing – builds off of all of the flaws discussed above, and adds a few more. As Professor Farrell explains, this Ramsey pricing analysis is infected by faulty estimates of elasticities of demand and an overstated margin that the labels are able to secure from interactive services. As a result, this analysis also generates wildly inflated royalty rates. Overall, Professor Farrell concludes that due to the many significant flaws in Professor Willig's analyses used to estimate royalty rates for Sirius XM, Professor Willig's results are inconsistent with the 801(b)(1) objectives and are entirely uninformative for rate-setting here.

John Hauser

John Hauser, the Kirin Professor of Marketing at the Massachusetts Institute of Technology Sloan School of Management, offers testimony critiquing the testimony of SoundExchange witnesses Professor Ravi Dhar and Mr. Stefan Boedeker. Professor Hauser identifies a host of problems with Professor Dhar's survey. Perhaps most fundamentally, Professor Dhar's pricing questions fail a basic requirement of a reliable scientific study: his survey results are not replicable. Professor Hauser explains that he re-tested Professor Dhar's

survey questions where respondents were asked whether they would continue to subscribe to Sirius XM at various prices *not just once, but twice* and each time the results of the key questions were statistically significantly different from those obtained by Professor Dhar (as well as statistically significantly different from one another).

Professor Hauser also identifies multiple flaws in Professor Dhar's survey design that likely biased his findings with respect to the alternatives to which the respondents would switch if they cancelled their current music service at a given price. He then explains how he re-ran Professor Dhar's survey modifying just one aspect of it to test whether fixing that aspect could change these switching results. Whereas Professor Dhar initially only provided respondents a limited set of alternatives focused on paid music services (with free alternatives such as listening to AM/FM radio only being shown to respondents after they affirmatively indicated that they were not interested in a paid subscription), Professor Hauser provided a more complete list of alternatives at the outset. As expected, with Professor Dhar's biased formatting corrected, the number of respondents who reported that they would switch to paid music options dropped significantly. Beyond his critique of Professor Dhar's pricing and switching questions, Professor Hauser expands on additional problems with Professor Dhar's survey, such as the various problems with the structure of his questions and the fact that his sample is both under-inclusive and not representative of the population he intended to study, in part because he surveyed only Sirius XM Select subscribers and disqualified nearly three-quarters of Sirius XM subscribers.

Professor Hauser also critiques the testimony of Mr. Boedeker, who conducted a survey that purports to measure the degree to which Sirius XM subscribers value music versus non-music content in Sirius XM's programming. He describes how Mr. Boedeker's survey generated internally inconsistent responses from the majority of his respondents and how such

inconsistencies raise serious concerns regarding the validity and reliability of his survey. Professor Hauser also explains how Mr. Boedeker failed to consider the variety of non-programming attributes of satellite radio that consumers may value and instead focused his questions solely on music and non-music programming, thus inflating the valuation of music and non-music programming. Further, he describes how Mr. Boedeker's survey failed to follow general principles of good survey design.

Sirius XM Fact Witnesses

David J. Frear

David J. Frear is the Senior Executive Vice President and Chief Financial Officer of Sirius XM and has worked in that capacity (previously with Sirius) since 2003. Mr. Frear provides the Judges with information regarding Sirius XM's provision of trial subscriptions and explains the many reasons why SoundExchange's assertion that Sirius XM should pay royalties on paid and unpaid trials should be rejected. For starters, trials have been offered since Sirius XM's inception to generate paid subscriptions without complaint from SoundExchange. Additionally, SoundExchange already receives tens of millions of dollars in royalties from the approximately [redacted] of Sirius XM trials are paid for by auto manufacturers, and Sirius XM incurs significant costs in acquiring trialers that interactive services do not. Moreover, unlike interactive services, Sirius XM subscriptions are ancillary to the purchase or lease of a car and thus require additional effort on the part of Sirius XM to convert such trialers to paying subscribers. Mr. Frear also responds to Professor Lys's incorrect assertion that certain of Sirius XM's direct licenses should be disregarded because they include payments for performances of Pre-72 Recordings.

Thomas D. Barry

Thomas D. Barry is the Senior Vice President and Controller of Sirius XM and also testified in the direct phase of this proceeding. Mr. Barry's rebuttal testimony responds to SoundExchange's proposals to change the governing regulations, including its efforts to deny Sirius XM the benefit of certain exclusions from the definition of "Gross Revenues." As part his critique, Mr. Barry addresses SoundExchange's proposal for treatment of revenue for non-music programming "bundled" with Sirius XM packages containing licensable music and explains how SoundExchange's "standalone sales" proposal relating to this type of programming and data services would be unfair and disruptive. Mr. Barry's testimony also responds to SoundExchange's punitive proposal to cap the amount of Sirius XM's direct-license royalty adjustment and its proposed audit regulations.

Designated Testimony from *SDARS I* (Docket No. 2006-1)

& *SDARS II* (Docket No. 2011-1)

Sirius XM has also designated Professor John Hauser's testimony from the *SDARS I* and *SDARS II* proceedings. Rather than having Professor Hauser restate that testimony, he cross-references the designated testimony in his current submissions and explains its relevance. Consistent with 37 C.F.R. § 351.4(b)(2) and 37 C.F.R. § 351.11, Sirius XM has provided a full copy of Professor Hauser's written testimony as well as the transcript from his trial testimony.

February 17, 2017

Respectfully submitted,

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Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of: **Determination of Royalty Rates and Terms for Transmission of Sound Recordings by Satellite Radio and "Preexisting" Subscription Services (SDARS III)**	)	**Docket No. 16-CRB-001-SR/PSSR (2018-2022)**

FIRST AMENDED PROPOSED RATES AND TERMS OF SIRIUS XM RADIO INC.

Pursuant to 37 C.F.R. § 351.4(b)(3), Sirius XM Radio Inc. ("Sirius XM") proposes that the Copyright Royalty Judges set the SDARS monthly royalty rate for the public performance of sound recordings pursuant to 17 U.S.C. § 114(d)(2) during the period January 1, 2018 through December 31, 2022, in the range of 8.1% to 11% of Sirius XM's monthly U.S. Gross Revenues as defined in 37 C.F.R. § 382.11. The fee for making ephemeral recordings to facilitate such performances pursuant to 17 U.S.C. § 112(e) shall be included within, and constitute 5% of, the Section 114 royalty payments.

The following pages display, in redline, the changes that Sirius XM proposes to the regulations governing preexisting SDARS at 37 C.F.R. §§ 382.10-17, including certain technical and conforming changes to the existing regulations. These changes are discussed in the written direct and rebuttal testimony of Sirius XM Senior Vice President and Controller Thomas Barry. Other than the changes shown below in redline, Sirius XM proposes that the terms currently set forth in 37 C.F.R. § 382.10-17 be continued.

TITLE 37 -- PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER III -- COPYRIGHT ROYALTY BOARD, LIBRARY OF CONGRESS

SUBCHAPTER E -- RATES AND TERMS FOR STATUTORY LICENSES

PART 382 -- RATES AND TERMS FOR DIGITAL TRANSMISSIONS OF SOUND RECORDINGS AND THE REPRODUCTION OF EPHEMERAL RECORDINGS BY PREEXISTING SUBSCRIPTION SERVICES AND PREEXISTING SATELLITE DIGITAL AUDIO RADIO SERVICES

SUBPART B -- PREEXISTING SATELLITE DIGITAL AUDIO RADIO SERVICES

§ 382.10 General.

(a) Scope. This subpart establishes rates and terms of royalty payments for the public performance of sound recordings in certain digital transmissions by Licensees in accordance with the provisions of 17 U.S.C. 114, and the making of Ephemeral Recordings by Licensees in accordance with the provisions of 17 U.S.C. 112(e), during the period from January 1, ~~2013~~2018, through December 31, ~~2017~~2022.

. . .

§ 382.11 Definitions.

For purposes of this subpart, the following definitions shall apply:

Collective is the collection and distribution organization that is designated by the Copyright Royalty Judges. For the ~~2013-2017~~2018-2022 license term, the Collective is SoundExchange, Inc.

. . .

GAAP shall mean U.S. Generally Accepted Accounting Principles in effect ~~from~~ at the time ~~to time in the United States~~ a Licensee calculates and makes its payment to the Collective.

. . .

Gross Revenues

(1) Gross Revenues shall mean revenue recognized by the Licensee in accordance with GAAP from the operation of an SDARS, and shall be comprised of the following:

(i) Subscription revenue recognized by Licensee directly from U.S. subscribers for Licensee's SDARS; and

(ii) Licensee's advertising revenues, or other monies received from sponsors, if any, attributable to advertising on channels other than those that use only

incidental performances of sound recordings, less advertising agency and sales commissions.

(2) Gross Revenues shall include such payments as set forth in paragraphs (1)(i) and (ii) of the definition of "Gross Revenues" to which Licensee is entitled but which are paid to a parent, wholly-owned subsidiary or division of Licensee.

(3) Gross Revenues shall exclude:

(i) Monies or other consideration attributable to the sale and/or license of equipment and/or other technology, including but not limited to bandwidth, sales of devices that receive the Licensee's SDARS and any taxes, shipping and handling fees therefor;

(ii) Royalties paid to Licensee for intellectual property rights;

(iii) Monies or other consideration received by Licensee from the sale of phonorecords and digital phonorecord deliveries;

(iv) Sales and use taxes, shipping and handling, late fees, and ~~credit card,~~ invoice~~,~~ and fulfillment service fees;

(v) Bad debt and credit card expense, and

(vi) ~~Revenues recognized by~~ Licensee revenues for the provision of

(A) Current and future data services ~~offered for a separate charge~~ (e.g., weather, traffic, destination information, messaging, sports scores, stock ticker information, extended program associated data, video and photographic images, and such other telematics and/or data services as may exist from time to time); in cases in which Licensee offers such data services in a bundle or package with its standard music/non-music package, the exclusion shall be an amount equal to the difference between: (a) the stated sale price of the bundle, minus (b) the stated sale price of the bundle multiplied by a fraction, the numerator of which is the publicly stated retail price of the standard music/non-music package when sold on a standalone and undiscounted basis, and the denominator of which is the publicly stated retail price of the bundle when sold on a standalone and undiscounted basis.

(B) Channels, programming, products and/or other services, other than as included in Licensee's standard music/non-music package, ~~offered for a separate charge~~ where such channels use only incidental performances of sound recordings; in cases in which Licensee offers such channels, programming, products and other service in a bundle or package with its standard music/non-music package, the exclusion shall be an amount equal to the difference between: (a) the stated sale price of the bundle, minus (b) the stated sale price of the bundle multiplied by a fraction, the numerator of which is the publicly stated retail price of the standard music/non-music package when sold on a standalone and undiscounted basis, and the denominator of which is the publicly stated retail price of the bundle when sold on a standalone and undiscounted basis.

(C) Channels, programming, products and/or other services provided outside of the United States; and

(D) Channels, programming, products and/or other services for which the performance of sound recordings and/or the making of Ephemeral Recordings is exempt from any license requirement or is separately licensed, including by a statutory license and, for the avoidance of doubt, webcasting, audio services bundled with television programming, interactive services, and transmissions to business establishments.

. . .

Qualified Auditor is a Certified Public Accountant who is independent of the Licensee and the Collective within the meaning of the AICPA Code of Professional Conduct.

. . .

Term means the period commencing January 1, ~~2013~~2018, and continuing through December 31, ~~2017~~2022.

. . .

§ 382.12 Royalty fees for the public performance of sound recordings and the making of ephemeral recordings.

(a) In general. The monthly royalty fee to be paid by a Licensee for the public performance of sound recordings pursuant to 17 U.S.C. 114(d)(2) and the making of any number of Ephemeral Recordings to facilitate such performances pursuant to 17 U.S.C. 112(e) shall be ~~a percentage~~ 8.1 percent of monthly Gross Revenues~~as follows: for 2013, 9.0%; for 2014, 9.5%; for 2015, 10.0%; for 2016, 10.5%; and for 2017, 11.0%~~, except that the royalty fee so determined may be reduced by the Direct License Share or the Pre-1972 Recording Share as described in paragraphs (d) and (e), respectively, of this section.

(b) Ephemeral recordings. The ~~royalty~~ fee for all Ephemeral Recordings is part of the total fee payable under ~~17 U.S.C. 112(e) for the making of phonorecords used by the~~ this section and constitutes 5% of it. All ephemeral recordings that a Licensee ~~solely to facilitate~~ makes which are necessary and commercially reasonable for making noninteractive digital transmissions ~~for which it pays royalties as and when provided in this subpart shall be~~ are included within~~, and constitute 5% of, the total royalties payable under 17 U.S.C. 112(e) and 114.~~the 5%.

(c) Ephemeral recordings minimum fee. Each Licensee making Ephemeral Recordings pursuant to 17 U.S.C. 112(e) shall make an advance payment to the Collective of $100,000 per year, payable no later than January 20th of each year. The annual advance payment shall be nonrefundable, but it shall be considered as an advance of the Ephemeral Recordings royalties due and payable for a given year or any month therein under paragraphs (a) and (b) of this section; Provided, however, that any unused annual advance payment for a given year shall not carry over into a subsequent year.

(d) Direct license share. The percentage of monthly Gross Revenues royalty fee specified in paragraph (a) of this section may be reduced by a percentage as set forth in this paragraph (referred to herein as the "Direct License Share").

(1) Subject to paragraph (d)(3) of this section, for each month, the Direct License Share is the result of dividing the ~~Internet Performances~~ transmissions of Directly-Licensed Recordings on ~~the Reference Channels~~ Licensee's SDARS by the total number of ~~Internet Performances~~ transmissions of all sound recordings on the ~~Reference Channels~~ Licensee's SDARS.

~~(2) For purposes of paragraph (d)(1) of this section:~~

~~(i) A "Performance" is each instance in which any portion of a sound recording is publicly performed to a listener within the United States by means of a digital audio transmission or retransmission (e.g., the delivery of any portion of a single track from a compact disc to one listener) but excluding an incidental performance that both:~~

~~(A) Makes no more than incidental use of sound recordings including, but not limited to, brief musical transitions in and out of commercials or program segments, brief performances during news, talk and sports programming, brief background performances during disk jockey announcements, brief performances during commercials of sixty seconds or less in duration, or brief performances during sporting or other public events; and~~

~~(B) Other than ambient music that is background at a public event, does not contain an entire sound recording and does not feature a particular sound recording of more than thirty seconds (as in the case of a sound recording used as a theme song).~~

~~(ii) The "Reference Channels" are Internet webcast channels offered by the Licensee that directly correspond to channels offered on the Licensee's SDARS that are capable of being received on all models of Sirius radio, all models of XM radio, or either or both, and on which the programming consists primarily of music.~~

(2~~3~~) A Direct License Share adjustment as described in paragraph (d) of this section is available to a Licensee only if

~~(i) The Reference Channels constitute a large majority of the music channels offered on the Licensee's SDARS and are generally representative of the music channels offered on the Licensee's SDARS; and~~

~~(ii)~~ the Licensee timely provides the relevant information required by § 382.13(h).

(3~~4~~) No ~~performance~~ transmission shall be credited as ~~an Internet Performance~~ a transmission of a Directly-Licensed Sound Recording under this section if that ~~performance~~ transmission is separately credited as ~~an Internet Performance~~ a transmission of a Pre-1972 ~~sound r~~Recording under paragraph (e)(1) of this section.

(e) Pre-1972 Recording Share. The percentage of monthly Gross Revenues royalty fee specified in paragraph (a) of this section may be reduced by a percentage as set forth in this paragraph (referred to herein as the "Pre-1972 Recording Share").

(1) Subject to paragraph (e)(3) of this section, for each month, the Pre-1972 Recording Share is the result of dividing the ~~Internet Performances~~ transmissions of Pre-1972 ~~Sound~~ Recordings on the ~~Reference Channels~~ Licensee's SDARS by the total number of ~~Internet Performances~~ transmissions of all sound recordings on the ~~Reference Channels~~ Licensee's SDARS.

~~(2) For purposes of paragraph (e)(1) of this section:~~

~~(i) A "Performance" is each instance in which any portion of a sound recording is publicly performed to a listener within the United States by means of a digital audio transmission or retransmission (e.g., the delivery of any portion of a single track from a compact disc to one listener) but excluding an incidental performance that both:~~

~~(A) Makes no more than incidental use of sound recordings including, but not limited to, brief musical transitions in and out of commercials or program segments, brief performances during news, talk and sports programming, brief background performances during disk jockey announcements, brief performances during commercials of sixty seconds or less in duration, or brief performances during sporting or other public events; and~~

~~(B) Other than ambient music that is background at a public event, does not contain an entire sound recording and does not feature a particular sound recording of more than thirty seconds (as in the case of a sound recording used as a theme song).~~

~~(ii) The "Reference Channels" are Internet webcast channels offered by the Licensee that directly correspond to channels offered on the Licensee's SDARS that are capable of being received on all models of Sirius radio, all models of XM radio or both, and on which the programming consists primarily of music.~~

(2~~3~~) A Pre-1972 Recording Share adjustment as described in paragraph (e) of this section is available to a Licensee only if

~~(i) The Reference Channels constitute a large majority of the music channels offered on the Licensee's SDARS and are generally representative of the music channels offered on the Licensee's SDARS; and~~

~~(ii)~~ the Licensee timely provides the relevant information required by § 382.13(h).

§ 382.13 Terms for making payment of royalty fees and statements of account.

…

(c) Monthly payments. A Licensee shall make any payments due under § 382.12 on a monthly basis on or before the 45th day after the end of each month for that month and, in the case the 45th day is on a weekend or holiday, the first workday thereafter. All payments shall be rounded to the nearest cent.

. . .

§ 382.15 Verification of royalty payments.

. . .

(c) Notice of intent to audit. The Collective must file with the Copyright Royalty Judges a notice of intent to audit a particular Licensee, which shall, within 30 days of the filing of the notice, publish in the Federal Register a notice announcing such filing. The notification of intent to audit shall be served at the same time on the Licensee to be audited. Any such audit shall be conducted by an independent and Qualified Auditor identified in the notice~~, and shall be binding on all parties~~.

(d) Acquisition and retention of report. The Licensee shall use commercially reasonable efforts to obtain or to provide access to any relevant books and records maintained by third parties for the purpose of the audit. The Collective shall retain the report of the verification for a period of not less than 3 years.

(e) Acceptable verification procedure. The auditor shall determine the accuracy of royalty payments or distributions, including whether an underpayment or overpayment of royalties was made. An audit, including underlying paperwork, which was performed in the ordinary course of business according to generally accepted auditing standards by an independent and Qualified Auditor, shall serve as an acceptable verification procedure for all parties with respect to the information that is within the scope of the audit.

(f) Consultation. Before rendering a written report to the Collective, except where the auditor has a reasonable basis to suspect fraud and disclosure would, in the reasonable opinion of the auditor, prejudice the investigation of such suspected fraud, the auditor shall review the tentative written findings of the audit with the appropriate agent or employee of the Licensee being audited in order to remedy any factual errors and clarify any issues relating to the audit; Provided that an appropriate agent or employee of the Licensee reasonably cooperates with the auditor to remedy promptly any factual errors or clarify any issues raised by the audit.

(g) Costs of the verification procedure. The Collective shall pay all costs associated with the verification procedure, unless it determines that the Licensee underpaid royalties in an amount of 10% or more, in which case the Licensee shall, in addition to paying the amount of any underpayment, bear the reasonable costs of the verification procedure.

(h) Interest. Interest on underpayments or overpayments discovered during an audit shall be allowed from the date of the underpayment, and charged at the post judgment interest rate specified in 28 U.S.C. 1961.

(i).Finalization of Results. In the event Licensee and the Collective are unable to reach resolution on disputed items identified in the course of an audit, Licensee's calculation of the disputed items shall be considered final on the date two years after delivery of the auditor's written report to Licensee, unless the Collective has initiated a legal action to compel payment of the disputed amounts.

§ 382.17 Unclaimed funds.

If the Collective is unable to identify or locate a Copyright Owner or Performer who is entitled to receive a royalty distribution under this subpart, the Collective shall retain the

required payment in a segregated trust account for a period of 3 years from the date of distribution. No claim to such distribution shall be valid after the expiration of the 3-year period. After expiration of this period, the Collective ~~may apply the~~ must handle unclaimed funds ~~to offset any costs deductible under 17 U.S.C. 114(g)(3). The foregoing shall apply notwithstanding the~~ in accordance with applicable federal, state and common law~~or statutes of any State~~.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of **DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)**	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

INDEX OF SIRIUS XM RADIO INC'S REBUTTAL WITNESS TESTIMONY

Witness	**Title**
Carl Shapiro	Transamerica Professor of Business Strategy, Hass School of Business, University of California at Berkley.
Joseph Farrell	Professor of Economics at the University of California, Berkeley and Partner with Bates White, LLC.
John Hauser	Kirin Professor of Marketing at Massachusetts Institute of Technology.
David J. Frear	Executive Vice President and Chief Financial Officer of Sirius XM Radio Inc.
Thomas D. Barry	Senior Vice President and Controller of Sirius XM Radio Inc.
Designated Witnesses from *SDARS I* (Docket 2006-1)	
John Hauser	Kirin Professor of Marketing at Massachusetts Institute of Technology.
Designated Witnesses from *SDARS II* (Docket 2011-1)	
John Hauser	Kirin Professor of Marketing at Massachusetts Institute of Technology.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

INDEX OF SIRIUS XM RADIO INC'S REBUTTAL EXHIBITS

Exhibit No.	Sponsoring Witness	Description	Bates No.
SXM Reb. Ex. 1	Carl Shapiro	Universal Music Group's White Paper Concerning Proposed Acquisition and Merger Guidelines, dated July 23, 2012.	SoundX_000072896-960
SXM Reb. Ex. 2	Carl Shapiro	Letter from Glenn D. Pomerantz to Robert Tovsky, Federal Trade Commission, Concerning Vivendi S.A.'s Proposed Acquisition of the Recorded Music Group of EMI Group Global, Ltd., dated June 22, 2012.	SoundX_000072627-55
SXM Reb. Ex. 3	Carl Shapiro	Presentation to the Federal Trade Commission, titled "Proposed Acquisition by UMG of EMI's Recorded Music Business," dated May 10, 2012.	SoundX_000072756-99

Before the
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Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION AND CERTIFICATION OF TODD D. LARSON
(On behalf of Sirius XM Radio Inc.)

1. I am counsel for Sirius XM Radio Inc. ("Sirius XM" or the "Company") in the above-captioned case. I respectfully submit this declaration and certification pursuant to 37 C.F.R. § 350.4(e)(1) and the terms of the Protective Order issued June 15, 2016 ("Protective Order"). I am authorized by Sirius XM to submit this Declaration on Sirius XM's behalf.

2. I and/or attorneys under my supervision have reviewed the Introductory Memorandum to the Written Rebuttal Statement of Sirius XM, Sirius XM's witnesses' written rebuttal testimony, exhibits and appendices, and the Redaction Log submitted in this proceeding. I have also reviewed the definitions and terms provided in the Protective Order. After consultation with my client, I have determined to the best of my knowledge, information, and belief that portions of these materials contain "confidential information" as defined by the Protective Order ("Protected Material"). The Protected Material is identified in the Redaction Log, shaded in the printed copies of Sirius XM's filing, and described in more detail below.

3. Such Protected Material includes, but is not limited to, testimony and exhibits involving (a) contracts, contractual terms, negotiations, and contract strategy that are proprietary, not available to the public, highly competitively sensitive and, at times, subject to express

confidentiality provisions with third parties; and (b) highly confidential internal business information, financial projections, financial data, and competitive strategy that are proprietary, not available to the public, and commercially sensitive.

4. If this contractual, strategic, negotiation, and financial information were to become public, it would place Sirius XM at a commercial and competitive disadvantage, unfairly advantage other parties to the detriment of Sirius XM, and jeopardize its business interests. Information related to confidential contracts or relationships with third-party content providers could be used by Sirius XM's terrestrial radio and Internet-based competitors, or by other content providers, to formulate rival bids, bid up Sirius XM payments, or otherwise unfairly jeopardize Sirius XM's commercial and competitive interests.

5. With respect to the financial information in the Protected Material, I understand that Sirius XM has not disclosed to the public or the investment community the financial information that it seeks to restrict here (including spending and investment projections, specific royalty payment information, and the like). As a result, neither the Company's competitors nor the investing public has been privy to that information, which the Company has viewed as highly confidential and sensitive, and has guarded closely. In addition, when Sirius XM does disclose information about the Company's finances to the market as required by law, the Company provides accompanying analysis and commentary that contextualizes disclosures by its officers. The information that Sirius XM seeks to restrict under the Protective Order, while truthful and accurate to the best of each witness's knowledge, was not intended for public release or prepared with that audience in mind, and therefore was not accompanied by the type of detailed explanation and context that usually accompanies such disclosures by a company officer. Moreover, the statements and exhibits containing the information have not been approved by

Sirius XM's Board of Directors, as such sensitive disclosures usually are, or accompanied by the typical disclaimers that usually accompany such disclosures. Sirius XM could experience negative market repercussions, competitive disadvantage, and even possible legal exposure were this confidential information released publicly without proper context or explanation.

6. Sirius XM has also marked certain additional material as Restricted where the material was so designated by SoundExchange, Inc. ("SoundExchange"), the American Association of Independent Music ("A2IM"), the Recording Industry Association of America ("RIAA"'), Sony Music Entertainment ("Sony"), Universal Music Group ("UMG"), Warner Music Group ("WMG"), the American Federation of Musicians ("AFM"), or the Screen Actors Guild and/or the American Federation of Television and Radio Artists ("SAG-AFTRA") (collectively, the "Copyright Owner Participants").

7. The introductory memorandum to the Written Rebuttal Statement of Sirius XM contains Protected Material concerning Sirius XM's payments to SoundExchange and its paid trial subscriptions.

8. The written rebuttal statement of Carl Shapiro, Transamerica Professor Business Strategy at the Haas School of Business at the University of California at Berkeley, contains Protected Material concerning terms of non-public contracts and negotiations as well as revenues and royalty payments relating to Sirius XM's direct licensing and OEM agreements. For the reasons discussed above, disclosure of the details of these contractual arrangements and negotiations and financial information would competitively disadvantage Sirius XM. Disclosure of the identities of certain third parties who communicated with Sirius XM with the understanding that the communications were private and confidential also could jeopardize the Company's relationships with them, thereby causing Sirius XM competitive harm. In addition,

Mr. Shapiro's testimony and three exhibits sponsored by Mr. Shapiro, SXM Reb. Exs. 1, 2, and 3, contain information designated as "Restricted" by the Copyright Owner Participants.

9. The written rebuttal statement of Joseph Farrell, Professor of Economics at the University of California, Berkeley and Partner at Bates White, LLC, contains Protected Material concerning Sirius XM's revenues, costs, and sound recording royalty payments. Mr. Farrell's testimony also contains Protected Material concerning experiment results that were designated as "Restricted" in the Web IV proceeding.

10. The written rebuttal statement of John Hauser, Kirin Professor of Marketing at Massachusetts Institute of Technology, contains Protected Material concerning internal surveys conducted by Sirius XM.

11. The written rebuttal statement of David J. Frear, Executive Vice President and Chief Financial Officer of Sirius XM, contains Protected Material concerning Sirius XM's partnerships with original equipment manufacturers and auto dealers as well as Sirius XM's trial subscription expenses, revenues, and conversion rates. Mr. Frear's testimony also contains Protected Material concerning the terms of confidential license agreements and negotiations between Sirius XM and record companies.

12. The written rebuttal statement of Thomas D. Barry, Senior Vice President and Controller of Sirius XM, contains Protected Material concerning new product and service development by Sirius XM, Sirius XM's accounting and royalty payment methodologies, and expenses incurred and fees collected in connection with the SDARS service.

13. The contractual, commercial and financial information described in the paragraphs above and detailed on the accompanying Redaction Log must be treated as Restricted Protected Material to prevent business and competitive harm that would result from the

disclosure of such information while, at the same time, enabling Sirius XM to provide the Copyright Royalty Judges with the most complete record possible on which to base their determination in this proceeding.

Pursuant to 28 U.S.C. § 1746 and 37 C.F.R. § 350.4(e)(1), I hereby declare under the penalty of perjury that, to the best of my knowledge, information and belief, the foregoing is true and correct.

Dated: February 17, 2017
New York, NY

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Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of **DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)**	**Docket No. 16–CRB–0001–SR/PSSR (2018–2022)**

REDACTION LOG FOR THE
WRITTEN REBUTTAL STATEMENT OF SIRIUS XM RADIO INC.

Pursuant to the requirements of the Protective Order entered by the Judges on June 15, 2016, Sirius XM Radio Inc. ("Sirius XM") hereby submits the following list of redactions from its Written Rebuttal Statement filed February 17, 2017, and the undersigned certify, in compliance with 37 C.F.R. § 350.4 (e)(1), that the listed redacted materials meet the definition of "Restricted" contained in the Protective Order.

Document	Page/Paragraph/Exhibit No.	General Description
Introductory Memorandum to the Written Rebuttal Statement of Sirius XM Radio Inc.	Page 1, Line 11	Contains material non-public financial information concerning the impact SoundExchange's proposal would have on Sirius XM.

	Page 13, Line 16	Contains material non-public information concerning the percent of Sirius XM trials that are paid for by auto manufacturers.
Written Rebuttal Testimony of Carl Shapiro	Page 1	Reflects material non-public financial information concerning Sirius XM's revenue and royalty rates.
	Page 2	Reflects material non-public information concerning Sirius XM's effective per-subscriber royalty rate.
	Page 2, Footnote 4	Reflects material non-public financial information concerning Sirius XM's revenue and royalty rates.
	Page 4	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 6, Footnote 9	Reflects material non-public information derived from Sirius XM's direct licenses and royalties.
	Page 8	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 8, Footnote 16	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 8, Footnote 18	Reflects information designated as "Restricted" by the Copyright Owner Participants.

	Page 8, Footnote 19	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 9, Lines 1-18	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 9, Lines 30-34	Reflects information designated as "Restricted" in the Web IV proceeding.
	Page 10, Lines 1-2	Reflects information designated as "Restricted" in the Web IV proceeding.
	Page 10, Lines 15-32	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 11	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 13, Footnote 40	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 14, Footnote 47	Contains material non-public proprietary information from internal surveys conducted by Sirius XM.
	Page 16, Footnote 55	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 18	Reflects material non-public financial information concerning Sirius XM's average revenue per user and royalty rates.

	Page 20	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 20, Footnote 71	Contains material non-public information concerning Sirius XM's number of performances per subscription per month.
	Page 21	Contains material non-public information concerning the ratio of average performances on Sirius XM versus the benchmark interactive services.
	Page 23, Footnote 79	Contains material non-public information concerning Sirius XM's average revenue per user for self-pay subscriptions.
	Page 25	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 25, Table 1	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 27	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 27, Footnote 88	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 29, Figure 1	Reflects information designated as "Restricted" by the Copyright Owner Participants.

	Page 32, Table 2	Contains material, non-public information concerning compensation paid by Sirius XM to creators of sound recordings, as well as information designated as "Restricted" by the Copyright Owner Participants.
	Page 39	Contains material, non-public information concerning Sirius XM's direct license royalty rates.
	Page 39, Footnote 116	Contains material, non-public information concerning Sirius XM's direct license royalty rates.
	Page 41	Reflects information designated as "Restricted" in the Web IV proceeding.
	Page 42, Figure 2	Contains material, non-public information concerning Sirius XM's direct license royalty payments.
	Page 42, Lines 1-2	Contains material, non-public information concerning Sirius XM's direct license royalty payments.
	Page 42, Footnote 129	Contains material, non-public information concerning Sirius XM's direct license agreements with record companies.
	Page 43	Contains material, non-public information concerning record labels' performances and royalty payments under Sirius XM direct license methodology.
	Page 44, Lines 2-3	Contains material, non-public information concerning record labels' performances and royalty payments under Sirius XM direct license methodology.

	Page 44, Figure 3	Contains material, non-public information concerning record labels' performance under Sirius XM direct license methodology
	Page 44	Contains material, non-public information concerning Sirius XM's royalty payments to direct licensors.
	Page 44, Lines 10 and 12	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 45	Contains material, non-public information concerning Sirius XM direct licensors' royalty payments.
	Page 47	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 48, Lines 9-16	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 48, Line 23	Contains material non-public information concerning the terms of direct license agreements between Sirius XM and record companies.
	Page 48, Footnote 150	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 49	Contains material non-public information concerning the terms of direct license agreements between Sirius XM and record companies.
	Page 52	Contains material non-public information concerning Sirius XM's non-music content costs.

	Page 53, Figure 4	Contains material non-public information concerning Sirius XM's non-music content costs.
	Page 56, Footnote 174	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 56, Footnote 175	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix B, Page B-6, Table B-1	Contains material, non-public information concerning compensation paid by Sirius XM to creators of sound recordings, as well as information designated as "Restricted" by the Copyright Owner Participants.
	Appendix C, Page C-1	Contains material, non-public information concerning Sirius XM's ARPU per subscriber per month.
	Appendix C, Page C-1, Footnote 2	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix C, Page C-2, Line 3	Contains material, non-public information concerning the number of Sirius XM subscribers.
	Appendix C, Page C-2, Lines 7-10	Contains material, non-public information concerning a record company's share of royalties for performances on Sirius XM.
	Appendix C, Page C-2, Footnote 2	Contains material, non-public information concerning Sirius XM's projected ARPU per subscriber.

	Appendix C, Page C-3	Contains material, non-public information concerning a record company's share of performances on Sirius XM.
	Appendix C, Page C-4, Lines 17, 26-27	Contains material, non-public information concerning a record company's share of performances on Sirius XM.
	Appendix C, Page C-4, Lines 18, 24-25	Contains material, non-public information concerning the number of Sirius XM subscribers.
	Appendix C, Page C-6, Line 6	Contains material, non-public information concerning Sirius XM royalty payments to a record company.
	Appendix C, Page C-6, Line 21	Contains material, non-public information concerning a record company's share of performances on Sirius XM.
	Appendix C, Page C-6, Line 22	Contains material, non-public information concerning the number of Sirius XM subscribers.
	Appendix C, Page C-7, Lines 17-18	Contains material, non-public information concerning a record company's revenues from Sirius XM.
	Appendix C, Page C-7, Line 24	Contains material, non-public information concerning the number of Sirius XM subscribers.
	Appendix C, Page C-7, Line 31	Contains material, non-public information concerning a record company's share of recorded music on Sirius XM.
	Appendix C, Page C-9, Table C-1	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-10, Table C-2	Contains material, non-public information concerning a record company's share of performances on and revenues

		received from Sirius XM.
	Appendix C, Page C-11, Table C-3	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-12, Table C-4	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-13, Table C-5	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-14, Table C-6	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-15, Table C-7	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix C, Page C-16, Table C-8	Contains material, non-public information concerning a record company's share of performances on and revenues received from Sirius XM.
	Appendix E, Page E-1, Footnote 2	Contains material, non-public information concerning Sirius XM's ARPU per month. for paid trial subscriptions.
	Appendix E, Page E-3, Table E-1	Reflects material, non-public information concerning royalty payments made by Sirius XM by type of subscriber.

	Appendix E, Page E-3	Reflects material, non-public information concerning the percentage of revenue per subscriber and monthly royalties paid by Sirius XM.
	Appendix E, Page E-3, Table E-2	Reflects material, non-public information concerning royalty payments made by Sirius XM by type of subscriber.
	Appendix E, Page E-4, Line 8	Reflects material, non-public information concerning royalty payments made by Sirius XM.
	Appendix E, Page E-4, Lines 11-13	Contains material, non-public information concerning Sirius XM's subscriber projections.
	Appendix E, Page E-4, Footnote 5	Contains material, non-public information concerning Sirius XM's subscriber projections.
	Appendix E, Page E-4, Footnote 6	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix E, Page E-7	Contains material, non-public information concerning Sirius XM's contribution margins.
	Appendix E, Page E-8, Line 34	Contains material, non-public information concerning a record company's share of plays on Sirius XM.
	Appendix E, Page E-8, Lines 35 and 37	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix E, Page E-9	Contains material, non-public information concerning record companies' share of plays and revenues per subscriber on Sirius XM.
	Appendix E, Page E-9, Footnote 13	Contains material, non-public information concerning a record company's share of plays and revenues per

		subscriber on Sirius XM.
	Appendix E, Page E-10	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix E, Page E-10, Footnote 20	Contains material, non-public information concerning the number of Sirius XM trial subscribers opted into email marketing communications.
	Appendix E, Page E-11	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix E, Page E-12, Footnote 25	Reflects information designated as "Restricted" by the Copyright Owner Participants.
Written Rebuttal Testimony of Joseph Farrell	Page 6, Paragraph 25	Contains material, non-public financial information concerning Sirius XM's revenue.
	Page 6, Footnote 9	Contains material, non-public financial information concerning Sirius XM's revenue.
	Page 7, Paragraph 25	Contains material, non-public financial information concerning Sirius XM's revenue.
	Page 7, Paragraph 26	Reflects information designated as "Restricted" by the Copyright Owner Participants.

	Page 7, Footnote 10	Contains material, non-public financial information concerning Sirius XM's revenue and reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 20, Paragraph 66	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 20, Footnote 49	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 21, Table 2	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 26, Paragraph 89	Contains material, non-public financial information concerning Sirius XM's variable cost and revenue.
	Page 26, Footnote 59	Contains material, non-public financial information concerning Sirius XM's variable cost and revenue.
	Page 26, Footnote 60	Contains material, non-public financial information concerning Sirius XM's revenue.
	Page 27, Paragraph 91	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Page 27, Footnote 64	Reflects information designated as "Restricted" by the Copyright Owner Participants.

	Appendix E, Pages E-8–E-9	Reflects information designated as "Restricted" in the Web IV proceeding.
	Appendix E, Pages E-9–E-10	Reflects information designated as "Restricted" by the Copyright Owner Participants.
	Appendix F, Page F-3	Reflects information designated as "Restricted" by the Copyright Owner Participants.
Written Rebuttal Testimony of John Hauser	Page 10, Paragraph 29	Contains material, non-public information concerning the percentages of Sirius XM subscribers who were billed monthly and annually, respectively.
	Page 13, Paragraph 39	Contains material, non-public information concerning the percentage of Sirius XM listeners aged 55 or above.
Written Rebuttal Testimony of David J. Frear	Page 2, Paragraph 4	Contains material non-public information concerning Sirius XM's trial subscriptions.
	Page 3, Paragraph 5	Contains material non-public information concerning a direct license between Sirius XM and a record company.
	Page 4, Footnote 3	Reflects material non-public financial information regarding Sirius XM's revenues.
	Page 6, Paragraph 11	Contains material non-public information regarding Sirius XM's trial subscription revenues and royalty payments.
	Page 6, Footnote 7	Contains material non-public proprietary information concerning Spotify revenues.

	Page 7, Paragraph 13	Contains material non-public information concerning Sirius XM's OEM subsidies, payments, and conversion rates.
	Page 9, Paragraph 16	Contains material non-public information concerning Sirius XM's email marketing to trial subscribers.
	Page 9, Footnote 13	Contains material non-public information concerning Sirius XM's email marketing to trial subscribers.
	Page 10, Paragraph 17	Contains material non-public information concerning expenses incurred by Sirius XM to convert trial subscribers to self-pay subscribers.
	Pages 11-12, Paragraph 22	Contains material non-public information concerning Sirius XM's royalty payments related to trial subscriptions.
	Page 12, Footnote 16	Contains material non-public information concerning Sirius XM's relationships with franchise auto dealers.
	Page 14, Paragraph 27	Contains material non-public information concerning a direct license between Sirius XM and a record company.
	Page 14-15, Paragraph 28	Contains material non-public information concerning a direct license between Sirius XM and a record company.
	Pages 15, Paragraph 29	Contains material non-public information concerning direct license between Sirius XM and a record company and the Flo & Eddie Settlement.

	Pages 15, Paragraph 30	Contains material non-public information concerning a direct license between Sirius XM and a record company.
Written Rebuttal Testimony of Thomas D. Barry	Page 7, Paragraph 16	Contains material, non-public information concerning Sirius XM's potential subscription offerings.
	Page 8, Paragraph 18	Contains material, non-public information concerning Sirius XM's new product, 360L.
	Page 9, Paragraph 19	Contains material, non-public information concerning Sirius XM's new product, 360L.
	Page 12, Paragraph 26	Contains material, non-public information concerning Sirius XM's accounting of sales and use taxes.
	Page 12, Paragraph 27	Contains material, non-public information concerning certain Gross Revenue exclusions.
	Page 13, Paragraph 28	Contains material, non-public information concerning credit card processing fees paid by Sirius XM.
	Page 13, Paragraph 29	Contains material, non-public information related to Sirius XM fees.
	Page 14, Paragraph 30	Contains material, non-public information concerning late fees charged by Sirius XM.
	Page 15, Paragraph 34	Contains material, non-public information concerning Sirius XM's sound recording royalty payment methodology.

	Page 19, Paragraph 43	Contains material, non-public information concerning Sirius XM's new product, 360L.
Exhibits	SXM Reb. Ex. 1	Contains information designated as "Restricted" by the Copyright Owner Participants.
	SXM Reb. Ex. 2	Contains information designated as "Restricted" by the Copyright Owner Participants.
	SXM Reb. Ex. 3	Contains information designated as "Restricted" by the Copyright Owner Participants.

CERTIFICATE OF SERVICE

I hereby certify that on February 17, 2017, I caused a copy of the PUBLIC version of Sirius XM Radio Inc.'s Written Rebuttal Statement to be served by email and overnight courier to the participants listed below:

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PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In re	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

WRITTEN REBUTTAL TESTIMONY OF CARL SHAPIRO

(On behalf of Sirius XM Radio Inc.)

17 February 2017

Table of Contents

1. Qualifications and Assignment 1

2. Overview of Testimony 1

A. SoundExchange's "Greater-Of" Rate Proposal 2

B. Written Direct Testimony of Mr. Orszag 3

C. Written Direct Testimony of Professor Willig 4

1. Impact of Sirius XM on Other Record Company Revenue 4
2. Record-Company Opportunity Cost of Performances on Sirius XM 4

D. Written Direct Testimony of Professor Lys 5

3. Mr. Orszag's Analysis Using the Interactive Services Benchmark 6

A. Severe Problems with the Interactive Services Benchmark 6

1. Complementary Oligopoly 7
2. Complete Lack of Price Competition 9
3. Anti-Steering Provisions 10
4. Summary 11

B. Mr. Orszag's Mistaken Reliance on the Web IV Decision and Its Limited Endorsement of "Ratio Equivalency" 11

1. The Judges Conception and Application of "Ratio Equivalency" in Web IV 12
2. "Ratio Equivalency" Does Not Apply to Sirius XM and Interactive Services 13
3. How the Judges Used "Ratio Equivalency" in Web IV 15
4. Applying "Ratio Equivalency" the Same Way to Sirius XM 16
5. How Mr. Orszag Departed from the Approach Taken in Web IV 18

C. Additional Flaws in Mr. Orszag's Calculations 18

1. Share of Sirius XM Revenue Attributable to Recorded Music 19
2. Number of Performances Per Subscription Per Month 20
3. Downstream Elasticities of Demand 21

D. The Continuing Need for a Steering Adjustment 23

E. Interactive Services Benchmark: Summary 26

4. The Impact of Sirius XM on Record Company Revenue 26

A. The Impact of Sirius XM on Paid Downloads..... 27

1. Professor Willig's Regression Analysis..... 27
2. Corrected Regression Analysis..... 30

B. Impact of Sirius XM on Interactive Services..... 33

C. Summary..... 33

5. A Record Company's Opportunity Cost of Plays on Sirius XM.....34

A. Professor Willig Rules Out Steering and Ignores Workable Competition..... 34

B. The Opportunity Cost to a Record Company of More Plays on Sirius XM..... 35

C. Survey Results 37

D. Promotional Effects 38

6. Using the Sirius XM Direct Licenses as a Benchmark.....39

A. Royalty Rates in the Direct Licenses Closely Track the Statutory Rate 39

B. The Direct Licenses Cover a Meaningful Share of Music on Sirius XM..... 40

C. Over-Indexing and Under-Indexing of Directly-Licensed Labels..... 42

1. Professor Lys's Analysis of Over-Indexing..... 43
2. A More Complete Analysis of Over-Indexing and Under-Indexing..... 43
3. Implications for the Direct License Benchmark 45

D. Other Benefits of Direct Licenses Raised by Professor Lys..... 46

1. The Share of Royalties Retained by the Label 46
2. Royalties for Pre-1972 Sound Recordings..... 48

7. Sirius XM's Overall Profitability 49

A. The Role of Profitability in a Bargaining Context..... 51

B. Empirical Evidence Regarding Content Providers and Sirius XM..... 52

8. The Treatment of Sirius XM Trial Subscriptions 53

A. Paid Trials..... 54

B. Unpaid Trials 55

1. Qualifications and Assignment

My name is Carl Shapiro. My qualifications are provided in my Written Direct Testimony submitted previously in this proceeding on behalf of Sirius XM.[1]

I have been asked by attorneys for Sirius XM to review and, where appropriate, respond to the testimony of certain of the witnesses put forth by SoundExchange in this proceeding, including Professor Robert Willig, Mr. Jonathan Orszag, Dr. George Ford, Professor Thomas Lys, Professor Ravi Dhar, and certain fact witnesses. I also have been asked to respond to the fee proposal put forward by SoundExchange.

In undertaking this assignment, I have reviewed the Written Direct Testimony of Professor Ravi Dhar, Dr. George Ford, Professor Thomas Lys, Mr. Jonathan Orszag, Professor Robert Willig, and other SoundExchange witnesses. I have also reviewed the transcript of the deposition of Mr. Orszag. I also have reviewed documents that have been produced in discovery. Appendix A lists the documents that I have relied upon for this Written Rebuttal Testimony.

This Written Rebuttal Testimony contains my conclusions to date as to the appropriateness of the rates proposed by SoundExchange and my analysis of the arguments and analyses put forth by SoundExchange in support of its rate proposal. I reserve the right to alter my analyses and conclusions based on evidence and analyses that become available to me at a later date.

2. Overview of Testimony

In my Written Direct Testimony, I concluded that a reasonable royalty rate for Sirius XM should be toward the lower end of the range of 8.1 to 11.0 percent of revenue. The lower end of this range is derived from the market benchmarks used in the *Web IV* proceeding. Using those benchmarks, I calculated a royalty rate for Sirius XM of $1.032 per subscriber per month in 2016.[2] Using a 2016 average revenue per user (ARPU) for 2016 of $12.80, this corresponds to a royalty rate of 8.1 percent of revenue. As I indicated in my deposition, if the Judges select a royalty base that is smaller than $12.80 per month, a higher percentage-of-revenue rate should be applied.[3] For example, if the royalty base selected by the Judges is closer to the [redacted] per subscriber per month figure used by Mr. Orszag, then my $1.032 per subscriber per month will correspond to a royalty rate of up to [redacted] of revenue.

I explained in my Written Direct Testimony why market conditions over the past several years do not support adopting a percentage-of-revenue rate for the 2018-2022 period that is higher than the 11.0 percentage-of-revenue statutory rate applicable in 2017. Indeed, to the extent market conditions have changed, they support a percentage-of-revenue rate that is lower than 11.0 percent, which is the upper end of my range of reasonable rates.

Under my preferred approach for calculating a rate for Sirius XM (which is based on the *Web IV* subscription non-interactive service rate), Sirius XM would pay royalties that, when expressed on a per-performance basis, amount to $0.0022 per performance in 2016, the same rate that the

[1] Written Direct Testimony of Carl Shapiro, October 19, 2016.

[2] Written Direct Testimony of Carl Shapiro at p. 54.

[3] Deposition of Carl Shapiro, December 16, 2016 (Shapiro Deposition) at 101-105.

Judges set for subscription webcasters in *Web IV*. I explained in my Written Direct Testimony why it would be inappropriate for the effective per-performance fee paid by Sirius XM to exceed that of subscription webcasters.

SoundExchange, on the other hand, as supported by its expert economists, proposes a royalty rate that is dramatically higher than (i) the rates set by the Judges in *SDARS II* – the prior proceeding in which the Judges evaluated this very marketplace, and (ii) the rates set by the Judges in *Web IV* – a more recent Determination in which they evaluated a different but related upstream market. In particular, SoundExchange proposes that Sirius XM pay the greater of (a) 23% of revenues; and (b) an escalating per-subscriber rate that ranges from $2.48 per month in 2018 to $2.79 per month by 2022. By way of comparison, the effective per-subscriber rate paid by Sirius XM today is [redacted] per month.[4]

The fundamental issue that this Written Rebuttal Testimony addresses is which approach – mine or that taken by SoundExchange's experts – yields reasonable royalty rates that more closely approximate the outcome called for by the 801(b)(1) policy objectives. As I summarize here, and as I discuss in greater detail throughout this testimony, (1) SoundExchange's experts have made fundamental errors that render their analyses invalid and uninformative for the rate-setting task at hand, and (2) SoundExchange's experts have not pointed to anything in their Written Direct Testimony that calls into question my own analyses. As a result, it remains my view that a reasonable royalty for Sirius XM should be no higher than 11.0 percent of revenue. My best estimate of the rate that Sirius XM should pay, when expressed on a per-subscriber basis, is $1.032 per subscriber per month in 2016.

A. SoundExchange's "Greater-Of" Rate Proposal

Not only has SoundExchange proposed a dramatic (and, as I show, unwarranted) increase over the rates currently in place; it also has proposed a change to the prevailing rate structure, which has been in place for the duration of both prior litigated SDARS license periods and was advocated for by both parties in the *SDARS II* proceeding. In place of the existing percentage-of-revenue structure, SoundExchange proposes a "greater-of" rate formula that shifts the risk-sharing as between Sirius XM and SoundExchange asymmetrically in SoundExchange's favor. SoundExchange's rate proposal would have Sirius XM bear all of the risk of a decline in Sirius XM's revenue per subscriber (leaving the record industry fully protected from this risk) while, at the same time, allowing SoundExchange to share in any upside should Sirius XM's revenue per subscriber grow.

SoundExchange has presented no sound economic rationale that would justify such a change from past practice. In fact, its own economic expert, Mr. Orszag, appears not to support such a fee structure. At his recent deposition, Mr. Orszag stated his view that Sirius XM should pay *either* a percentage-of-revenue rate or a per-subscriber rate, not the greater of those two metrics.[5]

To support the rate levels it seeks, SoundExchange relies on the testimony of Mr. Orszag, Professor Willig, and Professor Lys. I address the testimony of each of these expert economic

[4] This figure is equal to Mr. Orszag's royalty-base ARPU of [redacted] per month times the 2017 statutory rate, which is 11 percent of revenue.

[5] Deposition of Jonathan Orszag, January 17, 2017 (Orszag Deposition) at 130:3-19.

witnesses in turn, exposing what I believe to be their fundamental analytic flaws. From such analysis I have concluded that their testimony does not support the rates sought by SoundExchange.

B. Written Direct Testimony of Mr. Orszag

From his modes of analysis, Mr. Orszag concludes that it would be reasonable to *more than double* the rate currently paid by Sirius XM. More specifically, Mr. Orszag proposes that Sirius XM pay either $2.37 to $2.58 per subscription per month or between 22.12% and 24.08% of its revenue.[6] These rates are dramatically higher than the rates established by the Judges for the very same service under the very same governing standards in the *SDARS II* proceeding. They correspond to a per-performance rate of $0.0051 to $0.0055, which is about 2.5 times higher than the per-performance rate that the Judges more recently adopted for subscription webcasters in *Web IV*. Mr. Orszag's rate of $2.37 per subscription per month is twice as large as what Sirius XM is currently paying for recorded music under the statutory rate, which is $1.18 per subscription per month.

The rates produced from Mr. Orszag's analysis are perplexing.

First, as noted, while Mr. Orszag purports to establish rate equivalency for Sirius XM to the rates the Judges prescribed for subscription webcasters in the *Web IV* proceeding, he accomplishes nothing of the kind. As just noted, his rates are more than double the rates set by the Judges in *Web IV*. As I demonstrate, this anomalous result is explained by Mr. Orszag's adoption of a mode of analysis that is flatly inconsistent with that utilized by the Judges in setting rates for subscription webcasters in the *Web IV* proceeding.

Second, Mr. Orszag fails to explain why Sirius XM should be paying percentage-of-revenue or per-subscriber rates more than twice as high as it is currently paying pursuant to the Judges' *SDARS II* determination. Mr. Orszag is unable to identify any factors that have changed over the past several years that would warrant such an sharp increase in rates.[7]

As I address in depth in Section 3 below, there are two central reasons why Mr. Orszag's approach to rate-setting is flawed and unreliable.

First, Mr. Orszag bases his proposal on the concept of "ratio equivalency," as applied between Sirius XM and interactive subscription services, which (in common with the economic arguments presented by SoundExchange in the *SDARS II* proceeding) serve as his benchmark. He relies heavily on the *Web IV* determination for his use of "ratio equivalency." However, as discussed in Section 3.B below, the conditions identified by the Judges in *Web IV* under which the concept of "ratio equivalency" has rate-setting applicability clearly do not hold, even approximately, when applied as between Sirius XM and interactive subscription services. Specifically, in *Web IV*, the Judges applied "ratio equivalency" in a limited manner as between two species of webcasters. Mr. Orszag's attempt to carry over that concept by calibrating rates as between Sirius XM and interactive subscription services, which are quite different in numerous respects, including the content they offer and their cost structures, both misapplies the framework established by the Judges in *Web IV* and fails as matter of basic economics.

[6] Amended Written Direct Testimony of Jonathan Orszag at ¶10.

[7] Orszag Deposition at 61-65.

Second, however inappropriately, in my view, if one were to apply the concept of "ratio equivalency" as between Sirius XM and interactive subscription services in a manner faithful to the Judges' methodology in *Web IV*, while also making the necessary adjustments to account for the fact that Sirius XM's service offering embraces very different functionality (with resulting supporting costs), one obtains rates very similar to those that I have proposed, not the much higher rates proposed by Mr. Orszag. In Sections 3.C, 3.D, and 3.E, I explain the bases for these conclusions.

C. Written Direct Testimony of Professor Willig

Professor Willig also presents an analysis that purports to support SoundExchange's rate proposal. He begins his analysis by attempting to show that Sirius XM has cannibalized download sales, and, more generally, that by licensing to Sirius XM, the record labels have lost substantial revenue from other revenue-generating sources, notably, subscription interactive services. Taking this lost revenue – what he terms the opportunity cost of licensing to Sirius XM – as a starting point, Professor Willig concludes that a royalty for Sirius XM must, in his view, be no less than $2.55 per subscriber per month, and more appropriately should be between $3.94 and [redacted] per subscriber per month. Professor Willig's entire analysis that leads to these rates – rates that are dramatically higher even than those put forward by Mr. Orszag – is fundamentally flawed and is largely irrelevant to the rate-setting task at hand.

1. Impact of Sirius XM on Other Record Company Revenue

Professor Willig first attempts to show that the growth of "streaming" from 2010 to 2016 has had a substantial negative impact on other revenue earned by the record industry. He bases this conclusion on certain regressions that he has run. In Section 4 of this Written Rebuttal Testimony, and in greater detail in Appendix B, I address this part of Professor Willig's Written Direct Testimony.

In Section 4.A, I show that Professor Willig made a major error in his regression analysis relating the growth of "streaming" to record company revenue from paid downloads. His error was to lump together Sirius XM, non-interactive services, and interactive services, and treat them as a collective group of "streaming" services. Correcting that error by separating out the three types of services dramatically reverses Professor Willig's conclusions. According to Professor Willig's own methodology, Sirius XM has been strongly *promotional* of paid downloads while interactive services have been strongly substitutional for paid downloads.

In Section 4.B, I show that Professor Willig's assertion that Sirius XM has had a negative impact on record company revenue from interactive services is unreliable. By modifying his regression to account for the entry of Spotify into the U.S. market, Professor Willig's results are reversed.

2. Record-Company Opportunity Cost of Performances on Sirius XM

Professor Willig next attempts to estimate the opportunity cost to the record industry of licensing to Sirius XM. He concludes that this cost is $2.55 per subscriber per month, and places great significance on this figure.

In Section 5, I show that Professor Willig has vastly over-estimated the opportunity cost to a record company of having its music performed on Sirius XM. Most fundamentally, Professor

Willig is asking the wrong question. His analysis is constructed to calculate the opportunity cost *to the entire recording industry* of licensing Sirius XM, rather than the opportunity cost of *a particular record label*. This flaw alone renders his entire analysis irrelevant, since the proper focus is on the seller in the hypothetical negotiation with Sirius XM, which is a single record company, not a cartel of all record companies.

As I demonstrate in Section 5.B and in greater detail in Appendix C, when Professor Willig's analysis is corrected and when the correct question is asked – what is the opportunity cost to an individual label of licensing Sirius XM – the results are dramatically different. As I demonstrate, when properly analyzed, the opportunity cost to a label of licensing Sirius XM is well below the rates that I conclude are reasonable. Furthermore, Professor Willig has simply ruled out promotional effects from Sirius XM, which causes him to further over-estimate opportunity cost. This omission further invalidates his claim that record companies are not being properly compensated for making their music available on Sirius XM.

D. Written Direct Testimony of Professor Lys

SoundExchange also presents the testimony of an accounting expert, Professor Thomas Lys. Broadly speaking, Professor Lys' testimony covers two topics: (1) the recent financial performance of Sirius XM, and (2) the direct licenses that Sirius XM has entered into with independent record labels. I also discuss these direct licenses in my own Written Direct Testimony.

As I demonstrate in Section 7, while quite detailed and lengthy, Professor Lys' analysis of Sirius XM's overall profitability is entirely irrelevant to the rate-setting task at hand. Simply put, the overall profitability of Sirius XM, both as a matter of economic theory and as supported by the available empirical evidence, is not a factor that is relevant to the determination of what rates would prevail between a willing buyer and a willing seller in an effectively competitive market in the absence of a statutory license. The one metric that Professor Lys discusses that *is* relevant for rate-setting – Sirius XM's contribution margin – has, as Professor Lys notes, been remarkably constant over time. Accordingly, to the extent that Professor Lys' analysis of Sirius XM's financials is at all relevant, it points to maintaining the current rates paid by Sirius XM, and in no way supports the dramatic increase in rates that SoundExchange is seeking.

With respect to the licenses entered into between Sirius XM and independent record labels, Professor Lys and I are in agreement on many of the factors that one must consider when attempting to evaluate whether the direct licenses are informative for the rate-setting task at hand. Where we disagree is with respect to the ultimate conclusion that one should draw from the direct licensing evidence. Perhaps most critical is the different conclusion that we draw from the fact that the rates in the Sirius XM direct licenses closely track the statutory rate over time. From this, Professor Lys concludes that these direct licenses are entirely uninformative. As I discuss in Section 6.A, I very much disagree. As I discuss there (and as I discussed in detail in my Written Direct Testimony), the statutory rate serves as a magnet, pulling up the rates in the direct licenses toward the statutory rate. As a result, in cases where the direct licensee has offered a discount below the statutory rate at least in part to induce Sirius XM to rely more heavily on its sound recordings, the correct economic interpretation of this "magnet" effect is that the rates contained in the direct licenses are at or above the true competitive rate. Professor Lys does not address this point, likely because his economic model does not make any

distinction between a record company discounting below the statutory rate to have its music played more, in which case the royalty rate in the direct license rate is highly informative, as opposed to offering a discount so as to receive other benefits, in which case it is not.

In Sections 6.C and 6.D, I discuss the reasons, other than the prospect of more plays, that might have induced certain record labels to entered into direct licenses. As I show there, Professor Lys' analysis does not rebut the analysis that I put forward in my Written Direct Testimony. In short, Professor Lys has not undermined my use of the direct licenses as benchmarks for rate-setting in this proceeding.

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The remainder of this Written Rebuttal Testimony discusses the bases for these conclusions at greater length.

3. Mr. Orszag's Analysis Using the Interactive Services Benchmark

The benchmark used by Mr. Orszag in his Written Direct Testimony to derive a rate proposal in this proceeding – like that used by Professor Ordover on behalf of SoundExchange in the prior *SDARS* proceeding – is a set of contracts between subscription interactive service providers and major record labels. Mr. Orszag states: "I conclude that interactive subscription services represent the most reasonable and appropriate benchmark for establishing the royalty rate that Sirius XM should pay for access to digital sound recordings."[8] In this section, I evaluate Mr. Orszag's use of the interactive services benchmark and the rates he concludes are reasonable based on that benchmark.

A. Severe Problems with the Interactive Services Benchmark

Mr. Orszag uses the subscription interactive services benchmark despite serious problems with that benchmark that the Judges identified in the *SDARS II* proceeding and in the *Web IV* proceeding. Mr. Orszag greatly downplays these problems, which continue to plague the interactive services benchmark.

As an initial matter, the two approaches taken by Mr. Orszag to derive a rate from the interactive services benchmark are, with one exception, identical to the approaches taken by Professor Ordover on behalf of SoundExchange in *SDARS II*, both of which were rejected by the Judges.[9] In Mr. Orszag's first and preferred approach, he simply takes the effective percentage of revenue paid by subscription interactive services and cuts it in half, to account (in his view) for the fact that Sirius XM offers both music and non-music content. This approach, when undertaken by Professor Ordover in *SDARS II*, was rejected by the Judges.[10] Ultimately, the Judges concluded

[8] Amended Written Direct Testimony of Jonathan Orszag at ¶9.

[9] The one exception is that Mr. Orszag applies a [redacted] downward adjustment to the rates he derives using Professor Ordover's approaches. However, he only does so "subject to the caveat that [he] may propose a smaller (or no) adjustment in the future if newly available data and other evidentiary evidence so justify." Amended Written Direct Testimony of Jonathan Orszag, ¶ 68.

[10] *SDARS II* at 23065 ("the Judges do not find that the market for interactive subscription streaming services as characterized by Dr. Ordover in this proceeding offers a foundation to support a comparable benchmark from which to begin an analysis of reasonable rates for SDARS for the upcoming license period."); *id*. at 23066 ("The yawning

"that the rates Dr. Ordover calculated based on his proposed principal benchmark…are so much higher than the current statutory rate that they are outside the zone of reasonableness."[11]

Mr. Orszag's second approach, in which he applies the same effective percentage of revenue paid by subscription interactive services to the average retail price of a collection of services that he characterizes as non-interactive, is also identical to an approach taken by Professor Ordover in *SDARS II*. While the Judges "found [that] effort to be somewhat more pertinent" than the first approach taken by Mr. Orszag here and Professor Ordover there, the Judges ultimately found "that the differences between Sirius XM and the 'buyers' in the proposed benchmark severely constrain the usefulness of the proposed Ordover benchmark."[12] The rate derived from this second approach, when undertaken by Professor Ordover, was viewed by the Judges in *SDARS II* as being "no more than the upper bound of the zone of reasonableness" and a "bound that the Judges have little confidence in."[13] As I discuss in greater detail below, I agree with the Judges in *SDARS II* that the approaches taken by Professor Ordover there, and Mr. Orszag here, are fundamentally unsound and lead to greatly inflated royalty rates for Sirius XM. I further explain why Mr. Orszag's two approaches are inconsistent with what the Judges did in *Web IV*.

Mr. Orszag does acknowledge that in the *Web IV* proceeding the Judges concluded that the upstream market in which interactive services secure sound recording performance rights from record labels is not effectively competitive. However, Mr. Orszag appears to be of the view that this is no longer the case. As Mr. Orszag puts it: "I view the ultimate conclusion [reached by the Judges in *Web IV*] – an absence of effective competition in the interactive subscription marketplace – as undermined by the recent evolution of pertinent competitive dynamics in that marketplace."[14] However, the sole "competitive dynamic" that Mr. Orszag cites on this point is the use of service-generated playlists by interactive services.[15]

I address this specific claim of Mr. Orszag's in Section 3.D below. As I explain there, the use of playlists on interactive services, standing alone, is irrelevant to the question of whether the *prices* we observe in the interactive services market are at a level that would result from effective competition. Furthermore, as discussed below, Mr. Orszag neglects to mention that playlists are nothing new: interactive services offered playlists at the time of *Web IV* as well.

More fundamentally, Mr. Orszag never confronts the evidence demonstrating that the interactive services market is not workably competitive and is entirely devoid of pricing competition.

1. Complementary Oligopoly

The evidence shows clearly that the major interactive services "must have" the music of each major record company to be commercially viable. The repertoires of the major record companies are not substitutes for each other in the eyes of either interactive services or the record

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gap between the current rate of 8% and the highest rates proposed by Dr. Ordover raises additional concerns about the proposed Ordover benchmark.")

[11] *SDARS II* at 23066.

[12] *SDARS II* at 23065.

[13] *SDARS II* at 23066.

[14] Amended Written Direct Testimony of Jonathan Orszag at ¶74.

[15] Amended Written Direct Testimony of Jonathan Orszag at ¶¶74-75.

companies themselves. This means that there is no true "buyer choice" in the interactive services upstream market. Therefore, the market for licensing recorded music to interactive services is not workably competitive; it is more accurately described as one in which each of the major record companies has monopoly power. In *Web IV*, the Judges used the term "complementary oligopoly" to refer to this market structure.

[redacted][16]

[redacted][17]

Along similar lines, UMG noted:

[redacted][18]

Professor Daniel Rubinfeld – the economist retained by UMG to assist with the merger review and SoundExchange's principal expert economist in *Web IV* – made this same point to the FTC. In his presentation to the FTC, he stated that [redacted][19] He further stated of the major record companies: [redacted][20] He made the implications of this clear from a competition perspective: [redacted][21]

Similarly, Mr. Piibe of EMI testified:

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[16] In the FTC investigation of the UMG/EMI merger, the term "streaming services" was used to refer to interactive services. The term "online radio" was used to refer to statutory webcasters. This convention, which is different from the usage in the current proceeding, should be borne in mind when interpreting the documents from the merger review. I annotate some of the quotations from these documents to avoid confusion. UMG defines the term "streaming services" in its White Paper to the FTC this way: [redacted] This White Paper is attached hereto as SXM Reb. Ex. 1.

[17] SXM Reb. Ex. 1, SoundX_000072896 at 900-901.

[18] SoundX000072627, at 644 [redacted] This letter is attached hereto as SXM Reb Ex. 2.

[19] SoundX000072756, at 796 [redacted] This presentation is attached hereto as SXM Reb. Ex. 3.

[20] SXM Reb. Ex. 3, SoundX000072756, at 797.

[21] SXM Reb. Ex. 3, SoundX000072756, at 797.

[redacted][22]

[redacted][23]

A market with a complementary oligopoly, by definition, cannot be workably competitive.

2. Complete Lack of Price Competition

The interactive service upstream market is entirely devoid of price competition. This fact clearly tells us that the prices in that market are not at a level that would result from workable competition.

In a workably competitive market, one normally sees suppliers offering discounts to win the patronage of customers. Here, if the market for licensing recorded music to interactive services were workably competitive, I would expect to see record companies attempting to undercut the rates offered by their competitors in an effort to gain a greater share of the music played by those interactive services.

The testimony of record company executives in *Web IV* indicated that this behavior is absent from the market. [redacted][24]

[redacted][25]

[22] SXM Reb. Ex. 2, SoundX000072627 at 642-43 (footnote omitted).

[23] SXM Reb. Ex. 2, SoundX000072627, at 647 (footnote omitted).

[24] *Web IV* Harrison Deposition Testimony, p. 217.

[25] *Web IV* Harrison Deposition Testimony, p. 218.

[redacted][26]

Mr. Orszag has not provided any evidence that this practice has changed since the *Web IV* proceeding. In fact, despite having conversations with executives at the major labels that are directly involved in the negotiations with interactive services, he was unable to recall anyone saying that they have attempted to induce interactive services to rely more heavily on their sound recordings by reducing their price.[27] Furthermore, no fact witness testimony provided by SoundExchange at the direct phase of these proceedings is to the contrary.

3. Anti-Steering Provisions

The major record labels have included provisions in their license agreements with interactive services that explicitly prevent interactive services from steering towards a label that offers a lower price. Such provisions were discussed at some length by the Judges in *Web IV*.[28] These anti-steering provisions clearly impede price competition. These provision remain in force today. Here are a few examples.

- [redacted][29]
- [redacted][30]
- [redacted]

[26] *Web IV* Kooker Deposition Testimony, p. 64.

[27] Orszag Deposition at 279:14-282:16.

[28] See, e.g., *Web IV* at 26364-65 (noting that executives from each of the three major record labels acknowledged that "anti-steering provisions are commonly used in their agreements with on-demand services.").

[29] SoundX000065215, at 65236.

[30] SoundX_000012194, at 12207.

[redacted][31]

Mr. Orszag never acknowledges that these anti-steering provisions are in place. This is particularly surprising given that some of the agreements upon which he relies for benchmarking purposes have anti-steering provisions in them, including the three examples given above.

4. Summary

The evidence shows (1) that interactive services must have the repertoires of all the major record companies to be commercially viable, (2) that there is a complete lack of any price competition among the "must have" suppliers, and (3) that the major labels employ anti-steering provisions to contractually prevent price competition. As explained above, these facts alone imply that the market for the licensing of recorded music to interactive services is not workably competitive, and, critically, that the prices arising in that market do not reflect the forces of competition.

In fact, this evidence shows quite a bit more than that, when it comes to evaluating the usability of the interactive benchmark. As a general principle, industrial organization economics tells us that markets with multiple "must have" suppliers not only fail to be workably competitive, they are even worse for buyers than markets controlled by a single (monopoly) supplier.[32]

The fact that the royalties charged by the major record companies to interactive services *exceed* the royalties that would be charged by a *monopolist* is a very clear and strong indication that those royalty rates are far above the rates that would arise under workable competition. For this reason alone, the market for licensing recorded music to interactive services continues to be a very poor market to use as a source of benchmark agreements for services operating in distinct upstream markets, such as Sirius XM.

B. Mr. Orszag's Mistaken Reliance on the Web IV Decision and Its Limited Endorsement of "Ratio Equivalency"

Notwithstanding these fundamental limitations on relying upon the license experience of interactive subscription services, Mr. Orszag nevertheless proceeds to use those services as the basis for his fee proposal. He does so only by taking the following fallacious leap of logic: Since the Judges in *Web IV* found it relevant to setting fees for non-interactive subscription webcasters to examine *the minimum per-play prong* of the fees contracted to be paid by interactive subscription services, it must follow that the (wholly distinct) *percentages of revenue* contracted to be paid by interactive subscription services have direct relevance to the fees that ought to be paid by Sirius XM, since it, too, is a subscription service.

As I now proceed to describe, this attempted extrapolation from *Web IV* is unmoored from sound economics and is not grounded in the Judges' reasoning in the *Web IV* proceeding. The product of that effort is that Mr. Orszag replicates the methodology and resulting fees that Professor Ordover proposed five years ago on behalf of SoundExchange and were rejected by the Judges.

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[31] SoundX_000026724, at 26743.

[32] See, for example, Josh Lerner and Jean Tirole, "Efficient Patent Pools," 94 *American Economic Review* 691 (2004).

The key analytical construct utilized by Mr. Orszag to justify applying the interactive services benchmark to Sirius XM is what he refers to as "ratio equivalency." Mr. Orszag relies heavily on *Web IV* for his use of "ratio equivalency" and claims to be following the approach taken there by the Judges in applying it.[33] He is not. Whereas the Judges carefully defined the concept and the limited circumstances in which it might appropriately be applied in undertaking a benchmarking analysis, and in fact applied it in *Web IV* in a highly particularized manner based on the *Web IV* record, Mr. Orszag ignores all of that nuance and instead treats the concept of "ratio equivalency" as if it were presumptively applicable in a wide range of situations, including the present setting. I now explain at some length the numerous flaws in what represents the foundation of Mr. Orszag's entire benchmarking analysis.

1. The Judges Conception and Application of "Ratio Equivalency" in *Web IV*

To understand how Mr. Orszag has misapplied the concept of "ratio equivalency," it is necessary first to understand how the Judges defined and used this concept in *Web IV*. The context in which this arose was an analysis undertaken by SoundExchange's economist, Professor Rubinfeld, using the interactive service benchmark to derive its per-play proposal. Via this analysis, SoundExchange's attempted to engraft the same per-play fees that record labels had secured from subscription interactive services upon both non-subscription and subscription non-interactive webcasters. In response, the Judges placed sharp limits on the applicability of the per-play "ratio equivalency" concept proposed by SoundExchange. They indicated that the concept possesses a legitimate underlying economic rationale only if there is "a 1:1 'opportunity cost' for record companies, whereby, on the margin, a dollar of revenue spent on a subscription to a noninteractive service is a lost opportunity for royalties from a dollar to be spent on a subscription to an interactive service."[34]

Based on this rationale, the Judges reached the following conclusion regarding SoundExchange's use of the interactive services benchmark to derive its per-play proposal:

> "For these reasons, the Judges find that Dr. Rubinfeld's interactive benchmark is only applicable when
>
> - Revenues in both markets are derived from subscription revenues and are thus reflective of buyers with a positive WTP for streamed music;
> - functional convergence and downstream competition for potential listeners indicate a sufficiently high cross-elasticity of demand as between interactive and noninteractive services, provided the noninteractive subscription rate is reduced to reflect the absence of the added value of interactivity; and
> - a steering adjustment is made to eliminate the complementary oligopoly effect and thereby provide for an effectively competitive market price."[35]

The resulting "ratio equivalency" permitted to be established by the Judges (subject to further needed adjustments) represented the "equality between two ratios: (1) subscription revenues to

[33] Amended Written Direct Testimony of Jonathan Orszag at ¶37.

[34] *Web IV* at 26344-45.

[35] *Web IV* at 26353, footnote omitted.

royalties in the *interactive* market; and (2) subscription revenues to royalties in the *noninteractive* market."[36]

2. "Ratio Equivalency" Does Not Apply to Sirius XM and Interactive Services

Mr. Orszag's approach to rate-setting only has validity if the concept of "ratio equivalency," as developed and applied as described above, properly applies as between Sirius XM and interactive subscription services.[37] I now explain why it does not.

In line with the Judges' reasoning in *Web IV*, the economic rationale for applying "ratio equivalency" in the current proceeding would be present if one more dollar spent on a subscription to Sirius XM corresponded to one less dollar spent on interactive subscription services.[38] As the Judges stated, there must be *a high cross-elasticity of demand between Sirius XM and interactive services*.[39]

Mr. Orszag never makes the affirmative case that this condition holds.[40] Furthermore, we have clear empirical evidence that it does *not* hold. I address these points in turn.

Mr. Orszag Fails to Show a High Cross-Elasticity of Demand Between Sirius XM and Interactive Subscription Services

Mr. Orszag acknowledges the Judges' statement in *Web IV* that there must be a high cross-elasticity of demand between the benchmark service and the target service for "ratio equivalency" to hold. Regarding the interactive services and Sirius XM, he claims to have shown that "[t]he benchmark services and the target service are sufficient substitutes from a functional perspective to warrant analysis based on ratio equivalency."[41]

However, Mr. Orszag's supporting evidence for the proposition that Sirius XM and interactive subscription services are "sufficient substitutes" is very thin. In fact, looking closely, he only makes the far weaker assertion that Sirius XM and interactive services "offer competing functionalities."[42] In support of that assertion, which certainly does not imply a high cross-elasticity of demand, all that Mr. Orszag offers are citations to some documents indicating (a) that interactive services are used on mobile devices, (b) that subscribers to interactive services use playlists, (c) that some listening to non-interactive services and interactive services takes

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[36] *Web IV* at 26344, emphasis in original.

[37] Amended Written Direct Testimony of Jonathan Orszag at ¶37 ("Important to my analysis is the concept of 'ratio equivalency.'").

[38] *Web IV* at 26344-45.

[39] *Web IV* at 26353.

[40] Mr. Orszag's attempt to justify "ratio equivalency" by referencing the deals that [redacted] does not make up for this deficiency. Amended Written Direct Testimony of Jonathan Orszag at ¶38. Since [redacted] could avail themselves of the *Web IV* rates for their statutory services, any rates above the *Web IV* rates that they agreed to pay for their statutory services must be attributed to the non-statutory rights that they obtained in these deals. These deals thus provide one more data point indicating how much market power the major record companies have over interactive services. They are not informative about the willing buyer/willing seller rates for non-interactive services, much less for Sirius XM.

[41] Amended Written Direct Testimony of Jonathan Orszag at ¶40.

[42] Amended Written Direct Testimony of Jonathan Orszag at ¶39.

place in the car, and (d) that Sirius XM stated in a lawsuit against one of its former programmers that it competes directly with Spotify.[43]

Mr. Orszag provides no quantitative evidence regarding the cross-elasticity of demand between Sirius XM and interactive subscription services, and he certainly does not establish that one dollar more spent on a subscription to Sirius XM corresponds to one dollar less spent on interactive subscription services, or anything close to that.

The evidence offered by Mr. Orszag falls woefully short of establishing the high cross-elasticity of demand between Sirius XM and interactive subscription services that the Judges have stated is necessary for "ratio equivalency" to apply as between these two types of subscription services. To be clear, I am not disputing that Sirius XM competes against interactive subscription services *to some degree* – that is true of all music services. But that does not by any means establish the "high cross-elasticity of demand" required for "ratio equivalency" to be applicable.

Mr. Orszag's offers the tepid claim that "[b]oth the evidence and Sirius XM's own admission show that it competes with both interactive and noninteractive streaming services, demonstrating the requisite cross-elasticity of demand"[44] This assertion makes no economic sense. *Some* degree of competition is just not the same as a high cross-elasticity of demand. The Judges explicitly required more than "some" degree of competition, namely, a high cross-elasticity of demand between the two services. Mr. Orszag simply has not made the requisite showing. Certainly his assertion that Sirius XM is "similar" to interactive services because "both types of service offer mobile functionality, Sirius XM principally through in-vehicle receivers and interactive streaming through smartphones and other mobile devices" falls far short.[45]

Sirius XM and Interactive Services are Not Close Substitutes

Furthermore, and crucially, we have survey evidence showing that listening on Sirius XM mostly substitutes for listening on terrestrial radio, and that interactive subscription services are a relatively distant substitute for Sirius XM. In other words, we have evidence that the cross-elasticity of demand between Sirius XM and subscription interactive services is relatively *low*.

As I discussed in my Written Direct Testimony, the survey conducted by Mr. Joe Lenski of Edison Research asked Sirius XM subscribers what they would listen to if Sirius XM were no longer available.[46] The largest share of listening time, over 40%, would shift to terrestrial radio. The next category is CDs and digital downloads at 23%, followed by non-interactive webcasters at 14.3%. Only 7.8% of listening would shift to interactive services – and this 7.8% includes both subscription and non-subscription interactive services.[47] The survey conducted by Professor Dhar indicates a higher number for such switching from Sirius XM to subscription

[43] Amended Written Direct Testimony of Jonathan Orszag at ¶39. Mr. Orszag does not argue that Sirius XM's functionality has changed in any way since the *SDARS II* proceeding.

[44] Amended Written Direct Testimony of Jonathan Orszag at ¶42.

[45] Amended Written Direct Testimony of Jonathan Orszag at ¶32.

[46] Shapiro Written Direct Testimony at 14-15.

[47] This evidence is consistent with that from surveys conducted by Sirius XM in the regular course of business. [redacted] SXM_DIR_00023726-889 at 778.

interactive services, but still only 31%, which is far less than would be required to support ratio equivalency, based on the economic rationale that the Judges articulated in *Web IV*.[48] Regardless of which survey results one uses, the required "1:1 opportunity cost" relationship does not come close to holding as between Sirius XM and subscription interactive services.

In sum, the conditions identified by the Judges in *Web IV* under which "ratio equivalency" holds are clearly *not* met as between Sirius XM and subscription interactive subscription services.

This invalidates Mr. Orszag's entire approach, or at the very least seriously calls it into question, since Mr. Orszag's method of benchmarking is fundamentally based on "ratio equivalency."

3. How the Judges Used "Ratio Equivalency" in Web IV

For the reasons discussed above, I do not believe that "ratio equivalency" properly applies as between Sirius XM and interactive subscription services. Nonetheless, in this and the next subsection, I discuss what the concept of "ratio equivalency" would imply if it were applied in this case in a manner faithful to the approach taken by the Judges in *Web IV*. This analysis is relevant only if the Judges determine that consideration of the application of the concept of "ratio equivalency" in the instant setting is warranted. In Section 3.B.5, I then describe how Mr. Orszag's calculations have failed to accomplish that goal.

In *Web IV*, the Judges began with Dr. Rubinfeld's "Adjusted Minimum Per Play Rate" of $0.002376 per play,[49] which was derived from the "Weighted Average Minimum Per Play Rate" of $0.004868 that Dr. Rubinfeld found in contracts between the major record companies and various interactive services.[50] Dr. Rubinfeld next computed a blended major/indie rate of $0.005227 per play to account for additional fixed cash and advertising benefits received by major labels. Dr. Rubinfeld then invoked "ratio equivalency" to adjust that $0.005227 per-play rate: he applied an "interactivity adjustment" of 2.0 based on the ratio of the average retail price of interactive subscription service to the average retail price of non-interactive subscription services.[51] Put differently, Dr. Rubinfeld employed "ratio equivalency" to make an adjustment for the differences in the levels of interactivity offered by interactive services, on the one hand, and non-interactive services, on the other. Conceptually, one can also think of this adjustment as accounting for the differences in rights secured from record companies by interactive services as compared to noninteractive services. Mathematically, Professor Rubinfeld made his adjustment by taking the per-play rates found in the interactive subscription service agreements and multiplying those rates by the ratio of retail prices paid by consumers for non-interactive and interactive subscription services. This is the form of "ratio equivalency" that the Judges

[48] Written Direct Testimony of Robert Willig at Table 2. Furthermore, as discussed by Professor Hauser in his Written Rebuttal Testimony, there are a number of deficiencies in the Dhar survey design that lead to an inflated estimate of the number of people who would switch from Sirius XM to interactive subscription services. Hauser Written Rebuttal Testimony at ¶33-38. After correcting just one aspect of the survey design, Professor Hauser finds that only 15% of Sirius XM subscribers would switch to an interactive service subscription if Sirius XM were no longer available; *id.* at ¶110.

[49] *Web IV* at 26405.

[50] See Rubinfeld CWDT Exhibit 16a in the *Web IV* proceeding.

[51] *Web IV* at 26338. Dr. Rubinfeld also applied an adjustment factor of 1.1 to account for skips and pre-1972 recordings. *Web IV* at 26339.

accepted, and this is what led to the $0.002376 per-play rate. The Judges then made a further 12% downward steering adjustment to this figure to derive a rate of $0.0021 per play.[52]

In support of their conclusion that "ratio equivalency" was appropriate as between the subscription interactive services and the subscription non-interactive services, the Judges noted that the resulting rate that Dr. Rubinfeld derived from the subscription interactive services benchmark, after applying "ratio equivalency" and after applying a further steering-based adjustment, was very similar to the rate derived directly from the Pandora/Merlin agreement for subscription services – a rate that did not need to be adjusted for differences in rights and did not need to be adjusted to render it an effectively competitive rate.[53]

In using the $0.0021 per-play rate, and rejecting the greater-of rate structure proposed by SoundExchange, the Judges explicitly considered whether their per-play rate was too low:

> "A potential rationale for the percentage-of revenue prong is that it could offset a per-play rate that is 'too low.' The Judges have taken great care to discount any proposed rate that they believe would be too low to compensate adequately the licensors for the rights under the licenses. As discussed below, the per-play rates that the Judges adopt for commercial webcasters are consistent with rates negotiated in marketplace agreements."[54]

To summarize, the Judges used "ratio equivalency" to make an adjustment to the stated minimum per-play rates found in the interactive service agreements based on the ratio of subscription prices as between the target service (there, noninteractive services) and the benchmark services (there, interactive services). In the *Web IV* proceeding, this took the form of applying Dr. Rubinfeld's "interactivity adjustment" factor of 2.0 to the per-play rates, where the 2.0 is roughly the ratio of retail prices, $9.99 divided by $5.00.

4. Applying "Ratio Equivalency" the Same Way to Sirius XM

My next step toward showing how Mr. Orszag departed from what the Judges did in *Web IV* is to calculate the rates that would result in this proceeding if one were to implement the concept of "ratio equivalency" in the same way that Judges used that concept in the *Web IV* proceeding.

The starting point again is Dr. Rubinfeld's blended Weighted Average Minimum Per-Play Rate of $0.005227.[55] Following the approach taken by the Judges in *Web IV*, the next step is to use "ratio equivalency" by adjusting the $0.005227 per-play rate downward by the ratio of the retail price for the target services (here Sirius XM) to the retail price of the benchmark services (here

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[52] *Web IV* at 26404.

[53] *Web IV* at 26347.

[54] *Web IV* at 26326.

[55] This figure remains applicable in this proceeding. So far as I can tell [redacted] SoundX_000004293, SoundX_000004294, SoundX_000004302, SoundX_000005275, SoundX_000013927, SoundX_000045313, SoundX_000045316, SoundX_000045319, SoundX_000014917, SoundX_000014923, SoundX_000014921, SoundX_000014919, SoundX_000028249, SoundX_000028250, SoundX_000072623, SoundX_000072624, SoundX_000072625, SoundX_000072626, SoundX_000045477, SoundX_000045478, SoundX_000025986,SoundX_000025991.

subscription interactive services). According to Mr. Orszag, the interactive subscription retail prices have remained constant at $9.99.[56] We can use this number as the denominator for the adjustment factor.

It is more challenging to determine the appropriate numerator, as, unlike both the subscription interactive services and the subscription non-interactive services at issue in *Web IV*, Sirius XM offers more than just music content. A further complication is introduced by the fact that unlike subscription interactive services and subscription non-interactive services, the retail price of Sirius XM covers not just content, but also the delivery platform that Sirius XM provides. Accounting for this delivery platform further complicates the use of "ratio equivalency" in this setting.[57] For these reasons, it is evident that the retail price of Sirius XM cannot be used for purposes of employing "ratio equivalency" in the way the Judges did in *Web IV*. Were one to do so, the portion of the retail price attributable to the delivery platform and the non-music content would be captured, both of which clearly should be excluded for purposes of adjusting the value of the sound recording rights down to account for the difference in the scope of rights secured by subscription interactive services and those that Sirius XM requires.

The most straightforward way to estimate the appropriate retail price to use in the numerator for purposes of implementing "ratio equivalency" here is to use the average retail price of subscription non-interactive webcasting services that make similar, non-interactive, use of sound recordings. Doing so avoids the messy complications associated with teasing out just what portion of the Sirius XM retail price is attributable to music, and those that are not. Mr. Orszag has provided an estimate of this as well. He calculates that the average retail price of subscription non-interactive services is $4.91 per month.[58] Using this figure as our measure of the monthly retail value of the recorded music on Sirius XM, we arrive at a ratio of $4.91/$9.99 or 0.49. Applying this ratio to the starting per-play rate of $0.005227 yields a non-interactive per-play rate of $0.002569. It is worth noting that this approach is similar to Mr. Orszag's "Approach Two," in which he uses this average retail price for subscription non-interactive webcasting services (in place of any estimate of the value of Sirius XM's music offering) to derive a per-subscriber royalty for Sirius XM .

The final step is to apply the 12% steering adjustment that the Judges used in *Web IV*. This reduces the $0.002569 per play rate down to $0.002261. This is my best estimate of the per play rate that one obtains applying "ratio equivalency" in this proceeding in a manner that is consistent with how the Judges used "ratio equivalency" in the *Web IV* proceedings. This per play rate can be converted into a per-subscriber rate by employing the approach that I used in my Written Direct Testimony, namely, by multiplying it by 469 – the average number of Sirius XM plays per subscription per month. This results in a per-subscription rate of $1.06. This per-

[56] Amended Written Direct Testimony of Jonathan Orszag at ¶47.

[57] Indeed, as I noted in my deposition, these (and other) complications can be entirely avoided by taking the far more direct approach that I take in my Written Direct Testimony – simply taking the per-play rate that the Judges derive for non-interactive services and employing that to derive a rate for Sirius XM. Shapiro Deposition at 41:21-42:11.

[58] Amended Written Direct Testimony of Jonathan Orszag at ¶56. I note that the services that Mr. Orszag uses are more "interactive" than is Sirius XM. Accordingly, the $4.91 retail price used can be seen as an upper bound of the estimate of the retail price for the music content offered by Sirius XM. As Mr. Orszag agreed, to the extent that these "non-interactive" services are in fact more interactive than is Sirius XM, a downward adjustment to the $4.91 average retail price is warranted. Orszag Deposition at 263-266.

subscription rate can, in turn, be converted into a percentage-of-revenue rate by diving by ARPU. Using the ARPU of $12.80 that I used in my written direct testimony yields a percentage-of-revenue rate of 8.3%. Using the [redacted] measure of ARPU computed by Mr. Orszag results in a rate of [redacted]

I note that this approach gives very similar results to those that I concluded were reasonable in my Written Direct Testimony. There, using the same benchmarks that the Judges used to derive the subscription rate in *Web IV*, I calculated that Sirius XM should pay royalties of $1.032 per subscription per month.[59] This is very close to the $1.06 per-subscription per-month figure derived just above.

5. How Mr. Orszag Departed from the Approach Taken in Web IV

I now demonstrate how Mr. Orszag departed from the approach taken by the Judges in *Web IV*, which has been described and implemented in the two preceding sections. It is obvious that something is amiss with Mr. Orszag's analysis, since the 8.3 to 9.9 percentage-of-revenue rate just derived is very far from the 22 to 24 percentage-of-revenue rates derived by Mr. Orszag. In this section, I show precisely how Mr. Orszag went astray in applying the concept of "ratio equivalency," which led him to get much higher rates.

Mr. Orszag's critical departure from the approach taken by the Judges in *Web IV* was to use the effective rate paid under the interactive services contracts, some 56% of revenue, rather than using the minimum per-play rates from those contracts as the Judges did in *Web IV*.

By departing from the approach taken in *Web IV*, Mr. Orszag obtains far higher per-performance rates than the Judges established in the Web IV proceeding. Mr. Orszag proposes a rate for Sirius XM of between 22.12 and 24.08 percent of revenue.[60] Using 23 percent of revenue as roughly the midpoint of that range, and applying that rate to the [redacted] Sirius XM ARPU used by Mr. Orszag, produces a royalty rate for Sirius XM of [redacted] per-subscription per-month.[61] Dividing that figure by the 469 plays per Sirius XM subscription per month that I calculated in my written direct testimony gives a per-play rate for Sirius XM of [redacted] That rate is about 2.4 times as large as the $0.0022 per-play rate determined by the Judges as reasonable in *Web IV*.

In the end, without supporting rationale, Mr. Orszag is claiming that it would be reasonable for Sirius XM to pay 2.4 times as much as subscription non-interactive webcasters pay on a per-play basis.

C. Additional Flaws in Mr. Orszag's Calculations

The above discussion of Mr. Orszag's analysis, focusing on his deeply flawed use of "ratio equivalency," addresses the most significant and fundamental error that Mr. Orszag has made. In what follows, I identify three additional, significant errors that Mr. Orszag makes in implementing his two approaches for deriving rates for Sirius XM. The first of these only

[59] Written Direct Testimony of Carl Shapiro at 54.

[60] Amended Written Direct Testimony of Jonathan Orszag at ¶10.

[61] This is in the middle of Mr. Orszag's range of rates, which is from $2.37 to $2.58 per subscriber per month. Amended Written Direct Testimony of Jonathan Orszag at ¶10.

applies to his "Approach One" while the latter two apply to both of his approaches. Before turning to the specifics, I provide a brief summary of Mr. Orszag's two approaches.

In Mr. Orszag's preferred approach – which he refers to as "Approach One" – he takes the effective percentage-of-revenue rate paid by subscription interactive services and cuts it in half, because, in his view, "at least 50 percent of the value of Sirius XM's service is attributable to the transmission of music."[62] He then makes what he refers to as a tentative "steering adjustment."[63]

In Mr. Orszag's alternative approach – his "Approach Two" – Mr. Orszag takes the same effective percentage-of-revenue rate paid by subscription interactive services and applies it against the average retail price of a collection of subscription services that he describes as being non-interactive.[64] He then applies the same "steering adjustment" to the rates derived from this alternative approach.

With this background in mind, I now return to the three additional, significant errors that Mr. Orszag has made. First, Mr. Orszag's "Approach One" fails to assign value to any of the inputs to Sirius XM's service other than content. When assigning value to the various components of the bundle of goods provided by Sirius XM, Mr. Orszag only accounts for music and non-music content. Of critical importance, Mr. Orszag never assigns any value to the delivery platform that Sirius XM provides – a platform that is not also provided by his benchmark subscription interactive services. Second, both of Mr. Orszag's approaches fail to properly account for the different intensity of use of sound recordings as between the target market subscribers (Sirius XM) and the benchmark market subscribers (subscription interactive services). Third, Mr. Orszag fails to account for the differences in downstream elasticities of demand as between Sirius XM and subscription interactive services – an adjustment that, at his deposition, Mr. Orszag asserted should be made.[65] I now address each of these errors in turn.

1. Share of Sirius XM Revenue Attributable to Recorded Music

To implement his "Approach One," Mr. Orszag states that "it is necessary to estimate the portion of the value of Sirius XM's service that reasonably can be attributed to the distribution of sound recordings."[66] Ultimately, Mr. Orszag concludes "that at least 50 percent of the value of Sirius XM's service is attributable to the transmission of music."[67] As a result, Mr. Orszag is attributing a value of $15.99 (the retail price of Sirius XM's main satellite radio product) * 50% or $8 per subscription per month to the recorded music on Sirius XM.

Mr. Orszag's approach should be greeted with skepticism simply based on his own observation that the retail price of non-interactive subscription services averages $4.91 per month.[68] Mr. Orszag does not explain why the same music is worth much more to consumers on Sirius XM,

[62] Amended Written Direct Testimony of Jonathan Orszag at ¶ 48.

[63] Amended Written Direct Testimony of Jonathan Orszag at ¶¶ 67-68.

[64] Orszag Deposition at 268:16-269:22.

[65] Orszag Deposition at 191:25 to 192:7.

[66] Amended Written Direct Testimony of Jonathan Orszag at ¶48.

[67] Amended Written Direct Testimony of Jonathan Orszag at ¶48.

[68] Amended Written Direct Testimony of Jonathan Orszag at ¶56 and Table Two.

especially given that Sirius XM subscribers have less ability to customize the music than do subscribers to the non-interactive services such as Pandora that Mr. Orszag uses to calculate his $4.91 average retail price. Any higher price that consumers would pay for the music on Sirius XM as compared to a non-interactive subscription service cannot be attributed to the music itself. Rather, it must be due something provided by Sirius XM, such as the convenience of the Sirius XM delivery platform or Sirius XM's curation of the music, not the music itself, which, as Mr. Orszag notes, is the same on both platforms.[69] Mr. Orszag does not appear to recognize this basic point; he certainly does not acknowledge it.

Stated differently, Mr. Orszag's Approach One is fundamentally flawed because he assigns no value to any of the inputs to Sirius XM's service other than the content. By his method, recorded music is assigned a value equal to 50% of the retail price, or $8 per subscription per month. Identical reasoning to that used by Mr. Orszag in paragraph 49 of his written direct testimony would assign a value of $8 per subscription per month to the non-music content. As a result, Mr. Orszag is assigning no value to Sirius XM's satellite distribution network and infrastructure, or its curation of the music. Clearly, that cannot be right and betrays the very principle Mr. Orszag elsewhere recognizes and applies in apportioning value to other -- music and non-music – inputs. This is a fundamental flaw in his approach. Note that this critical issue did not arise as between non-interactive subscription services and interactive subscription services, the pair of services for which the Judges accepted "ratio equivalency" in *Web IV*.

Tacitly recognizing this error, Mr. Orszag's "Method Two" corrects for it. In his Method Two, instead of attempting to disentangle the bundle of goods offered by Sirius XM, Mr. Orszag uses the average retail price of subscription non-interactive services – which is $4.91 – as a proxy for estimating the retail price attributable to the music content offered by Sirius XM.

2. Number of Performances Per Subscription Per Month

In both his Approach One and his Approach Two, Mr. Orszag makes no adjustment to account for a significant difference in the amount of music that subscribers listen to on interactive subscription services as compared with Sirius XM.

The average number of performances of sound recordings per subscriber per month on interactive subscription services, as computed by Professor Willig, is [redacted][70] The average number of performances of sound recordings (including comedy) per subscription per month on Sirius XM is 469.[71] This disparity in the number of performances per month calls for a downward adjustment in the compensation for sound recordings on Sirius XM. The principle is the same as for the adjustment to reflect the contribution of various inputs into Sirius XM's service that was discussed previously: if Sirius XM subscribers listen to less music on average than do the

[69] Amended Written Direct Testimony of Jonathan Orszag at ¶30.

[70] Written Direct Testimony of Robert Willig at B-7.

[71] Shapiro Direct Testimony at 54. Professor Willig calculates that there are [redacted] performance per subscription per month on Sirius XM. Written Direct Testimony of Robert Willig at A-3. However, there are several deficiencies in Professor Willig's analysis. One of the surveys he uses to determine listening hours per subscriber is not representative of the full distribution of Sirius XM subscribers, since it is based on a self-selected online panel of Sirius XM subscribers. Furthermore, he misinterprets the listening hour results from a second survey. In addition, his estimate of the number of songs played per hour is deficient because the number of plays and the number of hours are measured for different, non-overlapping time periods.

subscribers to the benchmark service, then Sirius XM should pay proportionately less for sound recordings.[72] In this case, the adjustment for intensity of use, which is equal to the ratio of average performances on Sirius XM vs. the benchmark interactive services, is equal to [redacted]

It should be noted that in my implementation of "ratio equivalency" discussed above, the need to make such an adjustment for intensity of use is mooted, as the analysis starts and ends with a per-play rate, just as did the Judges' analysis in *Web IV*. Only after a per-play for Sirius XM is calculated is that per-play rate translated into a per-subscriber or percentage-of-revenue rate.

The same cannot be said of Mr. Orszag's approach. Mr. Orszag's use of ratio equivalency is not based on per-play rates. Accordingly, Mr. Orszag's Method One and Method Two are further compromised by his failure to make an adjustment for the intensity of use of sound recordings.

3. Downstream Elasticities of Demand

The third error that I address – Mr. Orszag's failure to account for the different downstream elasticities of demand as between Sirius XM and subscription interactive services – also applies to both of Mr. Orszag's approaches.

The elasticity of demand for a music service measures how responsive customers are to the price of that service. For example, an elasticity of 2.0 means that a one-percent increase in the price of the service will cause the service to lose two percent of its subscribers.

At his deposition, Mr. Orszag indicated that under his method a downward adjustment from the benchmark rate is warranted if the target downstream service (Sirius XM) faces more a higher elasticity of demand than does the benchmark downstream service (subscription interactive services).[73] Yet Mr. Orszag makes no such adjustment. Indeed, because he believes that the elasticity of demand for Sirius XM is lower than the elasticity of demand for interactive subscription services, Mr. Orszag touts the fact that he has not made an upward adjustment as evidence that his rate estimates are conservative.[74]

As it turns out, Mr. Orszag has it exactly backwards. He is simply incorrect when he claims that the elasticity of demand for Sirius XM is lower than the elasticity of demand for interactive subscription services. As I now demonstrate, Mr. Orszag's discussion of the relative elasticities of demand is based on faulty analysis.

In claiming that Sirius XM faces a lower price elasticity of demand than do the interactive services, Mr. Orszag relies on Professor Willig's analysis of the survey data described in the Dhar report.[75] Professor Willig, however, failed to measure the different elasticities in a consistent manner. When the Dhar survey results are analyzed in a consistent manner, that

[72] In a workably competitive market, I would expect services to negotiate a lower fee for inputs that are less intensively used, just as total compensation to labels with a smaller market share would be expected to be lower than for labels with a high market share.

[73] Orszag Deposition at 191:25 to 192:7.

[74] Orszag Deposition at 87:20-88:22.

[75] Professor Willig also conducted an econometric examination of the Sirius XM demand elasticity, but since that study was only done for Sirius XM, it cannot be used to compare elasticities between Sirius XM and interactive services.

survey actually measures a substantially *higher* elasticity for Sirius XM than for subscription interactive services. In other words, the data cited by Mr. Orszag on this point, properly interpreted, actually *contradict* Mr. Orszag's assertion.

In the Dhar survey, subscribers to various subscription services – including Sirius XM and interactive services –were asked if they would continue to subscribe to their current service as the price hypothetically was increased step by step to higher and higher levels. Respondents were asked whether they would cancel their service at up to seven price points, ranging from 30% below the "standard price" (or representative monthly list price) up to 30% above the standard price. For those respondents who at some price said they would cancel their subscription, the survey recorded the price at which that occurred. These responses were then used by Professor Willig to calculate an elasticity of demand for each type of music service.

When calculating or reporting the elasticity of demand, it is necessary to specify which interval along the demand curve that will be used. In this case, there are two natural candidates: (a) the interval corresponding to the monthly *list* price for the service, and (b) the interval around the *actual* average price that customers pay, accounting for discounts off the list price.[76] Either choice of price could be justified, provided that choice is made consistently across services.[77]

When Professor Willig used the Dhar survey data to compute elasticities, he was not consistent across services in how he selected the segment of the demand curve to examine. For the interactive services, he used the interval between the standard price and the next higher price. In contrast, for Sirius XM he used the interval between the lowest price point (30% below the standard price) and the next price point (20% below the standard price). Since the price elasticity tends to increase with price, this means that Professor Willig ended up comparing a portion of the Sirius demand curve with a relatively low elasticity to a portion of the demand curves for the interactive services with a relatively high elasticity.

I have corrected Professor Willig's calculations by eliminating this inconsistency. Making *just this change* to Professor Willig's analysis, I find that the elasticity of demand for Sirius XM, using the Dhar survey results, is *higher* than for interactive subscription services. This finding holds, whether one corrects Professor Willig's calculations by consistently using the list prices or by consistently using the actual average prices paid.[78]

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[76] Due to annual subscription fees and other discounts, the average price paid for all subscription interactive services is somewhat below the list price. For example, the list price for subscription interactive services is typically $9.99, whereas, as shown in Table 1, the average monthly subscription price in 2016 was $9.70.

[77] Respondents were told they were being presented with "several different monthly prices" which could be "higher or lower than the amount you currently pay." The reference to what respondents currently pay could be interpreted as the actual average monthly price. On the other hand, the reference to monthly price could be interpreted as the monthly list price. This is particularly true for respondents who are Sirius subscribers, since a few screens earlier they had been shown a description of the Sirius Select package with the $15.99 list price prominently displayed.

[78] Figure C-1 of the Written Direct Testimony of Robert Willig shows the spreadsheet that Professor Willig used to compute elasticities. Near the bottom of that figure are two rows labeled "Elasticity Price Step" that select the price interval over which the elasticity is computed. For Sirius XM, the lower price step is "1" and the upper price step is "2", indicating that the elasticity is computed between the two lowest price points (between 30% and 20% below the standard list price of $15.99). For all other services, the lower price step is "4", which is the standard list price, and the upper price step is "5", which is the next higher price point. My corrected computation of the elasticity of demand along different intervals of the demand curve is done simply by changing the indicated lower and upper price points for each service in the spreadsheet.

- **Actual Average Prices**: The Sirius XM elasticity as reported by Professor Willig, which is computed between the two lowest price points, is 0.8. For self-pay subscribers, the actual average price paid falls in the next higher interval, between 20% below and 10% below the list price.[79] On that interval the computed elasticity for Sirius XM is 1.6 or 1.8, depending on the sample of respondents used. When the elasticity for subscription interactive services is computed at the interval just below the list price that contains the actual average price paid, the measured elasticity ranges from 0.4 to 0.7, depending on which service and which subset of respondents is used in the calculation.[80]
- **List Prices**: The elasticity of demand for interactive services, measured between the standard price and the next higher price, as reported by Professor Willig, ranges from 1.6 to 1.9, while the elasticity of demand for Sirius XM, when measured between the standard price and the next higher price, is between 2.6 and 3.2.

In summary, when the Dhar survey data are used in a consistent fashion to measure the elasticity of demand for Sirius XM and for interactive services, one finds that Sirius XM faces a *higher* elasticity of demand than do interactive services.

If one accepts Mr. Orszag's approach, a downward adjustment is needed to account for the higher elasticity of demand facing Sirius XM. Using the Lerner Equation, the adjustment factor is given by

$$\frac{E_S}{E_S - 1}\frac{E_B - 1}{E_B}$$

where E_S is the elasticity of demand facing Sirius XM, and E_B is the elasticity of demand facing the benchmark interactive services.

Consistently using the list prices, and taking the mid-points of the estimates, we have $E_S = 2.9$ and $E_B = 1.75$. This implies an adjustment factor of 0.65. Therefore, following Mr. Orszag's approach, an additional deflation factor of 65% should be applied to the benchmark royalty rate for interactive subscription services to account for the difference in elasticities.

D. The Continuing Need for a Steering Adjustment

Mr. Orszag discusses steering in Section V.B of his Written Direct Testimony.[81] He notes that in *Web IV* "the Judges concluded that the interactive subscription services marketplace is not

[79] Professor Willig justifies using the lowest interval for the price change based on the royalty-based measure of ARPU he constructs in his Written Direct Testimony. Written Direct Testimony of Robert Willig at B-5, C-1. This is not the correct ARPU measure for two reasons. First, subscribers were asked about the price they pay, regardless on the fraction of those revenues on which Sirius XM pays royalties. Second, the calculation should be restricted to self-pay subscribers when looking at the responses for self-pay subscribers – the ARPU used by Professor Willig includes both self-pay subscribers and promotional (free to the user) subscribers. Based on Sirius XM financial projections, the correct self-pay subscription ARPU figure is [redacted] which is [redacted] below the list price.

[80] Professor Willig computes an elasticity for Apple and Spotify separately and also for both taken together. He also looks at two sets of respondents, depending on whether respondents who at some point said "Don't Know/Unsure" are dropped. See Written Direct Testimony of Robert Willig, Figure C-1.

[81] Amended Written Direct Testimony of Jonathan Orszag at ¶¶62-79.

effectively competitive."[82] Referring to that finding, he then states: "I view the ultimate conclusion – an absence of effective competition in the interactive subscription marketplace – as undermined by the recent evolution of pertinent competitive dynamics in the marketplace."[83]

In support of this assertion, Mr. Orszag claims that subscribers to interactive services are increasingly relying on playlists and other means of accessing a sequence of performances selected by the service (or by third parties) rather than by the subscribers themselves.[84]

Mr. Orszag presents some evidence that record labels compete for spots on playlists, such as by vying for inclusion in Spotify's "Discover Weekly" playlist. I agree with Mr. Orszag that some *non-price* competition of this form is taking place. However, this is nothing new: SoundExchange also emphasized this type of non-price competition in the *Web IV* proceeding.[85] Mr. Orszag does not present evidence that this type of competition is materially more significant now than it was at the time of the *Web IV* proceeding.

In any event, and crucially, the evidence strongly supports the conclusion that there still is no *price* competition in the upstream interactive services market. Indeed, to be clear, Mr. Orszag does not claim that there is any price competition in that market and, when asked at his deposition whether he was aware of any such evidence, he was not able to point to any.[86] Nonetheless, he questions the need for a steering adjustment. In Section IV.C of his report, Mr. Orszag states:

> I conclude that the recent market trends, including the increasing importance of subscription interactive streaming services to the record companies and the rise of playlist listening by subscribers, renders the market considerably more competitive than the Judges found based on the record in the Web IV case.[87]

I simply cannot fathom Mr. Orszag's position on this point. So far as I can determine, the complementary oligopoly that the Judges observed in *Web IV* in the interactive services upstream market, and the prices resulting from that complementary oligopoly, remain unchanged today. *The presence of non-price competition does not alter that fact*. Indeed, if prices are established at levels well above competitive levels, I would expect the record companies to compete all the more on non-price dimensions in an attempt to have their music played more at those inflated prices.[88] Plus, even that competition is hindered by the anti-steering provisions still used by the major labels.

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[82] Amended Written Direct Testimony of Jonathan Orszag at ¶73.

[83] Amended Written Direct Testimony of Jonathan Orszag at ¶74. In his deposition, Mr. Orszag clarified that he is looking at changes in the interactive services market over the last two to four years, and that he is particularly focused on the shorter end of that spectrum. Orszag Deposition at 161.

[84] Amended Written Direct Testimony of Jonathan Orszag at ¶73-78; see also Written Direct Testimony of George Ford at 21.

[85] *Web IV* at 26366.

[86] Orszag Deposition at 279:14-282:16.

[87] Amended Written Direct Testimony of Jonathan Orszag at ¶36.

[88] A well-known example in the economics literature is the non-price competition that existed between airlines prior to deregulation in 1978. Under regulation, the Civil Aeronautics Board controlled prices and entry, but airlines competed through a variety of dimensions of service for an increased share of the passenger market. See Elizabeth

For benchmarking purposes, the question is not whether there is non-price competition among the record companies to gain plays on the interactive services. The central issue here is whether the *prices* in the interactive market reflect workable competition and thus can be used as a benchmark for other music services without a steering adjustment. Clearly, they do not, and Mr. Orszag makes no argument to the contrary. Instead, he observes some non-price competition and then asserts that "the market is considerably more competitive than the Judges found based on the record in the Web IV case." This statement is unhelpful and misleading for the purpose of determining whether the *prices* in the interactive services upstream market are competitive.

Mr. Orszag is silent on the relevant question of whether licensing fees in the interactive upstream market have become more competitive as a result of changes in the interactive services marketplace that he identifies. However, the data that Mr. Orszag uses in his Written Direct Testimony can be used to answer this question unequivocally. In Table One of his Written Direct Testimony, Mr. Orszag shows the licensing fees paid by most of the large interactive subscription services to major record companies in 2014, 2015 and 2016. Mr. Orszag does not analyze these data on a year-by-year basis. Instead, he shows that, across all of these services and all three years, the average licensing fee (weighted by subscribers) is [redacted] per subscriber per month. Using exactly these same data, I have computed the weighted average licensing fee across services and record companies separately for 2014, 2015 and 2016. The results are shown below in Table 1.

Table 1: Interactive Service Weighted Average Revenues and Royalties
[RESTRICTED]

[redacted]

Overall, the royalties in the upstream interactive services market have been virtually unchanged for the past three years. If anything, the rates have increased very slightly, both in terms of the average royalty per subscriber per month and as a percentage of revenue. These data show beyond doubt that a steering adjustment is needed now just as much as it was during the *Web IV* proceeding.

E. Bailey, David R. Graham, and Daniel P. Kaplan, *Deregulating the Airlines*, MIT Press, 1985 at 18; Steven Morrison, and Clifford Winston, *The Economic Effects of Airline Deregulation*, The Brookings Institution, 1986 at 4; W. Kip Viscusi, Joseph E. Harrington, and John M. Vernon, *Economics of Regulation and Antitrust*, MIT Press, 2000 at 559.

E. Interactive Services Benchmark: Summary

Summarizing this section, I find that the range of reasonable rates that I have proposed in this proceeding is fully consistent with the interactive services benchmark as analyzed by the Judges in the *Web IV* proceeding. This should not be surprising, since my rate proposal built upon the rate that the Judges derived from both the Pandora-Merlin agreement and the interactive service benchmark agreements, after making all of the necessary adjustments. In contrast, Mr. Orszag's analysis of the interactive service benchmark is inconsistent with the approach in *Web IV* and fails to correctly make the necessary adjustments. The inconsistency between Mr. Orszag's approach and *Web IV* stems from Mr. Orszag's failure to adopt the same prong of the royalty rates specified in interactive services contracts that the Judges used in *Web IV*. Furthermore, the adjustments applied by Mr. Orszag do not correctly account for the value of sound recordings on the Sirius XM service. Because of these shortcomings, the rate proposal offered by Mr. Orszag substantially overstates the rates implied by the subscription interactive services benchmark.

4. The Impact of Sirius XM on Record Company Revenue

Professor Willig takes a very different approach to deriving royalty rates for Sirius XM than does Mr. Orszag. Professor Willig begins his analysis by attempting to demonstrate that Sirius XM has had a large negative impact on record company revenue streams. He then uses this assertion to support his claim that the royalties that Sirius XM currently pays come nowhere close to compensating recording companies for the revenue that they lose as a result of having their sound recordings performed on Sirius XM.

Professor Willig specifically asserts that Sirius XM and other streaming services have had a large negative impact on record company revenues:

> "In other words, movement of music distribution from paid downloads to streaming services other than subscription services that can be licensed at market rates (but including Sirius XM) reduces creator compensation because the royalty rates are too low to compensate for cannibalization, i.e. they do not compensate for the adverse financial impact of the substitution effect between the streaming service and paid downloads and other substitutable services."[89]

He purports to quantify that adverse financial impact as follows:

> "In sum, this assessment indicates that the increase in streaming from 2010 to 2016 is causing a net loss in creator compensation of more than $800 million per year."[90]

In this Section, I identify a fatal error in this portion of Professor Willig's analysis, which attempts to ascribe a significant portion of claimed "creator compensation" losses to Sirius XM's satellite radio service. After correcting this error, Professor Willig's conclusions are reversed, in a dramatic fashion. Professor Willig's methodology indicates that Sirius XM has a substantial *positive* impact on other record company revenue streams.

[89] Written Direct Testimony of Robert Willig at ¶21.

[90] Written Direct Testimony of Robert Willig at ¶27.

A. The Impact of Sirius XM on Paid Downloads

I now show that Professor Willig's conclusion in Section IV of his Written Direct Testimony – that the growth of "streaming" has had a substantial, negative impact on the record industry's revenue from paid downloads – emphatically does *not* apply to Sirius XM.

1. Professor Willig's Regression Analysis

In Section IV of his Written Direct Testimony, Professor Willig presents his analysis of how the growth of "streaming" from 2010 to 2016 displaced paid downloads and thus reduced record company revenue. In his Table 1, Professor Willig calculates that the growth of "streaming" from 2010 to 2016 reduced record company revenue in 2016 by $813 million.

In performing this analysis, Professor Willig constructs a single aggregate variable that he refers to as "streaming." Here is his description of this aggregate variable:

> "All streaming options with available data, including paid and promotional Sirius XM, interactive streaming, webcasting (non-interactive), video, subscription services and ad supported services, were aggregated into a single streaming variable after the monthly usage data were converted into a common unit of number of performances."[91]

While Professor Willig has data on the increase in the number of performances for each type of "streaming" service from 2010 to 2016, he nevertheless lumps all of these services together to perform his analysis. In doing so, Professor Willig estimates the overall increase in "streaming" from 2010 to 2016 as 614 billion performances.[92] Of this total, the increase in Sirius XM performances from 2010 to 2016 was 62 billion performances, just about 10% of the total increase. Nearly half of the total increase came from ad-supported non-interactive services (287 billion performances out of 614 billion performances, or 47%).

The lynchpin to Professor Willig's analysis is his estimate that "each streaming performance reduces the number of paid downloaded performance-equivalents by 0.8607."[93] I will refer to this estimate as Professor Willig's "86% diversion" estimate. According to Professor Willig, every six streaming performances displace five paid downloaded performance-equivalents.

As I now demonstrate (a) Professor Willig's 86% diversion estimate is dramatically incorrect as applied to Sirius XM and, as a result, (b) Professor Willig's conclusion in Section IV of his Written Direct Testimony regarding the impact of "streaming" on record company revenue from paid downloads emphatically does not apply to Sirius XM.

In defense of his 86% diversion estimate, Professor Willig states: "These findings are consistent with published reports and studies."[94] However, the Aguiar and Waldfogel study that he cites, "Streaming Reaches Flood Stage: Does Spotify Stimulate or Depress Music Sales," examines the

[91] Written Direct Testimony of Robert Willig at ¶24, footnote omitted.

[92] Written Direct Testimony of Robert Willig Table 1. Table 1 shows 249 billion performances in 2010 and 863 performances in 2016.

[93] Written Direct Testimony of Robert Willig at ¶25. In making this calculation, Professor Willig applies the calibration that "1,500 performances are equivalent to an album-equivalent."

[94] Written Direct Testimony of Robert Willig at ¶25, footnote 14.

impact of *Spotify* on music sales, not the impact of "streaming" as a whole on music sales, and certainly *not the impact of Sirius XM on music sales*.[95] The other source cited by Professor Willig, a two-page article in the *Atlantic* from 2015, simply reports that sales of CDs and digital downloads declined from 2013 and 2014 as streaming grew.[96] The author states: "Digital track sales are falling at nearly the same rate as CD sales, as music fans are turning to streaming—on iTunes, SoundCloud, Spotify, Pandora, iHeartRadio, and music blogs." Notably, this article makes no mention whatsoever of Sirius XM. As a result, in no way does it support Professor Willig's claim that Sirius XM has cannibalized paid download sales.

To be clear: Professor Willig has not identified any support in published reports and studies for *any* diversion between Sirius XM and paid downloads, much less his 86% diversion estimate.

Professor Willig's 86% diversion estimate comes from the regression model presented in Appendix E to his Written Direct Testimony, which covers the time period January 2004 to June 2016. Critically, as noted above, Professor Willig does not attempt to separately measure the impact of *Sirius XM* on paid downloads. Instead, he aggregates a number of types of music services together in his "streaming" variable. Professor Willig's "streaming" variable includes the following types of music services:

- Interactive Services (subscription and ad-supported)
- Non-Interactive Services (subscription and ad-supported)
- Sirius XM (paid and promotional)
- Video

Tacitly recognizing the dubious nature of lumping together all forms of "streaming" services for purposes of this analysis, Professor Willig attempts to justify doing so by claiming that "[i]t would be impossible to reliably estimate the individual impacts of each individual streaming service on legal downloads for several reasons." [97]

According to Professor Willig, the first such reason that it is impossible to estimate the individual impact of a particular services on download sales is because of "the strong correlation in the growth of the different streaming services" which, in his view, "creates an acute multi-collinearity problem for econometric analysis that does not allow evaluating the separate effects of downloads of each streaming service or service type."[98] In less technical language, Professor Willig is asserting here that the various types of services have all grown together over time, making it impossible reliably to separate out their individual influences. The other reason given by Professor Willig is that "it is likely that the demands for the different streaming services are interrelated, through their own substitution effects with each other."[99]

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[95] "Streaming Reaches Flood Stage: Does Spotify Stimulate or Depress Music Sales," Luis Aguiar and Joel Waldfogel, JRC Technical Papers, European Commission, 2015 at 13-15.

[96] "The Death of Music Sales," Derek Thompson, The Atlantic, January 25, 2015, available at www.the**atlantic**.com/business/archive/**2015**/01/buying-music-is-so-over/384790/.

[97] Written Direct Testimony of Robert Willig at ¶24, footnote 12.

[98] Written Direct Testimony of Robert Willig at ¶24, footnote 12.

[99] Written Direct Testimony of Robert Willig at ¶24, footnote 12.

I strongly disagree with Professor Willig, for reasons I now explain.

Professor Willig's first justification is demonstrably false. Using Professor Willig's own data, it is evident the actual growth patterns for interactive services, non-interactive services, and Sirius XM are not that highly correlated. This can be seen in Figure 1.

Figure 1: Number of Performances of Interactive Services, Non-Interactive Services, and Sirius XM, 2004-2016 [RESTRICTED]



One way of seeing that the growth rates for different types of services are not strongly correlated is to look at the period of most rapid growth for each type of service, as shown in Figure 1. For satellite radio, the period of most rapid growth was between 2004 and 2008. For non-interactive services, the period of most rapid growth was between 2010 and 2012. For interactive services, the period of rapid growth began toward the end of 2011 and continued through 2016. Just based on Figure 1, multi-collinearity does not appear to be a significant concern.

In any event, if multi-collinearity were a problem, that would become apparent in the regression results when we separate out the different types of services, since the standard errors of the relevant coefficients would then be high and the measured net substitution effect on downloads will not be statistically significant.[100] In fact, as shown below and in Appendix B, I am able to estimate the separate effect of Sirius XM on paid downloads in a statistically significant manner.

Professor Willig's second justification for not splitting out different types of "streaming" services – that the different types of services substitute for each other – also does not hold up to scrutiny. While it is true that there are relationships between the different services, it is not necessary for a regression that the various independent variables (here the performances on

[100] The parameter estimates will be unbiased, even if multi-collinearity is a significant concern.

different services) be independent of one another. The regression reports an unbiased estimate of the impact of each service separately, and these separate estimates will be meaningful so long as the variables are not highly multi-collinear. Therefore, so long as Professor Willig's first concern is not valid (and it is not, as shown above), his second concern will not be either.

2. Corrected Regression Analysis

I have run a revised version of Professor Willig's regression, breaking Sirius XM out from interactive services and non-interactive services. Appendix B describes how my regression analysis was done.

My regression uses exactly the same data that Professor Willig used. The *only* change I make is to break down Professor Willig's "streaming" variable into three components: (1) performances on Sirius XM; (2) performances on non-interactive services; and (3) performances on interactive services and video performances. As shown in Appendix B, my estimate of the impact of Sirius XM performances on paid downloads is highly statistically significant, as is my estimate of the impact of the impact of interactive services and video performances on paid downloads. This confirms that Professor Willig's concerns about multi-collinearity are not valid.

The main result from my regression is that Sirius XM *promotes* paid digital downloads. The estimated coefficient on Sirius XM performances is +0.0015143 and is highly statistically significant. This implies that every additional performance on Sirius XM is associated with an *increase* in downloaded album-equivalents of 0.0015143. Applying Professor Willig's calibration that one album-equivalent corresponds to 1500 performances, this implies that each performance on Sirius XM increases the number of paid downloaded performance-equivalents by 2.27. In other words, using Professor Willig's approach, these data indicate that Sirius XM has a strong promotional impact on paid downloads. This is in sharp contrast to Professor Willig's figure of -0.86 for all "streaming."

What accounts for this rather dramatic difference? My regression supplies the answer: performances on interactive services and video have a very strong negative impact on paid downloads. My regression results show that each performance on interactive and video services reduces the number of paid downloaded performance-equivalents by 1.24 – a result that is highly statistically significant. My regression also shows that each performance on non-interactive services increased the number of paid downloaded performance-equivalents by 0.19. (This estimate is not as statistically significant as the other two just reported.) Putting these pieces together, Professor Willig's estimated coefficient of -0.86 for all "streaming" reflects (1) a strong promotional effect from Sirius XM (+2.27), (2) a weak promotional effect from non-interactive services (+0.19), and (3) a strong substitutional effect from interactive services and video (-1.24).

Following Professor Willig's methodology, we can now repeat the analysis that he did to construct his Table 1, but focusing just on Sirius XM. From 2010 to 2016, the number of performances on Sirius XM grew by 76.7 billion, generating an additional $125 million in direct revenue for record companies. Using my regression results, and applying Professor Willig's methodology, these additional 76.7 billion performances led to an additional 174 billion downloaded performance-equivalents (174 = 76.7 * 2.27). Using Professor Willig's figure of $0.0051 of record company revenue for each of these performances, the promotional effect of Sirius XM on record company revenue was $890 million in 2016. Adding this to the $125 million paid by Sirius XM for these additional 76.7 billion performances implies that the growth

of Sirius XM from 2010 to 2016 added a total of $1.015 billion to record company revenue in 2016.

In Appendix B, I provide a revised version of Professor Willig's Table 1, based on my regression analysis. After correcting Professor Willig's econometric error, his methodology implies that the growth of Sirius XM and the various streaming services since 2010 is estimated to have increased record label revenue in 2016 by $1.7 billion. This figure stands in sharp contrast to $813 million net loss in record company revenue that Professor Willig shows in his Table 1. We also can break down the sources of that $1.7 billion of additional revenue: (a) $700 million in additional royalties paid by Sirius XM and non-interactive services (due to the growth of these services); plus (b) $1.2 billion in additional revenue from downloads resulting from the promotion effect of Sirius XM and non-interactive webcasters; and (c) a net loss of $160 million due to substitution from downloads to interactive streaming services and video.

My revised version of Professor Willig's Table 1, along with Professor Willig's original Table 1, are reproduced below as Table 2.

Table 2: Calculation of the Change in Sound Recordings' Creator Compensation in 2016 Due to Increased "Streaming" [RESTRICTED]

Shapiro Revision of Willig Table 1



Willig Table 1



B. Impact of Sirius XM on Interactive Services

Professor Willig separately examines the effect that Sirius XM has had on record company revenue from subscription interactive and non-interactive services.[101] However, his model is not properly specified. Correcting the specification reverses his results.

There are two problems with Professor Willig's model. First, as in his previous regression analysis, he improperly aggregates different streaming services, this time combining performances on subscription interactive and non-interactive services. Second, he leaves out key explanatory variables that govern the growth of these services.

In correcting Professor Willig's specification, I first separate out performances on subscription interactive services from those on subscription non-interactive services. This is important, particularly given that the possibility that satellite radio cannibalizes revenue from subscription interactive services appears to be Professor Willig's main point of concern.[102]

Looking at Figure 1 above, two things are apparent. First, although subscription interactive services such as Rhapsody (now Napster) have been around for many years, the accelerated growth of interactive services did not start until after 2011, when Spotify first entered the U.S. market. Second, this growth in interactive services was unrelated to changes in the number of performances on Sirius XM, which has been growing at roughly the same rate since 2009.

To capture the effect of the introduction of Spotify in 2011, I make one change in Professor Willig's model. I allow the estimated time trend coefficient to change starting in the third quarter of 2011, when Spotify launched its service in the United States.[103] This one change has a dramatic effect on the coefficient estimates in Professor Willig's model. Using my specification, Sirius XM is estimated to have a net promotional effect on interactive services, with a coefficient of 0.79. This coefficient is statistically significant. This means that every ten performances on Sirius XM lead to nearly eight additional performances on interactive services.[104]

C. Summary

Professor Willig paints a picture in which the growth of Sirius XM has been a net drain on record company revenue. According to Professor Willig, this occurs because Sirius XM substitutes very significantly for paid downloads and interactive services, which are more lucrative for record companies.

I have run revised versions of Professor Willig's regressions. Regarding his regression that studies the impact of the various services on paid downloads, my revision corrects for a clear error in Professor Willig's specification. Regarding his regression that studies the impact of Sirius XM on subscription interactive services, my revision is accounts for a highly significant event in the market: the launch of Spotify in the United States.

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[101] Written Direct Testimony of Robert Willig at ¶42-43.

[102] Written Direct Testimony of Robert Willig at ¶46.

[103] See "Hello America. Spotify here." available at https://news.spotify.com/us/2011/07/14/hello-america-spotify-here/.

[104] The details of this calculation are set forth in Appendix B.

Correcting and revising Professor Willig's regression analyses reverses his conclusions. When done correctly, Professor Willig's approach shows that the growth of Sirius XM has not been a drain on record company revenue at all. Quite to the contrary, the recent growth of Sirius XM has contributed substantially to record company revenues. Based on the corrected version of Professor Willig's regression involving paid downloads, his methodology indicates that the growth of Sirius XM since 2010 contributed a little over a billion dollars to record company revenue in 2016.

In summary, if one accepts Professor Willig's methodology, it robustly shows that the growth of Sirius XM in recent years has provided a very substantial boost to record company revenue.

5. A Record Company's Opportunity Cost of Plays on Sirius XM

I now turn to the crux of Professor Willig's testimony – his estimate of the opportunity cost of licensing Sirius XM. As Professor Willig notes, his estimate of opportunity cost forms the basis for his calculations of royalty rates for Sirius XM.

In this section, I show that Professor Willig's analysis of opportunity cost suffers from a number of crippling flaws. Most fundamentally, Professor Willig is *asking the wrong question*. Rather than attempting to calculate the opportunity cost to an individual label of having its sound recordings performed on Sirius XM, Professor Willig calculates the opportunity cost to the entire recorded music industry, as if a single entity (or a fully functioning cartel) controls the rights to all sound recordings. This leads Professor Willig to a dramatically inflated opportunity cost estimate. Professor Willig then employs a number of techniques for estimating a mark-up above opportunity cost to derive a royalty rate for Sirius XM. I understand that the Written Rebuttal Testimony of Professor Joseph Farrell is addressing in detail the flaws in the approaches that Professor Willig uses to derive a mark-up above opportunity cost.

Professor Willig and I are in agreement in one very important respect. We both are of the view that a critical factor in determining the rate at which a record company will license its music to a music service is the opportunity cost to that record company of having its music played on that service. However, I disagree with Professor Willig in some very important respects regarding how to properly measure that opportunity cost here. Some of the points on which we differ are conceptual, and some involve the empirical implementation of those concepts. I address all of these issues in this section. Appendix C provides an extended discussion of these issues, along with the details behind my calculation of the opportunity cost to a record company of having its music played by Sirius XM.

A. Professor Willig Rules Out Steering and Ignores Workable Competition

There are three fundamental reasons why Professor Willig grossly over-estimated the opportunity cost to a record company of licensing its music to Sirius XM.

First, Professor Willig entirely rules out even the possibility of steering. This is made most explicit in the following passage from Professor Willig's Written Direct Testimony:

> "It will be useful to recognize here that the applicable price elasticity of demand is that for the use of the music by the distribution mode in question. This price elasticity of 'derived demand' for the music is equal to the product of (a) the price elasticity of

> demand for the overall service in the distribution mode; and (b) the fraction of the price of the overall service that is comprised of the cost of the music input, *provided that the use of the music is proportional to the sales of the service.*"[105]

By assuming that "the use of the music is proportional to the sales of the service," Professor Willig does not allow the possibility that one record company could increase its share of the music on Sirius XM by offering lower royalties. In Professor Willig's world of proportionality, each record company's share of the music on Sirius XM is immutable, regardless of the royalties it charges. The only way a record company can have more of its music played on Sirius XM is if the sales of Sirius XM expand in equal proportion. Nothing in Professor Willig's Written Direct Testimony even contemplates competition among record companies.

Second, by assuming that "the use of the music is proportional to the sales of the service," Professor Willig also is assuming that the music from each record company is "must have" for Sirius XM. This follows, because if the "use of the music" is zero, the "sales of the service" must also be zero. Professor Willig's approach only applies if the market for the licensing of music to Sirius XM is a complementary oligopoly. As the Judges recognized in *Web IV*, a market with a complementary oligopoly cannot be workably competitive. And Mr. Orszag acknowledges that for a rate to satisfy the 801(b)(1) objectives, it must be one that arises under workably competitive conditions.[106] Professor Willig makes no mention of workable or effective competition anywhere in his Written Direct Testimony.

Third, Professor Willig appears to be studying the question of opportunity cost by asking about the opportunity cost *to the entire record industry* of licensing to Sirius XM. However, what matters when a single record company negotiates a license with Sirius XM is what *that record company's opportunity cost* is when licensing its music to Sirius XM. Put slightly differently, Professor Willig's analysis is, by design, one that calculates the opportunity cost to a monopolist that controls the rights to all sound recordings of having its music played on Sirius XM. As a result, Professor Willig's approach is fundamentally inconsistent with any economic interpretation of the 801(b)(1) policy objectives that is based on a willing buyer/willing seller framework in which the willing seller is a single record company.

B. The Opportunity Cost to a Record Company of More Plays on Sirius XM

As noted above, a critical factor governing the royalty that a record company would charge Sirius XM for its music, in the absence of any statutory license, is the opportunity cost to that record company of additional performances of its music on Sirius XM's service. In my Written Direct Testimony, I defined the "Full Marginal Cost" to a record company of an additional performance on a music service and I explained how to measure the opportunity cost to a record company of additional performances of its music on Sirius XM. This is discussed in detail in Appendix D to my Written Direct Testimony.

In Appendix C to this Written Rebuttal Testimony, I calculate the opportunity cost to a record company of having its music played more on Sirius XM under several different relevant scenarios. As I demonstrate there, the opportunity cost to a label of having its music performed

[105] Written Direct Testimony of Robert Willig at ¶33, emphasis added.

[106] Amended Written Direct Testimony of Jonathan Orszag at ¶16; see also Orszag Deposition at 40:2-41:10.

on Sirius XM is, under all scenarios, well below the rates currently being paid by Sirius XM, and well below the rates that I concluded in my Written Direct Testimony are reasonable.

Moreover, the analysis in Appendix C, like that undertaken by Professor Willig, does not account for any promotional effects of Sirius XM. Promotional effects lower the opportunity cost to a record company of having its music played more on Sirius XM, and can lead to a negative opportunity cost. This occurs when the promotional benefits to the label of having its music played on Sirius XM (i.e., because the airplay promotes sales of downloads) outweigh the lost revenue that results from Sirius XM cannibalizing other record label revenue streams.

In stark contrast to my findings, Professor Willig claims that the opportunity cost to the record industry of having its music played on Sirius XM is equal to $2.55 per Sirius XM subscriber per month. Using my estimate that on average there are 469 performances of recorded music on Sirius XM per subscription per month, this is equivalent to $0.00545 per performance.

My analysis in Appendix C shows that the true opportunity cost to an individual record company of having its music played on Sirius XM (this being the relevant metric) is far less than is claimed by Professor Willig.

In the "Pure Steering" scenario described in Appendix C, in which a record label cuts its price and, as a result, secures more plays at the expense of rival labels, without any impact on the total number of Sirius XM subscribers, the opportunity cost is zero. This is because Sirius XM neither gains nor loses subscribers – it simply shifts its mix of music toward the record company offering the lower royalty rate – so no other record company revenue streams are affected.

In the "Steering Loses Subscribers" scenario described in Appendix C, which is identical to the "Pure Steering" scenario except that, as a result of the steering, Sirius XM loses subscribers, who turn to other music services to listen to music, the opportunity cost is actually negative. This is because the record company in question earns *more* revenue from other music services, as some Sirius XM subscribers shift to services from which that record company earns royalties.

In the "Sirius XM Cuts Price" scenario, Sirius XM cuts its subscription price to offset the negative impact that steering has on the listening experience offered by Sirius XM. In this scenario, the opportunity cost is far smaller than Professor Willig's $0.00545 per performance number. In my central case, in which I use Warner as my example, Professor Willig's opportunity cost is more than 160 times as large as the true opportunity cost. Professor Willig's figure is about 122 times too large for Sony, and about 95 times too large for Universal.

Lastly, I consider a "Refusal to License" scenario in which the record company in question does not make its music available on Sirius XM at all. Even in this scenario, Professor Willig's $0.00545 per performance number far exceeds the true opportunity cost to the label. Again, this results because Professor Willig has ruled out any competition among record companies. A record company that refuses to license to Sirius XM will have no plays on Sirius XM and thus will lose market share to other record companies. In my central case, again involving Warner as the record company, Professor Willig's figure is 61 times as large as the true opportunity cost. Professor Willig's figure is roughly 39 times too large for Sony, and 25 times too large for Universal.

In fact, the only way that one can arrive at Professor Willig's opportunity cost number is to assume that each label is a "must have" label for Sirius XM, meaning that Sirius XM would lose every single one of its subscribers if it did not have access to this record company's music. As

noted above, that scenario – the one modeled by Professor Willig – departs sharply from workable competition and is wholly uninformative to the rate-setting task at hand.

In short, these findings demonstrate that Professor Willig's analysis has gone very far astray.

Ultimately, my analysis of the opportunity cost to a record company of having its music played on Sirius XM has three central implications for the current proceeding.

- Professor Willig's analysis of opportunity cost is fundamentally asking the wrong question and, consequently, is entirely irrelevant to the rate-setting task at hand.
- Professor Willig's claim that the statutory rates that Sirius XM has been paying fall short of a record company's opportunity cost of licensing to Sirius XM is not correct, even if one sets aside the promotional effects of Sirius XM.
- The rates that I have proposed are well above each record company's opportunity cost of licensing its music to Sirius XM.

C. Survey Results

In addition to the major flaws noted above, Professor Willig's opportunity cost calculations draw heavily from the Dhar survey. From the Dhar survey results, Professor Willig estimates the diversion rates between Sirius XM and other music services (the percentage of subscribers that would go to other services if they canceled their Sirius XM subscriptions).

Professor Hauser, in his Written Rebuttal Testimony, examines the Dhar survey. He identifies a number of important deficiencies in the Dhar survey, including some which significantly bias upward the estimated diversion from Sirius XM to subscription interactive services.[107] To test the significance of one of these biases, Professor Hauser reproduced the Dhar survey with one modification. Rather than highlight subscription services (as the Dhar survey does), Professor Hauser's revised version of the Dhar survey gives a more equal treatment to the various alternative means of listening to music that a Sirius XM subscriber might turn to should they cancel their subscription.

Professor Farrell, working with the results from this revised version of the Dhar survey, has recalculated Professor Willig's opportunity cost following Professor Willig's methodology. Professor Farrell computes a substantially lower opportunity cost: the $2.55 figure estimated by Professor Willig drop to $1.35.[108] Professor Farrell also notes that the diversion estimates based on the Hauser survey are notably closer to those from the survey results obtained by Mr. Joe Lenski, upon which I relied in my Written Direct Testimony, than they are to the Dhar survey results.[109]

These results indicate that, even taking Professor Willig's approach on its own terms, his opportunity cost estimates are substantially inflated as a result of relying on a flawed survey.

[107] Hauser Written RebuttalTestimony at ¶16-17.

[108] Written Rebuttal Testimony of Joseph Farrell at ¶66. Appendix E uses these revised opportunity cost estimates.

[109] Written Rebuttal Testimony of Joseph Farrell at ¶63.

D. Promotional Effects

Another major flaw in Professor Willig's calculation of opportunity cost is his failure to account for both substitution and promotion. Professor Willig's calculations address the former, but entirely ignore the later. Put differently, Professor Willig never addressed the relevant question: What is the *net* impact of Sirius XM listening on other record label and artist revenue streams, accounting for both substitution and promotion? Instead, Professor Willig addresses only half of the picture, namely, the substitutional impact of Sirius XM on other record label revenue streams.

This failure on Professor Willig's part to properly define opportunity cost is perplexing to me. I am confident that Professor Willig would agree that measuring opportunity cost in this setting requires that one look at the net effect of substitution and promotion effects. Mr. Orszag and Dr. Ford – two other economists that offer testimony on behalf of SoundExchange – both acknowledge that it is the net effect that matters, and that focusing solely on substitution would provide an incomplete picture.[110]

Professor Willig's failure to account for the promotional impact of Sirius XM on record label revenue streams is not a small issue. Using the values for the net promotional effect of Sirius XM on paid downloads and interactive services that I estimated in Appendix C, which are based on Professor Willig's methodology, one reaches an entirely different conclusion than did Professor Willig regarding the impact of Sirius XM on record company revenues.

Looking only at substitution effects based on the Dhar survey without taking promotion into account, Professor Willig calculated that each subscriber to Sirius XM costs the record industry $0.27 per month in compensation from downloads.[111] However, based on the correctly specified estimate of the impact of Sirius XM performances on revenue from paid downloads, the regression indicates that each Sirius XM subscription actually generates $5.45 per month in additional record company revenue. Rather than substitute for download sales, Sirius XM, on balance, promotes such sales.

The same is true with respect to subscription interactive services. The substitution effect computed by Professor Willig based on the Dhar survey is that each subscriber to Sirius XM costs the record industry $1.78 per month in foregone compensation from subscription interactive services. However, the correctly specified variation of Professor Willig's regression indicates that the net promotional benefit on additional interactive subscriptions attributed to an incremental Sirius XM subscription is $3.16 per month.

These regressions indicate that the promotional effect of Sirius XM on paid downloads and interactive service subscriptions outweighs the substitution effect by a wide margin.[112] Furthermore, given that the opportunity cost to the record industry from all other music outlets, as estimated by Professor Willig is only $0.51 per month, these results imply that the opportunity cost to the record industry of a Sirius XM subscription is actually negative, meaning that record

[110] Amended Written Direct Testimony of Jonathan Orszag at ¶¶97-99; Written Direct Testimony of George Ford at 3.

[111] Written Direct Testimony of Robert Willig at Table 2.

[112] Additional promotional effects on touring revenue and any related merchandise sales are not included in these regressions.

industry revenue from all other revenue streams actually increases when Sirius XM signs up a new subscriber.

6. Using the Sirius XM Direct Licenses as a Benchmark

In my Written Direct Testimony I used the direct licenses signed by Sirius XM with independent record labels as a benchmark for determining a reasonable rate in this proceeding. These direct licenses clearly have much to commend them: they involve the same sellers, the same buyer, the same rights as the statutory license, and they were negotiated under workably competitive conditions. However, since they unquestionably are signed in the shadow of the statutory license, I needed to conduct further analysis before using them as a benchmark. More specifically, I needed to check that a significant portion of the discount off the statutory rate in these direct licenses is properly attributable to the labels' expectation of increased performances on Sirius XM of their directly-licensed music.[113]

Professor Lys has also looked at the Sirius XM direct licenses. In his Written Direct Testimony, he discusses why he believes that the record labels signing direct licenses with Sirius XM have been willing to offer a rate to Sirius XM that is lower than the statutory rate.[114] Professor Lys states that "the direct license royalty rates are simply a reflection of the statutory rate and are not indicative of the fair market value or [sic] the underlying royalty rights."[115] I disagree.

In this section I examine several key points where my analysis differs from that of Professor Lys.

A. Royalty Rates in the Direct Licenses Closely Track the Statutory Rate

Professor Lys emphasizes that the royalty rates in the Sirius XM direct licenses closely track the statutory rate. This is the central point in Section III.B of his Written Direct Testimony. He estimates that the royalty rates in the direct licenses are [redacted] below the statutory rate.[116]

I agree with Professor Lys that the royalty rates in the Sirius XM direct licenses closely track the statutory rate. In my Written Direct Testimony, I stated: "I show that the statutory rate acts as a *magnet*, pulling the direct-license rate up, above the competitive level, toward the statutory rate."[117] Appendix E to my Written Direct Testimony provides a model showing how this occurs. That model shows that "the magnet effect is very strong for plausible rates of steering."[118] By this, I mean that when the statutory rate rises, my model predicts that the direct-license rate will rise by roughly the same amount.

Professor Lys and I differ sharply on how to *interpret* the fact that the rates in Sirius XM's direct licenses closely track the statutory rate. Professor Lys states that "this supports my conclusion

[113] Written Direct Testimony of Carl Shapiro at p. 37-44.

[114] Written Direct Testimony of Thomas S. Lys Section III, "Direct Licenses," at ¶¶252-326.

[115] Written Direct Testimony of Thomas S. Lys at ¶253.

[116] Written Direct Testimony of Thomas S. Lys at ¶275. Professor Lys measures the weighted average royalty rate under the direct licenses in May 2016 as [redacted], compared to the statutory rate during 2016 of 10.5%.

[117] Written Direct Testimony of Carl Shapiro at p. 45 (emphasis in original).

[118] Written Direct Testimony of Carl Shapiro at p. 45.

that the market value of the royalty rate **CANNOT** be inferred from the royalty rates in the direct license contracts."[119] He further states: "Equation (5) makes clear that the royalty rate in the direct licensing agreements is simply reflective of the statutory royalty rate and **NOT** reflective of the market value of the royalty rights."[120] I strongly disagree, for reasons I now explain.

With his equation (5) in his Written Direct Testimony, Professor Lys has done nothing more than write down, in the form of an inequality with variables, the notion that Sirius XM and the record label will only agree to a direct license if they both prefer that direct license to the statutory license. This simple observation is undisputed.

Equation (5) in Professor Lys's Written Direct Testimony is *completely unhelpful* regarding the key question: whether the rates in the direct licenses are informative regarding what Professor Lys calls the "market value of the royalty rights." As I explain in my Written Direct Testimony, the answer to that question hinges on whether the labels signing direct licenses have done so in significant part based on the expectation that their music will be played more on Sirius XM, or entirely for other reasons. Equations (1) through (5) in Professor Lys' Written Direct Testimony do not even address this question. And here is why: when Professor Lys defines the benefits that a label receives from a direct license, B_{Indie} in his notation, he makes *no distinction whatsoever* between benefits associated with steering and other benefits.

Due to this fundamental deficiency in the economic model that Professor Lys offers in Section III.A of his Written Testimony, his economic analysis there is completely uninformative regarding the proper interpretation of the undisputed fact that the royalty rates in the Sirius XM direct licenses closely track the statutory rate.

The model in Appendix E of my Written Direct Testimony also predicts that the royalty rates in the Sirius XM direct licenses will closely track the statutory rate. In that model, a label is willing to offer a discount below the statutory rate because of the expectation that Sirius XM will play its music more. In that model, the market value of the rights is less than the directly licensed rate, which in turn is less than the statutory rate. Nothing in Professor Lys's Written Direct Testimony challenges that analysis.

B. The Direct Licenses Cover a Meaningful Share of Music on Sirius XM

Section III.C of Professor Lys's Written Direct Testimony is entitled "Sirius XM's Direct Licenses Represent a Miniscule Part of its Total Royalties Paid."[121] At the outset of that section, he states: "My analysis has also shown that direct licenses account for only a small fraction of the sound recordings that Sirius XM's business model relies upon and as such could not be considered informative as to the market as a whole."[122]

Sirius XM's direct licenses accounted for approximately 6.4% of the tracks on the Sirius XM playlists across all music channels in July 2016.[123] It rose as high as 7.2% in August of 2016,

[119] Written Direct Testimony of Thomas S. Lys at ¶276 (emphasis in original).

[120] Written Direct Testimony of Thomas S. Lys at ¶265 (emphasis in original).

[121] Written Direct Testimony of Thomas S. Lys at ¶¶277 to 280.

[122] Written Direct Testimony of Thomas S. Lys at ¶277.

[123] Written Direct Testimony of George White, at ¶5. I cite this figure in my Written Direct Testimony at p. 35.

and varied between 6.2% and 6.8% for the remainder of the year (our data now goes through the end of 2016).[124] Professor Lys does not dispute the 6.4% figure or offer an alternative measure for the share of music on Sirius XM that is directly licensed. I do not believe it is accurate to describe 6.4% as "a miniscule part" of the music played on Sirius XM. Furthermore, it seems worth noting that in the *Web IV* proceeding, the Judges relied on the Pandora/Merlin Agreement, which covered roughly [redacted] of the music played on Pandora.[125]

When one sees a group of labels enter into direct licenses, a key question is whether those labels are reasonably representative of record companies on the whole. In my Written Direct Testimony, I raised this question regarding the Sirius XM direct licensing, and stated: "Based on the information currently available to me, I cannot say with certainty that [the royalty rate in the Sirius XM direct licenses] would be accepted by the major labels (and other independent labels) in a workably competitive market."[126] After reading Professor Lys's Written Direct Testimony, I continue to view the Sirius XM licenses as informative but not definitive for this very reason.

The share of music that is directly licensed, 6.4% here, is certainly an important factor to consider in assessing whether the labels signing direct licenses are representative of record companies as a whole. Given that the major record companies appear to be wary of entering into direct licenses for fear that those licenses will be used as benchmarks,[127] one can also look at the share of music not owned or distributed by the majors that is directly licensed. There was testimony in the *Web IV* proceeding that the share of performances on interactive services owned or distributed by the major labels was 76%.[128] Using this figure for Sirius XM, the directly-licensed music on Sirius XM represents roughly one-quarter of all performances that are not under the control of the major record companies (6.4% out of 24%). While this observation alone does not tell us that the directly-licensed music is fully representative of the music not controlled by the majors, it certainly represents a significant portion of that music.

Furthermore, Sirius XM's direct licensing program has grown quite rapidly in recent years. In Figure 69 in his Written Direct Testimony, Professor Lys shows the total royalty payments made by Sirius XM from 2011 Q1 through 2016 Q1. Figure 2 below shows Sirius XM's royalty payments under its direct licenses, using the same data that Professor Lys used in his Figure 69.

[124] MRI Inputs.xlsx

[125] *Web IV* Written Direct Testimony of Carl Shapiro, at 26.

[126] Written Direct Testimony of Carl Shapiro at p. 49.

[127] In my Written Direct Testimony, I noted some instances in which a direct license was cancelled after the label in question was acquired by one of the major record companies. Written Direct Testimony of Carl Shapiro at 46-7. These instances suggest to me that the major record companies are concerned that the Judges would use such direct licenses as benchmarks, a concern that is also expressed by Mr. White. Written Direct Testimony of George White at 16; Deposition of George White at 153-55, 161-62, 168-69.

[128] *Web IV* at 26339.

Figure 2: Sirius XM Royalty Payments for Direct Licenses [RESTRICTED]

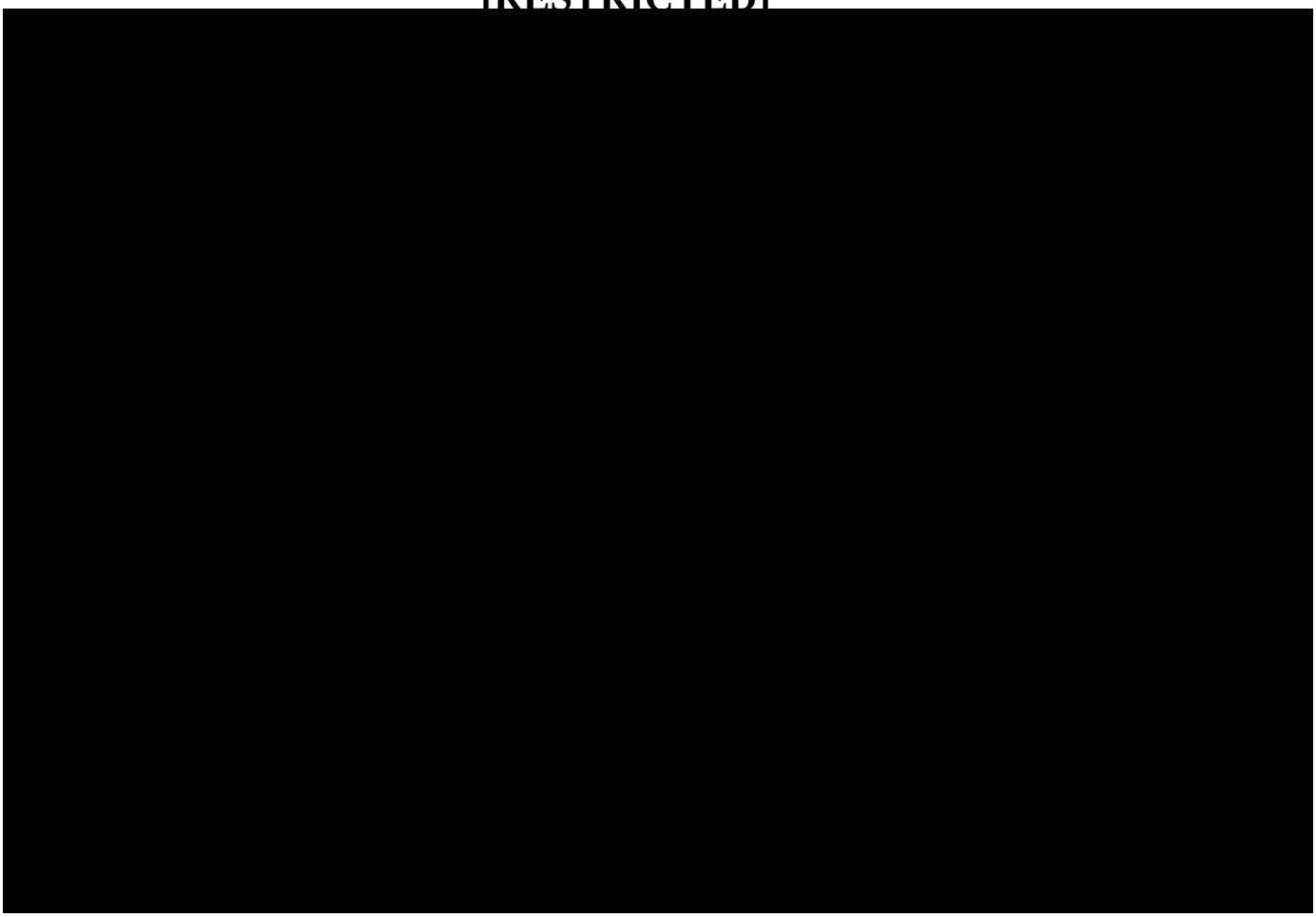


Figure 2 shows that Sirius XM's direct license payments nearly grew from roughly [redacted] in 2013 Q1 to over [redacted] in 2016 Q1. This is an annual growth rate of [redacted].[129]

C. Over-Indexing and Under-Indexing of Directly-Licensed Labels

As I describe in my Written Direct Testimony, a label that licenses directly to Sirius XM is compensated according to its share of performances on Sirius XM's webcasting service. In contrast, under the statutory license, a label's royalty payments are based on its share of "plays" or "spins" on Sirius XM's satellite radio service.

In my Written Direct Testimony, I examine whether this difference in compensation methodology explains at least part of the gap between the direct-license rate and the statutory

[129] My understanding is that the sharp increase 2016 Q1 resulted in large part from the efforts by George White to sign licenses with new labels, and especially the license signed in January 2016 by [redacted]. I also have been informed that the payout grew to [redacted] in 2016 Q3 (excluding payments for pre-72 recordings).

rate. I conclude that on average it does *not*, because on average direct licensors would actually earn *larger* royalties under the compensation methodology used by the statutory license.

1. Professor Lys's Analysis of Over-Indexing

Professor Lys analyzes this same issue in Section III.D.1 of his Written Direct Testimony. He finds that *some* labels who have signed direct licenses with Sirius XM have earned higher royalty payments because of this difference in compensation methodology.[130] Professor Lys refers to the increase in royalty payments for these labels as "over-indexing" on performances.[131]

To demonstrate the presence of such over-indexing, Professor Lys analyzes compensation for 18 labels that have signed direct licenses with Sirius XM. Professor Lys's analysis assumes away any steering toward direct licensors by Sirius XM: for a label signing a direct license, his calculation of the royalties that label would have received under the statutory license assumes the same number of plays on Sirius XM that the label actually received while operating under the direct license. With this assumption, Professor Lys reports in his Figure 71 and ¶¶291-292 to his Written Testimony that these 18 direct licensors received between [redacted] than they would have under the statutory rate.[132] As a group, these 18 labels received [redacted] due to the different direct license methodology.

I agree with Professor Lys that some of the labels that have signed direct licenses with Sirius XM have benefitted from "over-indexing" on performances. But what are the implications of this observation, given that Professor Lys *selected* the labels to include in his Figure 71 and ¶¶291-292 in order to demonstrate the presence of over-indexing for some labels?[133] After all, the 18 labels that Professor Lys selected are just 10% of the 176 labels appearing in Professor Lys's data, and account for [redacted] by directly licensed labels on the reference channels.

2. A More Complete Analysis of Over-Indexing and Under-Indexing

I have performed the exact same calculations that Professor Lys reports in his Figure 71 for *all* 176 of the labels appearing in Professor Lys's data.[134] This calculation shows that [redacted] received higher royalty payments under the direct license; in other words, there is indeed "over-indexing" on performances for [redacted]. The weighted average increase in royalty payments received by these [redacted] over what they would have earned under the statutory license, assuming no steering, was [redacted]. In contrast, there was "under-indexing" on performances for the [redacted], another [redacted]. In other words, these labels earned *less* under the direct license than they would have under the

[130] Written Direct Testimony of Thomas S. Lys at ¶19.

[131] Written Direct Testimony of Thomas S. Lys at ¶286.

[132] Two of the entries in Figure 71 are identical (Enhanced Music Limited), but Professor Lys also examines S-Curve records in the preceding text and Figure 70. Written Direct Testimony of Thomas S. Lys at ¶¶290-3.

[133] Professor Lys is explicit about this, stating: "To be clear, I do not mean to suggest that all indies that sign direct licenses that pay royalties based on the indie's share of performances succeed in achieve [sic] over-indexing." Written Direct Testimony of Thomas S. Lys at ¶295.

[134] For this purpose, I have used the data provided by Professor Lys. SOUNDX_000166251.xlsx. I have not separately tested whether these data are correct or complete, but I have been informed of certain anomalies in the data that may cause me to amend my conclusions in the event that significant errors in the data do in fact exist.

statutory license, assuming an equal number of plays. For these under-indexed labels, the weighted average decrease in royalty payments under the direct license was [redacted] Of all the reference channel performances made under Sirius XM's direct licenses, [redacted] were performances of music from direct licensors who were over-indexed.

The distribution across labels of the change in royalty payments caused solely by the difference in compensation methodology between a direct license and the statutory license is shown in Figure 3. The bars to the right of the vertical line show those licensors who are over-indexed and thus would earn more under the direct license even in the absence of any steering. The bars to the left of the vertical line show those licensors that are under-indexed and thus would earn less under the direct license in the absence of any steering.

Figure 3: Under-Indexing and Over-Indexing in Sirius XM Direct Licenses [RESTRICTED]



This analysis shows (a) that the impact of the different compensation methodologies used by the direct licenses and the statutory license varies considerably across labels, and (b) that there are

just as many labels that would be harmed by signing a direct license as would benefit from signing a direct license, assuming no steering by Sirius XM.

I have also compared the total royalty payments made by Sirius XM to all 176 direct licensors over the full period covered in the data set to what these labels would have earned in the aggregate under the statutory rate, again assuming no steering by Sirius XM. The 176 direct licensors earned [redacted] from Sirius XM under their direct licenses over the time period covered in the data. Assuming no steering by Sirius XM, Professor Lys computes that these same labels over the same time period would have earned [redacted] had they remained under the statutory license. Thus, according to Professor Lys's own data and analysis, the total royalties accrued by the labels signing direct licenses were [redacted] than what those labels would have received had they opted for the statutory rate. This broader look at over-indexing and under-indexing presents a very different picture than does Professor Lys's Figure 71, which reported on the 18 labels that he picked.

This analysis shows that the data used by Professor Lys supports and confirms the conclusion in my Written Direct Testimony that, averaging across all direct licensors, the change in methodology alone *reduces* their royalties from Sirius XM.[135]

3. Implications for the Direct License Benchmark

What does all of this imply for using the Sirius XM direct licenses as benchmarks? I draw two closely related conclusions.

First, [redacted], benefit from "over-indexing" on performances, so it is reasonable to believe that at least some of them viewed this as a significant benefit of signing a direct license. This conclusion is especially warranted since Sirius XM in some cases pointed out to a label that it would benefit from over-indexing as part of Sirius XM's efforts to encourage that label to sign a direct license, and because MRI, acting on behalf of Sirius XM, told a number of labels that they were likely to benefit from the direct-licensing methodology.[136]

Second, [redacted], are "under-indexed" on performances, so it is reasonable to believe that at least some of them viewed this as a cost of signing a direct license. For this group of labels, the under-indexing suggests more strongly that the prospect that Sirius XM would play their music more was a meaningful factor in their decision to sign a license with Sirius XM.[137]

In the end, I agree with Professor Lys that *some* of the labels that signed direct licenses likely did so in significant part because they anticipated that they would benefit from the different compensation methodology used in the direct licenses compared to the statutory license. However, there remain many labels to which his argument does not apply. Based on my analysis

[135] Written Direct Testimony of Carl Shapiro at 43-44 and Figure 6.

[136] See, e.g., SXM_DIR_00078090; SXM_DIR_00064652.

[137] For labels that did not anticipate either over-indexing or under-indexing, we also can infer that the label anticipated that it would benefit from increased plays on Sirius XM, but this inference is not as strong as for those who anticipated under-indexing. For labels that did not anticipate over-indexing or under-indexing, the analysis follows the lines of my Written Direct Testimony.

of Professor Lys's data, just half of the labels that signed direct licensed with Sirius XM have benefitted from the over-indexing that drives his argument. For the other half, we can conclude with somewhat greater confidence than I expressed in my Written Direct Testimony that the prospect of additional plays on Sirius XM was a meaningful factor in signing a direct license.

D. Other Benefits of Direct Licenses Raised by Professor Lys

Professor Lys discusses several other provisions of Sirius XM's direct license contracts, which, he claims, give additional benefits to licensors.[138] Having reviewed the available evidence, I have not found evidence that these provisions give substantial benefits to direct licensors relative to the statutory license or that they have been significant factors in the decisions made by independent labels to sign direct licenses with Sirius XM.

1. The Share of Royalties Retained by the Label

In Section III.D.2 of his Written Direct Testimony, Professor Lys discusses the fact that independent labels who sign direct licenses with Sirius XM directly receive 100% of the royalties paid by Sirius XM. This is in contrast to the statutory license, under which SoundExchange pays the label 50% of the performance royalties, with the artist (and the artist union) receiving the other 50% (after deducting the SoundExchange administrative fees).[139] This issue was also raised by SoundExchange during the *SDARS II* proceeding. However, as I discussed in my Written Direct Testimony, the initial distribution protocol does not change the contractual obligations between the label and its artists. This fact was noted by the Judges in *SDARS II*.[140]

Implicitly addressing this point, Professor Lys goes on to make this statement:

> "In particular, under a label's agreements with its artists, labels typically receive substantially more than 50% of royalties received. Rather, such agreements generally provide that the artist is entitled to 14-20% of royalties earned by the sound recording. Thus, simply by obtaining direct payment of royalties through a direct deal, the label can potentially receive 80% of the royalties paid by Sirius XM, rather than the 50% that it would receive under the direct [sic] license."[141]

Professor Lys is putting this forward as a potentially significant reason for independent labels to sign direct licenses with Sirius XM. Indeed, this passage appears in the section of Professor Lys's Written Direct Testimony entitled "Value That Direct Licensors Obtain by Signing a Direct License."

So far as I can determine, Professor Lys's argument on this point lacks factual support. It simply does not appear to be true that the contracts between artists and the independent record labels

[138] Written Direct Testimony of Thomas S. Lys at ¶¶303 to 322. One of these benefits is the avoidance of the SoundExchange administrative fee. I addressed that issue in my Written Direct Testimony and do not revisit it here.

[139] Written Direct Testimony of Thomas S. Lys at ¶303 and ¶304.

[140] *SDARS II* at 23064.

[141] Written Direct Testimony of Thomas S. Lys at ¶307 (footnote omitted).

signing direct licenses with Sirius XM "typically" assign to those labels more than 50% of the total royalties paid by Sirius XM.

The only support that Professor Lys cites for this claim is ¶¶38-39 from the Written Direct Testimony of Mr. Michael Kushner, who is the Executive Vice President, Business and Legal Affairs, at Atlantic Recording Corporation, a part of Warner Music Group.[142]

As a threshold issue, Mr. Kushner's is describing the practices at Warner Music Group, a major record company. Neither Warner nor any other major record company has signed a direct license with Sirius XM, so Warner's contracts with artists are not necessarily informative regarding the contracts between artists and the independent labels that *have* signed direct licenses with Sirius XM. Mr. Kushner does not claim to describe contracts between artists and independent labels. So far as I can tell, he is hypothesizing, without providing evidence, as to how independent labels might behave.[143]

Furthermore, there appears to be a significant problem with the way in which Professor Lys has interpreted and used Mr. Kushner's testimony. At this point, it becomes important to look closely at what Mr. Kushner actually says in his Written Direct Testimony. Here is ¶38:

> "A key term in any recording deal is the artist's royalty. These days, with respect to product that is sold either in physical form or as downloads, that is typically expressed as a percentage of the record company's wholesale price. For Atlantic's front-line artist roster, that percentage is typically in the range of [redacted] In rare instances we might sign a new artist at a rate as low as [redacted] or a star artist at a rate as high as [redacted] I estimate that our average royalty rate for active front-line artists is approximately [redacted] of the selling price of a CD or download."

Critically, the [redacted] range from Mr. Kushner's Written Direct Testimony is referring to royalties on CDs and downloads, *not* from streaming and certainly not from satellite radio.

Mr. Kushner then states that "streaming royalty rates in new contracts are in the same range as physical and digital product royalty rates (typically [redacted]."[144] It is not clear to me just what streaming services Mr. Kushner is referring to here, but these rates do not seem to be relevant to Sirius XM.

According to SoundExchange, the major labels have agreed that if they enter into a direct license with Sirius XM, they will continue to pay artists 50% of the royalties via SoundExchange, just as they do under the statutory license.

> "Under this agreement, if any of the majors were to sign a direct license with Sirius XM, then the artist share of the royalties would remain the same as it is under the statute (i.e., 50/50 split with the record company)."[145]

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[142] Written Direct Testimony of Thomas S. Lys at ¶307, footnote 222, citing Written Direct Testimony of Michael Kushner at ¶¶38-39.

[143] Written Direct Testimony of Michael Kushner at ¶44.

[144] Written Direct Testimony of Michael Kushner at ¶39.

[145] SoundExchange, "Opposition to the Motion to Compel SoundExchange to Produce Artist Contracts," at 3-4 (January 12, 2017).

Mr. Kushner's Written Direct Testimony makes the same point, describing Warner's agreement with the unions to pay the artist share of direct-license royalties from statutory services through SoundExchange.[146] Likewise, Mr. Van Arman, another SoundExchange witness, has testified that "[w]e typically share 50% of royalties from digital licensing agreements with our artists."[147] Mr. Van Arman states that Secretly Group's split "is more generous to artists than the terms of many other record companies' artist agreements," but he provides no evidence to support that claim.[148]

The handful of actual artist contracts produced by SoundExchange to date do not support Mr. Van Arman's claim. [redacted].[149] The licenses provided by [redacted].[150]

In summary, the evidence does not support Professor Lys's suggestion that the independent labels that have signed direct licenses with Sirius XM have received a significant benefit from those licenses in the form of a more favorable split of the revenue with artists. Furthermore, labels that follow the same approach taken by the major labels would receive no such benefit.

2. Royalties for Pre-1972 Sound Recordings

Professor Lys claims that some direct licensors got a substantial benefit by "negotiating direct licenses that are contingent on the payment of royalties for pre-1972 sound recordings."[151] He notes that several labels receive royalties of between [redacted] of revenue on performances of pre-1972 recordings under their direct license contracts with Sirius XM. However, this only counts as an extra benefit to these licensors attributable to post-72 recordings if their expectation was that they would otherwise not receive compensation, or receive compensation at a lower rate, for these performances.

We have clear evidence on this point that undercuts Professor Lys's argument.

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[146] Written Direct Testimony of Michael Kushner at ¶44 and Exhibit 5.

[147] Written Direct Testimony of Darius Van Arman at 8.

[148] Written Direct Testimony of Darius Van Arman at 8.

[149] SOUNDX_000478424 through SoundX_000478561.

[150] SoundX_000479246. [redacted]

[151] Written Direct Testimony of Thomas S. Lys at ¶315.

A class action regarding compensation for pre-1972 sound recordings was filed in August 2013.[152] Sirius XM also paid a significant settlement in June 2015 to major labels for performances of pre-1972 recordings.[153] Both events – as well as summary judgment rulings against Sirius XM in New York and California – occurred well before, for example, the signing of the Concord Music direct license contract in January 2016 that Professor Lys claims would not have been signed without an agreement about pre-1972 sound recordings.[154] The class action was settled in November, 2016, and provided for a going-forward, ten-year license to perform the class members' pre-72 recordings for pro rata royalty payments of [redacted] of Sirius XM revenues.[155] Since the direct-license contracts call for rates that are no more than the settlement rate, there is no reason to suppose that direct licensors believed they were getting an extra benefit from this aspect of the direct license contract beyond what they would receive as members of the class action.[156]

7. Sirius XM's Overall Profitability

Sirius XM has enjoyed steady growth in the number of subscribers, and hence subscriber revenue, in recent years.[157] Since the royalties that Sirius XM pays to recorded music content providers are based on a percentage of Sirius XM's revenue, this increase in the number of subscribers, and thus Sirius XM's total subscriber revenue, has also resulted in a substantial increase in the total royalty payments received by record companies and artists over the years.

In my Written Direct Testimony, I wrote:

> I have considered whether the growth in Sirius XM's subscriber base and revenues, and the general improvement in Sirius XM's financial position, implies that an upward adjustment from the 11 percent of revenue royalty rate for satellite radio services that was established in the *SDARS II* proceeding is warranted. I have concluded that it does not. The reason is straightforward: the basic service offered by Sirius XM has not changed, and the revenue that record companies receive from Sirius XM grows along with Sirius XM's subscriber base. Put simply: under the percentage-of-revenue rate structure that applies to Sirius XM, record companies *automatically* receive additional royalties when Sirius XM's subscriber base and revenue grow. This is inherent in the percentage-of-revenue rate structure. No adjustment to the 11 percent rate is needed simply because Sirius XM's revenue is growing over time.[158]

[152] Flo & Eddie, Inc. v. Sirius XM Radio Inc., United States District Court for the Central District of California, Case No. CV 13-05693 PSG (GJSx)

[153] Written Rebuttal Testimony of David J. Frear ¶ 29.

[154] Written Direct Testimony of Thomas S. Lys at ¶317.

[155] The settlement also establishes a settlement fund to cover payments for past performances, and specifies several contingencies affecting the size of the fund and the rate for future performances based on pending litigation.

[156] Written Rebuttal Testimony of David J. Frear ¶¶ 27-30.

[157] I discuss this growth in my Written Direct Testimony at p. 29.

[158] Written Direct Testimony of Carl Shapiro at 29-30 (footnote omitted).

Professor Lys evidently takes a very different view, stating: "The remaining Section 801(b)(1) factors, considered in light of Sirius XM's extraordinary financial performance, suggest a substantial increase in the current rates."[159] In this Section, I address this assertion.

Professor Lys seems to be confusing two concepts – what rate Sirius XM can afford to pay as opposed to what is a "reasonable" rate that satisfies the 801(b)(1) policy objectives. By attempting to characterize the dramatic increase in rates that SoundExchange is calling for as being consistent with the 801(b)(1) objectives – because, in his view, Sirius XM can afford to pay such rates – Professor Lys is taking a position that is entirely at odds with the economic interpretation of the 801(b)(1) objectives set forth by Mr. Orszag, a SoundExchange expert that, unlike Professor Lys, was tasked with actually evaluating, from an economic perspective, the first three statutory objectives.[160]

Mr. Orszag has testified that, in his view, the first three 801(b)(1) policy objectives are synonymous with a "willing buyer / willing seller" standard, where the operative question is what rate a willing buyer and a willing seller would agree to in a workably competitive market in the absence of a statutory license.[161]

As I discuss below, this conception of the first three 801(b)(1) policy objectives renders the question of what rates Sirius XM could afford to pay entirely irrelevant. Sirius XM's overall profitability simply does not come into play when a record label (willing seller) and Sirius XM (willing buyer) are negotiating in an effectively competitive market in the absence of any statutory license. I demonstrate this both theoretically and empirically in this section and in Appendix D.

In Section 7.A, I show that the only measure of Sirius XM's financial health that comes into play in such a negotiation is Sirius XM's contribution margin – a metric that Professor Lys notes has "remained remarkably consistent over time."[162] Accordingly, Professor Lys' own analysis demonstrates that the one financial metric of relevance unquestionably does not support the dramatic increase in rates that Professor Lys asserts is consistent with the 801(b)(1) objectives.

In Section 7.B, I demonstrate that Professor Lys' conclusion is belied by the empirical evidence. There I show that Sirius XM's payments for non-music content, which are negotiated in the absence of a statutory license, have declined, despite Sirius XM's increasing overall profitability.

The only way in which Sirius XM's profitability could conceivably enter into the 801(b)(1) analysis is with respect to the "disruption" objective. As Mr. Orszag suggests, this is the aspect of the rate-setting standard that Professor Lys' analysis speaks to. Even in this regard, according to SoundExchange's other economic experts, Professor Lys' analysis is irrelevant. As Mr. Orszag made clear at his deposition, it is his view that the disruption factor is simply irrelevant in this proceeding.[163]

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[159] Written Direct Testimony of Thomas S. Lys at ¶11.

[160] *See* Amended Written Direct Testimony of Jonathan Orszag at ¶¶ 13-14 (noting that his analysis relates to the first three statutory objectives, while that of Professor Lys addresses the fourth policy objective.).

[161] Amended Written Direct Testimony of Jonathan Orszag at ¶¶ 13, 15, 16, 18; Orszag Deposition at 80:19-81:10.

[162] Written Direct Testimony of Thomas S. Lys at ¶87.

[163] Orszag Deposition at 104:7-24.

A. The Role of Profitability in a Bargaining Context

In this Section I demonstrate that economic analysis tells us that Sirius XM's *overall profitability* does *not* enter into the royalty rate that Sirius XM would negotiate with a record company in a workably competitive market. What matters is the margin that Sirius XM earns on incremental subscribers, assuming that access to the music of the record company in question increases the number of Sirius XM subscribers.

Appendix E to my Written Direct Testimony presents an economic model in which Sirius XM and a record company negotiate over the royalty rate in a direct license. In that model, Sirius XM's overall profitability has no impact on the negotiated outcome. The following variables determine the negotiated royalty rate in that model:

- The extent to which Sirius XM will steer toward the record company if the record company offers a lower rate than Sirius XM is paying to other record companies.
- The record company's share of music on Sirius XM.
- The boost in plays on Sirius XM that the record company will experience if it enters into a direct license with Sirius XM.
- The share of subscribers that Sirius XM would lose as a result of steering toward the record company in question.
- The royalty rate paid by Sirius XM to other record companies.
- The record company's opportunity cost of performances of its music on Sirius.

The model in Appendix E of my Written Direct Testimony studied the conditions under which it would be mutually profitable for Sirius XM and a record company to enter into a negotiated license, assuming that Sirius XM would use the statutory license if no direct license is signed.

Appendix D to this Written Rebuttal Testimony provides a simple model of bargaining between Sirius XM and a record company *in the absence of any statutory license*. Appendix D assumes that Sirius XM would continue to operate its service even if it did not have access to this record company's music. In other words, the analysis in Appendix D assumes that the record company in question does not have must-have power. As recognized by the Judges in *Web IV*, a market with one or more must-have suppliers is not workably competitive.[164]

Consistent with how economists normally model price-setting and bargaining, I assume that Sirius XM and the record company split in some manner the gains from trade from making this record company's music available on Sirius XM.

Appendix D identifies the variables that enter into the pro-rata, percentage-of-revenue rate that a record company would negotiate with Sirius XM, assuming no steering. These variables are:

- Sirius XM's profit margin on an incremental subscriber, meaning the share of Sirius XM's subscription fee not accounted for by the incremental cost of a subscriber.

[164] *Web IV* at 26344.

- The record company's pro-rata profit per subscriber as a percentage of Sirius XM's subscription price, at the pro-rata percentage-of-revenue rate charged by other record companies.
- The loss of subscribers that Sirius XM would experience without this record company's music, relative to the record company's natural performance rate.

As Appendix D demonstrates, the level of Sirius XM's overall profits – those that Professor Lys documents in great detail – simply do not affect the negotiated royalty rate. It is only the *incremental* profit for additional Sirius XM customers, as measured by the contribution margin (which takes into account only variable costs) that enters into the analysis. According to Professor Lys, this metric has "remained remarkably consistent over time."[165] As a result, Professor Lys' analysis in no way supports the dramatic increase in royalty rates that SoundExchange is seeking in this proceeding.

B. Empirical Evidence Regarding Content Providers and Sirius XM

Empirical evidence also shows that content providers negotiating with Sirius XM in the absence of any statutory license have *not* increased the share of Sirius XM's revenue that they receive, notwithstanding Sirius XM's improved overall financial performance.

The only empirical evidence that directly speaks to this issue of which I am aware are the agreements that Sirius XM has entered into covering its *non-music* content, where there is no statutory license available. To perform my analysis, I considered all non-music content that is not truly exclusive to Sirius XM, which is all non-music content other than Howard Stern.[166]

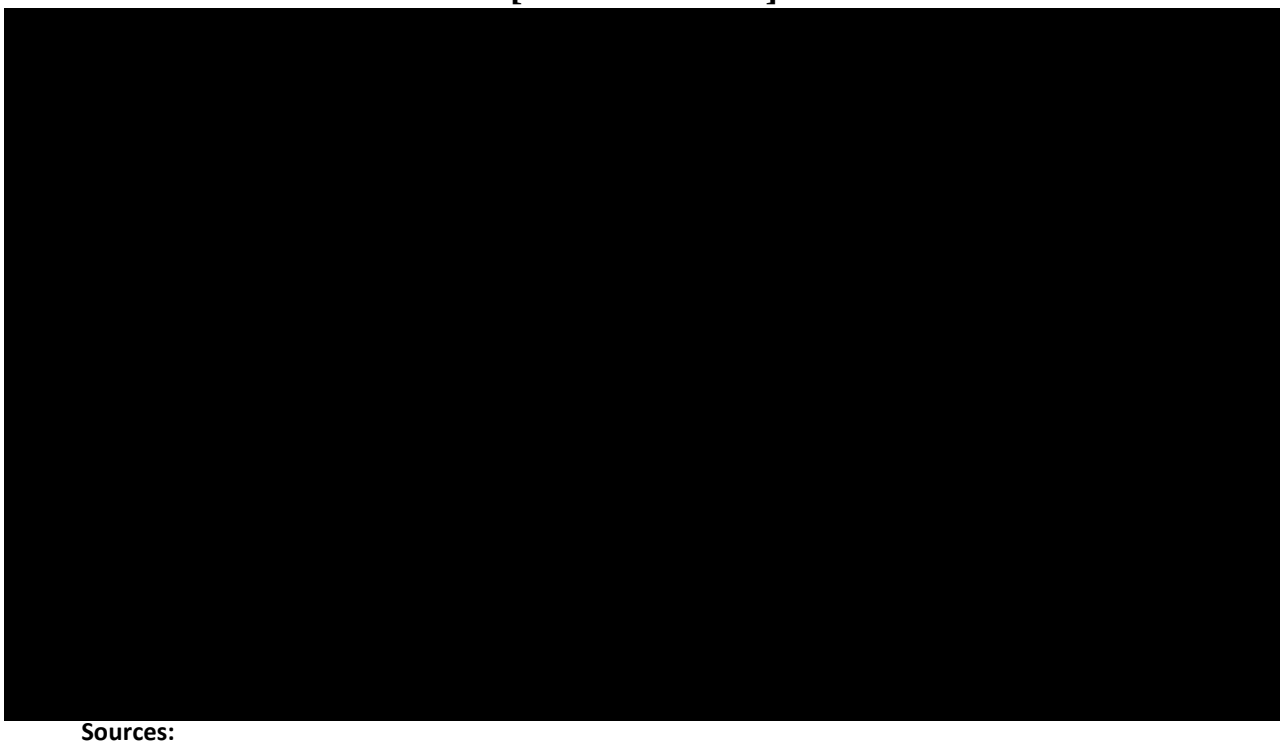
My analysis demonstrates that the ratio of Sirius XM's non-music content costs to Sirius XM's subscription revenue has actually *declined* year after year from 2009 through 2016. As shown in Figure 4, Sirius XM's non-music content payments as a percentage of its subscription revenue has fallen from [redacted].[167] This supports my conclusion that the increase in Sirius XM's overall profitability, in and of itself, does not imply that the percentage-of-revenue royalty rate that Sirius XM would negotiate with the providers of music content should increase.

[165] Written Direct Testimony of Thomas S. Lys at ¶87. Professor Lys also cites a 2015 presentation given by the CFO of Sirius XM, David Frear, who said that, "the contribution margin…has been a little over 70% for a really long time, and I don't see anything changing on that right now." Written Direct Testimony of Thomas S. Lys at ¶227.

[166] The exclusion of Howard Stern does not impact my time-series analysis, as Howard Stern has been offered exclusively by Sirius XM throughout the period I have analyzed.

[167] According to David Frear, these non-music costs have fallen as a percentage of Sirius XM revenue because Sirius XM has increasingly been able to take advantage of competition among different content providers to have their content heard on Sirius XM.

Figure 4: Sirius XM Non-Music Content Costs as a Percentage of Revenue [RESTRICTED]



Sources:
"Content Costs - Programming Trends_2016LRS_111716 - VO.xlsx"

Notes:
Non-music content excludes payments to Howard Stern.

8. The Treatment of Sirius XM Trial Subscriptions

Mr. Orszag makes two proposals regarding the trial subscriptions offered by Sirius XM.

First, he proposes that "Sirius XM should be required to pay royalties on free trials that extend beyond 30 days."[168] He further states: "I propose that the Judges adopt a per-subscriber-based approach with respect to Sirius XM's free trials."[169]

Second, he explains how he believes trial subscriptions should be handled under the statutory license if the Judges determine to instead apply a percentage-of-revenue rate to Sirius XM's trials subscriptions. In that case, Mr. Orszag proposes that, after the first month of a trial subscription, record companies should be compensated as if these subscriptions generated the same monthly revenue as do Sirius XM's self-pay customers.[170] Specifically, he proposes "a percentage of revenue royalty calculation that assigns Sirius XM's royalty base ARPU to each

[168] Amended Written Direct Testimony of Jonathan Orszag at ¶88.

[169] Amended Written Direct Testimony of Jonathan Orszag at ¶89.

[170] Amended Written Direct Testimony of Jonathan Orszag at ¶90.

free trial subscriber for whom Sirius XM should incur a royalty obligation."[171] In effect, the percentage-of-revenue rate would be applied to "phantom revenue" in order to give copyright holders the same compensation for promotional trials as for self-pay subscriptions.

In this section, I explain why both of these proposals are unnecessary and misguided. I show that Mr. Orszag's proposals are inconsistent with the facts about Sirius XM's unpaid trials and fail to take proper account of the incentives of record labels to partner with Sirius XM in making unpaid trials available. My discussion in this section relies heavily on the more detailed analysis provided in Appendix E.

To properly conduct this analysis, it is critical to distinguish between the two types of promotional trials offered by Sirius XM. Some promotional trials are *paid trials*, where Sirius XM has negotiated with car companies to provide a trial subscription when a car is purchased. The car company pays some amount to Sirius for the duration of these trials. Other promotional trials are *unpaid trials*, where Sirius XM receives no revenue from car companies or from customers for the duration of the trial. While Mr. Orszag acknowledges this distinction, he treats both types of promotional trials similarly in the proposals laid out in his Written Direct Testimony. This creates confusion and impedes proper analysis. These two types of trials must be examined separately to determine whether any modification of the current treatment of trial subscriptions is warranted.

A. Paid Trials

When it comes to paid trials, there is simply no need for any adjustment to the current treatment. Record companies are fully compensated for all performances of sound recordings, even during the first month of the trial, under my proposed royalty rate based on the *Web IV* benchmark.

The reason that my approach fully compensates record companies for all performances to paid trial subscribers is that I first determine the appropriate per-subscriber monthly royalty payment based on the benchmark rate, and then derive a percentage-of-revenue rate, using Sirius XM's average revenue per user (ARPU), that ensures that copyright holders receive the necessary per-subscriber payment, on average, for all users. In Appendix E I review how this per-subscriber royalty is determined. I then demonstrate that if Sirius XM pays the percentage-of-revenue rate that I propose, record labels will be fully compensated for performances to all self-paid and paid trial subscribers, even where the revenue for a given subscriber is discounted.[172] Under my proposal, Sirius XM will receive $1.032 per subscriber per month for paid-trial subscribers and for self-paid subscribers. No further adjustments are needed, and the Judges need not construct the "phantom revenues" called for Mr. Orszag's approach in order to properly compensate the record companies.

[171] Amended Written Direct Testimony of Jonathan Orszag at ¶90.

[172] In a nutshell, this is because the ARPU figure used in my calculations is a blended average of the various prices paid by subscribers each month, including paid trials. To the extent that Sirius XM receives lower revenue from listeners who are on paid trial subscriptions, Sirius XM's ARPU will be reduced. And that will *increase* the percentage-of-revenue royalty rate that I am proposing. The ARPU is the average rate paid by all subscribers, including those who pay a monthly price that is higher than the ARPU.

B. Unpaid Trials

Turning to unpaid trials, Mr. Orszag asserts that, because record labels waive their royalties for one month on free trials that are offered by subscription interactive services, Sirius XM should pay royalties on unpaid trials after the first month. In essence, Mr. Orszag is using the subscription interactive services as a benchmark for determining the length of time over which record companies would agree to waive their royalties.

In proposing that the SDARS statutory license should treat Sirius XM just like interactive services, by limiting the waiver of royalties for unpaid trials to one month, Mr. Orszag states: "In my view, *there is no sound economic basis* for the present disparate treatment, under which Sirius XM is permitted to offer the repertoires of rights owners for durations greater than one month without the payment of royalties."[173]

However, Mr. Orszag has provided no reason why subscription interactive services are a good benchmark for Sirius XM when it comes to the duration of unpaid trials. Critically, he has not examined the costs and benefits of unpaid trials to understand how the unpaid trial duration for different music services is determined. I *have* performed that analysis. The details of my analysis are given in Appendix E.

In my view, Mr. Orszag has not even posed the right question. In effect, he treats the waiver of royalties as a gift that record companies give to Sirius XM for the duration of the unpaid trial. This is not correct as a matter of economics. One could just as well say that Sirius XM is giving a gift to the record company by sacrificing its own revenue for the duration of the unpaid trial. Indeed, Sirius XM is sacrificing far more revenue than is any one record company, or even all of the record companies as a group.

The proper way to analyze these unpaid trials is to view them as a *joint effort* by Sirius XM and the record company to attract more Sirius XM subscribers – especially since many of these customers would otherwise listen to terrestrial radio, which generates no royalties for record companies. For both Sirius XM and the record company, unpaid trials are a promotion designed to attract customers and thus increase their future revenue. In studying that joint promotion effort, and the negotiations between Sirius XM and a record company over how the royalties for recorded music will be treated during the unpaid trial, the key question is how long each party would like the unpaid trials to last.

In Appendix E, I model the costs and benefits of unpaid trials to a music service and to a record company, if the record company is not collecting royalties during the unpaid trial. This model shows that the key driver for how long either party will want run these unpaid trials is the relative size of (a) the *benefit* per month that party earns if the person converts to a self-paid subscription and (b) the *cost* per month to that party of running the unpaid trial. The larger is the benefit/cost ratio, the longer that party will want to run the unpaid trials, other things equal.

Armed with this key economic insight, we can ask which of Sirius XM and the record company would rather have the unpaid trial run longer. Appendix E shows using the relevant data that *the record company has a higher benefit/cost ratio than Sirius XM*. This implies that the record company would agree to waive its royalties for as long as Sirius XM would choose to run unpaid

[173] Amended Written Direct Testimony of Jonathan Orszag at ¶85, emphasis added.

trials. Since Sirius XM chooses to run unpaid trials for two to three months, this analysis implies that record companies would be willing to waive their royalties for that period of time as well.

The same model can then be applied to interactive services. In this case, we ask whether the interactive service or the record company would rather have the unpaid trial run longer. Appendix E shows using the relevant data that *the interactive service has a higher benefit/cost ratio than the record company*. This implies that the record company will *not* agree to waive its royalties for as long as the interactive service would like to run unpaid trials (if the royalties were waived). This prediction from the model lines up with the Mr. Orszag's observation that record companies are only willing to waive their royalties for one month for interactive services, even when those services are prepared to offer longer unpaid trial subscriptions. In short, my analysis in Appendix E very much supplies the "sound economic basis" for a disparate treatment of unpaid trials on Sirius XM vs. the subscription interactive services. Effectively, what is needed is an adjustment to Mr. Orszag's benchmark to account for the different benefit/cost ratio that applies to unpaid trials on Sirius XM vs. the interactive services. He did not consider any such adjustment.

In fact, Mr. Orszag's proposal that, after the first month, record companies receive the full per-subscriber royalty that is paid by self-pay customers on Sirius XM would itself create disparate treatment between Sirius XM and interactive services. When a customer completes her one-month free trial on an interactive service without signing up for a paid subscription, she has the option of continuing to use the interactive service free of charge by switching to the ad-supported version of the service. In that event, record companies start receiving royalties for performances to that customer, but those royalties are far smaller than what they would receive if she had chosen a paid subscription.[174] However, under Mr. Orszag's rate proposal, the per-subscriber payment for customers in the second and third months of unpaid trials on Sirius XM would be roughly four times as large.[175]

Based on my analysis, I conclude that there is no basis for limiting the waiver of royalties during unpaid trials on Sirius XM to the first month (or any limited period) since record companies benefit from an unpaid trial period lasting at least as long as what Sirius XM would choose. To the extent that a limit is imposed, it should be at the upper end of the range of unpaid trial periods offered by Sirius XM, which is three months. To be clear, this waiver would only apply to unpaid trials. As discussed above, under my rate proposal, record companies are already fully compensated for performances to customers with paid trial subscriptions.

[174] According to the backup materials provided with Professor Willig's Written Direct Testimony, the average royalty per customer per month received by all record companies combined on ad-supported interactive services in the first half of 2016 was [redacted] SOUNDX_000156140.

[175] The per-subscriber rate proposed by Mr. Orszag is in the range of $2.37 to $2.58 per month, which is about [redacted] per month received by record companies for customers of ad-supported interactive services. Amended Written Direct Testimony of Jonathan Orszag at ¶10.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
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In the Matter of **DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)**	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION OF CARL SHAPIRO

I, Carl Shapiro, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 17th day of February, 2017.



Carl Shapiro

Appendix A: Documents Considered

CRB Hearing and Case Law Documents

13-05693 PSG (GJSx)
SDARS I.pdf
SDARS II.pdf
SDARS II Modification.pdf
Web IV.pdf
Rubinfeld CWDT Exhibit 16a (Web IV)

Academic Articles & Books

Luis Aguiar and Joel Waldfogel, "Streaming Reaches Flood Stage: Does Spotify Stimulate or Depress Music Sales," JRC Technical Papers, European Commission, 2015.
Elizabeth E. Bailey, David R. Graham, and Daniel P. Kaplan, Deregulating the Airlines, MIT Press, 1985
Josh Lerner and Jean Tirole, "Efficient Patent Pools," 94 American Economic Review 691 (2004).
Steven Morrison, and Clifford Winston, The Economic Effects of Airline Deregulation, The Brookings Institution, 1986
W. Kip Viscusi, Joseph E. Harrington, and John M. Vernon, Economics of Regulation and Antitrust, MIT Press, 2000

Studies & Reports

Trade Commission, May 10, 2012
Universal Music Group, "White Paper Concerning Proposed Acquisition and Merger Guidelines," July 23, 2012.

Other

"Hello America. Spotify here." available at https://news.spotify.com/us/2011/07/14/hello-america-spotify-here/.
Letter from Glenn D. Pomerantz to Robert Tovsky, June 22, 2012
"Opposition to the Motion to Compel SoundExchange to Produce Artist Contracts," SoundExchange.
Pandora Media, Inc. 2016 Annual Report (Form 10-K)
"The Death of Music Sales," Derek Thompson, The Atlantic, January 25, 2015, available at www.theatlantic.com/business/archive/2015/01/buying-music-is-so-over/384790/.
Sirius XM Used Car Free Trial, available at https://care.siriusxm.com/preownedvehiclestrial_view.action

Written Direct Testimonies

Written Direct Testimony of Carl Shapiro
Written Direct Testimony of Stefan Boedeker
Written Direct Testimony of Ravi Dhar
Written Direct Testimony of George Ford
Written Direct Testimony of Michael Kushner
Written Direct Testimony of Thomas S. Lys
Written Direct Testimony of Jonathan Orszag
Written Direct Testimony of Jonathan Orszag (Amended)
Written Direct Testimony of George White
Written Direct Testimony of Robert Willig

Written Rebuttal Testimonies

Written Rebuttal Testimony of David J. Frear
Written Rebuttal Testimony of Joseph Farrell
Written Rebuttal Testimony of John Hauser
Written Rebuttal Testimony of Darius Van Arman

Depositions & Deposition Testimonies

Deposition of Carl Shapiro
Deposition of Jonathan Orszag
Web IV Harrison Deposition Testimony
Web IV Kooker Deposition Testimony
Deposition of George White

Sirius XM Documents

Sirius XM Forecast - 2016 LRS plan, file "Consolidated Outputs - 2016 LRS Extract.xlsx"
Content Costs - Programming Trends_2016LRS_111716 - VO.xlsx
SXM_DIR_00023726-889
SXM_DIR_00064652
SXM_DIR_00078090
MRI Inputs.xlsx

SoundExchange Documents

SOUNDX_000028618
downloads substitution data.dta, file "SOUNDX_000156131"
SXM substitution data.dta, file "SOUNDX_000156137"
SOUNDX_000156140.xlsx
SOUNDX_000166248.xlsx
SOUNDX_000166251.xlsx
SOUNDX_000438590
SOUNDX_000438619
SOUNDX_000438644
SOUNDX_000478424 - SoundX_000478561
SoundX_000479246
SoundX_000479395
SoundX_000479420
SoundX_000479478
SoundX_000479620
SOUNDX_000157719.xlsx
SoundX_000004293
SoundX_000004294
SoundX_000004302
SoundX_000005275
SoundX_000013927
SoundX_000045313
SoundX_000045316
SoundX_000045319
SoundX_000014917
SoundX_000014923
SoundX_000014921
SoundX_000014919
SoundX_000028249
SoundX_000028250
SoundX_000072623
SoundX_000072624
SoundX_000072625
SoundX_000072626
SoundX_000045477
SoundX_000045478

SoundX_000025986
SoundX_000025991
Various contracts between major labels and interactive services
SoundX_000012194
SoundX_000026724
SoundX000065215

Appendix B

Impact of Sirius XM on Record Company Revenue: Corrected and Revised Professor Willig Regression Analysis

In this Appendix, I provide corrected and revised versions of the regression analysis reported by Professor Willig in Appendix E and Appendix F to his Written Direct Testimony.

I also provide a revised version of Table 1 from Professor Willig's Written Direct Testimony that reflects these corrections and revisions. I use the same data that Professor Willig used, and the same overall methodology. Professor Willig describes the data and his methodology at ¶¶22-25 and ¶¶42-43 in his Written Direct Testimony and in Appendices A, E, and F to his Written Direct Testimony.

My main finding, reported here, is that simple corrections and revisions to Professor Willig's regression specifications *reverse* his results and indicate that Sirius XM has a meaningful promotional impact on paid downloads and on interactive services.

Substitution Between Streaming and Downloads: Professor Willig Appendix E

Professor Willig reports a regression designed to estimate the impact on paid music downloads of music performances on Sirius XM, non-interactive and interactive streaming, and video streaming. I use the same data and empirical specifications employed by Professor Willig with one critical change: Professor Willig includes in his regression one independent variable, called "all plays_l1," calculated as the total plays for all streaming options (lagged one month). This variable includes: paid and promotional Sirius XM, interactive streaming, webcasting (non-interactive streaming), video, subscription services and ad supported services.

I have used Professor Willig's data to break down his single variable into the following components: (1) Sirius XM plays ("sxm_plays_l1"), including Sirius XM paid and promotional plays; (2) webcasting (non-interactive) plays ("web_plays_l1"), including non-interactive subscription and non-interactive ad-supported plays; and (3) interactive and video plays ("interacti_l1"), including video, interactive subscription and interactive ad-supported plays. All variables are lagged one month.

I include the same controls used by Professor Willig in his Appendix E regressions. Below I present Professor Willig's baseline regression and robustness checks with the sole change noted above. The coefficient on the variable "sxm_plays_l1" represents the change in album downloads when the number of Sirius XM plays increases by one. The interpretation is analogous for the variables "web_plays_l1" and "interacti_l1."

My results indicate that Sirius XM has a promotional effect on downloads, and this effect is statistically significant across all specifications. Non-interactive services appear to have a small promotional effect as well, but this coefficient is not statistically different from zero in the baseline regression. In contrast, an increase in interactive and video plays decreases album downloads and this result is statistically significant across all specifications.

Baseline Run

Source	SS	df	MS		
				Number of obs	= 149
				F(5, 143)	= 179.79
Model	5201.34653	5	1040.26931	Prob > F	= 0.0000
Residual	827.407551	143	5.78606679	R-squared	= 0.8628
				Adj R-squared	= 0.8580
Total	6028.75408	148	40.7348249	Root MSE	= 2.4054

downloads_~b	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_plays_l1	.0015143	.000321	4.72	0.000	.0008797	.0021488
web_plays_l1	.0001299	.0000876	1.48	0.141	-.0000434	.0003031
interacti_l1	-.0008252	.0000963	-8.57	0.000	-.0010156	-.0006348
time	.0788979	.0409611	1.93	0.056	-.0020695	.1598654
gdp	-.0024719	.0009577	-2.58	0.011	-.0043651	-.0005787
_cons	29.65525	11.7106	2.53	0.012	6.507011	52.8035

Baseline Run: Difference between Sirius XM Coefficient and Other Services Coefficients

This specification is identical to the specification above, but includes the sum of Sirius XM, interactive and non-interactive services plays (lagged one month) as an independent variable, instead of the variable capturing Sirius XM's plays. Because the rest of the specification has not changed, the coefficient on this variable will be identical to the coefficient on Sirius XM plays estimated above, but the coefficients on the variables capturing the interactive and non-interactive plays will change. These coefficients now measure the *difference* between the Sirius XM effect and the interactive and non-interactive effects, respectively. The fact that they are both statistically significant implies that the Sirius XM effect estimated in the baseline regression is statistically different from the effects of the interactive and non-interactive services estimated in the baseline regression.

Source	SS	df	MS	Number of obs	=	149
				F(5, 143)	=	179.79
Model	5201.34653	5	1040.26931	Prob > F	=	0.0000
Residual	827.407551	143	5.78606679	R-squared	=	0.8628
				Adj R-squared	=	0.8580
Total	6028.75408	148	40.7348249	Root MSE	=	2.4054

downloads_~b	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
all_l1	.0015143	.000321	4.72	0.000	.0008797	.0021488
web_plays_l1	-.0013844	.0002604	-5.32	0.000	-.0018992	-.0008696
interacti_l1	-.0023395	.0002859	-8.18	0.000	-.0029047	-.0017743
time	.0788979	.0409611	1.93	0.056	-.0020695	.1598654
gdp	-.0024719	.0009577	-2.58	0.011	-.0043651	-.0005787
_cons	29.65525	11.7106	2.53	0.012	6.507011	52.8035

The following regressions perform the same robustness checks that Professor Willig performed in Appendix E to his Written Direct Testimony. In each case, there is a large, positive, and statistically significant promotional effect of Sirius XM performances on downloads.

Robustness Test: Dropping GDP

Source	SS	df	MS	Number of obs	=	149
				F(4, 144)	=	214.63
Model	5162.80294	4	1290.70073	Prob > F	=	0.0000
Residual	865.951143	144	6.0135496	R-squared	=	0.8564
				Adj R-squared	=	0.8524
Total	6028.75408	148	40.7348249	Root MSE	=	2.4523

downloads_~b	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_plays_l1	.0009356	.0002342	3.99	0.000	.0004726	.0013986
web_plays_l1	-9.44e-07	.0000729	-0.01	0.990	-.000145	.0001431
interacti_l1	-.0009762	.000078	-12.51	0.000	-.0011304	-.000822
time	.0925744	.0414076	2.24	0.027	.0107291	.1744196
_cons	-.5220609	.6689121	-0.78	0.436	-1.844216	.8000941

Robustness test: Replacing GDP by Personal Disposable Income

Source	SS	df	MS	Number of obs	=	149
				F(5, 143)	=	170.73
Model	5163.76599	5	1032.7532	Prob > F	=	0.0000
Residual	864.988091	143	6.04886777	R-squared	=	0.8565
				Adj R-squared	=	0.8515
Total	6028.75408	148	40.7348249	Root MSE	=	2.4594

downloads_~b	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_plays_l1	.0010122	.0003034	3.34	0.001	.0004125	.001612
web_plays_l1	9.66e-06	.0000778	0.12	0.901	-.0001441	.0001634
interacti_l1	-.0009614	.0000867	-11.09	0.000	-.0011327	-.0007901
time	.0991394	.0446695	2.22	0.028	.0108415	.1874373
pdi	-.0005788	.0014507	-0.40	0.690	-.0034464	.0022887
_cons	4.538103	12.69941	0.36	0.721	-20.56472	29.64093

Robustness test: Replacing Lagged Streaming by Contemporaneous Streaming

Source	SS	df	MS	Number of obs	=	150
				F(5, 144)	=	201.08
Model	5417.36465	5	1083.47293	Prob > F	=	0.0000
Residual	775.916936	144	5.38831206	R-squared	=	0.8747
				Adj R-squared	=	0.8704
Total	6193.28159	149	41.5656482	Root MSE	=	2.3213

downloads_~b	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_plays	.0022261	.0003428	6.49	0.000	.0015484	.0029037
web_plays	.0003103	.0000879	3.53	0.001	.0001366	.0004839
interacti	-.000678	.0000937	-7.23	0.000	-.0008632	-.0004927
time	.0208417	.0401047	0.52	0.604	-.0584283	.1001117
gdp	-.0044252	.0010106	-4.38	0.000	-.0064228	-.0024277
_cons	52.87991	12.24218	4.32	0.000	28.68231	77.0775

Implications

Using the results from the baseline regression, I have produced a revised version of Table 1 in Professor Willig's Written Direct Testimony. See Table B-1.

Table B-1 shows that the additional revenue earned by record companies as a result of the growth in the number of performances on Sirius XM and streaming on non-interactive and interactive webcasting services as well as video from 2010 to 2016 is $1.889 billion. This figure is unchanged from Professor Willig's original table.

What is changed is the impact of the growth of these services on paid downloads. Table B-1 shows that the growth of Sirius XM from 2010 to 2016 has led to an additional $890 million in record company revenue from downloads. Similarly, the growth of non-interactive services from 2010 to 2016 has led to an additional $321 million in record company revenue from downloads. However, these effects are outweighed by the cannibalization of $1.36 billion of download revenue by interactive services and video.

Summarizing, after Professor Willig's regression specification is corrected, this regression indicates that the growth of Sirius XM from 2010 to 2016 has contributed $1.015 billion to record company revenue in 2016: $125 million in additional royalty payments to record companies by Sirius XM (from paid and promotional subscribers), plus $890 million in promotional effects associated with paid downloads. This is dramatically different from what Professor Willig asserts by lumping together Sirius XM with non-interactive and interactive services.

Table B-1 (Revised Professor Willig Table 1): Calculation of the Increase in 2016 Sound Record Creator Compensation Due to Increased "Streaming" [RESTRICTED]



Substitution Between Sirius XM and Streaming: Professor Willig Appendix F

In his Appendix F, Professor Willig estimates the effect of Sirius XM paid subscription plays ("sxm_paid_plays") on the sum of the interactive and non-interactive subscription services plays ("streaming_paid_plays"). I use the same data and empirical approach to estimate the effect of Sirius XM paid subscription plays on just the interactive subscription plays ("stream_paid_plays").

Professor Willig relies on an instrumental variable (2SLS) approach. Since the number of Sirius XM plays may be jointly determined with the number of interactive subscription services plays, Professor Willig uses two instruments: the Sirius XM price, lagged one period ("Psxm_l1"); and the number of plays on Sirius XM promotional subscriptions in the two earlier quarters ("sxm_promo_plays_6months_l1"). The regression includes a time trend ("time") and GDP ("gdp") as well.

I use the same independent variables and instruments used by Professor Willig with one change: I add a term that captures the change in the time trend due to the entry in the industry of Spotify ("spotifytime"). Spotify entered the U.S. market in July 2011 and grew rapidly. My specification allows the growth rate of interactive subscription plays to be different before and after the entry of Spotify.

This simple change *reverses* the main result from Professor Willig's regressions: rather than a substitutional effect, I find that Sirius XM has had a promotional effect on the interactive subscription plays. This effect is robust to Professor Willig's alternative specifications.

The first regression below uses interactive subscription plays as the dependent variable and Professor Willig's specification. As expected, it shows that Professor Willig's specification predicts that an increase in Sirius XM paid plays leads to a decrease in interactive subscription plays.

The second regression below adds the term capturing the change in trend after the entry of Spotify in the U.S. market, as described above. The addition of this term reverses Professor Willig's main result: in the revised regression, Sirius XM has a significant promotional effect on interactive subscription services. I report the first and second stage of the 2SLS regression for both Professor Willig's regression for subscription interactive services and my baseline regression. My finding that Sirius XM has a promotional effect on interactive subscription services is robust to the alternative specifications proposed by Professor Willig, as shown in the tables that follow.

Professor Willig's Regression Run on Interactive Subscription Plays Only

First-stage regressions

Source	SS	df	MS	Number of obs	=	48
				F(4, 43)	=	1020.31
Model	5.3569e+09	4	1.3392e+09	Prob > F	=	0.0000
Residual	56440372.5	43	1312566.8	R-squared	=	0.9896
				Adj R-squared	=	0.9886
Total	5.4133e+09	47	115177432	Root MSE	=	1145.7

sxm_paid_p~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
time	350.124	63.92865	5.48	0.000	221.1996	479.0484
gdp	1.340656	.6321482	2.12	0.040	.0658074	2.615504
Psxm_l1	-1611.354	477.9852	-3.37	0.002	-2575.303	-647.4053
sxm_pr~hs_l1	.9804164	.107978	9.08	0.000	.7626581	1.198175
_cons	8512.645	6402.14	1.33	0.191	-4398.5	21423.79

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	48
				F(3, 44)	=	34.75
Model	1.5444e+09	3	514784679	Prob > F	=	0.0000
Residual	655638471	44	14900874.3	R-squared	=	0.7020
				Adj R-squared	=	0.6817
Total	2.2000e+09	47	46808351.3	Root MSE	=	3860.2

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	-.6832901	.2561819	-2.67	0.011	-1.199591	-.1669895
time	-13.32916	258.7206	-0.05	0.959	-534.7463	508.088
gdp	7.604666	1.718249	4.43	0.000	4.141762	11.06757
_cons	-92912.79	20989.98	-4.43	0.000	-135215.3	-50610.26

Instrumented: sxm_paid_plays
Instruments: time gdp Psxm_l1 sxm_promo_plays_6months_l1

Shapiro Baseline Regression with Spotify Time Trend Change Term

First-stage regressions

Source	SS	df	MS	Number of obs	=	48
				F(5, 42)	=	834.57
Model	5.3594e+09	5	1.0719e+09	Prob > F	=	0.0000
Residual	53942592.5	42	1284347.44	R-squared	=	0.9900
				Adj R-squared	=	0.9888
Total	5.4133e+09	47	115177432	Root MSE	=	1133.3

sxm_paid_p~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
spotifytime	-142.1049	101.8998	-1.39	0.170	-347.7471	63.53719
time	332.7111	64.45864	5.16	0.000	202.6283	462.7939
gdp	2.0105	.7885016	2.55	0.015	.4192389	3.60176
Psxm_l1	-1165.859	570.6209	-2.04	0.047	-2317.419	-14.29972
sxm_pr~hs_l1	.8942019	.1234122	7.25	0.000	.645146	1.143258
_cons	-5741.004	12023.87	-0.48	0.636	-30006.16	18524.15

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	48
				F(4, 43)	=	68.53
Model	1.9015e+09	4	475379676	Prob > F	=	0.0000
Residual	298473803	43	6941251.24	R-squared	=	0.8643
				Adj R-squared	=	0.8517
Total	2.2000e+09	47	46808351.3	Root MSE	=	2634.6

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	.7913033	.300142	2.64	0.012	.1860094	1.396597
spotifytime	1653.94	251.1574	6.59	0.000	1147.433	2160.447
time	-359.1828	188.0276	-1.91	0.063	-738.3765	20.011
gdp	-4.452542	2.191234	-2.03	0.048	-8.871586	-.0334984
_cons	52996.54	26445.93	2.00	0.051	-336.7609	106329.8

Instrumented: sxm_paid_plays
Instruments: spotifytime time gdp Psxm_l1 sxm_promo_plays_6months_l1

Robustness Test: Dropping GDP

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	48
				F(3, 44)	=	86.55
Model	1.8814e+09	3	627126613	Prob > F	=	0.0000
Residual	318612671	44	7241197.07	R-squared	=	0.8552
				Adj R-squared	=	0.8453
Total	2.2000e+09	47	46808351.3	Root MSE	=	2690.9

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	.4026429	.2138662	1.88	0.066	-.028376	.8336619
spotifytime	1243.546	138.3179	8.99	0.000	964.7843	1522.307
time	-426.1516	196.5104	-2.17	0.036	-822.1923	-30.1109
_cons	-1004.478	1739.825	-0.58	0.567	-4510.864	2501.909

Instrumented: sxm_paid_plays
Instruments: spotifytime time Psxm_l1 sxm_promo_plays_6months_l1

Robustness Test: Replacing GDP by Personal Disposable Income

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	48
				F(4, 43)	=	63.49
Model	1.8811e+09	4	470276685	Prob > F	=	0.0000
Residual	318885768	43	7415948.09	R-squared	=	0.8551
				Adj R-squared	=	0.8416
Total	2.2000e+09	47	46808351.3	Root MSE	=	2723.2

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	.4147071	.2973705	1.39	0.170	-.1849978	1.014412
spotifytime	1246.177	179.7779	6.93	0.000	883.62	1608.733
time	-448.1888	219.1364	-2.05	0.047	-890.1194	-6.258102
pdi	.1236636	3.035977	0.04	0.968	-5.998969	6.246296
_cons	-2192.413	26032.46	-0.08	0.933	-54691.88	50307.05

Instrumented: sxm_paid_plays
Instruments: spotifytime time pdi Psxm_l1 sxm_promo_plays_6months_l1

Robustness test: Replacing Lagged Instruments by Contemporaneous Instruments

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	49
				F(4, 44)	=	66.57
Model	1.8958e+09	4	473958170	Prob > F	=	0.0000
Residual	322754793	44	7335336.2	R-squared	=	0.8545
				Adj R-squared	=	0.8413
Total	2.2186e+09	48	46220572.4	Root MSE	=	2708.4

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	1.084444	.3250726	3.34	0.002	.4293035	1.739585
spotifytime	1850.943	267.3945	6.92	0.000	1312.045	2389.842
time	-475.444	192.0372	-2.48	0.017	-862.4695	-88.41838
gdp	-5.993987	2.307552	-2.60	0.013	-10.64455	-1.343421
_cons	70665.89	27648.41	2.56	0.014	14944.19	126387.6

Instrumented: sxm_paid_plays
Instruments: spotifytime time gdp Psxm sxm_promo_plays_6months

Robustness Test: Replacing 6-Month Promo Plays Instrument by 3-Month Promo Plays

Instrumental variables (2SLS) regression

Source	SS	df	MS		
				Number of obs	= 49
				F(4, 44)	= 69.10
Model	1.9112e+09	4	477801503	Prob > F	= 0.0000
Residual	307381462	44	6985942.33	R-squared	= 0.8615
				Adj R-squared	= 0.8489
Total	2.2186e+09	48	46220572.4	Root MSE	= 2643.1

stream_pai~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sxm_paid_p~s	.9318085	.3201128	2.91	0.006	.2866636	1.576953
spotifytime	1743.707	262.6768	6.64	0.000	1214.316	2273.097
time	-417.6922	188.1068	-2.22	0.032	-796.7966	-38.58779
gdp	-5.147105	2.264422	-2.27	0.028	-9.710748	-.5834623
_cons	60874.12	27121.36	2.24	0.030	6214.618	115533.6

Instrumented: sxm_paid_plays
Instruments: spotifytime time gdp Psxm_l1 sxm_promo_plays_l1

Appendix C

The Opportunity Cost of Performances on Sirius XM

In this Appendix, I calculate the opportunity cost to a record company of having its music played more on Sirius XM. I perform this calculation for several different relevant scenarios, each of which is calibrated based on the available data.

Professor Willig and I agree that a record company's opportunity cost of having its music played on Sirius XM is an very important factor for determining the price that the record company would charge Sirius XM for the right to play its music in the absence of a statutory license.

To facilitate comparison with Professor Willig's measure of opportunity cost, this entire analysis ignores the promotional effects of Sirius XM (as does Professor Willig). Including promotional effects would unquestionably reduce the opportunity cost of performances on Sirius XM. Promotional effects can cause a record company's opportunity cost of having its music played on Sirius XM to be negative. Record companies appear to have a negative opportunity cost of having their music played on Sirius XM's closest competitor, terrestrial radio, since record companies routinely undertake efforts to have their music played more on terrestrial radio, despite the lack of any royalties for such performances.

This Appendix shows that Professor Willig has vastly overstated a record company's opportunity cost of having its music played on Sirius XM.

In explaining my calculations, for illustrative purposes, I use Warner Music Group as the record company in question. All of my results also apply to the other record labels.[1]

Table C-1 reports my calculations for Warner. Table C-2 reports my calculations for Sony. Table C-3 reports my calculations for Universal. Table C-4 reports my results for a representative independent label whose music is assumed to comprise 1% of the performances of recorded music on Sirius XM.

Baseline

I begin by describing the baseline from which I measure the opportunity cost to a record company of additional performances on Sirius XM.

This baseline uses the following 2017 market data:

- Sirius XM Royalty Base ARPU: [redacted] per Subscriber per Month.[2]

[1] The only variable that changes from one record company to another is the record company's share of performances of recorded music on Sirius XM, which is assumed to be equal to its share of performances of recorded music on other music services.

[2] Here I am using Mr. Orszag's estimate of the royalty-base ARPU of [redacted] projected forward to 2017 by multiplying by the percentage increase in the reported ARPU for 2017, as forecast in the Sirius XM financial

- Number of Music Performances per Sirius XM Subscription per Month: 469.[3]
- Prevailing Royalty Rate: 11% of revenue.[4]
- Number of Sirius XM Subscribers: [redacted].[5]

These numbers imply that Sirius XM pays $1.19 per subscriber per month in music royalties, which comes to $0.00254 per performance.

Warner Music Group's share of royalties for performances of sound recordings on Sirius XM is [redacted].[6] The royalties paid to Warner by Sirius XM at the statutory royalty rate are [redacted] per subscriber per month. This is equal to [redacted] per performance for each of the [redacted] performances of Warner music per Sirius XM subscription per month. Multiplying the [redacted] per subscriber per month by the [redacted] million Sirius XM subscribers, Warner is receiving [redacted] million per month of royalties from Sirius XM in the baseline.

Professor Willig's Opportunity Cost

Professor Willig asserts that the opportunity cost to record companies as a group of one more Sirius XM subscriber is $2.55 per month; see Written Direct Testimony of Robert Willig, Table 2. This corresponds to $0.00425 per performance, using his figure of 601 performances per Sirius XM subscriber per month. The analysis here allows us to compare that figure to the correct measure of the opportunity cost to Warner of an additional performance of Warner music on Sirius XM in various scenarios.

In computing the $2.55 opportunity cost figure, Professor Willig assumes that Sirius XM subscribers hear 601 performances of sound recordings per month. This figure is well above my estimate of 469 performances per month. I note elsewhere in my Written Rebuttal Testimony several reasons why the figure used by Professor Willig is inaccurate.[7]

If Professor Willig had assumed 469 performances per month for Sirius XM subscribers when constructing his measure of opportunity cost, he would have obtained a slightly lower opportunity cost of $2.47 per subscriber per month, which corresponds to $0.00527 per performance.[8] I use this modified number below, but my results do not change in any

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projection. ARPU is projected to be $12.80 in 2016 and [redacted] in 2017, an increase of [redacted] See "Sirius XM Forecast - 2016 LRS Plan."

[3] Written Direct Testimony of Carl Shapiro at p. 54.

[4] This is the statutory royalty rate for Sirius XM for 2017.

[5] This is Sirius XM's forecast for 2017, which includes paid trial subscriptions but not free trial subscriptions. Sirius XM Forecast - 2016 LRS Plan.

[6] SOUNDX_000028618, SOUNDX_000438590, SOUNDX_000438619, SOUNDX_000438644.

[7] Written Rebuttal Testimony of Carl Shapiro at *supra* note 71.

[8] If a Sirius XM subscriber cancels and switches to *non-subscription* alternatives, Professor Willig assumes that this subscriber listens to 601 performances per month on those services. If the number of diverted performances is only 469, then the foregone royalties from these non-subscription alternatives is not as large, which lowers the opportunity cost per subscriber. The opportunity cost for subscribers switching to *subscription* alternatives is unchanged by using 601 vs. 469 performances per subscription per month on Sirius XM.

meaningful way if one instead uses his reported figure of $2.55 per subscriber, which corresponds to $0.00545 per performance.

Ultimately, the number of performances per Sirius XM subscription per month used in my analysis in this Appendix makes very little difference for my measurements of opportunity cost and my critique of Professor Willig's estimate of opportunity cost. If the number of performances per month increases, the opportunity cost per performance as well as the royalty per performance both decrease proportionally. But the ratio of the opportunity cost for one record company to the opportunity cost for the industry as a whole does not depend on the number of performances per month. As a result, the only impact of modifying Professor Willig's estimate of the number of performances per Sirius XM subscription per month is the 3% reduction in the opportunity cost per performance, from $0.00545 to $0.00527, that one obtains using Professor Willig's approach (see just above). My central conclusion, that Professor Willig has vastly overstated the opportunity cost for a record company, holds, whether one uses the 469 figure or the 601 figure.

In Table C-5 through Table C-8, I report the results of my calculations for the four record labels using Professor Willig's figure of 601 performances per Sirius XM subscription per month.

I now address the relevant scenarios to consider for assessing the opportunity cost of a record label in licensing Sirius XM. In each scenario, I show that Professor Willig has greatly overstated the opportunity cost.

Pure Steering

In the first scenario, Warner offers a 10% discount to Sirius XM in exchange for Sirius XM steering toward Warner. In this "Pure Steering" case, Sirius XM responds to the lower Warner royalty rate by increasing Warner's share of performances by 20 percent, from [redacted] of the performances of recorded music, but Sirius XM does not adjust its subscription fee in response to the lower royalty rate on Warner music, and the increase in Warner's share of music performances from [redacted] has no impact on the number of Sirius XM subscribers or on how much they listen to music on Sirius XM.

In this case, Warner listening on Sirius XM goes up from [redacted] per subscription per month to [redacted] per subscription per month, which is an increase of [redacted] performances per month. However, since there is no change in the number of Sirius XM subscribers or on how much they listen to Sirius XM, there is no impact on Warner's revenue from other music services. Therefore, the opportunity cost to Warner of these additional performances on Sirius XM is *zero*.

In this "Pure Steering" scenario, all of the substitution of music listening toward Warner and away from other record companies is taking place in the *upstream* market, as Sirius XM steers toward Warner. The cost of this steering is entirely borne by Warner's competitors (the other record labels that, as a result of the discount offered by Warner, have their share of performances of Sirius XM reduced). Professor Willig flatly rules this possibility out and thus ignores any steering. In fact, his calculations of opportunity cost never allow for any price competition between record labels to have their works performed on Sirius XM. In the "Pure Steering" scenario, no substitution is taking place in the downstream market. For that reason, Professor Dhar survey results are simply irrelevant in this scenario, because consumers are not shifting among downstream music services.

Summary: In the "Pure Steering" scenario, Professor Willig's opportunity cost of $0.00527 per performance is highly inaccurate. The true number is zero for Warner and for any other record company. This result does not depend at all on the particular numbers used in this scenario.

Sirius XM Loses Subscribers Due to Steering

In the next scenario, I build on the previous scenario, but I now assume that Sirius XM loses some of its subscribers as a result of shifting its mix of music toward Warner. Sirius XM would experience some loss of subscribers if (a) some Sirius XM subscribers are close to the margin of dropping Sirius XM, (b) the altered music mix makes the Sirius XM service sufficiently less attractive to these subscribers that the prevailing Sirius XM subscription price no longer exceeds the willingness-to-pay of these subscribers, and (c) Sirius XM does not pass through any of its reduced royalty costs in the form of a lower subscription fee to offset (at least to some degree) the perceived decline in the quality of the service.[9] Immediately below, I build on this scenario by studying the situation in which Sirius XM *does* pass through some or all of its reduced royalty costs in the form of a lower subscription fee.

In this scenario, "Steering Loses Subs," Warner again offers a 10% discount to Sirius XM, and Sirius XM again steers toward Warner by 20%, just as in the "Pure Steering" scenario. But now I assume that Sirius XM loses 0.14% of its subscribers as a result of this steering. This 0.14% is taken as [redacted] of Warner's share of the music played on Sirius XM.[10] This corresponds to [redacted] lost Sirius XM subscribers.

At this point, I use an opportunity cost of $2.47 per Sirius XM subscriber per month, which is the figure from Table 2 of Professor Willig's report modified using 469 performances per Sirius XM subscriber per month. That figure is Professor Willig's estimate of the cost to the record companies when Sirius XM *gains* subscribers, so this likewise is the *benefit* to the record companies when Sirius XM loses subscribers. Using Professor Willig's figure, as modified, which is for the record companies as a group, the [redacted] lost Sirius XM subscribers generate a benefit of [redacted] per month. Assuming Warner's "natural performance rate" on other services is the same as it is on Sirius XM, Warner gets [redacted] of these benefits, or [redacted] per month. Dividing this figure by the [redacted] additional Warner performances per month on Sirius XM, Warner *gains* $0.000037 per performance, which is a *negative* opportunity cost.

In this scenario, I have assumed that Sirius XM would lose 0.14% of its subscriber if it were to steer 20% toward Warner. But my central point here is extremely robust with respect to that number. The finding holds with *any number of lost Sirius XM subscribers*, since these lost subscribers, when they turn to other services, will boost Warner's revenue from these other services. As a result, Warner's opportunity cost must be negative. To illustrate how the

[9] A similar analysis to the current scenario would apply if some Sirius XM subscribers would respond to the steering toward Warner by reducing their listening on Sirius XM, rather than by dropping their Sirius XM subscriptions, so long as those subscribers shifted some of their listening to other music services. In that scenario, this shift to other music services, especially advertising-supported services, would tend to generate additional revenue for Warner. Therefore, my main point here would apply in that situation as well: the opportunity cost to Warner of the additional listening to its music on Sirius XM would again be *negative*.

[10] When looking at other labels, I assume that the impact of a given percentage steering toward or away from a given label on the number of Sirius XM subscribers is proportional to that label's share of music on Sirius XM.

arithmetic works, if we double the number of subscribers lost by Sirius XM as a result of steering toward Warner, from 0.14% to 0.28%, the opportunity cost to Warner also doubles, from negative $0.000037 per performance to negative $0.000075 per performance.

Summary: In the "Steering Loses Subs" scenario, when Warner cuts its price to Sirius XM to obtain more plays on Sirius XM, Warner not only benefits from these extra plays on Sirius XM, but also from the additional revenues generated as a result of some Sirius XM subscribers leaving Sirius XM and using other revenue-generating services. In other words, in this scenario, Professor Willig has it exactly backwards. He gets the sign wrong on the opportunity cost to a record company of additional plays on Sirius XM. Professor Willig would assert an opportunity cost of $0.00527 per performance, while the correct figure for Warner's opportunity cost in this scenario is *negative* $0.000037 per performance. The results for Sony and Universal are even more negative. The fact that Professor Willig gets the sign wrong on the opportunity cost does not depend on the particular numbers used in this scenario.

Sirius XM Reduces its Subscription Fee

In my next scenario, I assume that Sirius XM reduces its subscription fee in response to the lower royalty rate charged by Warner. I further assume that by reducing its subscription fee, Sirius XM on net gains subscribers, notwithstanding the adverse effect on subscribership of steering toward Warner. If Sirius XM on net were to lose subscribers, Warner's opportunity cost would again be negative, as in the "Steering Loses Subs" scenario just discussed.

In this scenario, "Sirius XM Cuts Price," I modify the previous scenario by assuming that Sirius XM passes through 100% of the lower royalties charged by Warner in the form of a lower Sirius XM subscription price. I further assume that the elasticity of demand for Sirius XM's service is 1.43, based on my estimate that Sirius XM's variable costs are 30% of revenue.[11] This implies that on net Sirius XM gains 40,130 subscribers in comparison with the baseline. In this scenario, Warner's opportunity cost is equal to $0.000032 per-performance.[12]

As in the previous scenario, Warner's opportunity cost is lower if Sirius XM would lose more subscribers due to steering toward Warner. To illustrate how the arithmetic works, if we double the number of subscribers lost by Sirius XM as a result of steering toward Warner, from 0.14% to 0.28%, the opportunity cost to Warner would fall from $0.000032 per performance to negative $0.000004 per performance. Moving in the other direction, if steering toward Warner would not cause Sirius XM to lose any subscribers, the opportunity cost to Warner would be $0.000068 per performance, still a tiny fraction of Professor Willig's number.

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[11] This is an application of the Lerner Equation with a price/cost margin of 70%. Professor Willig asserts that Sirius XM faces a much lower elasticity of demand, 0.8. With a lower elasticity of demand, Sirius XM would gain fewer subscribers by cutting its subscription price, and Warner's opportunity cost would be lower. If I use Professor Willig's figure for Sirius XM's elasticity of 0.8, Warner opportunity cost would be $0.000002 per performance rather than the $0.000032 per performance that I calculate. However, any elasticity less than one is inconsistent with Sirius XM setting its price at the profit-maximizing level.

[12] If Sirius XM were to pass through only 50% of the lower royalties charged by Warner, then Warner's opportunity cost would be negative, as in the "Steering Loses Subs" scenario.

Summary: In the "Sirius XM Cuts Price" scenario, Professor Willig's opportunity cost figure of $0.00527 per-performance is more than 160 times the correct number for Warner. Professor Willig's figure is about 122 times too large for Sony and about 95 times too large for Universal.

Refusal to License to Sirius XM

My last scenario, "Refusal to License," considers what would happen if Warner were to refuse to license its music to Sirius XM.

In the baseline situation, Warner was earning [redacted] per month of royalties from Sirius XM. By refusing to license to Sirius XM, Warner would forego these revenues.

A key issue for this scenario is what share of its subscribers Sirius XM would lose if Sirius XM did not have access to Warner' music. In his Written Direct Testimony, Mr. Boedeker presents survey evidence on the fraction of Sirius XM subscribers who would cancel their subscriptions if Sirius no longer offered *any* music. He found that 70% of Sirius XM's subscribers would cancel if no music were offered.[13] Professor Willig relies on this estimate in his Written Direct Testimony.[14] Using Mr. Boedeker's estimate, an upper bound on the share of subscribers who would cancel if one record label with, for example, a 20% share of music were no longer available on Sirius XM would be 70% times 20% which is equal to 14%. This is an *upper bound* because consumers no doubt consider music from one label to be a substitute to some extent for music from other labels.[15] More generally, for a label with an X% share of performances, I will use 70% times the X% as the fraction of Sirius XM subscribers who would cancel their subscriptions if that label were no longer available on Sirius XM.[16] Using a lower figure, rather than this upper bound, would lower the opportunity cost that I calculate in this scenario.

If Warner, which has a [redacted] of the performances of recorded music on Sirius XM, were to refuse to license Sirius XM, Sirius XM would lose [redacted] (70% times [redacted]) of its subscribers. In this scenario I assume that, in response to the loss of 14% of the music it had been playing, Sirius XM would cut its price. To estimate the change in price, I reduce the $4.91 per subscriber per month value of recorded music that I estimate in the main text of my Written Rebuttal Testimony

[13] Written Direct Testimony of Stefan Boedeker at ¶14.

[14] Written Direct Testimony of Robert Willig at ¶48.

[15] The fact that music from different labels are substitutes for each other implies that losing all music has more than five times the overall effect on the number of Sirius XM subscribers as would losing one label that provides one-fifth of the music.

[16] Another reason why this is an upper bound is that, besides steering to the music of other record companies, Sirius XM can respond to the loss of one label's music by reducing its overall music content and adding to its non-music content to retain subscribers. Mr. Orszag points out at paragraph 31 of his Amended Written Direct Testimony that Sirius XM has stronger incentives to shift to non-music content as music licensing rates rise. This is all the more true if some music is not available to Sirius XM.

by 14%.[17] In this situation, Sirius XM would lose 528,691 subscribers in response to Warner's refusal to license its music to Sirius XM.[18]

In this "Refusal to License" scenario, the opportunity cost to Warner of having its music played on Sirius XM is equal to $0.000086 per performance. Professor Willig's figure of $0.00527 per performance is more than 60 times as large as the correct figure in this scenario.

Modifying the "Refusal to License" scenario in reasonable ways does not alter my conclusions here. For example, if we assume that Sirius XM does not make any price adjustment in response to the absence of the Warner music, then Warner's opportunity cost becomes $0.000516 per performance. Professor Willig's figure is still about ten times too large.

All of these opportunity cost figures in this "Refusal to License" scenario are considerably less than the current statutory rate, which is $0.00254 per performance. Contrary to Professor Willig's claim, Sirius XM is paying each record company considerably more than that record company's opportunity cost. Likewise, the rates that I have proposed in my Written Direct Testimony are well above each record company's opportunity cost.

Because Warner's opportunity cost of licensing Sirius XM is so much less than the rate it gets paid, Warner's profits would fall significantly if it refused to license its music to Sirius XM. By refusing to license Sirius XM, Warner would forego [redacted] in royalties per month, but Warner would only gain [redacted] of additional revenue from other sources as Sirius XM subscribers shift to other forms of listening. In other words, Warner would only recover about 3.4% of its lost revenue.

To check the sensitivity of these opportunity cost calculations to the particular assumptions I have made, I calculated Warner's opportunity cost using more extreme assumptions about how many subscribers Sirius XM would lose if Sirius XM did not have access to Warner's music. If one assumes that Sirius XM would lose 20% of its subscribers rather than [redacted] in the absence of Warner's music, Warner's opportunity cost increases to $0.000672 per performance. Professor Willig's figure is still nearly eight times too large. If one assumes that Sirius XM would lose 30% of its subscribers in the absence of Warner's music, Warner's opportunity cost becomes $0.001246 per performance. Professor Willig's rate is still more than four times the correct measure. I have seen no evidence suggesting that the absence of Warner's music would have anywhere near this large an impact on the number of subscribers to Sirius XM.

If the absence of Warner music, which accounts for [redacted] of the recorded music on Sirius XM, would cause Sirius XM to lose 30% of its subscribers, or more, then Warner would have a great deal of market power in the target market, i.e., in the licensing of recorded music for use on satellite radio. Therefore, if Professor Willig were to continue to claim that the prevailing license fees paid by Sirius XM fail to cover Warner's opportunity cost under a "Refusal to License" scenario, he would also have to believe that Warner has a great deal of market power in the target market. The only way to recover Professor Willig's opportunity cost is to assume that

[17] See Section 3.B.4 of my Written Rebuttal Testimony for an explanation of this $4.91 figure. Using a larger figure here would mean a larger price decrease, fewer lost subscribers for Sirius XM, and a lower opportunity cost.

[18] As above, I am assuming, based on Sirius XM's observed price/cost margin, that the elasticity of demand facing Sirius XM is 1.4.

Sirius XM would lose 100% of its subscribers if it lacks access to the music from the label in question – in other words, if the label is must-have for Sirius XM.

Summary: In the "Refusal to License" scenario, Professor Willig's opportunity cost figure of $0.00527 per-performance is about 61 times too large for Warner. Professor Willig's figure is about 39 times too large for Sony and 25 times too large for Universal.

Tables summarizing all of the scenarios discussed above are provided below.

Promotional Effects

As noted above, none of these calculations take account of Sirius XM's promotional effects. In Section 4.A of my Written Rebuttal Testimony, I show that if one uses Professor Willig's data, and corrects his regression analysis, Sirius XM's promotional effects are estimated to be quite large. These promotional effects reduce a record company's opportunity cost of having its music played on Sirius XM, and can make that opportunity cost negative.

Table C-1: Opportunity Cost of Performances on Sirius XM: Warner Music Group [RESTRICTED]



Table C-2: Opportunity Cost of Performances on Sirius XM: Sony Music Entertainment [RESTRICTED]



Table C-3: Opportunity Cost of Performances on Sirius XM: Universal Music Group
[RESTRICTED]



Table C-4: Opportunity Cost of Performances on Sirius XM: Indie Label (1% share)
[RESTRICTED]



The following four Tables present results for Warner, Sony, Universal, and an Indie Label under the assumption that the average number of performances per month for Sirius XM subscribers is 601, the number used by Professor Willig.

Table C-5: Opportunity Cost of Performances on Sirius XM: Warner Music Group [RESTRICTED]



Table C-6: Opportunity Cost of Performances on Sirius XM: Sony Music Entertainment [RESTRICTED]



Table C-7: Opportunity Cost of Performances on Sirius XM: Universal Music Group
[RESTRICTED]



Table C-8: Opportunity Cost of Performances on Sirius XM: Indie Label (1% share)
[RESTRICTED]



Appendix D

Bargaining Between Sirius XM and a Record Company

In this Appendix, I show that Sirius XM's overall profitability does not enter into the royalty rate it would negotiate with a record company that lacks must-have power.

The key Sirius XM financial variable that *does* matter is Sirius XM's contribution margin from incremental subscribers.

Basic Model

The model developed here involves a single record company, *R*, licensing its music to Sirius XM. We are interested in the factors that determine the royalty rate *r* that Sirius XM and this record company would negotiate in a direct license, in a workably competitive market with no statutory license. All royalty rates are expressed as a pro-rata percentage of revenue.

Denote by *N* the number of subscribers that Sirius XM will have if Sirius XM has access to this record company's music. Denote by *P* Sirius XM's subscription fee.

Denote by *t* the weighted average royalty rate that Sirius XM pays to all other record companies.

Denote by *s* this record company's share of music on Sirius XM.

Denote by γs the share of its subscribers that Sirius XM would lose if it did not have access to the music of the record company in question.

Denote by aP Sirius XM's incremental non-music cost per subscriber.

Denote by *F* all other Sirius XM costs, which do not vary with the number of subscribers, at least over the relevant range.

Denote by cP the opportunity cost to the record industry as a whole of one more Sirius XM subscriber. Therefore, the opportunity cost to the record company in question of one more Sirius XM subscriber is scP, assuming that this record company's share of revenue from other forms of music distribution is equal to its share on Sirius XM.

Denote by π this record company's profits (from other sources of revenue) if it does not make its music available to Sirius XM.

Sirius XM and Record Company Profits Under a License

Suppose Sirius XM and the record company enter into a license at royalty rate *r*. In that event, Sirius XM's profits are given by

$$NP(1-a) - sNPr - (1-s)NPt - F.$$

The first term is the contribution net of non-music costs from Sirius XM's *N* subscribers, each of which pays *P*, the second term is Sirius XM's royalty payments to the record company in

question, the third term is Sirius XM's royalty payments to other record companies, and the last term reflects the costs Sirius XM incurs that do not vary with the number of subscribers.

The record company's profits are given by

$$sNP(r-c)+\pi,$$

where the first term is the margin the record company earns on Sirius XM subscribers, accounting for the opportunity cost of licensing to Sirius XM, and the second terms is the record company's profits from other revenue sources.

Their combined profits are equal to

$$NP(1-a)-sNPc-(1-s)NPt-F+\pi.$$

Sirius XM and Record Company Profits with No License

Alternatively, suppose that Sirius XM and the record company fail to reach an agreement. In that event, assuming Sirius XM does not lower its subscription price, its profits are given by

$$NP(1-\gamma s)(1-a-t)-F.$$

The first term reflects the fact that Sirius XM only has $N(1-\gamma s)$ subscribers without the music of this record company, together with the fact that Sirius XM is paying tP in royalties to the other record companies for each subscriber.

The record company's profits are simply π, by definition. Their combined profits are equal to

$$NP(1-\gamma s)(1-a-t)-F+\pi.$$

Gains from Trade

The extra profits that Sirius XM earns from signing a license at royalty rate *r* are given by

$$sNP(t-r)+sNP\gamma(1-a-t).$$

The first term reflects the change in Sirius XM's royalty payments as a result of signing the direct license. This is positive if the direct license rate is less than the weighted average rate that Sirius XM pays to other record companies, and negative if the reverse.

The second term is the extra profits that Sirius XM earns by signing a license with this record company because it avoids losing $Ns\gamma$ subscribers due to lack of access to the music from this record company.

The extra profits that the record company earns by signing a license at royalty rate *r* are given by

$$sNP(r-c).$$

The combined gains from trade are given by

$$sNP(t-c)+sNP\gamma(1-a-t).$$

I now express these extra profits and gains from trade as a pro-rata percentage of revenue. This involves dividing the last three expressions by this record company's share times Sirius XM's revenue, sNP. Therefore, expressed as a pro-rata percentage of revenue, Sirius XM's extra profits from signing a license with this record company are given by

$$(t - r) + \gamma(1 - a - t).$$

Likewise, the extra profits for the record company are given by

$$(r - c),$$

and the combined gains from trade are given by

$$(t - c) + \gamma(1 - a - t).$$

Implications

None of these last three expressions involve Sirius XM's overall profits, which grow with *N* due to economies of scale caused by the fixed costs *F*.

Here are the factors that *do* enter into the pro-rata, percentage-of-revenue rate that Sirius XM and the record company would negotiate in the absence of the statutory license (in the absence of any steering, as we are assuming for the entire analysis in this Appendix):

- Sirius XM's contribution margin on incremental subscribers, $1 - a - t$.
- The loss of subscribers that Sirius XM would experience without this record company's music, relative to this record company's share of music on Sirius XM, as measured by γ.
- The record company's margin at the rate charged by other record companies, expressed as a percentage of the record company's share of Sirius XM revenues, $t - c$

Appendix E

Paid and Unpaid Trials on Sirius XM

This Appendix establishes two points about Sirius XM free-to-the-customer trial subscriptions in response to Mr. Orszag's Amended Written Direct Testimony at ¶¶80-92.

First, I show that under the *Web IV* benchmark approach that I presented in my Written Direct Testimony, copyright owners are fully compensated for listening by Sirius XM subscribers who have trial subscriptions paid by the OEMs ("paid trials"), even where those trial subscriptions are offered at a discounted price.

Second, I examine the optimal duration of unpaid trials from the perspective of both Sirius XM and record labels. I begin by developing a model that determines how the optimal unpaid trial duration depends on the costs and benefits of unpaid trials. Using that model, I show that record companies have a financial interest in waiving their royalties for unpaid trials on Sirius XM for at least as long as Sirius XM is willing to do so. I then compare unpaid trials on satellite radio and interactive webcasting services, and identify differences that lead to a longer unpaid trial on Sirius XM than on interactive services. Lastly, I use the model to show that record companies prefer a shorter unpaid trial for interactive services than those services themselves prefer. This implies that, whereas record labels have an incentive to contractually limit the duration of the waiver of royalties for unpaid trials on interactive services, in negotiations between Sirius XM and a record company in the absence of the statutory license, the record company would agree to waive its royalties for the unpaid trial period offered by Sirius XM. This finding is consistent with the observation that the hundreds of record companies that have signed direct licenses with Sirius XM have agreed to waive their royalties for the unpaid trial period offered by Sirius XM.

Background on Sirius XM Paid and Unpaid Trials

Sirius XM offers two kinds of free-to-the-consumer trials for its satellite radio service.

First, for customers buying many makes of new cars and some used cars, Sirius XM has arranged for the cars to be sold with the built-in Sirius or XM radio already turned on when the vehicle is purchased. Sirius XM contacts customers after they purchase their vehicle by direct mail, email, and telephone, and provides information about their satellite radio service, as described in the Written Rebuttal Testimony of David J. Frear.[1] Sirius XM then continues to contact these customers to encourage them to transition to a self-paid subscription when their trial ends. Many of these trials are *paid trials*, in which Sirius XM receives revenue from the automobile manufacturer that covers at least part of the normal subscription fee.[2] All of the revenue from paid trials is reported at Sirius XM as part of its subscription revenue and is included in the

[1] Written Rebuttal Testimony of David J. Frear at ¶17.

[2] The ARPU for paid trials was [redacted] per month in 2016. This compares to an ARPU of [redacted] for self-paid subscribers in 2016. Consolidated Outputs - 2016 LRS Extract.xlsx.

revenue base (subject to standard deductions applicable to all revenue) on which Sirius XM pays royalties under the statutory license.[3]

Second, Sirius XM also offers *unpaid trials* to some customers. These unpaid trials do not generate any revenue for Sirius XM. In some cases, the unpaid trial starts automatically as soon as the customer buys a new or used car from a car dealer. Unpaid trials are also available to buyers of used cars with deactivated Sirius XM radios who initiate the trial on their own, e.g., by signing up for a trial on the Sirius XM website.

When Sirius XM reports its financial results, it includes paid trials and self-pay subscribers in its subscriber count, but not unpaid trials. I follow that usage here.

Paid Trial Subscribers Under My *Web IV* Benchmark Approach

In my Written Direct Testimony, I showed that the *Web IV* subscription non-interactive per-play rate and the underlying agreements on which that rate was based imply a Sirius XM royalty payment per subscriber per month of $1.032. That figure is calculated as the product of the *Web IV* per-play rate, $0.0022, and the number of plays per subscription per month on Sirius XM, which is 469. I then divided this per-subscriber figure by Sirius XM's projected ARPU of $12.80 to get a percentage-of-revenue figure of 8.1%.

The key observation here with respect to paid trial subscriptions is that the ARPU measure is an average revenue computed across *all* revenue-generating subscribers, whether paid trial or self-paid. ARPU is defined simply as total revenue from all subscribers divided by the total number of subscribers, adding up paid-trial subscribers and self-pay subscribers. As a result, dividing the target per-subscriber royalty of $1.032 per month by the ARPU to get a percentage-of-revenue rate *automatically* ensures that the proposed percentage-of-revenue rate, when applied to all subscription revenue, will generate the same total royalties for record companies as if Sirius XM paid a $1.032 per month in royalties for all paid-trial and self-pay subscribers.

A simple initial example illustrates the arithmetic point. Suppose that the reasonable royalties for Sirius XM are $1.20 per subscriber per month. Suppose there is one subscriber on a paid trial, for which Sirius XM receives an $10 subscription fee, and one self-pay subscriber who is paying a $14 subscription fee. Under my approach, the ARPU is $12. Therefore, the reasonable percentage-of-royalty rate is 10%, since $10% of the $12 ARPU gives the required payment of $1.20 per subscriber per month. Applying that 10% rate, Sirius XM will pay $2.40 per month in royalties: 10% times the ARPU of $12 times 2 subscribers. This could be broken out as $1.00 of royalties on the subscriber with the paid trial (10% times $10) and $1.40 of royalties on the self-pay subscriber (10% times $14). But it would be mistake to "gross up" the $10 revenue from the subscriber on the paid trial to the ARPU of $12. The $1.40 royalties from the self-pay subscriber makes that unnecessary.

The following examples clarify why the mix between paid-trial and self-pay subscribers is automatically incorporated in my calculation of the proper percentage-of-revenue royalty rate for

[3] In some cases the net revenue received by Sirius XM is less than the reported revenue because Sirius XM pays a revenue share back to the car companies for these paid trials. Nevertheless, it is the gross revenue, before deducting revenue share payments to car companies, that is the basis on which royalties are paid under the statutory license. Written Rebuttal Testimony of David J. Frear at ¶13.

Sirius XM. Table E-1 shows the baseline, using the target royalty payment of $1.032 per subscriber per month for both types of subscriber. In Table E-1, I have taken the number of paid-trial and self-pay subscribers on Sirius XM and the ARPU for each type from Sirius XM's 2016 financial reports.[4] However, my central point here does not depend on the particular values for the number of each type of subscriber or the ARPU for that type.

Table E-1: Royalty Payments by Type of Subscriber [RESTRICTED]

[redacted]

As shown in Table E-1, the effective percentage-of-revenue rate differs between the two types of subscribers. By paying $1.032 per subscriber per month, Sirius XM effectively pays [redacted] of the revenue for each self-pay subscriber and [redacted] of revenue for each paid-trial subscriber. Combined, Sirius XM pays the 8.1 percent of revenue rate that ensures that record labels receive $1.03 per subscriber per month overall, which comes to [redacted] per month in royalties.

Put another way, if Sirius XM pays 8.1% of the revenue collected from each subscriber, it will pay less than $1.032 for those subscribers (including paid-trial subscribers) who pay less than the ARPU, but *more* than $1.032 for those subscribers who pay more than the ARPU, and $1.032 per subscriber on average across the entire subscriber base. This is precisely the result suggested by the *Web IV* benchmark.

Table E-2 shows what would have happened to my proposal had the mix between paid-trial and self-pay subscribers been different. Table E-2 assumes that paid-trial subscribers account for one-third of all Sirius XM subscribers, rather than the 18% shown in Table E-1.

Table E-2: Royalty Payments by Type of Subscriber [RESTRICTED]

[redacted]

Like Table E-1, Table E-2 follows the calculations from my Written Direct Testimony and starts from the assumption that Sirius XM pays $1.032 per subscriber per month for both paid-trial and

[4] Consolidated Outputs - 2016 LRS Extract.xlsx

self-pay subscribers. Changing the mix of subscriber types does not affect the ARPU for each type of subscriber or the royalty payment per subscriber, which remains at $1.032 per month. However, changing the mix of subscriber types does lower Sirius XM's ARPU, from $12.80 per month to $11.99 per month. As a result of this change, in the last step of my percentage-of-revenue rate derivation I would have divided $1.032 by $11.99 and obtained a royalty rate of 8.6 percent of revenue rather than 8.1 percent of revenue. With this change, the record companies would again have been fully compensated, earning $1.032 per subscriber and total monthly royalties of [redacted] The decline in Sirius XM's revenue due to the lower level of self-pay subscribers and higher level of paid-trial subscribers would have been made up for automatically by an increase in the royalty rate.

It is worth noting that the Sirius XM financials project that the [redacted][5] A consequence of this shift is that the percentage-of-revenue rate needed to generate a particular per-subscriber royalty payment to copyright holders will decline over time as the mix of customers shift. Since I am proposing using an ARPU measure that reflects the current revenue base for royalty payments, this means that the percentage of revenue derived from that ARPU will give copyright holders an increasing per-subscriber royalty over time, even if there is no change is Sirius XM's subscription fees. Nevertheless, I am not proposing a downward adjustment in the percentage-of-revenue rate to account for the changing mix of subscribers over the 2018-2022 time period.

Paid Trial Subscribers Under Mr. Orszag's "Approach 2"

The logic just presented applies regardless of the mix between Sirius XM self-pay subscribers and paid-trial subscribers. This proves that the approach taken in my Written Direct Testimony automatically accounts for the presence of paid-trial customers.

This "neutrality" result is also true under Mr. Orszag's Approach 2. Under his Approach 2, Mr. Orszag, like me, derives a per-subscriber per-month payment ($2.76 in his case, vs. my $1.032) which he then divides by his measure of ARPU to obtain a percentage-of-revenue rate.[6] For the same reasons as discussed above, that measure of ARPU already reflects the mix of self-pay and paid-trial subscribers and the prices charged to each, thus ensuring an average per-subscriber royalty equal to what Mr. Orszag proposes.

The Treatment of Unpaid Trials by Sirius XM and Record Companies

In this section, I discuss how unpaid trials would likely be addressed in hypothetical negotiations between Sirius XM and a record label in the absence of the statutory license. As factual background for that discussion, I note that Sirius XM's unpaid trials generally run no more than

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[5] [redacted]

[6] He then applies a [redacted] steering adjustment to that rate to obtain his proposed rate. Mr. Orszag's proposed per-subscriber rate using Approach 2 is $2.37, which is his $2.76 figure less this [redacted] steering adjustment. Amended Written Direct Testimony of Jonathan Orszag at ¶60 and ¶68.

three months.[7] I first show that the tradeoffs between the costs and benefits for unpaid trials for records labels are such that they would prefer a *longer* unpaid trial period than Sirius XM. Next I briefly discuss why Sirius XM prefers unpaid trial periods extending longer than a month. Lastly, I contrast my analysis of unpaid trials with that of Mr. Orszag, which is based on unpaid trials offered by interactive services.

A Record Company Prefers Longer Unpaid Trials Than Does Sirius XM

In this section, I show why a record company prefers *longer* unpaid trials than does Sirius XM, assuming that the record company is waiving its royalties during the unpaid trial.

This finding is highly significant because it implies that, in a hypothetical negotiation between Sirius XM and a record company in the absence of the statutory license, the record company would agree to waive its royalties for at least as long as Sirius XM would be willing to offer the unpaid trial. Presumably, Sirius XM's preferred duration for unpaid trials with no music royalties is the one they have been choosing under the statutory license. The implication is that the record companies would agree to waive royalties for this period of time, so the statutory license can continue to treat unpaid trials in this manner.

Optimal Duration of Unpaid Trials for Sirius XM

First, I consider the duration that Sirius XM would choose for its unpaid trials, assuming that the record company is waiving its royalties for the duration of the unpaid trial.

Define the following variables, all of which are taken as given for this analysis:

- The Sirius XM subscription price, denoted by P.
- The share of Sirius XM's revenue from paid subscribers that Sirius XM pays in royalties for recorded music, denoted by r.
- Sirius XM's other incremental costs per subscriber, denoted by cP.
- The fixed cost to Sirius XM of each unpaid trial, denoted by F.
- The interest rate used to discount cash flows, denoted by i.
- The attrition rate for self-pay subscribers, denoted by ρ, where $0 < \rho < 1$. This means that the probability that a given person who is paid subscriber today will still be a subscriber after time t has passed is equal to ρ^t.

Sirius XM chooses the duration of unpaid trials, which is denoted by D. This duration affects the number of people who sign up for unpaid trials and the rate at which they are converted to paid subscribers. Denote by $T(D)$ the number of people who sign up for a unpaid trial. I assume that

[7] Written Rebuttal Testimony of David J. Frear at ¶11, footnote 6. Mr. Orszag claims that unpaid trials last for anywhere from three to twelve months. Amended Written Direct Testimony of Jonathan Orszag at ¶81. However, he appears to be referring to all free-to-the-customer trials. Some paid trials offered with new cars do indeed last as long as a year. However, Sirius XM does not offer unpaid trials lasting more than three months. Written Rebuttal Testimony of David J. Frear at ¶6, footnote 2. The Sirius XM website offers a two month unpaid trial for those who buy an eligible used car with an existing Sirius or XM radio. See https://care.siriusxm.com/preownedvehiclestrial_view.action, accessed on February 2, 2017.

longer unpaid trials attract more people, so $T'(D) > 0$, but this relationship exhibits diminishing returns, so $T''(D) < 0$. Denote by $S(D)$ the number of people who will become paid subscribers after the unpaid trial. I assume that longer unpaid trials end up converting more people into paid subscribers, so $S'(D) > 0$, but this relationship exhibits diminishing returns, so $S''(D) < 0$.

Sirius XM's profits from choosing duration *D* for unpaid trials are given by:

$$\Pi(D) = T(D)\int_0^D e^{-it}(-cP)dt + S(D)\int_D^\infty e^{-it}\rho^{(t-D)}(1-r-c)Pdt - T(D)F.$$

We are interested in the duration that maximizes Sirius XM's profits, which we denote by D^*. The first-order condition defining D^* is $\Pi'(D) = 0$. At the optimum, $\Pi''(D^*) < 0$.

We first address the fixed cost per unpaid trial, *F*. Note that $\frac{d\Pi}{dF} = -T(D)$, so $\frac{d^2\Pi}{dFdD} = -T'(D) < 0$. Totally differentiating the first-order condition for D^* gives $\Pi''(D^*) + \frac{d^2\Pi}{dFdD}\frac{dD^*}{dF} = 0$, so we know that $\frac{dD^*}{dF} < 0$. In words, the higher is Sirius XM's fixed cost per unpaid trial, the fewer unpaid trials that Sirius XM will want to offer, and thus the shorter the duration that Sirius XM will pick.

For the rest of the analysis, we will set $F = 0$. Because $\frac{dD^*}{dF} < 0$, setting $F = 0$ will increase the optimal duration of unpaid trials for Sirius XM. So our analysis with $F = 0$ will overstate the duration that Sirius XM will pick with a positive *F*. We use this fact below.

Define

$$G(D) = T(D)\int_0^D e^{-it}\,dt \quad \text{and} \quad H(D) = S(D)\int_D^\infty e^{-it}\rho^{(t-D)}dt.$$

Note that $G(D)$ is increasing in D, because both $T(D)$ and $\int_0^D e^{-it}\,dt$ are increasing in *D*. In words, a longer duration means that more people sign up for unpaid trials and Sirius XM bears the cost of each unpaid trial for a longer period of time.

With $F = 0$, Sirius XM's profits can now be written as

$$\Pi(D) = -cP * G(D) + (1-r-c)P * H(D).$$

Therefore, the first-order condition for the optimal duration for Sirius XM is given by

$$-cG'(D) + (1-r-c)H'(D) = 0$$

which can be written as

$$\frac{c}{1-r-c} * G'(D) = H'(D). \qquad (E.1)$$

Since $G(D)$ is everywhere increasing in D, we know that $H(D)$ must also be increasing in D at D^*, which tells us that at the optimal trial duration a longer duration yields enough more paid subscribers to more than make up for the fact that they start paying at a later time.

The key ratio that drives the optimal duration for Sirius XM is

$$\frac{c}{1-r-c}.$$

This ratio measures the (flow) cost to Sirius XM of a unpaid trial, *c*, relative to the (flow) margin that Sirius XM will earn if an individual converts to a paid subscription, which is $(1 - r - c)$. The smaller this ratio, the longer will be the optimal duration of the unpaid trial for Sirius XM.[8]

This ratio is about 27%, based on Sirius XM's financial reports. The expression $(1 - r - c)$ represents Sirius XM's contribution margin. As discussed in Section 7.A, Sirius XM's contribution margin has been around 70% for a number of years and is [redacted].[9] The royalty rate *r* is simply the statutory rate, which is 11% in 2017. Deducting this royalty rate from Sirius XM's overall incremental costs of 30% of revenue implies that the non-music incremental costs, *c*, are about 19% of revenue. Therefore, $\frac{c}{1-r-c} = \frac{19}{70}$ which is 27%.

Optimal Duration of Unpaid Trials for the Record Company

We can now repeat this analysis for the record company, to see what duration of unpaid trial on Sirius XM maximizes the record company's profits.

Define the following additional variables, all of which are taken as given for this analysis:

- The record company's share of the performances on Sirius XM, denoted by σ.
- The opportunity cost to the record company of having its music performed for one more self-pay Sirius XM subscriber, denoted by K.
- The opportunity cost to the record company of having its music performed for one more Sirius XM listener on a unpaid trial, denoted by θK, where $\theta \leq 1$.

The record company's profits are given by

$$\Phi(D) = T(D) \int_0^D e^{-it} (-\theta K) dt + S(D) \int_D^\infty e^{-it} \rho^{(t-D)} (\sigma r P - K)\, dt.$$

This can be written as

$$\Phi(D) = -\theta K * G(D) + (\sigma r P - K) * H(D).$$

The first-order condition for the record company's optimal duration of unpaid trials is

$$\frac{\theta K}{\sigma r P - K} * G'(D) = H'(D). \qquad (E.2)$$

Note that (E.2) is very similar to (E.1), which is the first-order condition for Sirius XM's optimal duration of unpaid trials, except that the ratio $\frac{\theta K}{\sigma r P - K}$ appears here instead of the ratio $\frac{c}{1-r-c}$.

The ratio $\frac{\theta K}{\sigma r P - K}$ measures the record company's opportunity cost of a performance for a Sirius XM unpaid trial subscriber relative to the margin that the record company earns from a Sirius

[8] Formally, one can totally differentiate the first-order condition for D^* with respect to this ratio and use the second-order condition at D^* to show that a higher value of this ratio leads to a lower value of D^*. This exercise is much like the comparative statics result above showing that a higher level of *F* leads to a lower value for D^*.

[9] Note that Professor Lys also says this figure has been steady around 70%. Written Direct Testimony of Thomas S. Lys at ¶87.

XM self-pay subscriber, accounting for the opportunity cost to the record company of that self-pay subscriber. Recall that the lower is this ratio, the longer is the optimal duration of the unpaid trial. Therefore, if this ratio is lower for a record company than for Sirius XM, the record company would prefer a longer unpaid trial than would Sirius XM. That is indeed the case, as we now show.

The opportunity cost to a record label of making its music available to Sirius XM depends on how customer listening on Sirius XM would change if this label's music were not available on Sirius XM. In particular, as discussed in detail in Appendix C, this opportunity cost depends on the extent to which customers would switch to performances on other record labels, versus switching to other revenue generating distribution outlets for music.

Here I use the "Refusal to License" scenario from Appendix C to estimate the record company's opportunity cost of making its music available on Sirius XM. Consider the incremental profits to the record label from unpaid trials if it agrees to waive its royalties for the entire unpaid trial period. If a deal is not reached, Sirius XM will continue to offer its service using music from other record labels, and will continue to offer unpaid trials as part of that service. Thus the opportunity cost for performances to unpaid trial customers is based on the same customer switching behavior as for the service as a whole.

In Appendix C I calculate the opportunity cost for a record label under the Refusal to License scenario. This opportunity cost depends on two factors: (1) the opportunity cost to the record industry as a whole, and (2) the ratio of the opportunity cost for one label to the opportunity cost for the industry as a whole. This second factor increases as the share of the negotiating label decreases. For the largest record label, Universal, the factor reported in Appendix C is 25.

In his Written Rebuttal Testimony, Professor Farrell computes the opportunity cost to the record industry as a whole for Sirius XM subscribers, using data from the Hauser survey.[10] He does this separately for Sirius XM paid customers and Sirius XM promotional customers. Note that these estimates overstate the true opportunity cost to the extent that Sirius XM promotes listening on other distribution channels.

Using the midpoint of the range of opportunity cost computed by Professor Farrell, the opportunity cost to the record industry as a whole for paid subscribers is $1.40 per subscriber per month, while for trial subscribers it is $0.87 per subscriber per month. These numbers imply that θ, the ratio of unpaid-trial to paid-subscriber opportunity cost, is 62%.

We are now ready to compare Universal's opportunity cost of a Sirius XM unpaid trial and the margin that Universal earns on Sirius XM paid subscribers. For paid subscribers, Universal's opportunity cost, K, is $1.40/25 = $.06. As reported in Appendix C, Universal has a [redacted] share of plays on Sirius XM. Using Professor Willig's figure of [redacted] for record industry revenue per Sirius XM subscriber per month, the revenue per subscriber accruing to Universal, which is $\sigma r P$, is [redacted][11]

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[10] Written Rebuttal Testimony of Joseph Farrell, Appendix D.

[11] Written Direct Testimony of Robert Willig at Table 2. Professor Farrell uses Professor Willig's estimates of record industry revenue in deriving his measure of opportunity costs. Written Rebuttal Testimony of Joseph Farrell, Appendix D.

Recall that the record label's preferred unpaid trial duration will be at least as long as the duration preferred by Sirius XM as long as[12]

$$\frac{\theta K}{\sigma r P - K} \leq \frac{c}{1 - r - c} = 27\%. \qquad (E.3)$$

Plugging in values for Universal, $\frac{\theta K}{\sigma r P - K} =$ [redacted] $= 21\%$. Thus Universal would prefer a longer unpaid trial duration than would Sirius XM. Smaller labels would prefer a trial duration at least as long as Universal. For example, for Warner, which has a [redacted] share of plays on Sirius XM, the ratio of costs to returns on the left hand side of E.3 comes out to 11%.[13]

Since the ratio of opportunity cost to net royalties (no more than 21%) is less than the ratio of non-royalty variable costs to contribution margin for Sirius XM (27%), each record label prefers an unpaid trial duration at least as long as that preferred by Sirius XM. The longer unpaid trial duration increases the net present value of the incremental royalties that the record company gets from unpaid trials on Sirius XM. Therefore, it is in each record company's interest to waive its royalties for the unpaid trial duration chosen by Sirius XM.

Why Sirius XM Offers Unpaid Trials Longer than One Month

Sirius offers unpaid trials lasting two or three months to give trial customers sufficient time to learn about and experience the satellite radio service. Because many unpaid trials are automatically initiated when people buy a used car, they may not even know that they have an active Sirius XM radio, or understand what the service offers, when the unpaid trial begins. As described by Mr. Frear in his Written Rebuttal Testimony, Sirius spends the first 45 days of a trial making the customer aware that they have the service and explaining the various features and functions to customers.[14]

Sirius XM marketing efforts continue well beyond this initial period. Because the satellite service does not provide for two-way communication, Sirius XM has no way to monitor whether or how intensively customers are using the service other than by asking them through marketing contact.[15] Consequently, Sirius XM engages in a series of contacts to try to encourage the person on the unpaid trial to convert to a self-pay subscription. In addition, since unpaid trial subscriptions are for radios installed in cars, usage of the service is limited by the amount of time customers are in their cars. A longer trial period gives customers additional time to sample and explore Sirius XM's offerings.[16]

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[12] As noted above, the preferred duration for Sirius XM will be even shorter if there are some fixed costs per trial subscriber that are borne by Sirius XM but not by record labels.

[13] The opportunity [redacted] ctor from Appendix C for Warner is 61. Thus $K = \$1.40/61 = \$.02$, and $\theta K/(\sigma r P - K) =$ [redacted] $= 11\%$.

[14] Written Rebuttal Testimony of David J. Frear at ¶¶17-18.

[15] Sirius XM differs sharply from the interactive services in this respect.

[16] Written Rebuttal Testimony of David J. Frear at ¶25.

Mr. Orszag's Treatment of Unpaid Trials in a Hypothetical Negotiation

Mr. Orszag states: "In terms of projecting how unpaid trial subscribers would be addressed in hypothetical voluntary negotiations between Sirius XM and a record label, I have examined the treatment of unpaid trials in agreements between the major record companies and the benchmark interactive subscription services."[17] He reports that his benchmark interactive services generally limit their unpaid trials to no more than 30 days.[18]

Mr. Orszag further states:

> "As discussed below, voluntary agreements between benchmark interactive subscription services and record labels [redacted] In my view, *there is no sound economic basis* for the present disparate treatment, under which Sirius XM is permitted to offer the repertoires of rights owners for durations greater than one month without the payment of royalties."[19]

There are two issues here: (1) why Sirius XM chooses to offer longer unpaid trial periods than are typically offered by subscription interactive services, and (2) whether, in a hypothetical negotiation between Sirius XM and a record company in the absence of a statutory license, the record company would agree to waive its royalties for the two- or three-month period for which Sirius XM seeks to offer unpaid trials. The analysis in this Appendix directly addresses both of those issues.

Regarding (1), my discussion just above provides several reasons why Sirius XM offers unpaid trials lasting longer than the one-month period used by a number of the subscription interactive services. More specifically: most Sirius XM unpaid trials result from the indirect car-dealer mechanism, under which the unpaid trial comes with the purchase of a car and is not initiated by the customer. In contrast, unpaid trials on subscription interactive services are initiated directly by the customer. Sirius XM unpaid trials run longer in part simply to inform the customers that they *have* a unpaid trial and to give them time to acquaint themselves with Sirius XM's offerings; the first of these is not necessary for interactive services, and the second may well take longer in the case of Sirius XM for the reasons given above. Furthermore, it is much easier for interactive services to communicate with their customers on unpaid trials, since they can use the information provided when the customer signs up to send her messages.[20] Meanwhile, the time a customer has to try Sirius XM is limited to the time that customer spends in the car, a limitation that does not apply to interactive services.

Regarding (2), Mr. Orszag seems to think that a record company is giving a gift to Sirius XM by agreeing to waive its royalties for the duration of the unpaid trial. One could just as well say that

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[17] Written Direct Testimony of Jonathan Orszag at ¶86.

[18] Written Direct Testimony of Jonathan Orszag at ¶81 and Table Four. Of the seven services listed in Table 4, five (including Spotify) offer 30 day trials, one (Slacker) does not offer free trials, and one (Apple Music) offers a three month free trial.

[19] Written Direct Testimony of Jonathan Orszag at ¶85.

[20] As described by Mr. Frear, interactive service users provide an email address when they sign up for a free trial and must opt-out if they do not want to receive email communications. In contrast, Sirius trial subscribers must opt-in to receive email communications, and only about [redacted] do so. Written Rebuttal Testimony of David J. Frear at ¶22.

Sirius XM is giving a gift to the record company. In my opinion, the proper way to analyze these unpaid trials is as a *joint effort* by Sirius XM and the record company to attract more Sirius XM subscribers – especially since many of these customers would otherwise listen to terrestrial radio, which generates no royalties for record companies. Sirius XM and the record company both view unpaid trials as a promotion designed to attract customers and thus increase their future revenue. In studying that joint effort, and the negotiations between Sirius XM and a record company over how the royalties for recorded music will be treated during the unpaid trial, the key question is how long each party would like the unpaid trials to last.

The model developed above shows that record labels would prefer that the unpaid trials on Sirius XM last at least as long as Sirius XM prefers. This directly answers question (2).

That still leaves the question of why the record companies do not agree to unpaid trials lasting longer than one month on subscription interactive services. As noted above, Mr. Orszag states: "In my view, *there is no sound economic basis* for the present disparate treatment, under which Sirius XM is permitted to offer the repertoires of rights owners for durations greater than one month without the payment of royalties."[21]

As I now demonstrate, my analysis explains why record companies would find it worthwhile to waive their royalties for a *longer* period than Sirius XM chooses to offer unpaid trials, but *not* for as long as the interactive services would choose to offer unpaid trials. Mr. Orszag found no "sound economic basis" for a difference between Sirius XM and interactive services because he did not investigate the underlying factors that determine the optimal length of unpaid trials. I have done that and thereby supplied the "sound economic basis" that Mr. Orszag found lacking.

Looking first at a representative interactive service, royalty payments as a percentage of price are [redacted] according to Mr. Orszag's Written Direct Testimony.[22] As an estimate of the other variable costs of operating a music streaming service, I use the amount of other variable costs as a percentage of revenue for Pandora. According to Pandora's annual reports, these variable costs are about 7% of revenue.[23] Thus the key ratio, $\frac{c}{1-r-c}$, for an interactive service in (E.3) is [redacted][24]

Turning to record labels, the opportunity cost to the record industry as a whole for a paid interactive service subscriber, as computed by Professor Farrell using data from the Hauser survey, is between $2.15 and $2.45 per month; for this computation I will use the midpoint of the range, $2.30. Professor Farrell does not report an opportunity cost for trial subscribers, so I will use the same θ as for satellite radio, which is 62%. Given that the major labels are must-have for interactive services, the opportunity cost for a major label is equal its music share times the opportunity cost for the industry as a whole. If we define the opportunity cost to the record industry as a whole as Z, then we have $K = \sigma Z$. Lastly, the record industry revenue from an interactive service subscriber, as reported in Table 2 of Professor Willig's Written Direct Testimony, is [redacted] per month. This is rP in my model.

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[21] Written Direct Testimony of Jonathan Orszag at ¶85, emphasis added.

[22] Written Direct Testimony of Jonathan Orszag at ¶47.

[23] Pandora Media, Inc. Form 10-K at 68. Available at http://investor.pandora.com/Cache/1001215554.PDF.

[24] [redacted]

Putting these pieces together, for major labels licensing to interactive services, we have

$$\frac{\theta K}{\sigma r P - K} = \frac{\theta \sigma Z}{\sigma r P - \sigma Z} = \frac{\theta Z}{r P - Z}$$

This shows that the key ratio, $\frac{\theta K}{\sigma r P - K}$ in (E.3), is the same for all must-have labels regardless of the label's music share. That value is 42%.[25]

Since the key ratio for the major record labels, 42%, is much greater than the 19% ratio for a representative interactive service, the major record labels prefer a *shorter* duration for unpaid trials on interactive services than do those services themselves. This is the opposite of the result for satellite radio, where record labels prefer a longer unpaid trial period than does Sirius XM.

In summary, the model developed in this Appendix provides the sound economic basis for the disparate treatment toward unpaid trials that Mr. Orszag viewed as lacking. Whereas the major record labels have an interest in limiting the unpaid trial duration set by interactive services, in the hypothetical negotiation with Sirius XM, a major label would actually want to encourage Sirius XM to offer *longer* unpaid trials to maximize the expected royalty payments resulting from unpaid trials.

Continuing to waive royalties for the full duration of the unpaid trial period on Sirius XM is consistent with the relative costs and benefits to record labels from unpaid trials on Sirius XM.

[25] 42% = [redacted]

PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In re	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

WRITTEN REBUTTAL TESTIMONY OF JOSEPH FARRELL

(On behalf of Sirius XM Radio Inc.)

17 FEBRUARY 2017

Table of contents

I. Executive Summary 1

II. Introduction 4
- II.A. Qualifications 4
- II.B. Assignment 5

III. Professor Willig's approach: monopoly versus competition 5
- III.A. Summary of Professor Willig's approach 5
- III.B. Professor Willig calculates an opportunity cost for a monopoly label or cartel of labels 7
- III.C. Workable competition versus monopoly 9
- III.D. Workable competition and the 801(b) factors 11
  - III.D.1. Economic principles and the 801(b) factors 11
  - III.D.2. SoundExchange experts agree that the Section 801(b) factors require a workably competitive market 13

IV. Professor Willig's estimates are significantly infected by the non-competitive market for licenses to interactive services 14

V. Other issues in Professor Willig's approach for calculating opportunity cost 15
- V.A. Professor Willig's opportunity cost calculation ignores promotional impact 15
- V.B. Professor Willig's reliance on the Dhar survey 16
- V.C. Professor Willig's opportunity cost calculation assumes each negotiating label is must-have for Sirius XM 22

VI. Adjusting the opportunity cost upward 23

VII. Professor Willig's use of the Nash bargaining solution 25

VIII. Professor Willig's use of Ramsey pricing 27

IX. Conclusion 28

Appendix A. Curriculum Vitae of Joseph Farrell, D.Phil. A-1

Appendix B. Recent testifying experience B-1

Appendix C. Documents considered C-1

Appendix D. Professor Willig's opportunity cost calculation ignores Sirius XM subscribers who will not divert to other sources of music if Sirius XM is without a label's music content D-1

Appendix E. Effect of steering E-1

Appendix F. Estimation of opportunity cost based on the results of the Hauser-revised Dhar survey F-1

Appendix G. Detailed summary of survey results G-1

List of figures

Table 1. Summary of diversion ratios from Dhar, Hauser-revised Dhar, and Lenski surveys 19

Table 2: Calculation of Professor Willig's interpretation of opportunity cost using Dhar, Hauser-revised Dhar, and Lenski surveys 21

Table 3. Choices for respondents who would cancel Sirius XM paid subscription F-2

Table 4: Detailed summary of diversion ratios from Dhar, Hauser-revised Dhar, and Lenski surveys.....G-1

I. Executive Summary

(1) In his Written Direct Testimony (WDT), Professor Willig presents two approaches for determining royalty rates applicable to Sirius XM's use of sound recordings on its satellite service: (1) a Nash bargaining model and (2) application of Ramsey pricing principles and unregulated profit-maximizing pricing. Both approaches use a version of opportunity cost as a critical input.

(2) In calculating his version of opportunity cost, Professor Willig relies on a survey that asked subscribers to Sirius XM (among other paid music services) to identify the music distribution channels to which they would switch should the price of their current music service rise to such a point that the subscriber would discontinue service. Combining the results of the survey with estimates of creator compensation (per subscriber per month) for these alternative music distribution channels, Professor Willig derives a weighted average level of creator compensation of $2.55 per subscriber per month, which he describes as the opportunity cost of licensing music to Sirius XM. He argues that this opportunity cost should be a floor on the royalty charged to Sirius XM.

(3) As I describe below, Professor Willig appears to assume that there is either a single monopoly record label or a fully effective cartel, both when he calculates his opportunity cost and then again in his Nash bargaining and Ramsey pricing calculations. This assumption implies an opportunity cost, and a resulting royalty, that is significantly different than would prevail in a workably competitive market.

(4) In a workably competitive market, rival record labels would be willing to take business away from each other even though collective profits might fall as a result. In particular, the possibility that Sirius XM will adjust the mix of sound recordings it plays in response to changes in the price (royalty) offered by individual record labels ("steering") allows price competition among labels. The opportunity cost to an individual label from expanding Sirius XM's usage of that label's performances through such price competition is quite different from, and likely far lower than, the opportunity cost to a monopoly label or a cartel of labels from expanding Sirius XM's subscriber base, which is the concept that Professor Willig appears to be pursuing. As is normally the case, workable competition would lead to lower royalties relative to the monopoly outcome.

(5) Professor Willig also assumes (in key places, though not everywhere in his testimony) that Sirius XM would cease to be a music service if it did not reach agreement with a copyright owner. In the simple version of the economics of bargaining that he describes, such an intimidating threat pushes toward a higher royalty than would prevail in a workably competitive licensing market in

which no single copyright owner could effectively threaten to shut down Sirius XM as a music service.

(6) Even if it were factually correct as a description of this industry and of Sirius XM's market position, Professor Willig's assumption that there is a single monopoly label (or a fully effective cartel) implies that his results are inherently unhelpful as a guide to workably competitive royalties. Workably competitive royalties, not monopoly royalties, are the relevant standard according to: (1) my understanding of the objectives of Section 801(b)(1), (2) the testimony of other SoundExchange economic experts, including their understandings of Section 801(b)(1), and (3) the views expressed by the Copyright Royalty Judges in *SDARS I.*[1]

(7) Beyond this over-arching choice to analyze a monopoly label rather than a workably competitive industry, there are several significant problems with Professor Willig's calculation of opportunity cost.

- Professor Willig's opportunity cost approach assumes that existing royalty rates paid by other music services are appropriately set. In the case of interactive services, however, those rates were almost certainly inflated by the market power of record labels in an environment where workable competition was unlikely. Thus, Professor Willig imports the market power that is generally recognized to be at play in the interactive market into his recommended royalty for Sirius XM. This is quantitatively important in his estimate, as he acknowledges. As he puts it, "Most of the current opportunity cost arises from the cannibalization of interactive streaming services – namely […] 70%"[2] and he further warns that growth in paid interactive services should make this "apt to rise significantly in the near future".[3]
- The high markup on interactive services is so influential in Professor Willig's opportunity cost calculation because it receives a heavy weight in the weighted average that he calculates. This weighting is his estimate of a diversion ratio -- *i.e.*, the percentage of Sirius XM subscribers for whom interactive services would be their next choice. For this estimate, Professor Willig relies on data from a survey directed by Professor Dhar ("the Dhar survey") that yield diversion ratios that are surprisingly high for paid interactive services and surprisingly low for free terrestrial radio. Other surveys directed by Mr. Lenski ("the Lenski survey") and Professor Hauser ("the Dhar survey as revised by Hauser" or "Hauser-revised Dhar survey") estimate much lower diversions to interactive services, and much higher diversions to terrestrial radio. As I show below, if we seek to reproduce Professor Willig's methodology but use the data from the Lenski and the Hauser-revised Dhar surveys in place of Professor Dhar's, this significantly reduces the resulting opportunity cost estimate.

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1 My discussion of the Section 801(b)(1) objectives is limited to the first three objectives.

2 Written Direct Testimony of Robert Willig, October 19, 2016 ("Willig WDT"), at 29.

3 *Id.* at 32.

- Testimony in the record suggests that airplay on Sirius XM can increase CD and download sales and interactive play on streaming services. Such "promotional" effects are an offset to correctly calculated opportunity cost. Professor Willig ignores this offset, biasing his calculation upward.
- Professor Willig's assumption that labels are must have for Sirius XM – *i.e.*, that Sirius XM would cease to exist without access to the label's music – also tends to inflate his estimate of opportunity cost. If some of Sirius XM's subscribers would remain even if it lost access to (a label's, or even to all) music, as indeed Professor Willig assumes elsewhere, this factor would lower the calculated opportunity cost.

(8) Professor Willig goes on to argue that the opportunity cost as he calculates it is an "absolute minimum level" on appropriate royalties for Sirius XM, and that "fair" royalties would be "significantly above opportunity cost."[4] He then describes two approaches (Nash bargaining, and Ramsey pricing or unregulated monopoly pricing) for gauging how big a markup above opportunity cost is appropriate. While he does not describe it as such, his opportunity cost calculation is mathematically equivalent to a weighted-average benchmarking exercise, with the benchmarks being the royalties paid by other services, weighted by his estimates of diversion ratios between Sirius XM and such services. Thus, his approach implies that each service should actually pay a royalty that is "significantly above" the weighted average of what other services pay. Absent a clear limiting principle, that logic would lead to an ever-upward spiral, irrespective of the details of Professor Willig's implementation of "significantly above."

(9) Professor Willig's implementation of that troubling logic via a Nash bargaining calculation suffers from a number of other serious flaws. In particular, Professor Willig assumes that each label is must-have. That assumption inflates the walk-away opportunity cost for the record label and worsens the threat to Sirius XM. Similarly, Professor Willig ignores the possibility of steering. These factors raise his estimate of the royalties that would be agreed to in a Nash bargaining solution.

(10) Professor Willig's Ramsey pricing discussion likewise assumes, troublingly, that there must be a positive markup over the weighted average benchmark that he calls opportunity cost; and it too suffers from other flaws. As I explain, his estimate of the opportunity cost for labels to license Sirius XM is inflated. In addition, when he estimates the opportunity cost of paid interactive services he fails to allow for diversion among separate paid interactive services (he effectively treats interactive services as if there was only one such service), an error that conduces toward an overestimate of the margin on paid interactive services, which, in turn, raises his calculation of the level of royalties payable by Sirius XM that would conform to the Ramsey or unregulated pricing pattern.

[4] *Id.* at 29-31.

(11) For these reasons, I conclude that Professor Willig's approach to calculating a royalty for Sirius XM is inconsistent with the Section 801(b)(1) objectives. In particular, his estimates are not likely to approximate, and are likely significantly above, what would prevail in a hypothetical workably competitive market in which Sirius XM secures sound recording performance rights from competing record labels.

II. Introduction

II.A. Qualifications

(12) I am Professor of Economics at the University of California, Berkeley. I am also a Partner with Bates White, LLC. I received my DPhil, MSc, and BA degrees from Oxford University.

(13) From 1996 to 1997, I served as Chief Economist for the Federal Communications Commission (FCC), where I reported directly to the Chairman and Commissioners.

(14) From 2000 to 2001, I served as Deputy Assistant Attorney General for Economic Analysis for the Antitrust Division of the US Department of Justice (DOJ). In this position, which is the chief economist position at the Division, I supervised approximately 50 PhD-level economists and reported directly to the Assistant Attorney General for Antitrust.

(15) From 2009 to 2012, I served as Director of the Bureau of Economics at the Federal Trade Commission (FTC), where I supervised approximately 70 PhD-level economists and reported directly to the Chairman and Commissioners. I was responsible for economic analysis relating to the Commission's broad antitrust and consumer protection portfolios.

(16) I have taught undergraduate and PhD-level courses at the University of California at Berkeley and earlier at the Massachusetts Institute of Technology (MIT), and the University of Michigan, on microeconomic theory, industrial organization, and game theory. My teaching experience includes both theoretical and empirical analysis.

(17) I have published extensively in peer-reviewed academic journals and elsewhere on topics centering on the economics of competition, industrial organization, and innovation.

(18) I have served on the editorial boards of professional journals, including serving as Editor of the *Journal of Industrial Economics* from 1995 to 2000 and on the Board of Editors of *Information Economics and Policy* from 2004 to 2007. I am a Fellow of the Econometric Society, past President of the Industrial Organization Society, and former Board Member for the National

Academies' Computer Science and Telecommunications Board. In 2016, I received the Distinguished Service Award from the Industrial Organization Society.

(19) I have been retained as a consultant or expert witness in a variety of matters involving telecommunications, intellectual property, competition, antitrust and merger analysis. I have served as a consultant to the DOJ, FTC, Canadian Bureau of Competition, Reserve Bank of Australia, and many private parties. I have testified on matters related to economic policy in hearings before the Senate Judiciary Committee, the FCC, the FTC, the DOJ, the Organization for Economic Co-operation and Development, and the International Trade Commission (ITC). A list of the matters in which I have provided testimony during the past four years is included in Appendix B.

II.B. Assignment

(20) I have been asked by Sirius XM to review, and where appropriate, to respond to the WDT of Professor Robert Willig.[5] In particular, I have been asked to examine and comment on the following aspects of Professor Willig's analysis: (1) his calculation and use of what he calls the opportunity cost of licensing music to Sirius XM, (2) his use of the Nash bargaining solution, and (3) his application of the Ramsey pricing principle.

(21) This rebuttal testimony contains my conclusions to date. I reserve the right to alter my analysis or conclusions, or to supplement them, based on evidence and analyses that become available to me subsequently.

III. Professor Willig's approach: monopoly versus competition

III.A. Summary of Professor Willig's approach

(22) Professor Willig's WDT includes his calculation of two different approaches for estimating the appropriate royalty rates applicable to Sirius XM's use of sound recordings under the statutory license provided in Sections 114 and 112(e) of the Copyright Act: (1) a Nash bargaining model and (2) Ramsey pricing principles (which in broad terms may also be relevant to unregulated profit-maximizing pricing). Both of these approaches use an opportunity cost as a critical input and propose markups above that level. Neither of these approaches explicitly relies on benchmarking to other rates, but, as I explain below, his calculation of his "opportunity cost" is mathematically equivalent to a weighted average of benchmarks consisting of the royalties

[5] *Id.*

received from other music distribution channels. In addition, Professor Willig's application of Ramsey pricing makes further benchmarking-like use of his estimate of the margin charged to, and hence of the royalty received from, paid interactive services such as Spotify.[6]

(23) Professor Willig relies on the Dhar survey – a survey of subscribers to Sirius XM, paid interactive services (*e.g.*, Spotify), and paid non-interactive services (*e.g.*, Pandora One (recently renamed Pandora Plus)). The survey asked whether the subscribers would discontinue their service if the service price were raised by specific increments. If the surveyed subscribers said yes, then they were asked which alternative methods they would use to listen to music as a result of stopping their current service, including paid music subscriptions (such as Spotify or Pandora Plus), CDs and downloads (both currently owned and newly purchased), and unpaid means of access, such as over-the-air radio or non-subscription interactive or non-interactive music services. Combining the results of the Dhar survey with his estimated figures for creator compensation per subscriber per month for the alternative methods of listening to music, Professor Willig derives a weighted average level of creator compensation of $2.55 per diverted Sirius XM subscriber per month, which he claims "can be logically interpreted as the creator compensation opportunity cost of according access to sound recordings."[7] In other words, Professor Willig claims that each Sirius XM subscriber costs the record labels collectively $2.55 in lost revenues from other foregone means of accessing music.

(24) Professor Willig goes on to argue that this opportunity cost should be viewed as a "floor," in the sense of the minimum royalty that would be negotiated with Sirius XM. He then argues that economic theory suggests that the royalty charged to Sirius XM "should significantly exceed the absolute minimum level of the current opportunity cost of $2.55 per subscriber per month."[8] He presents two alternative approaches for estimating how far the royalty rate for Sirius XM should exceed that $2.55 "floor."

(25) Under his first approach, Professor Willig applies the Nash bargaining solution and calculates a royalty rate of $3.94 per subscriber per month. To arrive at this royalty rate, Professor Willig estimates Sirius XM's variable profits from an agreement between Sirius XM and the record label for access to music as [redacted] per subscriber per month. He further argues that, absent an agreement between the record label and Sirius XM, Sirius XM's earnings per subscriber per month would be [redacted][9] while the record label's royalty earnings would be $2.55 (i.e., the revenues earned from the

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6 Professor Willig defines "opportunity cost" as "the additional creator compensation that would result from other modes of distribution if the music were not licensed to the mode in question." *Id.* at 21.

7 *Id.* at 26.

8 *Id.* at 29. *See also id.* at 6-8, 20-24, &31.

9 Professor Willig argues that, if Sirius XM lost access to all music, its revenues would fall to its per-subscriber margin (of [redacted] less variable costs (excluding royalties) of [redacted] times the 30% of the original subscribers that would remain, or [redacted] *Id.*at 31.

sources of music that Professor Willig estimates Sirius XM subscribers would turn to if they stopped using Sirius XM). This means that an agreement between Sirius XM and the record label will yield a joint surplus of [redacted] per subscriber per month.[10] If that surplus is split equally between Sirius XM and the record label, that implies a royalty rate of $3.94 per subscriber per month – or a markup of $1.39 (half of the joint surplus) over the $2.55 opportunity cost.

(26) For his second approach, Professor Willig argues that "[i]t is also clear from the public interest pricing theory, the profit maximizing unregulated pricing benchmark, and the empirical analyses reported here on price elasticities of demand for music, that the margin between the Sirius XM royalty and its opportunity cost should equal or exceed that of the benchmark paid interactive streaming services."[11,12] According to Professor Willig, "[i]t would take a royalty of [redacted] per subscriber per month to yield the same margin as that paid by the interactive streaming services."[13]

III.B. Professor Willig calculates an opportunity cost for a monopoly label or cartel of labels

(27) While Professor Willig does not discuss the competitive assumptions underlying his opportunity cost calculation, his analysis does not reflect workable competition among labels. Rather, his analysis is equivalent to assuming a single monopoly record label or a fully effective cartel of labels or some other complete failure of competition among them. I come to this conclusion for the following reasons.

(28) First, a central theme of Professor Willig's analysis is what he calls "the" opportunity cost of licensing to Sirius XM.[14] What he calculates (subject to certain errors and biases discussed below) is the opportunity cost for a monopoly record label that controls the right to license all sound recordings, and whose only means for increasing subscriber-plays on Sirius XM is to increase subscribership. This omits any kind of competitive expansion of plays that one label might achieve at the expense of other labels' plays, within Sirius XM. According to Professor Willig, his weighted average of creator compensation amounts "can be logically interpreted as the creator

[10] Professor Willig calculates this [redacted] joint surplus by deducting the earnings of the copyright owners ($2.55) and those of Sirius XM [redacted] absent an agreement from the total earnings of [redacted] should an agreement be reached.

[11] *Id.* at 31.

[12] Professor Willig also points to the "efficient component pricing rule," which, as he notes, "was developed to guide pricing of access to assets that are necessary to the production of competing services or products, particularly where there are complaints of anticompetitive foreclosure of access." *Id.*at 7. He goes on to point out, however, that "complaints about anticompetitive foreclosure of access to copyrights would be unjustified, and therefore the ECPR is only partially relevant to the determination of the royalty rate for Sirius XM." Professor Willig also fails to explain how the ECPR is relevant to setting royalty rates in this proceeding where the record labels are not competing in the downstream markets for access to music. *Id.* at 8.

[13] *Id.* at 31.

[14] *See, e.g.*, *id.* at 25 ("I have undertaken an analysis to quantify the size of the opportunity cost of access to the music by Sirius XM."); *id.* at 30 (discussing "the opportunity cost of music at Sirius XM.").

compensation opportunity cost of according access to the sound recordings."[15] Note that he does not say access to one label's music, but rather "access to the sound recordings" generally. As I explain in Appendix D, Professor Willig's calculation assumes that all of Sirius XM's subscribers will switch to other sources for music if Sirius XM fails to reach agreement with the un-named counter-party: an assumption more consistent with a monopoly than with a single label in a competitive environment.

(29) It is not completely clear whether Professor Willig is calculating a monopoly "marginal" opportunity cost or a monopoly "walk-away" opportunity cost (also referred to as threat points or reservation values). The walk-away opportunity cost is the revenue that the hypothetical label would have earned from other music distribution channels if the label did not license Sirius XM. The marginal opportunity cost is the decrease in the revenue from other distribution channels if Sirius XM adds a few additional subscribers. He uses the opportunity cost he calculates as a walk-away opportunity cost (or threat point) in his Nash bargaining solution and as a marginal opportunity cost in his Ramsey pricing analysis. More importantly, whether he is using his opportunity cost calculation to consider the monopoly label's incentives for encouraging a marginal expansion/shrinking of Sirius XM subscriptions or to consider the monopoly label's bargaining position if it is threatening to deny all music to Sirius XM, it is still a monopoly opportunity cost.

(30) Second, when Professor Willig uses a simple Nash bargaining model, he is modelling only one record label negotiating with Sirius XM, rather than modeling Sirius XM negotiating with multiple labels. Similarly, Professor Willig's application of Ramsey pricing considers only a single label with no substitution between it and other labels when it changes the royalty it charges Sirius XM. That is, in his model, a label cannot compete for an increased play-share by offering lower royalties to Sirius XM. This again suggests that Professor Willig is assuming a single monopoly record label.

(31) Finally, it is instructive that Professor Willig, in his WDT, never mentions competition or workable competition or the possibility of competition among record labels through steering. Nor for that matter does he discuss the possibility that the royalty might be set above monopoly levels as a result of multiple monopoly or "complementary oligopoly."[16] Instead, he considers versions of opportunity cost, bargaining, Ramsey pricing, and unregulated profit maximization, all of which are addressed with the unstated assumption that one can analyze market behavior as if there were a single relevant supplier of "music" to Sirius XM. In short, Professor Willig is analyzing monopoly pricing, and not just the legitimate monopoly of a copyright holder over its own sound

[15] *Id.* at 26.

[16] Copyright Royalty Board, *Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings* ("*Web IV*"), 81 Fed. Reg. (May 2, 2016) at 26343.

recordings, but essentially a record label monopolist that controls the right to license *all* sound recordings.

III.C. Workable competition versus monopoly

(32) A familiar principle in economics is that suppliers' incentives are different, and more pro-customer, when there is a reasonable degree of competition than in monopoly. In this section, I briefly review how that might play out in the upstream market in which Sirius XM secures the rights at issue from either a single or multiple record labels. There are certainly various possibilities for how, and how well, these competitive mechanisms might work, in practice and in a normative benchmark;[17] what is striking is that Professor Willig nowhere discusses any of them.

(33) Without proposing a specific definition of workable competition, I believe that some features of workably competitive markets are clear.

(34) In a workably competitive market, non-colluding rival sellers are willing to take business away from each other, provided it is individually profitable, without being unduly deterred by the fact that joint or collective profits may fall as a result. In general, a customer (here Sirius XM) and an individual seller (here, a record label) will have a competitive incentive to pursue mutually beneficial opportunities, even though that will often mean cannibalizing business and eliminating profit that would otherwise go to another seller (label). For instance, a record label could compete by unilaterally lowering its royalty rate so as to incentivize a music distribution channel to increase the number of performances of its sound recordings, at the expense of performances of other labels' recordings. Or a record label and a music distribution channel may enter into an agreement that specifies both a discounted price and the amount of play time the record label's sound recordings will receive.[18] In this rebuttal, I use the term "steering" to refer to both of these forms of competition, and similar arrangements – providing the incentive to increase the number of plays of recordings in response to lower royalties and to formal agreements to steer.

(35) In addition, a market for music licenses is unlikely to be workably competitive if one or more record labels is "must have" in the sense that without it, music services would have to shut down. At a minimum, if there are labels that are "must have," then workable competition would require that there must exist mechanisms to prevent such labels from using their power either directly to

[17] That is, whether workable competition in fact takes place in these markets, and whether one expects that it would take place if certain things (e.g. the availability of a statutory rate) changed, one can still take the view that a statutory rate ought to reflect approximately what would happen under workable competition.

[18] *Cf. Web IV*, 81 Fed. Reg. at 26367 (finding Professor Shapiro's equating of steering with price competition to be correct).

extract near-monopoly prices, or less directly, for instance to negotiate contracts that neutralize competition.[19]

(36) In his analysis, Professor Willig makes assumptions that directly violate these conditions. For example, in portions of his testimony he assumes that the monopoly supplier is "must-have" in the sense that Sirius XM would cease to exist as a music service without a license from the monopolist record label.[20] And in his bargaining approach, he assumes that this fact should drive Sirius XM to agree to royalties that are much higher than those it currently pays. Second, as previously discussed, Professor Willig never focuses on the existence of multiple labels or analyzes the possibility that they might compete. In his discussion of "the" opportunity cost of licensing Sirius XM, the central factor that Professor Willig considers is the lost demand for (*i.e.*, diversion from) other music distribution channels when subscribers choose Sirius XM. That is, Professor Willig's analysis relies on the presence of competition among music distribution channels, but, asymmetrically, ignores the possibility of competition among record labels.

(37) More specifically, Professor Willig ignores the possibility that record labels could compete for plays on Sirius XM through steering. The possibility that a music service can steer toward sound recordings with lower royalty rates – whether this is done unilaterally by the music service or through a formal steering agreement with a label – represents an important way, though not necessarily the only way, that incentives in a workably competitive market for record labels differ from incentives in a market with a single monopoly record label.[21]

(38) In particular, if a record label competitively gains additional plays on Sirius XM, the opportunity cost of the expansion in demand for that label is very different from, and likely to be far lower than, its pro-rated share of the monopoly label's walk-away opportunity cost.[22]

(39) To see this, observe that for the monopoly label, as Professor Willig points out,[23] an expansion in Sirius XM subscribership will come in part at the expense of purchased downloads or

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[19] *Id.* at 26364-65 (discussing the possible use of an "anti-steering clause or a more general 'Most Favored Nation' (MFN)").

[20] For example, in calculating the opportunity cost of Sirius XM, he relies on a survey that develops diversion ratios based on the assumption that all Sirius XM subscribers will drop their subscriptions and switch to other music distribution channels. *See* Willig WDT at 25 (noting that the survey asked respondents "if they would discontinue their service with questions that kept moving the price point up until the respondent answered 'yes.'").

[21] In *Web IV*, the Copyright Royalty Judges recognized that both record labels and music distribution channels may find it in their mutual interest to negotiate a steering agreement in which the distribution channel offers more plays of a label's music in return for a lower royalty. *Web IV*, 81 Fed. Reg. at 26366. They further found that "the ability of noninteractive services to steer away from higher priced recordings and toward lower priced recordings (or threaten to do so) serves as a buffer against the supranormal pricing that arises from the impact of complementary oligopoly." *Id.* at 26348.

[22] *Id.* at 26347 ("Another important change in opportunity cost arises when the upstream purchaser . . . has the ability to: (1) Purchase a substitute input and 'bypass' the input from the complementary oligopolists or monopolist; and/or (2) the ability to 'use proportionately less' of the input of the complementary oligopolists or monopolist.").

[23] Willig WDT at 11-12.

subscriptions to other paid services, from which the monopoly label derived the full level of licensing revenues paid by those services. In contrast, for a label competing against other labels, an *expansion of its share of plays on Sirius XM* will come largely at the expense of other labels' plays on Sirius XM—from which this label derived no revenues. This indifference by a record label in a workably competitive market to the impact of its expansive move on rivals' profits is a hallmark of effective competition. Or, to put it in the language of opportunity cost, a steering-based expansion by a label competing against other labels has a completely different opportunity cost than does a monopoly label's decision to license a particular service, such as Sirius XM, that may draw subscribers away from other services.

(40) Of course, it is a very familiar theme that given equal costs, a firm facing competition will price lower and behave in a more pro-customer fashion than will a monopoly. My point here is that, *in addition*, a competitive label that expands by substituting plays of its music for plays of other labels' music with the same music service (in this case Sirius XM) *has a lower opportunity cost* than applies to a monopoly label's deciding whether to license Sirius XM. As I previously explained, if a competitive label lowers its price to Sirius XM so as to expand its share of plays on Sirius XM, this expansion would come at the expense of other labels' plays on Sirius XM. In contrast, a monopoly label's license of (or expansion of plays on) Sirius XM will largely cannibalize plays (or subscribers) of other music distribution channels, as Professor Willig analyzes. The high level of that monopoly opportunity cost that he calculates, if even broadly correct, would be a powerful reason to resist monopoly in this market.

(41) Because a competitive expansion by an individual record label in a workably competitive market has a quite different (and I would expect much lower) marginal opportunity cost than the opportunity cost of licensing or output expansion by a monopoly label, it is incorrect to characterize the *monopoly* opportunity cost as "the" opportunity cost, especially if our goal is to consider the behavior of a workably competitive market.

III.D. Workable competition and the 801(b) factors

III.D.1. Economic principles and the 801(b) factors

(42) In *SDARS II*, the Copyright Royalty Judges explained that, in determining royalty rates for Satellite Digital Audio Radio Services (*SDARS*) under Section 114 of the Copyright Act, "the Judges begin with an analysis of proposed market benchmarks, if any, and voluntary license agreements as described in Section 114(f)(1)(B), and . . . then measure the rate or range of

rates…against the statutory policy objectives [of Section 801(b)(1)] to reach a determination of rates and terms."[24] The four statutory objectives laid out in Section 801(b)(1) are:

> (A) To maximize the availability of creative works to the public.
>
> (B) To afford the copyright owner a fair return for his or her creative work and the copyright user a fair income under existing economic conditions.
>
> (C) To reflect the relative roles of the copyright owner and the copyright user in the product made available to the public with respect to relative creative contribution, technological contribution, capital investment, cost, risk, and contribution to the opening of new markets for creative expression and media for their communication.
>
> (D) To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.[25]

(43) While a legal interpretation of the 801(b)(1) factors is beyond the scope of my testimony and my expertise, from an economist's perspective, these first three factors, in a general sense, seem consistent with competitive market outcomes and inconsistent with monopoly market outcomes.

(44) The first three objectives of Section 801(b)(1) seem to reflect a desire of the drafters of the statute to maximize the surplus generated by the creation, supply, and consumption of sound recordings. Workable competition appears consistent with factor (A), as competitive markets generate greater total surplus than monopoly markets. Similarly, workable competition is consistent with factors (B) and (C) by affording fair economic returns for both the creator and user of the copyright. In particular, in a competitive market, a supplier receives a profit commensurate with its incremental contribution to social welfare. Under competition, supplier rewards tend to approximate the incremental value of investments. In contrast, monopoly outcomes are generally inconsistent with these factors.

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[24] Copyright Royalty Board, *Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services* ("*SDARS II*"), 78 Fed. Reg. (Apr. 17, 2013), at 23054-55; *see also* Copyright Royalty Board, *Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services* ("*SDARS I*"), 73 Fed. Reg. (Jan. 24, 2008) at 4082-84 ("[The Judges] shall adopt reasonable royalty rates that satisfy all of the objectives set forth in Section 801(b)(1)(A)–(D). In doing so, [they will] begin with a consideration and analysis of the [market] benchmarks and testimony submitted by the parties, and then measure the rate or rates yielded by that process against the [Section 801(b)] statutory objectives to reach [a] decision . . .").

[25] 17 U.S.C. § 801(b)(1).

III.D.2. SoundExchange experts agree that the Section 801(b) factors require a workably competitive market

(45) I understand that, in this proceeding and in earlier SDARS proceedings, several economic experts testifying on behalf of SoundExchange have agreed that the 801(b)(1) objectives call for workably competitive rates – not monopoly rates.

(46) For example, Mr. Orszag, in his written direct testimony in this proceeding, states that "the 801(b) statutory factors are aligned with a royalty rate determination that approximates the terms that would be arrived at through voluntary, arm's length negotiations between a willing buyer and a willing seller."[26] He then goes on to state that "[a]n outcome that is 'fair' from an economic perspective reasonably is one that arises through arm's length dealings in an effectively competitive marketplace, *i.e.*, a marketplace in which competition is not undermined by the exercise of monopoly (seller) power or monopsony (buyer) power."[27] In his deposition testimony on January 17, 2017, Mr. Orszag also acknowledged that the availability of creative works is maximized by a rate that arises through arm's-length dealings in an effectively competitive marketplace, and is not maximized in a non-workably competitive marketplace where the record label is a monopolist.[28]

(47) Similarly, in *SDARS II*, Professor Ordover, on behalf of SoundExchange, asserted that "[r]ates determined through voluntary negotiations in a competitive marketplace can be expected to meet" the requirements of objective (1) of 801(b).[29] In *SDARS I*, Professor Ordover expressed a similar opinion when he stated that the 801(b) statutory standard "points towards rates that best reflect what would be the result of unimpeded negotiations among buyers and sellers in a workably competitive marketplace.[30] And in *SDARS I*, Dr. Pelcovits agreed with Professor Ordover that "the policy objectives set out by Congress [in Section 801(b)] are most fully satisfied by rates that would be the likely outcome of marketplace negotiations among the individual record companies and the individual SDARS . . . [in] a competitive marketplace, were it to exist."[31]

(48) In *SDARS I*, the Copyright Royalty Judges appeared to agree with Professor Ordover's view of the Section 801(b)(1) factors as consistent with a workably competitive market. In relevant part, the Judges stated:

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[26] Written Direct Testimony of Jonathan Orszag ("Orszag WDT"), Oct. 18, 2016 at 2-3.

[27] *Id.* at 6.

[28] Deposition of Jonathan Orszag, Jan. 17, 2017 at 74:13–74:18, 75:16–75:24.

[29] Written Direct Testimony of Janusz Ordover on behalf of SoundExchange in *SDARS II*, Nov. 28, 2011 at 6.

[30] Written Direct Testimony of Janusz Ordover on behalf of SoundExchange in *SDARS I*, Oct. 30, 2006 at 13. Professor Ordover further testified that the second Section 801(b) policy objective – of achieving fairness for both the copyright owner and copyright user – relates "to outcomes that arise through unfettered market interactions in workably-competitive markets, that is, in markets that are not distorted by undue exercise of monopoly (seller) or monopsony (buyer) power." *Id.* at 25-26.

[31] Written Direct Testimony of Michael Pelcovits on behalf of SoundExchange in *SDARS I*, Oct. 27, 2006 at 5.

> We agree with Dr. Ordover that ‘‘voluntary transactions between buyers and sellers as mediated by the market are the most effective way to implement efficient allocations of societal resources.’’ Ordover WDT at 11. An effective market assures absence of both below-market prices and supracompetitive prices, so that suppliers will not reduce output and innovation in response to the former and consumers will not experience a reduction in consumer welfare in response to the latter. In other words, an effective market determines the maximum amount of product availability consistent with the efficient use of resources.[32]

(49) While Professor Willig's discussion of the first three Section 801(b)(1) objectives stresses their consistency with unregulated marketplace outcomes, he does not comment on whether the market should be workably competitive. His subsequent analysis, however, does not allow for competition and in fact appears to assume a monopoly market.

IV. Professor Willig's estimates are significantly infected by the non-competitive market for licenses to interactive services

(50) In *Web IV,* the Copyright Royalty Judges, in applying the "willing-buyer/willing-seller" standard of Section 114(f)(2)(B) to non-interactive webcasting services, found that "the *interactive* services market is *not* effectively competitive."[33]

(51) In his WDT, Professor Willig at least twice partially imports the level of royalties charged to paid interactive services, which the Copyright Royalty Judges found to be "not effectively competitive," into the rates he claims Sirius XM should pay.

(52) First, Professor Willig adopts an estimate that the diversion ratio from Sirius XM to paid interactive services is 31%, meaning that 31% of Sirius XM subscribers would turn to subscription interactive services if they stopped using Sirius XM. This relatively high diversion ratio causes his estimate of the monopoly opportunity cost of licensing Sirius XM to be significantly driven by the supra-competitive level of royalties those services pay. Of course, this has the effect of raising his estimate of the monopoly opportunity cost.[34] As I show in Section V.B, *infra,* if one adopts different (and plausibly more realistic) diversion ratios, this will significantly lower estimates of the monopoly opportunity cost.

(53) Second, in his discussions of "Ramsey Pricing" and "Unregulated Profit-Maximizing Pricing,"[35] Professor Willig argues that, in setting a royalty for Sirius XM, the Copyright Royalty Judges

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32 *SDARS I* at 4094, 73 Fed. Reg.

33 *Web IV,* 81 Fed. Reg. at 26344 (emphasis added).

34 Willig WDT at 31.

35 *Id.* at 6-8, 20-24, and 31-32.

should impose a mark-up over the monopoly opportunity cost such that "the margin between the Sirius XM royalty and its opportunity cost should equal or exceed that of the benchmark paid interactive services."[36] I discuss a general pitfall in imposing any such margin in Section VI below. As mentioned above the Judges have concluded that the margin on paid interactive is inflated by the likely failure of workable competition there. In the next section I explain how Professor Willig's *estimate* of that margin is biased upward by the way that Professor Willig estimates the opportunity cost for licensing interactive services.

V. Other issues in Professor Willig's approach for calculating opportunity cost

(54) In addition to inflating his opportunity cost calculation by assuming that there is a single monopoly record label or fully effective cartel and that the monopoly seller is must have, Professor Willig makes a number of other decisions, discussed below, that tend to inflate his opportunity cost calculation.

V.A. Professor Willig's opportunity cost calculation ignores promotional impact

(55) Professor Willig's opportunity cost calculation focuses only on substitution (cannibalization) between Sirius XM and other music services. He fails to consider the possibility that Sirius XM, in playing particular sound recordings, might promote music sales (*e.g.*, of the same recording, the same work, or the same artist) or increase performances of that recording or of recordings of the same artist through other music distribution channels. Nor does he consider that such a promotional effect might be larger if Sirius XM has more subscribers.

(56) A properly calculated opportunity cost should account for both substitutional and promotional effects. For example, a label would tend to agree to a lower royalty rate if Sirius XM had a greater promotional effect, while it would tend to demand a higher royalty rate, *ceteris paribus*, if Sirius XM had a greater substitution effect. Thus, it is the *net* effect of the two that matters to record labels when they evaluate the opportunity cost of selling to Sirius XM. Focusing entirely on substitution effects and ignoring promotional effects will bias calculations of opportunity costs upward.

(57) There is evidence in the record that, when Sirius XM plays a record label's song, it promotes additional sales of CDs and downloads as well as further listening on interactive services like

[36] *Id.* at 31.

Spotify. For example, Sirius XM Senior VP Steven Blatter testified that artists, labels and managers recognize "the direct impact that Sirius XM airplay has had in driving sales of their releases, including on iTunes,"[37] and that the promotional impact is not limited to download sales. Rather, Mr. Blatter testified that "airplay on Sirius XM stations also leads to a marked increase in on-demand play on streaming services such as Spotify and YouTube."[38]

(58) Evidence regarding promotional effects from another non-interactive service is found in the WDT of Stephan McBride on behalf of Pandora in *Web IV*. Dr. McBride described evidence that Pandora promotes aggregate sales of sound recordings that are played on Pandora.[39] The promotional effect exists for both major label recordings and independent label recordings, and for both music new to Pandora and catalog music on Pandora.[40] Moreover, increased exposure on Pandora is associated with greater promotional impact.[41]

V.B. Professor Willig's reliance on the Dhar survey

(59) Professor Willig relies on diversion ratios calculated from a survey by Professor Dhar. Professor John Hauser, in his rebuttal testimony, offers a critique of that survey. Here, I identify two diversion ratios whose estimates based on the Dhar survey: (a) are surprising based on general economic principles, (b) differ markedly from estimates based on other surveys that are more consistent with those general economic principles, and (c) strongly influence Professor Willig's calculation of opportunity cost. These are the diversion ratios from Sirius XM to paid interactive services and to free terrestrial radio.

(60) Economic logic suggests that the diversion ratios should typically be higher: (1) between services that are more similar, and (2) toward services with larger market shares.[42] These general principles are well recognized in antitrust merger analysis, where diversion ratios have long been recognized as key inputs.[43]

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37 *See, e.g.*, Written Direct Testimony of Steven Blatter, Oct. 14, 2016 at 6.

38 *Id.* at 11-12.

39 Written Direct Testimony of Stephan McBride on behalf of Pandora Media, Inc. in *Web IV* ("McBride WDT in *Web IV*"), Oct. 7, 2014 at 10-22. Aggregate music sales are unit sales (both physical and digital) tracked by SoundScan (*see* McBride WDT in *Web IV* at 13).

40 *Id.* at 18-19.

41 *Id.* at 19.

42 *Cf.* Robert D. Willig, "Merger Analysis, Industrial Organization Theory, and Merger Guidelines," in Martin N. Baily & Clifford Winston, eds., *Brookings Papers on Economic Activity, Microeconomics 1991*, 281, 301 (1991) ("there are rigorously characterized scenarios in which market shares can be accurate indicators of the competitive effect of a merger between producers of differentiated products. In those circumstances, the bigger the market share of 2, the more attractive a product it is, and so the more appealing it is as an alternative to those who buy 1. Thus the bigger the share of 2, the more of the marginal buyers of 1 who would divert to 2 in reaction to a rise in the price of 1.").

43 Carl Shapiro, "Mergers with Differentiated Products," *Antitrust* 10, (1996): 23, 24; Joseph Farrell & Carl Shapiro,

(61) The first principle suggests that one would expect more diversion from Sirius XM to terrestrial radio than from Sirius XM to paid interactive services: Sirius XM seems clearly more similar to terrestrial radio than it is to interactive services. In using either Sirius XM or terrestrial radio the listener selects a particular station, but otherwise has no control over the songs that are played, in contrast to the use of interactive services. Thus both Sirius XM and terrestrial radio both offer a more passive user experience than do interactive services. Moreover (and plausibly in part as a result), both Sirius XM and terrestrial radio are frequently listened to in the car.[44] The second principle suggests that diversion to terrestrial radio should be greater than to paid interactive services because terrestrial radio has a higher market share.[45] Yet the Dhar survey, as used by Professor Willig, estimates that the diversion ratio from Sirius XM to terrestrial radio (18%) is about half that from Sirius XM to paid interactive services (31%).[46]

(62) The estimates of these two diversion ratios based on the Dhar survey as used by Professor Willig are also in tension with estimates based on two other surveys in the record.

a. A 2016 national telephone survey designed and directed by Mr. Joe Lenski estimated that, if Sirius XM were no longer available, current Sirius XM listeners would switch to spending 40.8% of Sirius XM listening time on traditional AM/FM radio, followed by 23.1% on CDs or music downloads, 14.3% on non-interactive online streaming (Pandora, iHeartRadio, online streams of AM/FM), 7.8% on interactive online streaming (Spotify, Rhapsody), and 2.4% on podcasts.[47]

b. A revision of the Dhar survey by Professor Hauser found that of the 456 people who responded that they would cancel their Sirius XM paid subscriptions when faced with a price hike,[48] 359 (79%) stated that at least one of the alternatives they would switch to is AM/FM radio, and while only 69 (15%) responded that they would switch to alternate paid-interactive services, as one of the alternatives.

"Upward Pricing Pressure in Horizontal Merger Analysis," *The B.E. Journal of Theoretical Economics: Policies and Perspectives*, 10, no. 1 (2010): 1, 5-6.

44 The Edison Share of Ear survey data (from 2015 Quarter 3 to 2016 Quarter 2) suggest that 69% of Sirius XM music listening occurs in the car, while 43% of AM/FM music listening occurs in the car. In contrast, only 8% of music listening on Spotify, a major interactive music service occurs in the car. Edison Research, Share of Ear Survey – Q2 2016, survey conducted August 2015 – June 2016, file *Share of Ear Q2 weil.sav*.

45 The Edison Share of Ear Survey data suggest that 44% of respondents' music listening time is spent on AM/FM radio, while only 17% is spent on Internet-only radio (including both interactive and non-interactive streaming services), which means that interactive streaming services account for less than 16.6% of respondents' music listening time. *Id.*

46 Willig WDT, Table 2.

47 WDT of Joe Lenski, Oct. 18, 2016 at 9. The other two options are "Would listen to less audio overall" (10%) and "Other" (1.7%).

48 Consistent with Professor Willig's approach, these 456 respondents do not include those who said they would cancel Sirius XM subscription when faced with a price hike, but didn't know or were unsure which alternative services to choose. There are seven such respondents.

(63) Table 1 reports at a high level the diversion ratios based on the Dhar survey, the Hauser-revised Dhar survey, and the Lenski survey. It is evident from the comparison that the Dhar survey reports much higher diversion to interactive services and much lower diversion to free music services than do the other two surveys.

Table 1. Summary of diversion ratios from Dhar, Hauser-revised Dhar, and Lenski surveys

Category of respondent choice	Dhar survey (with Willig intensity adjustment)	Hauser-revised Dhar (with intensity adjustment)	Lenski survey (listening time)
Interactive	33.6%	14.2%	7.8%
Non-interactive	19.4%	13.2%	14.3%
CDs and downloads	19.6%	25.2%	23.1%
AM/FM radio	18.1%	37.0%	40.8%
Free non-streaming services	4.6%	7.3%	2.4%
Other	3.5%	1.3%	1.7%
None	1.1%	1.8%	10.0%
Total	**100%**	**100%**	**100%**

Note: For a more detailed version of the table, with the categories broken out, refer to Table 4 in Appendix G. Here "Interactive" is made up of "Alternate paid interactive service," "Existing paid interactive service," and "Ad-supported interactive service"; "Non-interactive" is made up of "Alternate paid non-interactive service," "Existing paid non-interactive service," and "Ad-supported non-interactive service"; "CDs and downloads" is made up of "Existing CDs or music collection," "Alternate CDs or music downloads," and "Borrow CDs, vinyl or tapes from friends or a library"; "Free non-streaming services" is made up of "Ad-supported music video sites," "Cable/satellite music channels," "Peer-to-peer file sharing or free download sites," "Podcasts," "Free services," and "Don't know/unsure" (which was given by the respondent only after answering a previous question that he/she would use some free service to replace Sirius XM); and "AM/FM radio," "Other," and "None" are made up of their respective corresponding respondent choices from Table 4 in Appendix G.

(64) As previously explained, Professor Willig calculates the opportunity cost for Sirius XM as a weighted average of the royalty rates paid by alternative music services, with the weights being his estimates of diversion ratios from Sirius XM to the other music services. Because the royalty rate on paid interactive services is so high, the resulting opportunity cost is heavily influenced by the relatively high diversion to paid interactive services (31%) suggested by the Dhar survey on which Professor Willig relies.

(65) For very similar reasons, any underestimate of the diversion ratio to terrestrial radio, which pays no royalties, also biases upward the calculated opportunity cost. Table 1 also reports the three surveys' estimated diversion ratios to free terrestrial radio. The Dhar survey estimate again stands out, this time as much lower than the other two.

(66) Using the Dhar estimates, Professor Willig calculated a (monopoly) opportunity cost of $2.55. To illustrate how much the different diversion estimates drive the result, I calculated that had he used the same methodology (to the extent possible), but based the diversion ratios on the Lenski survey results instead of the Dhar survey results, his methodology would have yielded a monopoly opportunity cost of no more than $1.43.[49] Alternatively, if he had derived diversion ratios based on

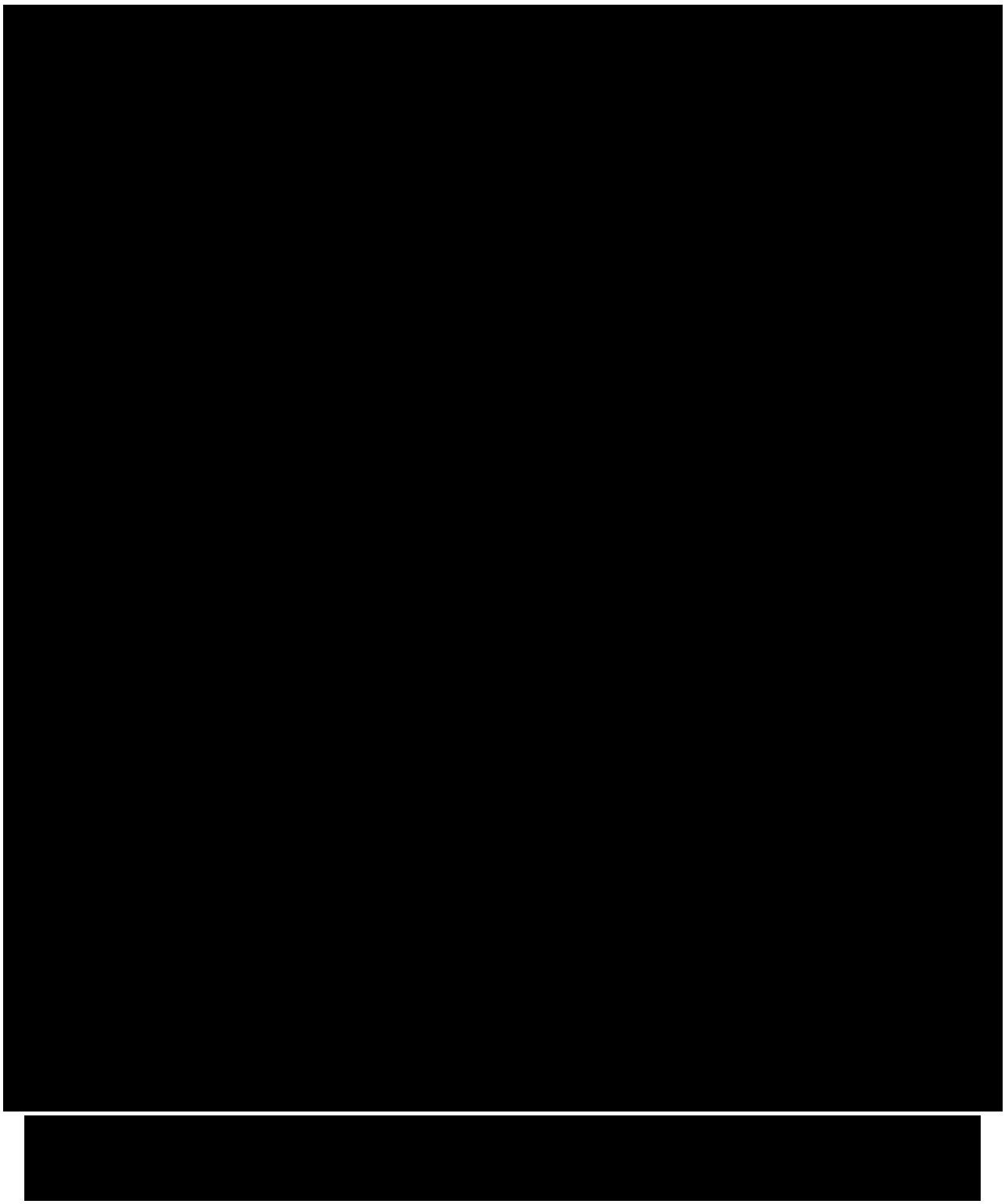
[49] The alternatives to Sirius XM in the 2016 National Telephone Survey sometimes contain several possible services with different royalty rates. For example, there is a 7.8% diversion ratio to interactive services (online radio services where you pick the specific song you want to hear). This 7.8% would include both paid interactive and free, ad-supported

the results of Professor Hauser's modification of Professor Dhar's survey, his methodology would have yielded [redacted][50]

interactive services, the royalty rates of which are [redacted] and [redacted], respectively (according to Table 2 in Willig WDT). In calculating the opportunity cost based on the 2016 National Telephone Survey results, I assume (tending to lead to a high estimate for opportunity cost) that all the switching is to the service with the highest royalty rate among each group of services. In the case of interactive services, this assumption means that I assign all 7.8% of switching to paid interactive services.

[50] The derivation is described in Appendix F.

Table 2: Calculation of Professor Willig's interpretation of opportunity cost using Dhar, Hauser-revised Dhar, and Lenski surveys [RESTRICTED]



V.C. Professor Willig's opportunity cost calculation assumes each negotiating label is must-have for Sirius XM

(67) Professor Willig's calculation assumes that the fraction of music listening that would be diverted elsewhere without a license from the label with which Sirius XM negotiates is 100%. This is (a) by definition extreme, (b) attributes to every label, not only the majors, the must-have status that raises significant concerns about workable competition, and (c) may be in tension with Professor Willig's own testimony, where he relies on an estimate that if Sirius XM lost access even to *all music*, it would lose approximately 70% of its subscribers.[51] As I now discuss, this assumption leads to inflated opportunity cost estimates.

(68) If a label fails to reach an agreement with Sirius XM and as a result Sirius XM cannot play that label's music, then, as I explain in Appendix D, some subscribers will likely leave Sirius XM, and as Professor Willig describes, these former Sirius XM subscribers may listen to music in other ways (for example, by using alternative services or by listening to CDs and downloads) that may generate revenue for that label.

(69) However, as to the subscribers that don't leave Sirius XM, the label in question earns no additional revenues from these other sources (*i.e.,* gets no opportunity cost revenues). Those subscribers are still at Sirius XM, which is paying royalties on their behalf— none of which now go to that label, as that label no longer has its music played on Sirius XM.

(70) As a result, the walk-away opportunity cost for a particular label will depend on the fraction of Sirius XM subscribers who would leave Sirius XM in response to this hypothetical failure to negotiate a license, along with whatever pricing and other adjustments Sirius XM would make to mitigate the damage to itself. The walk-away opportunity cost for that label is the product of that quantity times that label's share of the monopoly walk-away opportunity cost.[52]

(71) If one then divides this label-specific walk-away opportunity cost by the label's play share, the result would be an aggregate royalty for Sirius XM that if divided according to play share would just compensate this label for its opportunity cost of licensing Sirius XM. To the extent that this calculation yields the same result for each label, that aggregate royalty would just convince each label to be willing to license Sirius XM given its opportunity costs, and would thus be most directly comparable with what Professor Willig calculates. To illustrate the calculation, if the judges were to use Mr. Lenski's survey for the diversion ratios (leading to a monopoly walk-away

[51] A loss of that many subscribers might cause Sirius XM to shut down—I don't know—but that number is for losing access to all music, a threat much more severe than (absent collusion) it would be in any label's power to make. In any case, my point is that Professor Willig apparently makes a strong assumption about either subscriber response or Sirius XM's business viability, without discussion.

[52] The details of this derivation are in Appendix D.

opportunity cost estimate of $1.43) and were to assume that Sirius XM would lose 10% of its subscribers if it failed to secure a license with Warner (as Professor Shapiro estimates), Warner would agree to license Sirius XM if the aggregate royalty paid by Sirius XM to all labels were at least $0.143 per subscriber per month. As discussed above, this number is calculated by multiplying this $1.43 times this 10%.[53,54]

VI. Adjusting the opportunity cost upward

(72) Having estimated an opportunity cost for licensing music to Sirius XM, Professor Willig proposes some approaches to estimating how high *above* that opportunity cost an appropriate royalty would be. As I discuss above, his opportunity cost is inappropriate and inflated. Here I raise a concern with the idea that an appropriate royalty will always involve a markup over opportunity cost. There are troubling implications of a methodology that effectively insists that every music service should pay substantially above the weighted average of what its rivals pay. A simple way to describe the problem with this approach to opportunity cost is that Professor Willig's calculation of what he calls the opportunity cost is mathematically equivalent to calculating a weighted-average royalty benchmark. Doing so clearly results in upward departures from appropriate levels in at least some simple cases, as I illustrate by example below. Moreover, if one considers a process that sequentially revisits royalty determination for various services, and that always marks up weighted average benchmarks, royalties can spiral upwards with no apparent limit. One might call this a "Lake Wobegon" ("…all the children are above average") approach to royalty determination.[55]

(73) To illustrate, assume there are three symmetric music services and that services 1 and 2 have both agreed to pay music royalties of $2 per subscriber per month. How much should service 3 pay?

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53 Written Rebuttal Testimony of Carl Shapiro ("Shapiro WRT"), Feb. 17, 2017 at C-6.

54 As another illustration, if one believed that the loss of any one label's music would cause Sirius XM to lose a share of its subscribers equal to the label's share times 70% (as discussed by Professor Shapiro), then the aggregate royalty that if distributed according by play share would compensate each label for its opportunity cost would be 0.7 times the HHI (the sum of the squares of market shares) of concentration among labels, times the monopoly opportunity cost. This observation illustrates the connection between labels' opportunity costs and the concentration of the sound recording market. (HHI is a quantity between 0 and 1 in this calculation, because market shares are measured as numbers between 0 and 1; if market shares are expressed as percentages, HHI ranges from 0 to 10,000, and the formula described must allow for this.)

55 More seriously, a widespread parallel idea that one's top employees ought to be paid noticeably more than the market average in their job category has been faulted for driving escalation of executive compensation. *Cf.* Rachel M. Hayes & Scott Schaefer, "EO Pay and the Lake Wobegon Effect," *Journal of Financial Economics*, 94, No. 2 (2009): 280; Peter Whoriskey, "Cozy Relationships and 'Peer Benchmarking' Send CEO's Pay Soaring," *Washington Post*, Oct. 3, 2011, https://www.washingtonpost.com/business/economy/cozy-relationships-and-peer-benchmarking-send-ceos-pay-soaring/2011/09/22/gIQAgq8NJL_story html/

(74) A music label commissions a survey that shows, let us say, that half of service 3's customers, if priced out of subscribing to that service, would instead go to service 1, while the other half would go to service 2. Professor Willig's methodology would, it seems, prompt him to undertake the following calculation (very simple in this highly simplified example):

(75) A (monopoly) label's opportunity cost of a license to service 3 is the weighted average (weighted by diversion ratios) of its margins at services 1 and 2. Suppose that its direct marginal costs are zero; thus, each of those margins is $2 per subscriber-month, so the weighted average margin or calculated opportunity cost is $2 per subscriber-month also.

(76) If the response were to license service 3 at a royalty *equal to* the label's opportunity cost in that sense, we would get the answer of $2; and given the assumed symmetry, if that $2 royalty was indeed the right answer for services 1 and 2, it would presumably be the right answer for service 3.

(77) But suppose that Professor Willig's argument, that firms normally price *above*, not *at*, their opportunity costs, was accepted in this context. Then service 3 would end up paying more than $2, departing from what by assumption is the right answer in this example. For example, service 3 might end up paying $3 per subscriber per month.

(78) Next, consider the analysis when service 1's royalty arrangement comes up for renewal. The argument that every service should pay at a bare minimum its opportunity cost would imply that service 1's royalty should be adjusted so as to be at the very least $2.50, the (equally-weighted) average of service 2's $2 royalty license and service 3's $3 royalty license. The argument that every service should pay over the opportunity cost would imply that the service should pay an even higher royalty. But suppose this time the judges award only the bare opportunity cost, or $2.50.

(79) Now, what about service 2? It is paying only $2, and that is well below the calculated opportunity cost: the equally weighted average of service 1's $2.50 and service 3's $3. At a bare minimum, this logic would claim, service 2's $2 rate should be bumped up to cover the label's opportunity cost of $2.75 and perhaps substantially more. Thus, by applying Professor Willig's logic, opportunity cost will keep rising without limit, and so will royalty rates.

(80) It is clearly not true that it is never appropriate to price above opportunity cost, and I am certainly not saying that. However, as the simple example above demonstrates, (1) application of such a rule can force prices above the correct level, and (2) if applied iteratively, such a rule can lead to a Lake Wobegon effect involving an ever increasing spiral in prices. When applying such a rule, we should be careful to consider whether such a rule is appropriate in the context.

VII. Professor Willig's use of the Nash bargaining solution

(81) After calculating a monopoly record label's opportunity cost of licensing music to Sirius XM, Professor Willig uses a simple Nash bargaining model to determine by how much Sirius XM's royalty rate should exceed that opportunity cost. He again treats the copyright owners as a monopoly record label in the negotiation with Sirius XM and splits the bargaining surplus equally between the record label and Sirius XM. I describe this calculation in Section III.A.

(82) Professor Willig's use of the Nash bargaining solution to estimate Sirius XM's royalty rate suffers from a number of serious flaws.

(83) The first flaw is the issue that I describe in the section above: that is, the Nash bargaining solution will always suggest a positive mark-up above the walk-away opportunity cost. To be clear, this is not a general criticism of the Nash bargaining solution – it is a concern regarding its particular application by Professor Willig in this circumstance.

(84) Second, as discussed above in Section V.C, Professor Willig uses the monopoly walk-away opportunity cost for the disagreement point for the record label, rather than the lower label-specific walk-away opportunity cost.

(85) Third, Professor Willig's approach does not allow for any competition between labels to have their works performed on Sirius XM, because he models a monopoly label and ignores the possibility of steering. Consequently, his calculated royalty rate does not reflect the outcome of a hypothetically workably competitive market. In *Web IV*, the Judges found that competitive steering reduced royalty rates in the non-interactive market, and they envisioned that steering would have a similar effect in the hypothetical market as well.[56]

(86) Accounting for the effect of steering in the Nash bargaining model can have a dramatic effect. To explore this, I analyze an illustrative "Nash-in-Nash" model of bargaining, in which record labels compete with each other on price to have their sound recordings performed on Sirius XM. (The details of this model are presented in Appendix E.) Unlike the two-party Nash bargaining model used by Professor Willig, the Nash-in-Nash framework allows for the modeling of competition among labels through independent and competing negotiations with Sirius XM. It has become a well-regarded economic model to analyze situations where prices are determined by bargaining, but buyers can substitute between suppliers, as is the case here on the "workably competitive" assumption that Sirius XM can increase or decrease the use of a particular record label's sound recordings in response to differences in relative prices or royalties.[57]

[56] *Web IV*, 81 Fed. Reg. at 26343.

[57] *See, e.g.*, Allan Collard-Wexler, Gautam Gowrisankaran, and Robin S. Lee, "'Nash-in-Nash' Bargaining: A

(87) In this model, the royalty rate I use is a pro-rated percentage revenue royalty (consistent with that historically paid by Sirius XM). In the model, at a given pro-rated percentage revenue royalty, all else equal the label receives a larger payment the more Sirius XM plays the label's sound recordings, and Sirius XM has an incentive to increase plays of sound recordings on which it pays a lower pro-rated percentage of revenue royalty. For simplicity, the model assumes that there are two identical record labels (each of which controls the right to license half of all sound recordings) simultaneously bargaining with Sirius XM. The model elucidates how the resulting royalties depend on a variety of factors including how much Sirius XM will steer in response to price differences.

(88) In Appendix E, I do an illustrative numerical calculation with this model. To be very clear, I am not at all proposing that the Judges should order royalties to be set at the levels I calculate. Among other reasons, I have not come to any conclusions regarding what assumptions I would consider reliable. This illustrative calculation merely attempts to match Professor Willig's assumptions as closely as possible with the exception of having more than one label and allowing for steering, so as best to highlight the importance of those factors. Given that Professor Willig's calculations suffer from multiple problems as described above, and my highly simplified illustrative calculation does not seek to address them all, I in no way endorse the results as a reliable estimate of the reasonable royalty.

(89) In the illustrative numerical example, then, I assume that: (1) Sirius XM loses 35% of its subscribers if it loses one half of its music content,[58] (2) Sirius XM's variable cost excluding sound recording royalty payments is [redacted] of its revenue, [59] and (3) each label's threat point is [redacted] of Sirius XM's revenue.[60] Finally, it is necessary to calibrate the degree to which Sirius XM

Microfoundation for Applied Work" (working paper, National Bureau of Economic Research, 2016); Gautam Gowrisankaran, Aviv Nevo, and Robert Town, "Mergers when prices are negotiated: Evidence from the Hospital Industry," *American Economic Review*, 105, no.1 (2015), 172-203; Gregory S. Crawford and Ali Yurukoglu, "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review*, 102, no.2 (2012), 643-685.

[58] Professor Willig assumes that with no music content, approximately 70% Sirius XM subscribers would cease their subscription. Willig WDT at 21. In my example, I assume half of these 70% would cease their subscription if Sirius XM has half of all the music content, which means 65% of subscribers would keep their subscription. This approach is similar to the one adopted by Professor Shapiro in his WRT. Shapiro WRT at C-6.

[59] Professor Willig estimates that Sirius XM's variable cost per subscriber-month is [redacted] and revenue per subscriber-month is [redacted]. *Id.* at 31. In these numerical examples, I use these two numbers to estimate $\hat{c}$ as [redacted]

[60] Professor Willig estimates that copyright owners' opportunity cost is $2.55 and Sirius XM's average revenue per user, or ARPU, is [redacted]. *Id.* at 18, 21. In my example, I assume the walk-away opportunity cost of each of the two labels is Professor Willig's copyright owners' opportunity cost multiplied by 35% (assuming Sirius XM will lose 35% of its subscribers if it loses one of the two labels music) and multiplied by 50% (assuming each label gets half of the increased royalty income from other music services). Therefore, a label's walk-away opportunity cost per subscriber in my example is assumed to be 35%*50%*$2.55=$0.45. (*See* Appendix D for discussion of how I calculate a label's walk-away opportunity cost: here, I substitute into Eq. (8) of Appendix D the assumptions $\alpha_i = 35\%$, $s_i = 50\%$ and $\sum_{n=1,\ldots,N} r_n d_n = \$2.55$.) Dividing this per subscriber walk-away opportunity cost of $0.45 by Sirius XM's ARPU of [redacted] we get a label's walk-away opportunity cost as a percentage of Sirius XM's average monthly revenue, *i.e.*, [redacted]

would lose subscribers as a result of steering. I do that by making some additional functional form assumptions and using the results of certain steering experiments conducted by Pandora to measure the degree to which Pandora users reduced usage in response to steering.[61] With these assumptions, the Nash-in-Nash model results in royalty rates that are between 58% and 67% lower than the royalty that Professor Willig proposes using his Nash bargaining calculation. As this illustrative calculation shows, even in this highly simplified model with only two record labels, the possibility of competition steering can have a dramatic impact on the resulting royalty rates.

VIII. Professor Willig's use of Ramsey pricing

(90) Professor Willig, citing Ramsey pricing[62] and an "unregulated profit-maximizing pricing" benchmark, argues that the monopoly label's markup of price (royalties) over opportunity cost should be inversely related to demand elasticity. He applies this principle to the pricing (royalties) charged to Sirius XM compared with those charged to paid interactive services.

(91) Drawing on the inverse elasticity rule underlying Ramsey pricing, Professor Willig suggests that the markup over opportunity cost for Sirius XM should be equal to or greater than the markup over opportunity cost for interactive services, since he claims that the demand for Sirius XM is less elastic than that for interactive services.[63] He calculates a royalty of [redacted] per subscriber per month, although he acknowledges that this "is too jolting and uncertain to be practically contemplated."[64]

(92) There are a number of problems with Professor Willig's Ramsey pricing calculation. The first problem is the general issue with methodologies that apply markups above opportunity cost, which I discuss in Section VI. The other problems with Professor Willig's calculation are with the inputs he uses.

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61 McBride WDT in *Web IV* at 5-10 and Table 1.

62 Ramsey pricing sets linear prices so as to maximize the sum of consumer and producer surplus subject to the constraint that profits achieve some given revenue requirement. *See, e.g.*, Ronald Braeutigam, "Optimal Policies for Natural Monopolies," in *Handbook of Industrial Organization*, vol. 2, edited by Richard Schmalensee and Robert Willig (Amsterdam: North Holland, 1989), 1322; Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications* (Cambridge, MA: The MIT Press, 2000), 61; Robert Wilson, *Nonlinear Pricing* (New York: Oxford University Press, 1993), 99. Where the demands for a firm's products are independent, Ramsey pricing implies that prices are set so that proportional markups over marginal cost are inversely proportional to the products' own elasticities of demand. Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications* (Cambridge, MA: The MIT Press, 2000), 62-63. The same qualitative statement is true of profit-maximizing pricing by an unregulated monopolist or by a non-monopoly, provided that one focuses on its "residual" firm-specific demand curves. *Id.* at 63.

63 Willig WDT at 31-32.

64 *Id.* at 31-32. That number is also more than [redacted] times his estimate of Sirius XM's current variable margin. *Id.* at 30. Consequently, if it were imposed, Sirius XM (if it survived) would presumably have to raise its prices dramatically.

(93) For the reasons I discuss in Section IV, Professor Willig's opportunity cost is likely significantly above the opportunity costs that one would want to employ to estimate reasonable royalties. For example, his calculation ignores the effect of steering. Another way of making the same point is that, even if Professor Willig were correct that Sirius XM's demand for *all* music is less elastic than that of paid interactive services, Sirius XM is likely to be significantly more apt to steer in response to price differences, and therefore Sirius XM's demand for a particular *label's* music may well be more elastic than that of paid interactive services for that label's music.[65]

(94) The opportunity cost for paid *interactive* services is also an input to the Ramsey pricing calculation. Professor Willig's calculation of this opportunity cost for interactive services does not allow for any diversion to other interactive services. This biases his estimated opportunity cost downward (assuming that the correct diversion among interactive services is positive). That bias in turn biases upward his estimate of the relative margin on paid interactive services (since the relative margin is simply equal to the royalty paid less the opportunity cost as a fraction of the royalty). Since Professor Willig then proceeds to argue that the relative margin on Sirius XM should be no less than that on paid interactive services, this error has the final effect of inflating his calculated Ramsey royalty for Sirius XM.

IX. Conclusion

(95) Professor Willig's calculation of "the" opportunity cost of licensing Sirius XM contains a number of serious flaws that inflate his estimate. In particular, his calculation: (1) does not address competition among labels ("steering"); (2) assumes that the label is "must have" in the sense that no Sirius XM subscribers would continue to use Sirius XM to consume any music if it lacked access to the label's recordings; (3) assumes that the royalty rates for other music services are appropriately determined (crucially including the rate for paid interactive services, despite the fact that the Copyright Royalty Judges found those rates to be supracompetitive); and (4) fails to allow for promotional effects.

(96) In addition, in calculating the weighted average creator compensation, Professor Willig relies on a survey that generates diversion ratios that are surprising given general economic principles and that differ significantly from the results of two other surveys in the record. Professor Willig's use

[65] Professor Willig estimates the own-price elasticity of demand for Sirius XM subscriptions to be 0.8, and he also provides a range of estimates from 0.3 to 0.9. *Id.* at 28-29. All of those estimates are inconsistent with profit-maximizing behavior. If a firm's price elasticity of demand is less than 1, it will always find it profitable to raise price until the demand becomes elastic. That is, it would be irrational for a profit-maximizing Sirius XM to choose prices such that its price elasticity of demand is less than 1. An under-estimate for Sirius XM's demand elasticity would tend to inflate the royalty resulting from Professor Willig's Ramsey pricing calculation.

of these diversion ratios also significantly inflates his calculated opportunity cost of licensing Sirius XM, compared with the use of ratios generated by other surveys in the record.

(97) These factors significantly inflate Professor Willig's calculation of the opportunity cost of licensing Sirius XM.

(98) That calculation itself is mathematically equivalent to calculating a weighted average benchmark royalty (and one that gives very substantial weight to the supracompetitive rates for paid interactive services).

(99) He then asserts that the royalty for Sirius XM must be set "significantly above" that level.[66] Absent a limiting principle, this approach would risk an ever-upward spiral in royalties. He nevertheless offers two approaches to calculating how far above opportunity cost the royalties paid by Sirius XM should be: a Nash bargaining approach and a Ramsey pricing approach. His Nash calculation uses the monopoly walk-away opportunity cost, rather than a label-specific walk-away opportunity cost, and fails to allow for competition among labels through steering. And his Ramsey pricing approach relies not only on the monopoly walk-away opportunity cost for licensing Sirius XM, but also on a downwardly biased estimate for the opportunity cost for paid interactive services, the use of which increases Professor Willig's calculated markup over his estimated opportunity cost.

[66] *Id.* at 30.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of **DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)**	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION OF JOSEPH FARRELL

I, Joseph Farrell, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 17th day of February, 2017.



Joseph Farrell

Appendix A. Curriculum Vitae of Joseph Farrell, D.Phil.

Professor of Economics, University of California, Berkeley, since 1991
(Associate Professor 1989-1991).

PREVIOUS POSITIONS:

Director, Bureau of Economics, US Federal Trade Commission, June 2009-May 2012.
Deputy Assistant Attorney General and Chief Economist, Antitrust Division,
US Department of Justice, July 2000–June 2001.
Chief Economist, Federal Communications Commission, January 1996–June 1997.
Affiliated Professor, Haas School of Business, 1994–2015.
Chair of the Competition Policy Center, 1999–2006.
National Fellow, Hoover Institution, Stanford University, 1988–1989.
Visiting Assistant Professor, University of California, Berkeley, 1986–1988.
Principal Member, Technical Staff, GTE Laboratories, 1985–1986.
Senior Member, Technical Staff, GTE Laboratories, 1984–1985.
Assistant Professor of Economics, MIT, 1980–1984.
Instructor, MIT, 1979–1980.
Visitor, Bell Laboratories, summer 1978.
Visiting Assistant Professor, University of California, San Diego, spring 1983.

EDUCATION:

D.Phil., economics, Oxford University, 1981.
Thesis title, "Prices as Signals of Quality."
Advisors: James A. Mirrlees and Joseph E. Stiglitz.
M.Sc., mathematics, Oxford University, 1976.
Advisors: M.F. Atiyah and P.M. Neumann.
B.A., mathematics, First Class Honours, Oxford University, 1975.

TEACHING EXPERIENCE:

Graduate and undergraduate industrial organization, regulation and antitrust, competitive strategy, microeconomics, statistical decision theory, and game theory, at Massachusetts Institute of Technology, University of Michigan, University of California at Berkeley and at San Diego.

P**UBLICATIONS:**

also see Google Scholar page: https://scholar.google.com/citations?user=y9LJ5jcAAAAJ&hl=en

[In approximate chronological order of original publication]

"Standardization, Compatibility and Innovation," *Rand Journal of Economics* **16** (Spring 1985) 70-83
(with Garth Saloner).

Reprinted in *The Economics of Information*, Steven Lippman and David K. Levine, eds., *International Library of Critical Writings in Economics*, Elgar.
To be reprinted in *Path Dependence and Lock-In*, Stanley Liebowitz and Stephen Margolis, eds., Edward Elgar, 2014 approx.

"Owner-Consumers and Efficiency," *Economics Letters* **19** (1985) 303-306.

"How Effective is Potential Competition?" *Economics Letters* **20** (1986) 67-70.

"Standardization and Variety," *Economics Letters* **20** (1986) 71-74 (with Garth Saloner).

"Voluntary Disclosure: Robustness of the Unraveling Result," in *Antitrust and Regulation*, R. Grieson, ed., Lexington Books (1986), 91-103.

"A Note on Inertia in Market Share," *Economics Letters* **21** (1986) 73-75.

"Moral Hazard as an Entry Barrier," *Rand Journal of Economics* **17** (1986), 440-449.

"Economic Issues in Standardization," in *Telecommunications and Equity: Policy Research Issues*, J. Miller, ed., North-Holland (1986), 165-178 (with Garth Saloner).

"Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation," *American Economic Review* **76** (December 1986), 940-955 (with Garth Saloner).
Reprinted in *The Economics of Innovation Policy*, Albert Link, ed., *International Library of Critical Writings in Economics*, Elgar, 2008.

"Experience Rating and Premium Risk," *Economics Letters* **21** (1986), 311-314.

"Cheap Talk, Coordination and Entry," *Rand Journal of Economics* **18** (1987), 34-39.
Reprinted in Eric Rasmusen, *Readings in Games and Information*. Oxford: Blackwell (2001).
Reprinted in Yanis Varoufakis and Anthony Housego, editors, *Game Theory: Critical Concepts in the Social Sciences*, Routledge (2001).

"Rigidity versus License," *American Economic Review* **77** (March 1987), 195-197.

"Competition, Compatibility and Standards," pages 1-18 in *Product Standardization and Competitive Strategy*, H. Landis Gabel, ed., North-Holland, 1987 (with Garth Saloner).

"Competition with Lock-In," pages 353-362 in *Telecommunications Demand Modeling: An Integrated View*, de Fontenay, Shugard and Sibley (eds.), North-Holland, 1990.

"Partnerships," *Quarterly Journal of Economics* **103** (May 1988), 279-297 (with Suzanne Scotchmer).

"Information and the Coase Theorem," *Journal of Economic Perspectives* **1** (1987), 113-129.
Reprinted (in part) in S. Baker and C. Elliott, eds., *Economics of the Public Sector: Readings and Commentary*, Lexington, Mass: Heath, 1989.

"Dynamic Competition with Switching Costs," *Rand Journal of Economics* **19** (Spring 1988), 123-137 (with Carl Shapiro).

"Puzzles: Sylvia, Ice Cream, and More," *Journal of Economic Perspectives*, **2**, Summer 1988, 175-182.

"Coordination Through Committees and Markets," *Rand Journal of Economics* **19** (Summer 1988) 235-252 (with Garth Saloner).

"Communication, Coordination, and Nash Equilibrium," *Economics Letters* **27**:3 (1988) 209-214; misprint corrected in *Economics Letters* **33**:3 (July 1990) 299.

"Cheap Talk Can Matter in Bargaining," *Journal of Economic Theory* **47** (1989), 221-237 (with Robert Gibbons).

Reprinted in *Bargaining with Incomplete Information*, P. Linhart, R. Radner, and M. Satterthwaite, eds., Academic Press, 1992.

"Second-Sourcing as a Commitment: Monopoly Incentives to Attract Competition," *Quarterly Journal of Economics* **103** (November 1988), 673-694 (with Nancy T. Gallini).

"Optimal Contracts with Lock-In," *American Economic Review* **79**:1 (March 1989) 51-68 (with Carl Shapiro).

"Competition Between and Within Teams: The Lifeboat Principle," *Economics Letters* **29** (1989), 205-208 (with Eric Lander).

"Standardization and Intellectual Property," *Jurimetrics Journal* **30**:1 (Fall 1989), 35-50.

Reprinted in P. Drahos, ed., *Intellectual Property*, Essays in Law and Legal Theory, 1999.

Reprinted in R. Towse and R. Holzhauer, eds., *The Economics of Intellectual Property* (International Library of Critical Writings in Economics).

"Evolutionary Stability in the Repeated Prisoner's Dilemma," *Theoretical Population Biology* **36** (October 1989), 161-166 (with Roger Ware).

"Renegotiation-Proof Equilibrium: Reply," *Journal of Economic Theory* **49** (December 1989), 376-378 (with Eric Maskin).

"Cheap Talk with Two Audiences," *American Economic Review* **79** (December 1989), 1214-1223 (with Robert Gibbons).

"Horizontal Mergers: An Equilibrium Analysis," *American Economic Review* **80**:1 (March 1990), 107-126 (with Carl Shapiro).

Reprinted in *Takeovers Volume I*, A. Cosh and A. Hughes, eds., International Library of Management.

Reprinted in *Applied Industrial Economics*, L. Phlips, Cambridge Univ. Press.

Reprinted in *Recent Developments in Monopoly and Competition Policy*, George Norman, ed., International Library of Critical Writings in Economics, Edward Elgar (2008).

"Renegotiation in Repeated Games," *Games and Economic Behavior* **1** (December 1989), 327-360 (with Eric Maskin).

Reprinted in *International Library of Critical Writings in Economics: Recent Developments in Game Theory*, Edward Elgar 1999: 388-421.

"Asset Ownership and Market Structure in Oligopoly," *Rand Journal of Economics* **21** (Summer 1990), 275-292 (with Carl Shapiro).

"The Economics of Standardization: A Guide for Non-Economists," in J. L. Berg and H. Schumny, eds., *An Analysis of the Information Technology Standardization Process: Proceedings of the International Symposium on Information Technology Standardization, INSITS*. Amsterdam: North-Holland, 1990, pp 189-198.

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"The Role of the ITU in Standardization: Pre-Eminence, Impotence, or Rubber Stamp?" *Telecommunications Policy*, August 1991, 311-321 (with Stanley M. Besen).

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"Converters, Compatibility and the Control of Interfaces," *Journal of Industrial Economics* **40**:1 (March 1992), 9-36 (with Garth Saloner).

"Standard Setting in High-Definition Television," *Brookings Papers on Economic Activity*: *Microeconomics*, 1992, 1-93 (with Carl Shapiro).

"The Dynamics of Bandwagons," in *Problems of Coordination in Economic Activity*, edited by James W. Friedman: Kluwer, 1993 (with Carl Shapiro).

"Meaning and Credibility in Cheap-Talk Games," *Games and Economic Behavior* **5** (October 1993), 514-531.

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"Choosing How to Compete: Strategy and Tactics in Standardization" (with Stanley M. Besen); *Journal of Economic Perspectives*, **8** (Spring 1994), 117-131.

"Irrational Behavior in the AT&T Investment Game," *Economics Letters* **45**:4 (August 1994), 471-474 (with Suzanne Scotchmer).

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"Some Arguments for Weaker Intellectual Property Protection in Network Industries," *StandardView* **3**:2 (June 1995): 46-49.
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"Talk is Cheap," *American Economic Review* **85**:2 (May 1995), 186-190.

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"The Effects of Antitrust and Intellectual Property Law on Compatibility and Innovation," *Antitrust Bulletin*, Fall/Winter 1998, 609-650 (with Michael L. Katz).

"Inside the Pin Factory: Empirical Studies Augmented by Manager Interviews," *Journal of Industrial Economics* **46**:2 (June 1998) 123-124, editorial introduction (with Severin Borenstein and Adam Jaffe).

"Using Cost-Cutting Announcements to Diagnose X-Inefficiency," *American Economic Review*, **90**:2 (May 2000) (with Severin Borenstein).

Reprinted in National Bureau of Economic Research, *Industrial Technology and Productivity: Incorporating Learning from Plant Visits and Interviews into Economic Research*, 2000."Renegotiation in Repeated Oligopoly Interaction," in *Incentives, Organisation, and Public Economics: Papers in Honour of Sir James Mirrlees*, edited by Gareth Myles and Peter Hammond, Oxford University Press, 2000.

"The Professor and the Madmen: Review of *New Palgrave Dictionary of Economics and the Law*," *Economic Journal*, November 2000.

"Innovation, Rent Extraction, and Integration in Systems Markets" *Journal of Industrial Economics* **48**:4 (December 2000), 413-432 (with Michael L. Katz).

"Scale Economies and Synergies in Horizontal Merger Analysis," *Antitrust Law Journal* **68**: 685-710 (2001) (with Carl Shapiro).

Speeches as Deputy Assistant Attorney General:
http://www.usdoj.gov/atr/public/speeches/speech_farrell.htm

"Monopoly Slack and Competitive Rigor," in Eric Rasmusen, *Readings in Games and Information*. Oxford: Blackwell Publishing (2001).

"Renegotiation in the Repeated Amnesty Dilemma, with Economic Applications," in *Business Applications of Game Theory*, edited by Kalyan Chatterjee and William Samuelson, Kluwer, 2001 (with Georg Weizsäcker).

"Market Structure, Organizational Structure, and R&D Diversity," pp. 195-220 in Richard Arnott et al., eds., *Economics for an Imperfect World: Essays in Honor of Joseph E. Stiglitz*, MIT Press (2003) (with Richard Gilbert and Michael L. Katz).

"The American Airlines Case: A Chance to Clarify Predation Policy," in John Kwoka and Lawrence White, editors, *The Antitrust Revolution*, 4th edition, Oxford University Press (2003), 502-527 (with Aaron Edlin).

"Integration and Independent Innovation on a Network," *American Economic Review, Papers and Proceedings*, **93**:2 (May 2003), 420-424.

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"Listening to Interested Parties in Antitrust: Competitors, Customers, Complementors, and Relativity," *Antitrust* **18:**2 (Spring 2004), 64-68.

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"Competition or Predation? Consumer Coordination, Strategic Pricing, and Price Floors in Network Markets," with Michael L. Katz, *Journal of Industrial Economics* **53**:2 (June 2005), 203-231.

"Innovation and Regulation" (invited review of part of *Economic Report of the President*), *Journal of Economic Literature* **43** (September 2005), 801-805.

"Deconstructing Chicago on Exclusive Dealing," *The Antitrust Bulletin* **50**:3 (2005), 465-480.

"Amicus Brief of 37 Business, Economics and Law Professors" in Tamoxifen Citrate antitrust litigation, December 2005, written together with Mark Lemley and Carl Shapiro, also signed by 34 other professors of business, economics and law.

"Assessing Australian Interchange Regulation: Comments on Chang, Evans and Garcia Swartz," *Review of Network Economics* **4**:4 (Dec. 2005): 359-363.

"Complexity, Diversity, and Antitrust," *The Antitrust Bulletin* **51**:1 (Spring 2006): 165-173.

"Open Access Arguments," chapter 6 (pp. 195-214) in *Net Neutrality or Net Neutering: Should Broadband Services be Regulated?* edited by Thomas Lenard and Randolph May, Springer, 2006.

"Efficiency and Competition among Payment Instruments," *Review of Network Economics* **5**:1 (March 2006), 26-44.

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"Compatibility and Competition Policy," chapter 12 (pp. 372-388) in *STANDARDS AND PUBLIC POLICY*, Cambridge University Press 2007, Shane Greenstein and Victor Stango, editors.

"Do Investors Forecast Fat Firms? Diagnosing Profit Dissipation from Stock Market Values of Gold Mining Firms," *RAND Journal of Economics* **38**:3 (Autumn 2007), 626-647, with Severin Borenstein.

"Coordination and Lock-In: Competition with Switching Costs and Network Effects" (with Paul Klemperer), in *HANDBOOK OF INDUSTRIAL ORGANIZATION*, volume **3** (2007), Elsevier, edited by Mark Armstrong and Robert Porter, pp. 1967-2072.

"Standard Setting, Patents, and Hold-Up," *Antitrust Law Journal* **74**:3 (Fall 2007): 603-670, with John Hayes, Carl Shapiro, and Theresa Sullivan.

"Improving Critical Loss Analysis," with Carl Shapiro, *Antitrust Source*, February 2008.

"Merger to Monopoly to Serve a Single Buyer: Comment," *Antitrust Law Journal* **75:**2 (Summer 2008), 637-646, with Jonathan Baker and Carl Shapiro.

"How Strong Are Weak Patents?" *American Economic Review* **98**:4 (September 2008): 1347-1369, with Carl Shapiro.

"Intellectual Property as a Bargaining Environment," in *INNOVATION POLICY AND THE ECONOMY*, National Bureau of Economic Research/University of Chicago Press, Josh Lerner and Scott Stern, eds., 2008.

"Economics at the FTC: Retrospective Merger Analysis with a Focus on Hospitals," *Review of Industrial Organization* **35** (2009): 369–385, with Paul Pautler and Michael Vita.

"Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," with Carl Shapiro, *Berkeley Electronic Press Journal of Theoretical Economics* **10**(1) (2010).

"Upward Pricing Pressure and Critical Loss Analysis: Response," *Global Competition Policy* (2010), with Carl Shapiro.

"Recapture, Pass-Through, and Market Definition," *Antitrust Law Journal* **76** (2010), pp. 585-604, with Carl Shapiro.

"Upward Pricing Pressure in Horizontal Merger Analysis: Reply to Epstein and Rubinfeld," *Berkeley Electronic Press Journal of Theoretical Economics* **10**:1 (2010), with Carl Shapiro.

"Economics at the FTC: Mergers, Dominant-Firm Conduct, and Consumer Behavior," with Janis Pappalardo and Howard Shelanski, *Review of Industrial Organization* **36** (2010).

"Four Paths to Compatibility," in *Oxford Handbook of the Digital Economy*, ed. Martin Peitz and Joel Waldfogel, Oxford University Press, 2012 (with Tim Simcoe).

"Fox, or Dangerous Hedgehog? Keyte and Schwartz on the 2010 Horizontal Merger Guidelines," *Antitrust Law Journal* **77:**2, 661-668 (2011).

"Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets," with David Balan, Keith Brand, and Brett Wendling, *Review of Industrial Organization* **37** (2011).

"Choosing the Rules for Consensus Standardization," with Tim Simcoe, *RAND Journal of Economics* **43**:2 (Summer 2012).

"Market Data and Participants' Views in Horizontal Merger Analysis," *Concurrences*, 2012; republished in *New Frontiers of Antitrust: A tribute to Bill Kovacic*, ed. Nicolas Charbit.

"Can Privacy Be Just Another Good?" *Journal on Telecommunications and High Technology Law*, 2012.

"Keynote Address: Mosquitoes, Micropayments, and Privacy," pp. 89-97 in *Consumer Payment Innovation in the Connected Age*: Proceedings of 2012 Federal Reserve payment systems conference, Kansas City Fed.

"Economics at the FTC: Drug and PBM Mergers and Drip Pricing," with Howard Shelanski, Christopher Metcalf, Mary Sullivan, and Brett Wendling, *Review of Industrial Organization*, 2012.

"Freedom to Trade and the Competitive Process," with Aaron Edlin, in *Oxford Handbook of International Antitrust Economics*, Roger D. Blair and D. Daniel Sokol, editors, Oxford University Press, 2015.

"Comments on Merger Guidelines," chapter 8 in *Competition Law and Economics: Beyond Monopoly Regulation*, ed. Jay Pil Choi et al., Edward Elgar, forthcoming (2017?).

"The US Federal Trade Commission at 100: A symposium on FTC Economics", *Review of Industrial Organization* (2015).

"Some Failures of the Popular Coase Theorem," chapter 24 in Claude Menard, ed., *The Elgar Companion to Ronald H. Coase*, Edward Elgar, 2016.

"Resetting Merger Policy in the New Administration," with John Kwoka, *Concurrences*, 2016.

"Some Simple Analytics of Vertically Linked Markets," *Review of Industrial Organization*, forthcoming.

PROFESSIONAL ACTIVITIES AND HONORS:

Distinguished Service Award, Industrial Organization Society, April 2016.

Fellow, Econometric Society (since 2002).

Chair, Competition Policy Center, 1999-2006.

Computer Science/Telecommunications Board, National Academy of Sciences, 2001-2004.

Editor, *Journal of Industrial Economics*, 1995-2000 (previously Associate Editor).

Board of Editors, *Information Economics and Policy*, 2004-2007.

President, Industrial Organization Society, 1996.

Vice-Chair, Economics Committee, Antitrust Section, American Bar Association, 2001.

Academic Advisor, OECD competition section, 2015.

Refereeing for multiple economics journals, research agencies, publishers, etc.

Academic Advisory Boards

Consortium on Telecommunications Policy (1997)
Power and Telecom (1997-1999)
Economics of Innovation and New Technology (1990-1995)
Centre for Competition Policy (UK), 2004-2008 approx.

Selected Recent Presentations (since 2013): American Bar Association, Bates White, Competition and Markets Authority (UK), European Commission DG Competition, University of East Anglia, Federal Communications Commission, Federal Trade Commission, Global Competition Review/George Mason University, NBER, Northwestern, Stanford, University of British Columbia, University of California, US Department of Justice.

Co-Chair, American Bar Association conference on antitrust in high technology, June 2005.

Faculty, New York University graduate workshop on economics of technology, June 2005.

Organized the GTE Laboratories Economics Symposium, August 1985.

Organizing Committee, Telecommunications Policy Research Conference, April 1986.

Program Committee, Econometric Society, June 1992; American Economic Association, January 2000.

Scientific Committee, Toulouse, 2004.

Reviewer, U. S. Office of Technology Assessment:
"Computer Software and Intellectual Property", *Finding a Balance*, 1992.
Global Standards: Building Blocks for the Future, March 1992.

Reviewer, National Academy of Sciences/National Research Council Transportation Research Board (2015).

Witness, US Senate Judiciary Committee, FCC, FTC, and DOJ hearings.

University and departmental administrative service including past service as Chair of the Competition Policy Center, Chair of the Graduate Committee, membership of the Personnel Committee and Undergraduate Committee, promotion and tenure committees, and *ad hoc* committees.

Senior Consultant, Charles River Associates, 2003-2009. **Consultant** for Department of Justice, Federal Trade Commission, Canadian Bureau of Competition, Reserve Bank of Australia, and private parties (currently through Bates White LLC).

SCHOLARSHIPS AND GRANTS

Open Scholarship in Mathematics (undergraduate) 1972-1975.
College Book Prize for academic performance, 1974.
University Prize for final examinations in mathematics, 1975.
Taberdar Senior Scholarship [awarded to one to two graduate students in all subjects], 1975-76.
Science Research Council Studentship, 1975-78.
Amphlett Senior Scholarship [one of six in all subjects], 1976-78.
Hulme Senior Scholarship [one of three in all subjects], 1978-79.
University Prize for best economics master's thesis, 1979.
Principal Investigator, NSF, "Economics of Compatibility Standards and Lock-In," 1987-89.
National Fellow, Hoover Institution, Stanford University, 1988-9.
Co-Principal Investigator (with Carl Shapiro), NSF grant, "The Evolution of Network Industries," 1989-91.

Hewlett Fund grant, Institute of International Studies, Berkeley, 1990-91.
Co-Principal Investigator (with Carl Shapiro), NSF, "Technology Transitions with Network Externalities," 1992-94.
Sloan Foundation/NBER grant (with Severin Borenstein), “Why Do Firms Cut Costs?” 1998-2000.
Gordon Cain Senior Fellow, SIEPR, 2001-2002.

Appendix B. Recent testifying experience

- Served as testifying expert on behalf of Samsung in US International Trade Commission (ITC) cases No. 337-TA-862, No. 337-TA-866, and No. 337-TA-868, three related investigations involving standard-essential patents (SEPs). Provided deposition and live testimony at the ITC proceedings.

Appendix C. Documents considered

C.1. Copyright Royalty Board hearing and case law documents

- Copyright Royalty Board, *Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services* ("*SDARS I*"), 73 Fed. Reg. (Jan. 24, 2008).
- Copyright Royalty Board, *Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services* ("*SDARS II*"), 78 Fed. Reg. (Apr. 17, 2013).
- Copyright Royalty Board, *Determination of Reasonable Rates and Terms for Digital Performance of Sound Recordings and Ephemeral Recordings* ("*Web I*"), 37 Fed. Reg. (July 8, 2002).
- Copyright Royalty Board, *Determination of Reasonable Rates and Terms for Digital Performance of Sound Recordings and Ephemeral Recordings ("Web II"),* 72 Fed. Reg. (May 1, 2007).
- Copyright Royalty Board, *Determination of Reasonable Rates and Terms for Digital Performance of Sound Recordings and Ephemeral Recordings ("Web III"),* 76 Fed. Reg. (Mar. 9, 2011).
- Copyright Royalty Board, Determination of Royalty Rates for Digital Performance Right in Sound Recordings and Ephemeral Recordings ("*Web III remand*"), 79 Fed. Reg. (Apr. 25, 2014).
- Copyright Royalty Board, *Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings ("Web IV"),* 81 Fed. Reg. (May 2, 2016).
- Copyright Royalty Judges; appointments and functions, 17 U.S. Code § 801 (2004).
- Written Direct Testimony of Janusz Ordover on behalf of SoundExchange in *SDARS I*, Oct. 30, 2006.
- Written Direct Testimony of Janusz Ordover on behalf of SoundExchange in *SDARS II*, Nov. 28, 2011.
- Written Direct Testimony of Michael Pelcovits on behalf of SoundExchange in *SDARS I*, Oct. 27, 2006.
- Written Direct Testimony of Stephan McBride on behalf of Pandora Media, Inc. in *Web IV*, Oct. 7, 2014.

C.2. Academic articles & books

- Boiteux, Marcel, "On the Management of Public Monopolies Subject to Budgetary Constraints," *Journal of Economic Theory* 3 (1971): 219-40.
- Braeutigam, Ronald, "Optimal Policies for Natural Monopolies," In *Handbook of Industrial Organization*, vol. 2. Edited by Richard Schmalensee and Robert Willig (Amsterdam: North Holland, 1989), 1289-1346.
- Collard-Wexler, Allan, Gautam Gowrisankaran, and Robin S. Lee, "'Nash-in-Nash' Bargaining: A Microfoundation for Applied Work." Working paper, National Bureau of Economic Research, 2016.
- Crawford, Gregory S. and Ali Yurukoglu, "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review,* 102, no.2 (2012), 643-685.
- Farrell, Joseph and Carl Shapiro, "Upward Pricing Pressure in Horizontal Merger Analysis," *The B.E. Journal of Theoretical Economics: Policies and Perspectives*, 10, no. 1 (2010).
- Gowrisankaran, Gautam, Aviv Nevo, and Robert Town, "Mergers when prices are negotiated: Evidence from the Hospital Industry," *American Economic Review*, 105, no. 1 (2015), 172-203.
- Hayes, Rachel M. and Scott Schaefer, "EO Pay and the Lake Wobegon Effect," *Journal of Financial Economics*, 94, no. 2 (2009).
- Laffont, Jean-Jacques and Jean Tirole, *Competition in Telecommunications* (Cambridge, MA: The MIT Press, 2000).
- Ramsey, Frank, "A Contribution to the Theory of Taxation," *Economic Journal* 37 (1927): 47-61.
- Shapiro, Carl, "Mergers with Differentiated Products," *Antitrust* 10, (1996).
- Willig, Robert D., "Merger Analysis, Industrial Organization Theory, and Merger Guidelines," In *Brookings Papers on Economic Activity, Microeconomics 1991*, edited by Martin N. Baily and Clifford Winston, 281 (1991).

C.3. Studies & reports

- Edison Research, Share of Ear Survey – Q2 2016, survey conducted May 2015 – March 2016, file *Share of Ear Q2 weil.sav*.

C.4. Other

- Warner Music Group, Annual Report (Form 10-K) (Dec. 10, 2015).

- Whoriskey, Peter, "Cozy Relationships and 'Peer Benchmarking' Send CEO's Pay Soaring," *Washington Post*, Oct. 3, 2011, https://www.washingtonpost.com/business/economy/cozy-relationships-and-peer-benchmarking-send-ceos-pay-soaring/2011/09/22/gIQAgq8NJL_story.html.

C.5. Written direct testimonies

- Written Direct Testimony of Steven Blatter, Oct. 14, 2016.
- Written Direct Testimony of Ravi Dhar, Oct. 18, 2016.
- Written Direct Testimony of George Ford, Oct. 18, 2016.
- Written Direct Testimony of Joe Lenski, Oct. 18, 2016.
- Written Direct Testimony of Thomas Lys, Oct. 19, 2016.
- Written Direct Testimony of Jonathan Orszag, Oct. 18, 2016.
- Written Direct Testimony of Carl Shapiro, Oct. 19, 2016.
- Written Direct Testimony of Robert Willig, Oct. 19, 2016.

C.6. Depositions

- Deposition of Jonathan Orszag, Jan. 17, 2017.

C.7. Written rebuttal testimonies

- Written Rebuttal Testimony of John Hauser, Feb. 17, 2017.
- Written Rebuttal Testimony of Carl Shapiro, Feb. 17, 2017.

Appendix D. Professor Willig's opportunity cost calculation ignores Sirius XM subscribers who will not divert to other sources of music if Sirius XM is without a label's music content

Suppose there are M record labels. Assume a label's direct marginal cost of having music played on a service is zero. Label i's profit if it licenses Sirius XM (service 0 out of $N+1$ here) is

$$\pi_i^L = s_i p_i \theta X_0 + s_i \sum_{n=1}^{N} r_n X_n, \quad (1)$$

where for $n = 1, \dots, N$, r_n is the total sound recording royalty per subscriber from service n, X_n is service n's number of subscribers if this label licenses Sirius XM, s_i is label i's market share, p_i is label i's pro-rated percentage of revenue royalty from Sirius XM,[67] θ is Sirius XM's per subscriber revenue, and X_0 is Sirius XM's number of subscribers if it reaches an agreement with this label. For simplicity, I assume a label's play share on Sirius XM and its share of total label royalties from other music services are the same.

If label i does not license Sirius XM, its profit is

$$\pi_i^{NL} = s_i \sum_{n=1}^{N} r_n (X_n + \Delta X_{ni}), \quad (2)$$

where ΔX_{ni} is the change in the number of subscribers or users of service n as a result of label i not licensing Sirius XM. (Note that if a label does not license Sirius XM it receives no royalty from Sirius XM.)

Economic logic suggests that label i would only license Sirius XM at pro-rated royalty p_i if $\pi_i^L \geq \pi_i^{NL}$, which implies

$$s_i p_i \theta X_0 \geq s_i \sum_{n=1}^{N} r_n \Delta X_{ni}, \quad (3)$$

where the right side of the inequality is the walk-away opportunity cost of licensing Sirius XM for label i.

Dividing both sides of the above equation by X_0, we get

[67] By this I mean that given p_i, label i would receive in royalties from Sirius XM p_i times Sirius XM's revenue times, label i's share of plays on Sirius XM.

$$s_i p_i \theta \geq s_i \sum_{n=1}^{N} \frac{r_n \Delta X_{ni}}{X_0}. \quad (4)$$

That is, if label i is willing to license to Sirius XM, its per subscriber royalty from Sirius XM, $s_i p_i \theta$, is at least as large as its per subscriber walk-away opportunity cost, $s_i \sum_n r_n \Delta X_{ni} / X_0$.

Let ΔX_{0i} be the decrease in the number of subscribers as a result of label i not licensing Sirius XM. Define diversion ratios as

$$d_n \equiv \frac{\Delta X_{ni}}{\Delta X_{0i}}, \qquad n = 1, \ldots N;\ i = 1, \ldots, M \quad (5)$$

That is, a fraction d_n of the subscribers leaving Sirius XM will use service n instead as a result of the loss of label i's music content. For simplicity, I assume the diversion ratios are not label-specific.

Let the percentage loss of Sirius XM's subscribers if label i does not license Sirius XM be α_i, *i.e.*,

$$\alpha_i \equiv \frac{\Delta X_{0i}}{X_0}. \quad (6)$$

Using the definitions of α_i and d_n, Eq. (4) can be rewritten as

$$s_i p_i \theta \geq \alpha_i s_i \sum_{n=1}^{N} r_n d_n. \quad (7)$$

Therefore, a label's walk-away opportunity cost per subscriber is

$$C_i = \alpha_i s_i \sum_{n=1}^{N} r_n d_n. \quad (8)$$

Professor Willig's opportunity cost is mathematically equivalent to $\sum_{n=1,\ldots,N} r_n d_n$. If one divides label i's walk-away opportunity cost C_i as defined in Eq. (8) by its market share s_i, the result would be an aggregate royalty for Sirius XM that if distributed according to label i's market share would just compensate this label for its opportunity cost. To the extent that this calculation yields the same result for each label, that aggregate royalty would just convince each label to continue to license Sirius XM given its walk-away opportunity costs, and would thus be most directly comparable with what Professor Willig calculates. One can see that Professor Willig's opportunity cost calculation assumes $\alpha_i = 1$, *i.e.*, 100% of Sirius XM subscribers without a label's music would switch to other sources of music.

Furthermore, if one assumes α_i is proportional to s_i, say $\alpha_i = \beta s_i$, then the sum of all labels' walk-away opportunity costs per subscriber can be written as

$$\sum_{i=1}^{M} C_i = \sum_{i=1}^{M} \alpha_i s_i \sum_{n=1}^{N} r_n d_n = \beta \left(\sum_{i=1}^{M} s_i^2 \right) \left(\sum_{n=1}^{N} r_n d_n \right) = \beta \times HHI \times \left(\sum_{n=1}^{N} r_n d_n \right), \quad (9)$$

where $HHI = \sum_{i=1,\ldots M} s_i^2$ is the Herfindahl-Hirschman index, which measures the concentration of the sound recording market in this context. (Note that in this equation, the shares are assumed to be numbers between 0 and 1 that sum to 1, making the Herfindahl index also be a number between 0 and 1; if the shares are quoted as percentages then the index becomes a number between 0 and 10,000, and the right hand side should be divided by 10,000.)

Appendix E. Effect of steering

This appendix uses an example to explore how allowing for competition between labels through steering can significantly reduce the negotiated royalty rate. In this example, Sirius XM simultaneously bargains with two symmetric copyright owners over play-share prorated royalty rates (as a percentage of Sirius XM's revenue). Given that the bargaining with one copyright holder affects the bargaining with the other, we employ a Nash-in-Nash model.[68] Once the royalty rates are agreed, Sirius XM chooses its mix of music so as to maximize its profit. Therefore, it would tend to play the music with lower royalty rates more frequently. In bargaining over play-share prorated royalty rates, copyright owners compete for increased play shares by offering lower royalty rates.

With the illustrative parameter values used here, this ability to steer generates bargaining outcomes at significantly lower royalty rates than would prevail without the ability to steer. A model with more copyright owners would likely involve more competition for play-shares and thus lower royalty rates as a result of that competition. I have not analyzed a model of bargaining with commitments to play shares.

E.1. Setup

E.1.a. Sequence of the game

Consider a game of two stages. In the first stage, Sirius XM bargains with two copyright holders to determine the prorated royalty rates. In the second stage, Sirius XM chooses optimal play shares given the royalty rates. The solution concept applied is the standard subgame perfect equilibrium.

The first stage, bargaining, is modeled as simultaneous bilateral bargaining between Sirius XM and each one of the copyright owners. The solution concept is a Nash equilibrium in Nash bargaining. The idea of the Nash-in-Nash solution is to find the vector of share-prorated percentage of revenue royalties p_1^* and p_2^* such that for each $i = 1,2$, p_i^* is the solution to Nash

[68] *See, e.g.*, Allan Collard-Wexler, Gautam Gowrisankaran, and Robin S. Lee, "'Nash-in-Nash' Bargaining: A Microfoundation for Applied Work" (working paper, National Bureau of Economic Research, 2016); Gautam Gowrisankaran, Aviv Nevo, and Robert Town, "Mergers when prices are negotiated: Evidence from the Hospital Industry," *American Economic Review*, 105, no.1 (2015), 172-203; Gregory S. Crawford and Ali Yurukoglu, "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review*, 102, no.2 (2012), 643-685.

bargaining between Sirius XM and copyright owner i, taking as given that the other copyright owner's royalty rate is p_j^*.

For simplicity, I assume that the two copyright holders are identical and each has the same bargaining power as Sirius XM. I focus on the bargaining problem between Sirius XM and copyright owner 1; the bargaining problem between Sirius XM and copyright owner 2 is symmetric.

E.1.b. Sirius XM's bargaining payoffs

Let $R(s_1)$ denote Sirius XM's revenue as a function of the play share of copyright owner 1's music. Copyright owner 2's play share is thus $s_2 = 1 - s_1$. I assume that Sirius XM's revenue is equal to the number of subscribers $X(s_1)$ times the subscription fee θ. That is, $R(s_1) = \theta X(s_1)$. (For simplicity, I assume that the subscription fee is fixed; generally the demand for subscriptions would depend on the subscription fee θ.) Assume the unique maximizer of $X(s_1)$ is $s_1 = 1/2$. That is, Sirius XM's number of subscribers and revenue are maximized if it plays both copyright owners' music with equal shares. Let $R^* \equiv R(1/2)$ and $X^* \equiv X(1/2)$.

Assume Sirius XM's variable cost excluding payments to record labels per subscriber is c. Define $\hat{c} \equiv c/\theta$. Sirius XM's payoff if it agrees on royalty rates p_1, p_2 and chooses copyright owner 1's play share s_1 is then

$$\pi_0(p_1, p_2, s_1) = R(s_1)(1 - \hat{c} - p_1 s_1 - p_2(1 - s_1)) - K, \quad (1)$$

where K is its fixed cost.

Thus if its bargaining with copyright owner 1 breaks down but it reaches an agreement with copyright owner 2 at royalty rate p_2, Sirius XM's payoff is

$$\pi_0^N(p_2) = R(0)(1 - \hat{c} - p_2) - K. \quad (2)$$

E.1.c. Copyright owners' bargaining payoffs

If label 1 reaches agreement with Sirius XM on royalty rate p_1 and Sirius XM plays its music with share s_1, then (assuming zero marginal costs other than opportunity costs) label 1's royalty income from Sirius XM and other music services is

$$\pi_1(p_1, s_1) = p_1 s_1 \theta X(s_1) + \sum_n s_1^n r^n X^n(s_1), \quad (3)$$

where s_1^n is label 1's play share in service n, r^n is service n's total royalty per subscriber, and $X^n(s_1)$ is service n's number of subscribers. We assume label 1's play share in other services, s_1^n, does not depend on its play share on Sirius XM. Let $X^{n*} \equiv X^n(1/2)$.

Define the diversion ratios for departures from equal play shares as

$$d^n(s_1) = \frac{X^n(s_1) - X^{n*}}{X^* - X(s_1)}, s_1 \neq 1/2. \tag{4}$$

Assume diversion ratios are constants with respect to a label's play share on Sirius XM. Thus, define $d^n \equiv d^n(s_1)$, for $s_1 \neq 1/2$. Then for all $s_1 \in [0,1]$,

$$X^n(s_1) = \big(X^* - X(s_1)\big)d^n + X^{n*} \tag{5}$$

Label 1's agreement and disagreement payoffs can be written as

$$\pi_1(p_1, s_1) = p_1 s_1 \theta X(s_1) + \sum_n s_1^n d^n r^n \big(X^* - X(s_1)\big) + \sum_n s_1^n r^n X^{n*} \tag{6}$$

$$\pi_1^N(p_2) = \sum_n s_1^n r^n d^n \big(X^* - X(0)\big) + \sum_n s_1^n r^n X^{n*} \tag{7}$$

For ease of notation, I will normalize label 1's payoffs relative to its royalty income from services other than Sirius XM in the symmetric equilibrium. Therefore, the $\sum_n s_1^n r^n X^{n*}$ term in Eq. (6) and (7) will be dropped from both Label 1's agreement and disagreement payoffs from this point onward. Note that this normalization does not affect the equilibrium royalty rates because the $\sum_n s_1^n r^n X^{n*}$ term will cancel out in the Nash product.

Assume $s_1^n = 1/2$, for all n, *i.e.*, when label 1 is negotiating with Sirius XM on its royalty rate, its play shares in all other services are 1/2. Then label i's agreement and disagreement payoffs (with the normalization discussed above) can be rewritten as

$$\pi_1(p_1, s_1) = p_1 s_1 \theta X(s_1) + \frac{X^* - X(s_1)}{2} \sum_n d^n r^n,$$

$$\pi_1^N(p_2) = \frac{X^* - X(0)}{2} \sum_n d^n r^n. \tag{8}$$

Let $c_o \equiv \sum_n d^n r^n$. c_o is the increase in royalties from services other than Sirius XM if Sirius XM loses one subscriber. If $c_0 < 0$ then Sirius XM's promotion effect dominates substitution effect. If $c_0 > 0$, then Sirius XM's substitution effect dominates its promotion effect. Let

$$C = c_0 * \frac{X^* - X(0)}{2}. \tag{9}$$

C can be viewed as each label's walk-away opportunity cost. Then label 1's disagreement payoff, Eq. (8) can be rewritten as

$$\pi_1^N(p_2) = C. \tag{10}$$

E.2. Equilibrium royalty rates with steering effect

E.2.a. First-order conditions for the optimal play shares

Define $s_1^*(p_1, p_2)$ as Sirius XM's profit-maximizing play share of copyright owner 1's music given (p_1, p_2), the share-prorated percentage of revenue royalties. Then its profit-maximizing play share of copyright owner 2's music is $1 - s_1^*(p_1, p_2)$. Therefore, $s_1^*(p_1, p_2)$ is the solution to the problem below:

$$s_1^*(p_1, p_2) = \underset{s_1}{\operatorname{argmax}}\, \pi_0(p_1, p_2, s_1) = \underset{s_1}{\operatorname{argmax}}\, R(s_1)(1 - \hat{c} - p_1 s_1 - p_2(1 - s_1)) - K. \tag{11}$$

I assume the revenue function $R(\cdot)$ satisfies regularity conditions such that the optimal play share $s_1^*(p_1, p_2)$ is well defined and differentiable for $p_1, p_2 \in (0,1)$.

The first-order condition with respect to s_1 implies for $p_1, p_2 \in (0,1)$,

$$\frac{dR(s_1^*)}{ds_1}(1 - \hat{c} - p_1 s_1^* - p_2(1 - s_1^*)) = (p_1 - p_2)R(s_1^*). \tag{12}$$

Taking derivative with respect to p_1 of the above equation, we get

$$\begin{aligned} &R''(s_1^*)\frac{\partial s_1^*}{\partial p_1}(1 - \hat{c} - p_2 - (p_1 - p_2)s_1^*) - R'(s_1^*)\left(s_1^* + (p_1 - p_2)\frac{\partial s_1^*}{\partial p_1}\right) \\ &= R(s_1^*) + (p_1 - p_2)R'(s_1^*)\frac{\partial s_1^*}{\partial p_1}. \end{aligned} \tag{13}$$

If $p_1 = p_2 = p$, then $s_1^* = 1/2$ and the above equation becomes

$$R''(1/2)\frac{\partial s_1^*(p,p)}{\partial p_1}(1 - \hat{c} - p) = R(1/2), \tag{14}$$

since $R'(1/2) = 0$. Let $\epsilon(p)$ be Sirius XM's royalty rate elasticity of play share evaluated at $p_1 = p_2 = p$. That is,

$$\epsilon(p) \equiv \frac{p}{s_1^*(p,p)} \frac{\partial s_1^*(p,p)}{\partial p_1}$$

Eq. (14) yields

$$\epsilon(p) = -\gamma \frac{p}{1-\hat{c}-p}, \tag{15}$$

where

$$\gamma \equiv -\frac{2R\left(\frac{1}{2}\right)}{R''\left(\frac{1}{2}\right)}. \tag{16}$$

E.2.b. Nash product and first-order conditions for the royalty rates

Using Eqs. (1), (2), (8), and (10) and substituting $s_1^*(p_1, p_2)$ for s_1, the Nash product of the bargaining between Sirius XM and record label 1 is

$$\begin{aligned}
&\left(R\left(s_1^*(p_1,p_2)\right)\left(1-\hat{c}-p_1 s_1^*(p_1,p_2)-p_2\left(1-s_1^*(p_1,p_2)\right)\right)-R(0)(1-\hat{c}-p_2)\right)\times \\
&\quad\times\left(p_1 s_1^*(p_1,p_2)R\left(s_1^*(p_1,p_2)\right)+\frac{\left(X^*-X\left(s_1^*(p_1,p_2)\right)\right)}{2}\sum_n d^n r^n - C\right) \\
&=\left(R\left(s_1^*(p_1,p_2)\right)\left(1-\hat{c}-p_1 s_1^*(p_1,p_2)-p_2\left(1-s_1^*(p_1,p_2)\right)\right)-R(0)(1-\hat{c}-p_2)\right)\times \\
&\quad\times\left(p_1 s_1^*(p_1,p_2)R\left(s_1^*(p_1,p_2)\right)+\frac{c_0}{2\theta}\left(R^*-R\left(s_1^*(p_1,p_2)\right)\right)-C\right),
\end{aligned} \tag{17}$$

where we use the definition that $R(s_i) = \theta X(s_i)$.

Denote the equilibrium royalty rates by p_1^* and p_2^*. Then p_1^* maximizes the above Nash product, given that record label 2's royalty rate is p_2^*. That is,

$$p_1^* = \underset{p_1}{\text{argmax}} \left\{ \begin{array}{c} \left(R\left(s_1^*(p_1,p_2^*)\right)(1-\hat{c}-p_1 s_1^*(p_1,p_2^*)-p_2^*(1-s_1^*(p_1,p_2^*))-R(0)(1-\hat{c}-p_2^*)\right)\times \\ \times\left(p_1 s_1^* R\left(s_1^*(p_1,p_2^*)\right)+\frac{c_0}{2\theta}\left(R^*-R\left(s_1^*(p_1,p_2)\right)\right)-C\right) \end{array} \right\}. \tag{18}$$

I assume the revenue function $R(\cdot)$ satisfies regularity conditions such that the Nash product described above is strictly concave in p_1 for all $p_2^* \in (0,1)$.

Making use of the Envelope Theorem, the first-order condition with respect to p_1 yields

$$\begin{aligned}
&\left[p_1^* s_1^* R(s_1^*)+\frac{c_0}{2\theta}\left(R^*-R(s_1^*)\right)-C\right]s_1^* R(s_1^*) \\
&=\left[(1-\hat{c}-p_1^* s_1^*-p_2^*(1-s_1^*))R(s_1^*)-(1-\hat{c}-p_2^*)R(0)\right]\times
\end{aligned}$$

$$\times \left[s_1^* R(s_1^*) + p_1^* \left(s_1^* \frac{dR(s_1^*)}{ds_1} \frac{\partial s_1^*}{\partial p_1} + R(s_1^*) \frac{\partial s_1^*}{\partial p_1} \right) - \frac{c_0}{2\theta} \frac{dR(s_1^*)}{ds_1} \frac{\partial s_1^*}{\partial p_1} \right]. \quad (19)$$

By symmetry, $p_1^* = p_2^*$ and $s_1^* = s_2^* = 1/2$. Note that $dR(s_1^*)/ds_1 = 0$ because Sirius XM's revenue is maximized at $s_1^* = 1/2$. The above equation becomes

$$\frac{p_1^* R^*}{2} - C = (1 - \hat{c} - p_1^*)\big(R^* - \mathrm{R}(0)\big)\big(1 + \epsilon(p_1^*)\big). \quad (20)$$

Let $\alpha \equiv (R^* - R(0))/R^* = (X^* - X(0))/X^*$. α is the percentage of revenue or the percentage of subscribers that Sirius XM would lose without the music of one of the two labels. Then C can be rewritten as $C = X^* \alpha c_0/2$. Eq. (20) can be rewritten as

$$\frac{p_1^*}{2} - \frac{\alpha c_0}{2\theta} = \alpha(1 - \hat{c} - p_1^*)\big(1 + \epsilon(p_1^*)\big). \quad (21)$$

E.2.c. Solving for equilibrium royalty rates

Substituting Eq. (15) into Eq. (21), we get

$$\frac{p_1^*}{2} - \frac{\alpha c_0}{2\theta} = \alpha(1 - \hat{c} - p_1^*)\left(1 - \gamma \frac{p_1^*}{1 - \hat{c} - p_1^*}\right). \quad (22)$$

Solving the above equation, the equilibrium royalty rates are

$$p_1^* = \frac{\alpha(1 - \hat{c}) + \alpha c_0/2\theta}{\alpha(1 + \gamma) + 1/2}. \quad (23)$$

By symmetry, $p_2^* = p_1^*$. This, incidentally, implies that the equilibrium shares are 50% and thus no actual steering occurs in equilibrium, but the possibility of steering is very relevant.

E.3. Estimating R/R''

E.3.a. Relationship between R/R'' and play share elasticity of revenue

Assume

$$R(s_1) = a - b\left(s_1 - \frac{1}{2}\right)^2, \quad (24)$$

where $a, b > 0$.

Then

$$\gamma = -\frac{2R\left(\frac{1}{2}\right)}{R''\left(\frac{1}{2}\right)} = \frac{a}{b}. \tag{25}$$

Let $\eta(s_1)$ be the play share arc elasticity of revenue between play shares s_1 and 1/2, *i.e.*,

$$\eta(s_1) \equiv \frac{\frac{\left(R(s_1) - R\left(\frac{1}{2}\right)\right)}{R\left(\frac{1}{2}\right)}}{\frac{s_1 - \frac{1}{2}}{\frac{1}{2}}} = \frac{\frac{\left[\left(a - b\left(s_1 - \frac{1}{2}\right)^2\right) - a\right]}{a}}{2\left(s_1 - \frac{1}{2}\right)}$$

$$= -\frac{b\left(s_1 - \frac{1}{2}\right)^2 / a}{2(s_1 - \frac{1}{2})} = -\frac{b}{2a}\left(s_1 - \frac{1}{2}\right) = -\frac{1}{2\gamma}\left(s_1 - \frac{1}{2}\right). \tag{26}$$

Therefore, by the equation above

$$\gamma = -\frac{s_1 - \frac{1}{2}}{2\eta(s_1)}. \tag{27}$$

E.3.b. Pandora's steering experiment

Pandora performed steering experiments to answer the question of whether increases or decreases in performances of sound recordings owned by a particular record company would have a measurable impact on a key listener metric, specifically average hours listened per registered users.[69] These experiments started on June 4, 2014 and ended on September 3, 2014 (13 weeks).

"The Steering Experiments consisted of a group of 12 experiments, each defined by a combination of target ownership group (UMG/Sony/WMG) and a target deflection in share of spins (treatment group) as compared to spins that would occur according to the standard Pandora music recommendation results (control group). The requested spin share deflections (the 'steering') were: -30%, -15%, +15%, and +30% for each of the three ownership groups manipulated."[70]

"The experimental subjects were all Pandora listeners, each of whom was randomly assigned to one of the 12 treatment groups, to the single control group, or were included in the portion of

[69] McBride WDT in *Web IV*.

[70] *Id.* at 7.

listeners excluded from all experiments. The treatment groups for UMG each had 5% of listeners, the treatment groups for Sony each had 7% of listeners, and the treatment groups for WMG each had 8% of listeners; the control had 10% of listeners."[71]

The table below is from McBride's WDT in *Web IV*.

[RESTRICTED]



E.3.c. Using Pandora's steering experiment to estimate R/R''

My model has two symmetric labels. However, the real world has three major labels and numerous small ones. "According to Music and Copyright, in 2014, the three largest major record companies were Universal Music, Sony Music and us [Warner], which collectively accounted for 74% of worldwide recorded music sales."[72] Therefore we need to make some assumptions on how to interpret Pandora's steering experiment in the context of a model with two labels. (Of course, this does not change the fact that Pandora is not Sirius XM and vice versa—just one of a number of reasons that this calculation is illustrative.)

The statistically significant estimates of percentage changes of listening hours in the -30% and +30% steering experiments range from [redacted] Suppose illustratively that the percentage change of listening hours would double if there are two symmetric labels and that revenue is proportional both to number of listening hours and number of subscribers. Then the range of percentage revenue change caused by plus or minus 30% steering can be translated to our

[71] *Id.* at 7.

[72] Warner Music Group, Annual Report (Form 10-K) (Dec. 10, 2015) at 12.

illustrative model with two symmetric labels as [redacted]

The 30% steering corresponds to $s_{-} = (1 - 30\%) * (1/2) = 0.35$ and the range of $\eta(0.35)$ is [redacted]

Using Eq. (27), we get

$$\gamma = \text{[redacted]} \tag{28}$$

E.4. Illustrative example of how one would calculate an equilibrium royalty rate from the model

Professor Willig's royalty rate is [redacted] Here I provide an example of how different the equilibrium royalty that is generated by this model would be from the royalty calculated by Professor Willig using the Nash bargaining model.

We make the following assumptions on input parameters:

- Per subscriber revenue is $\theta =$ [redacted][73]
- Per subscriber variable cost (excluding sound recording royalty) is [redacted][74] Therefore, $\hat{c}$ [redacted]
- Suppose $\alpha = 0.35$, *i.e.*, 35% of subscribers would leave Sirius XM if it would lose one of the two labels.[75]
- Suppose $c_0 = \$2.55$.[76]
- The two assumptions above yield that each label's walk-away opportunity cost per subscriber is $\alpha c_0/2 = \$0.45$, or [redacted] as a percentage of Sirius XM's per subscriber revenue.

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[73] Willig WDT at 30.

[74] *Id.*

[75] Professor Willig assumes that with no music content, approximately 70% Sirius XM subscribers would cease their subscription. *Id.* at 31. In my example, I assume half of these 70% would cease their subscription if Sirius XM has half of all the music content, which means 65% of subscribers would keep their subscription. This approach is similar to the one adopted by Professor Shapiro in his WRT. Shapiro WRT at C-6.

[76] Willig WDT at 26.

- [redacted] (Pandora's steering experiment as described above).

Using these parameters as input, Eq. (23) gives that [redacted] or the calculated per subscriber per month royalty is greater than [redacted] These royalty rates are 58% to 67% lower than Professor Willig's royalty rate.

Appendix F. Estimation of opportunity cost based on the results of the Hauser-revised Dhar survey

This appendix seeks to apply Professor Willig's methodology (to facilitate comparisons—as will be clear, I do not agree with his methodology) to recalculate his estimate of the monopoly record label's opportunity cost for licensing to Sirius XM, but using the results of the revised Dhar survey instead of the survey results on which Professor Willig relies (from Professor Dhar's original survey). In doing this, I have tried to follow Professor Willig's methodology as closely as possible.

The revised Dhar survey has 498 respondents in the Sirius XM paid subscription group. Of these 498 respondents, 13 said that they would continue to subscribe to Sirius XM at any price and were excluded from this opportunity cost calculation; 22 responded with "Don't know/unsure" and were assumed to follow the same distribution as the remaining 463 respondents, who said they would cancel their subscription if Sirius XM's price reached a certain level.[77] These 463 respondents were then asked what source of music they would switch to as a result of not listening to Sirius XM anymore.

Table 3 displays the options from which the 463 respondents in the survey could choose and the counts of respondents who chose these options. I also list in Table 3 the ratio by which the respondents would divert to each option and the creator compensation for each option. I explain the calculation of both below.[78]

[77] Professor Willig made the same assumption in treating "Don't know/Unsure." *See id.* at B-3.

[78] Whenever available, the creator compensation figures come from Table 2 in Willig WDT. The few options that Professor Willig does not cover in his Table 2 are: peer-to-peer file sharing or free download sites, borrow CDs, vinyl or tapes from friends or a library, other free services, don't know/unsure under free options, and other. With the exception of "Don't know/unsure" under free options, the other services not in Professor Willig's Table 2 have zero creator compensation.

Table 3. Choices for respondents who would cancel Sirius XM paid subscription [RESTRICTED]



I then calculate the monopoly record label's opportunity cost for licensing to Sirius XM in the following steps:

1. I drop the seven respondents who chose "Don't know/unsure" in calculating diversion ratios. This is equivalent to assuming that they would divert to the different options in the same way as the remaining 456 respondents, whose answers I use in calculating the diversion ratios. Professor Willig adopts the same approach when treating "Don't know/unsure."[79]
2. The diversion ratio for an option is calculated as the number of respondents who chose that option divided by 456.
3. I use the creator compensation per subscriber per month set forth in Table 2 of Professor Willig's WDT. Creator compensation for some of the sources of music vary by intensity of use, e.g., CDs or downloads and ad-supported music video sites. In applying these compensation estimates Professor Willig adjusts for intensity of use where he judges it appropriate. Without opining on the appropriate method for adjusting for intensity of use, I use Professor Willig's approach here to the extent possible.

[79] *See* Willig WDT, at B-3.

4. Many respondents indicated that they would choose multiple options. I generally try to match Professor Willig's approach of assuming equal intensity of use for all options chosen by a respondent; *i.e.*, I assume that the respondent's listening time would be divided equally among the alternative options he chose.[80] For example, if a respondent chose three options as substitutes for Sirius XM, I would assign a percentage of 33.3% to each of the three options (one could think of the percentage associated with each option as fraction of time devoted to it).

5. The overall intensity of use for an option is the average intensity for that option across all respondents who selected that option. For example, suppose there were four respondents who chose alternate CDs or music downloads and their intensities for this option were 100%, 50%, 75%, and 33.3% respectively. Then the overall intensity of use for alternate CDs or music downloads would be (100%+50%+75%+33.3%)/4 = 64.6%.

6. For each option, I calculate an intensity-adjusted creator compensation. Following the above example, the intensity-adjusted creator compensation for alternate CDs or music downloads would be [redacted]

7. I assume that the creator compensation for the option "Other" is zero.

8. Seven respondents who said they would switch to "Other free options" selected "Don't know/unsure" to answer which of these they would switch to. I assume that these respondents would follow the same distribution of choices as the respondents who chose the other options under this category. The creator compensation for "Don't know/unsure" under "Other free options" is, therefore, set equal to the average of compensation adjusted for intensity of use for the rest of free options.

9. Assuming that both the creator compensation for paid services and paid non-interactive services do not decrease for decreased intensity of use, the calculation described above generates an opportunity cost of $1.44. Assuming that only the creator compensation for paid interactive services do not decrease for decreased intensity of use, this calculation generates an opportunity cost of $1.35.[81]

Using the same methodology, I calculate the monopoly record label's opportunity cost of licensing to Sirius XM free trial subscribers. The opportunity cost is $0.91 if one assumes that the creator compensation for both paid interactive services and paid non-interactive services do not decrease

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[80] *See id.* at B-3 and B-4. A difference between my approach and Professor Willig's approach is that I treat the free options the same as the paid options in assigning intensity percentages. For example, if a respondent chose three options, alternate CD or music downloads plus two free options: ad-supported interactive services and borrow CDs, I would assign 33.3% to each of the three options, whereas Professor Willig would assign 50% to alternate CD or music downloads, and 25% to each of the free options. This difference does not have a large impact on the size of the opportunity cost.

[81] If I follow Professor Willig's way of assigning intensity percentages, the resulting opportunity costs would be $1.41 and $1.32 depending on whether paid non-interactive services are adjusted for intensity of use.

for decreased intensity of use and $0.83 if one assumes that only the creator compensation for paid interactive services does not decrease for decreased intensity of use.

Similarly, for paid interactive subscribers, the monopoly record label's opportunity cost is $2.45 if one assumes that the creator compensation for both paid interactive services and paid non-interactive services does not decrease for decreased intensity of use and is $2.15 if one assumes that only the creator compensation for paid interactive services does not decrease for decreased intensity of use.

Appendix G. Detailed summary of survey results

Table 4 below shows a more detailed summary of data from Table 1 presented in Section V.B. The striking differences between the Dhar survey results, as analyzed by Professor Willig, and the other two surveys persist when the broader categories presented in Table 1 are broken out in more detail.

"Alternate paid interactive service" under the Dhar survey has a much higher diversion ratio than under the Hauser modification of the Dhar survey and the Lenski survey.

Both the Hauser modification of the Dhar survey and the Lenski survey estimated the diversion ratio to AM/FM radio to be more than twice the original Dhar survey's estimate.

For the purpose of comparing the diversion ratios derived from the results of the Dhar, Hauser-revised Dhar, and Lenski surveys, I make an intensity adjustment to the revised Dhar survey results. I note, however, that when I calculate the opportunity cost in Table 2 above I do not make an intensity adjustment for the alternate paid interactive services because I assume that their royalties are not based on usage; this assumption will tend to increase the estimated opportunity cost.

Table 4: Detailed summary of diversion ratios from Dhar, Hauser-revised Dhar, and Lenski surveys

Respondent choice	Dhar survey (with Willig intensity adjustment)	Hauser-revised Dhar survey (with intensity adjustment)	Lenski survey
Alternate paid interactive service	31.0%	5.6%	
Existing paid interactive service		4.7%	7.8%
Ad-supported interactive service	2.6%	4.0%	
Alternate paid non-interactive service	15.2%	3.6%	
Existing paid non-interactive service		2.5%	14.3%
Ad-supported non-interactive service	4.2%	7.1%	
Existing CDs or music collection	6.9%	17.1%	
Alternate CDs or music downloads	10.4%	5.5%	23.1%
Borrow CDs, vinyl or tapes from friends or a library	1.5%	2.0%	
Ad-supported music video sites	2.2%	3.1%	
Cable/satellite music channels	2.4%	2.5%	
AM/FM radio	18.1%	37.0%	40.8%
Peer-to-peer file sharing or free download sites	0.9%	0.6%	
Podcasts			2.4%
Free streaming services		0.8%	
Don't know/unsure		0.9%	
Other	3.5%	1.3%	1.7%
None	1.1%	1.8%	10.0%
Total	**100%**	**100%**	**100%**

PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
The Library of Congress
Washington, D.C.

In the Matter of: Determination of Royalty Rates and Terms for Transmission of Sound Recordings by Satellite Radio and "Preexisting" Subscription Services (SDARS III)	Docket No. 16-CRB-0001 SP/PSSR (2018-2022)

Rebuttal Expert Report of John Hauser

February 17, 2017

Table of Contents

I. Qualification 1

II. Assignment 3

III. Summary of Opinions 3

A. Professor Dhar's Survey 3

B. Mr. Boedeker's Survey 5

IV. Overview of Professor Ravi Dhar's Survey....6

V. Professor Dhar's Pricing Questions Are Potentially Confusing and Likely to Elicit Biased Responses....8

A. Professor Dhar's Pricing Questions 8

B. The Pricing Questions in Professor Dhar's Survey Are Potentially Confusing 10

C. Professor Dhar's Pricing Questions Do Not Accurately Measure Respondents' Switch Prices and Likely Result in Lower Switch Prices than Would Be Observed in the Actual Marketplace 11

1. Professor Dhar's Choice of the Starting Price Is Arbitrary and His Pricing Questions Likely Suffer from a "Starting-Point Bias" That Leads to Reported Lower Switch Prices....11

2. Professor Dhar Does Not Rotate the Order in Which He Presents Prices and This Lack of Rotation Likely Results in Lower Switch Prices 12

3. Switching in Professor Dhar's Survey Likely Occurs at Lower Prices than Would Occur in the Actual Marketplace Because He Does Not Consider Switching Costs 13

VI. Survey Evidence Demonstrates That the Results of the Pricing Questions in the Dhar Survey Are Unreliable 14

A. The Results of the Pricing Questions in the Dhar Survey Cannot be Reproduced 14

B. A Further Replication of the Pricing Questions Confirms That Results in the Dhar Survey Cannot be Reproduced....16

C. Results from the Modified Dhar Survey Indicate that Professor Dhar's Pricing Questions May Not Accurately Measure Switch Prices 18

1. Many Respondents May Not Be Able to Answer Professor Dhar's Pricing Questions Accurately Because They Do Not Know How Much They Pay or Do Not Pay a Monthly Price....18

2. Several Respondents in the Modified Dhar Survey Switch At Prices Lower Than the Prices They Currently Pay Suggesting That Professor Dhar's Pricing Questions Lead to Biased Responses 19

VII. Professor Dhar's Switching Questions Elicit Biased Responses 20

A. Professor Dhar's Switching Questions 20

B. General Principles of Good Survey Design Relevant to Professor Dhar's Switching Questions 24

C. Professor Dhar's Switching Questions Focus Excessively on Paid and Streaming Music Services, Provide Incomplete Response Options, and Likely Suffer from Demand Artifacts 26

D. Analysis of Professor Dhar's Survey Data Suggests that Response Options in The Switching Questions May Have Led to Biased Responses 28

VIII. Modifications, Which Address Deficiencies in Professor Dhar's Switching Questions, Demonstrate That the Results of Professor Dhar's Switching Questions are Biased ..30

A. Modifications to Professor Dhar's Survey 31

B. Qualitative Pretesting of Modifications to Professor Dhar's Survey 33

C. Modified Switching Question 34

D. Survey Design and Administration 36

E. Results from the Modified Dhar Survey 39

1. Respondents in the Modified Dhar Survey Are Less Likely to Switch to Paid Music Services, and More Likely to Use Non-Paid Options Compared to the Dhar Survey, Confirming That Professor Dhar's Results Are Biased ... 39

2. Switching Behavior of Respondents with Multiple Paid Subscriptions in the Modified Dhar Survey Provides Further Evidence That Professor Dhar's Switching Questions are Poorly Framed 44

IX. Professor Dhar's Survey Is Not Incentive-Aligned, Contains Complex Terms of Art, and Uses an Under-Inclusive Sample 45

A. Professor Dhar's Survey Does Not Have an Incentive-Aligned Design 45

B. Professor Dhar's Survey Uses Complex Terms of Art when Asking Respondents Questions. Professor Dhar Fails to Adequately Verify Respondents' Comprehension of These Terms 46

C. Professor Dhar's Survey Sample is Under-Inclusive and May Be Biased toward More Switching to Music Streaming Services 48

X. Survey of Mr. Stefan Boedeker 51

A. Overview of Mr. Stefan Boedeker's Survey 51

B. Mr. Boedeker's Survey Elicits Internally Inconsistent Responses, Overvalues Music and Non-Music Content, and Does Not Follow General Principles of Good Survey Design 52

1. Mr. Boedeker's Discount Questions Elicit Internally Inconsistent Responses....53

2. Mr. Boedeker's Survey Likely Leads Respondents to Overvalue Music and Non-Music Programming in the Discount Questions....54

3. Mr. Boedeker's Survey Does Not Follow General Principles of Good Survey Design....55

XI. Conclusion....56

I. Qualification

1. I am the Kirin Professor of Marketing at the Massachusetts Institute of Technology ("MIT") Sloan School of Management. The principal focus of my research and teaching at MIT has been in the areas of marketing management, new product and service development, consumer satisfaction, marketing research, research methodology, and competitive marketing strategy. My research includes the evaluation of consumer decision-making, product and service development, customized communications designed around customers' cognitive styles, and determination of relative feature preferences and implicit product valuations. I have conducted research on consumer products and services in intellectual property and false advertising in multiple industries, including satellite and online radio and music services as well as online retail, fashion, and luxury goods. I have evaluated the factors that influence consumer purchasing decisions, consumer preferences, and consumer impressions in a variety of matters related to pricing, distribution, and advertising. I have published about the use of conjoint analysis and other methods to measure consumers' willingness to pay for and willingness to buy product and service features.

2. I have testified on matters related to my research, which includes retail products, technology products, digital services, and media services. My testimony history includes, but is not limited to, matters on behalf of Sirius XM, Comcast, Dish Network, TiVo, We: Woman's Entertainment, Louis Vuitton, Apple Inc., Microsoft, Johnson & Johnson, and Procter & Gamble. My testimony in these matters has addressed trademark infringement, patent infringement, and false advertising, among other issues. In addition, I have provided strategic market-research based consulting to numerous consumer products, technology/software, and durable goods manufacturers, including American Airlines, Johnson & Johnson, IBM, Procter & Gamble, Fidelity Investments, Pacific Gas & Electric Company, Ford Motor Company, General Motors, and Chrysler.

3. I have served as Editor-in-chief of *Marketing Science* and have held senior editorial positions with *Management Science*, the *Journal of Marketing Research*, and the *Journal of Product Innovation Management*. I have received numerous awards for excellence in research and teaching in marketing and was recognized by the American Marketing Association with the Paul D. Converse Award for "outstanding contributions to marketing

scholarship."[1] In 2001, I received the Parlin Award, which is a "preeminent national honor...[awarded for] outstanding leadership and sustained impact on advancing the evolving profession of marketing research over an extended period of time," according to the American Marketing Association.[2] In 2011, I received the Churchill Lifetime Achievement Award of the American Marketing Association for contributions to marketing research. In 2013, I was awarded the Buck Weaver Award by the Institute for Operations Research and the Management Sciences ("INFORMS") Society of Marketing Science ("ISMS"), for lifetime contributions to the theory and practice of marketing science.[3] I am a Fellow of INFORMS and an Inaugural Fellow of the ISMS. I am Past-President of the ISMS (a board position). I have also served as a Trustee of the Marketing Science Institute.

4. I am the co-author of two textbooks, *Design and Marketing of New Products* and *Essentials of New Product Management*, as well as more than 100 articles, papers, and books, including professional articles on various methods used to determine the importance of product (or service) features in consumer decision-making and to determine consumer response to changes in price and positioning of products or services. I have developed market research techniques that enable marketing researchers, experts, and managers to predict the value of individual features in both existing and hypothetical products and to predict how consumers will respond in the marketplace. These methods have been employed numerous times by academic researchers, as well as practitioners from major international corporations. Many of these papers have been recognized with national and international awards.[4]

5. My curriculum vitae is attached as Appendix A, and my testimony at deposition or trial within the last four years is attached as Appendix B.

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[1] "The Paul D. Converse Awards," *American Marketing Association*, https://archive.ama.org/Archive/Community/ARC/Pages/Career/Awards/Converse.aspx.
[2] "Charles Coolidge Parlin Marketing Research Award," *American Marketing Association*, https://www.ama.org/AboutAMA/Pages/Parlin-Award.aspx.
[3] "Buck Weaver Award," *INFORMS*, https://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Marketing-Science-Society/Buck-Weaver-Award.
[4] Olivier Toubia et al., "Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis," *Journal of Marketing Research* 41, no. 1, 2004, pp. 116–131; Michael Yee et al.,"Greedoid-Based Noncompensatory Inference," *Marketing Science* 26, no. 4, 2007, pp. 532–549; Olivier Toubia et al., "Fast Polyhedral Adaptive Conjoint Estimation," *Marketing Science* 22, no. 3, 2003, pp. 273–303; Ely Dahan and John R. Hauser, "The Virtual Customer," *Journal of Product Innovation Management* 19, no. 5, 2002, pp. 332–353; Olivier Toubia et al., "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," *Marketing Science* 26, no. 5, 2007, pp. 596–610.

II. Assignment

6. I was asked by counsel for Sirius XM Radio, Inc. ("Sirius XM") to review and provide an opinion on the Written Direct Testimony of Ravi Dhar and Written Direct Testimony of Stefan Boedeker in the matter of Determination of Royalty Rates and Terms for Transmission of Sound Recordings by Satellite Radio and "Preexisting" Subscription Services (SDARS III). In particular, I have been asked to assess the surveys conducted by Professor Dhar and Mr. Boedeker, and comment upon their survey methodology and results.

7. I am being compensated at my standard billing rate of $950 per hour. I have been assisted in this matter by staff of Cornerstone Research, who worked under my direction. I receive compensation from Cornerstone Research based on its collected staff billings for its support of me in this matter. Neither my compensation in this matter nor my compensation from Cornerstone Research is in any way contingent or based on the content of my opinion or the outcome of this or any other matter.

8. Part of the survey work for this investigation was performed by Applied Marketing Science ("AMS"), a market research and consulting firm. I am a member of the board at AMS. AMS's fees are not contingent or based on the content of my opinion or the outcome of this or any other matter.

9. In undertaking this assignment, I utilized my extensive expertise in developing, testing, and analyzing surveys, as well as my experience in interpreting qualitative and quantitative research about consumer attitudes, intentions, and behavior. A list of materials I relied upon to date in connection with this assignment is provided in Appendix C. To the extent that I review additional information after this report is filed, I will supplement this list.

III. Summary of Opinions

A. Professor Dhar's Survey

10. Professor Ravi Dhar's survey is unreliable because it elicits biased responses. The questions in Professor Dhar's survey that attempt to measure the monthly price at which a respondent would switch from his or her current subscription are potentially confusing and likely to underestimate this price. Professor Dhar uses an "iterative bidding" type approach in these questions—an approach that was virtually abandoned more than a decade ago after it

was shown to suffer from biases that lower the price at which respondents would switch. The bias in Professor Dhar's survey is likely accentuated because he does not provide proper context to respondents about the costs involved in switching. Because consumers may not fully account for the switching costs of their decisions in Professor Dhar's survey, they may respond that they would switch at lower prices than they would in reality.

11. Further, Professor Dhar's questions about the price at which respondents would switch may be confusing because many consumers do not know how much they pay, and therefore, may not know how to accurately answer the questions about monthly prices. These questions also do not account for the fact that even among the respondents who know how much they pay, the vast majority of them do not pay a monthly price. Such respondents may have difficulty calculating their effective monthly price, and therefore, their responses may be prone to error.

12. Professor Dhar's survey is unreliable because it is not a proper scientific study. One requirement for a proper scientific study is that it should be replicable or reproducible. I attempted to reproduce a critical aspect of Professor Dhar's study—in particular, the set of questions in which he asks respondents about the price at which they would switch out of their subscription. I did so (1) using the same panel that Professor Dhar used and (2) using a second high-quality panel that also provides a representative sample of the US population. In each case, Professor Dhar's survey could not be replicated—the answers to his key questions were statistically significantly different from those obtained by Professor Dhar himself (and statistically significantly different from one another). Because Professor Dhar's survey does not meet the standard of replicability, it cannot be relied upon.

13. Professor Dhar's questions about the alternatives to which respondents would switch also elicit biased responses. These questions focus excessively on paid music services and do not provide a comprehensive list of options to which respondents might switch. They likely also suffer from demand artifacts. For all these reasons, respondents are more likely to choose paid music options in Professor Dhar's survey than they would in the actual marketplace.

14. Professor Dhar's survey initially only gave respondents the option to switch to a new paid service or not to switch to a new paid service; this incomplete set of available options increases the likelihood that respondents would choose paid music options, likely overstating the number of respondents who would actually switch to paid music options. In order to test

whether Professor Dhar's results for these questions are biased, I modified one aspect of Professor Dhar's survey—the question about the music options to which respondents would switch—while keeping all other aspects unchanged, and ran his survey. In my modification, I simply made available to respondents a more comprehensive set of options to which they could switch. My modifications produced statistically significantly different results, demonstrating that Professor Dhar's results are biased and cannot be relied upon.

15. Professor Dhar's survey suffers from a number of issues that may negatively impact the reliability of his results. Professor Dhar's survey does not provide appropriate incentives to respondents to act as they would in the actual marketplace. Without such incentives, respondents may choose responses that may not resemble their choices in reality.

16. Professor Dhar's survey uses complex terms of art that respondents may not understand, thus affecting the quality of his results. The extent and impact of respondents' potential misunderstanding is not known, as he also does not conduct adequate tests of respondent comprehension. If respondents completed Professor Dhar's survey without an adequate understanding of these terms, their responses would be unreliable.

17. Professor Dhar's survey sample is under-inclusive and is not representative of the population he intends to study. In particular, by surveying only Sirius XM Select subscribers, Professor Dhar disqualifies the majority (73%) of paid Sirius XM subscribers, most of who subscribe to more expensive packages than those subscribed to by respondents in Professor Dhar's sample. Because his population was under-inclusive, Professor Dhar's survey sample cannot be relied upon to predict what choices Sirius XM subscribers would actually make.

B. Mr. Boedeker's Survey

18. The majority of respondents in Mr. Stefan Boedeker's survey gave internally inconsistent responses, casting serious doubt on the validity and reliability of his survey. For example, 87% of respondents who said that they would continue subscribing to Sirius XM at their current subscription price even if music programming were no longer offered, also indicated that they would need a discount to continue subscribing. Mr. Boedeker also does not provide respondents the opportunity to consider the variety of non-programming attributes of satellite radio that consumers may value, but focuses his questions solely on music and non-music programming, thus biasing the valuation of music and non-music

programming upward. In short, Mr. Boedeker's survey does not follow the general principles of good survey design, and is therefore, unlikely to yield any reliable results.

IV. Overview of Professor Ravi Dhar's Survey

19. Professor Ravi Dhar administers and interprets an online survey (the "Dhar Survey"), targeting three groups of respondents who are users of various music services:[5]

a. **Sirius XM Satellite Radio**. This group includes individuals with a subscription to the paid service Sirius XM Select or the free Sirius XM Trial.[6]

b. **On-Demand Music Streaming Services**. This group includes individuals with subscriptions to either the paid services Apple Music or Spotify Premium, or free ad-supported Spotify.

c. **Not-On-Demand Music Streaming Services**. This group includes individuals with subscriptions to the paid service Pandora One or users of free ad-supported Pandora.

20. In the Dhar Survey, a survey "cell" corresponds to one of the seven music services in this survey (i.e., Sirius XM Select, Apple Music, Spotify Premium, Pandora One, free ad-supported Pandora, free ad-supported Spotify, and Sirius XM Trial). Based on initial screening questions, respondents are assigned to one cell, and only asked questions pertaining to the music service represented by that cell.[7] For example, if a respondent has both Sirius XM Select and Apple Music, he or she is assigned to either the Sirius XM Select cell or the Apple Music cell, and only asked questions about the corresponding service.

21. Professor Dhar sets cell quotas, i.e., a maximum number of respondents that can be assigned to any one cell.[8] If the quota is met for a given cell, an individual with multiple subscriptions (including one which corresponds to that cell) is randomly assigned to another open cell for which he or she qualifies.[9] For example, suppose the respondent has subscriptions to Sirius XM Select, Apple Music, and uses free ad-supported Pandora, and

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[5] Written Direct Testimony of Ravi Dhar, October 18, 2016 ("Dhar Report"),¶ 32.
[6] As I discuss later, subscribers to Sirius XM Select or users of Sirius XM Trial are only a part of the entire Sirius XM user base. A large proportion of the Sirius XM user base is comprised of subscribers to packages such as All Access and Mostly Music, which are not included in Professor Dhar's survey.
[7] Dhar Report, footnote 20.
[8] Dhar Report, Appendix D ("Dhar Survey"), p. 59.
[9] Dhar Survey, Question 150.

suppose that the quota has already been met for Apple Music. In this case, the respondent would be randomly assigned to either the Sirius XM Select cell or the free ad-supported Pandora cell.

22. After respondents are assigned to a survey cell, respondents are asked to read descriptions of three types of music services:

> ***Satellite Radio (Sirius XM)*** *which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.*
>
> ***On-Demand*** *music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service.* ***On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others.***
>
> ***Not-On-Demand*** *music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a preprogrammed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist).* ***Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.***[10]

Respondents are asked whether they understand the descriptions of the three services and are permitted to proceed with the survey only if they answer "Yes."[11] The rest of the survey is specific to the cell to which the respondent is assigned.

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[10] Dhar Survey, Question 200 (emphasis in original).
[11] Dhar Survey, Question 201.

23. Respondents are asked two sets of questions. The first set (henceforth called the "Pricing Questions"), described in Section V.A, asks respondents whether they would continue subscribing to their music service across a sequence of hypothetical prices. The second set (henceforth called the "Switching Questions"), described in Section VII.A, asks respondents who choose to cancel their subscriptions in the Pricing Questions to indicate to which music options they might switch.[12]

24. In what follows, I will refer to the questions that Professor Dhar asks respondents in the Sirius XM Select, Sirius XM Trial, and Paid On-Demand cells as the "Sirius XM Select Survey," the "Sirius XM Trial Survey," and the "Paid On-Demand Survey," respectively. The Dhar Survey refers to these three surveys taken together, in addition to the surveys Professor Dhar administers to Paid Not-On-Demand users and users of free ad-supported music streaming services.

V. Professor Dhar's Pricing Questions Are Potentially Confusing and Likely to Elicit Biased Responses

A. Professor Dhar's Pricing Questions

25. For respondents belonging to Sirius XM Select, Sirius XM Trial, Apple Music, Spotify Premium, or Pandora One cells, Professor Dhar sequentially presents increasing hypothetical monthly prices for the service, ranging from 30% below what Professor Dhar describes as "…the standard [monthly] price of [the] service" to 30% above this "standard price."[13,14] At each price, Professor Dhar asks respondents whether they would continue their subscription to the service, cancel their subscription, or if they are unsure.[15] Respondents taking the Sirius XM Select Survey are shown the following Pricing Questions:

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[12] To be precise, Switching Questions refer to Questions 210, 310, and 510 of the Dhar Survey.
[13] Dhar Survey, Questions 203–203.6; Dhar Report, ¶¶ 64, 71. *See* Dhar Report, ¶ 56, 64, 71 for price ranges.
[14] For respondents belonging to ad-supported Spotify or Pandora cells, Professor Dhar only presents respondents with a sequence of increasing discounts on the monthly subscription price of the paid version of the service (10% 20%, and 30%). At each discount level, Professor Dhar asks respondents whether they would subscribe to the paid service, continue using only the free service, or are unsure. The survey terminates for these respondents after they elect to subscribe to the paid service at a given discount level, or when all discount levels have been exhausted.
[15] Dhar Survey, Questions 203–203.6.

> *If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE…FROM CHART…]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…? **Please select one answer.***
>
> *1: Continue to subscribe to Sirius XM Satellite Radio…*
> *2: Cancel your subscription to Sirius XM Satellite Radio…*
> *3: Don't know/unsure…*[16]

26. Respondents taking the On-Demand Survey are asked similar questions, except that the prices they are shown correspond to a "standard price" of $9.99/month. For Sirius XM Trial users, Professor Dhar presents increasing hypothetical monthly prices that represent the amount respondents would be charged for Sirius XM Select at the end of their trial subscription.[17] Therefore, respondents taking the Sirius XM Trial Survey are asked a slightly different question, which is based on prices displayed in Table 3 of Professor Dhar's report.

> *At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio**, at the price of **[INSERT Price…FROM CHART…]** per month, would you or would you not subscribe to the service? **Please select one answer.***
>
> *1: Yes, I would subscribe to the service…*
> *2: No, I would <u>not</u> subscribe to the service…*
> *3: Don't know/unsure…*[18]

27. As long as a respondent chooses to continue his or her subscription (chooses to subscribe in the case of a Sirius XM Trial user) or reports that he or she is unsure, Professor Dhar presents the respondent with increasing prices, up to a predetermined price ceiling.[19]

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[16] Dhar Survey, Questions 203–203.6
[17] Dhar Survey, Questions 503–503.6.
[18] Dhar Survey, Questions 503–503.6
[19] Dhar Survey, Questions 203–203.6; 503–503.6; 303–303.6.

The price at which a respondent chooses to switch out of his or her current subscription will henceforth be referred to as the respondent's "switch price."[20]

B. The Pricing Questions in Professor Dhar's Survey Are Potentially Confusing

28. For the respondents (who have a paid subscription) to answer the Pricing Questions accurately, they must know how much they are paying for their subscription while taking Professor Dhar's survey. Without that knowledge, they may find Professor Dhar's question confusing and their responses to this question may be unreliable. I demonstrate later in this report that many subscribers to Sirius XM Select and Paid On-Demand services either do not know or could not readily recall how much they pay on a monthly basis.

29. Professor Dhar ignores the fact that many subscribers (or prospective subscribers) to Sirius XM *are not* on monthly plans. In 2015, only [redacted] of Sirius XM subscribers were billed monthly whereas [redacted] were billed annually.[21] Sirius XM also offers quarterly, two-year, and three-year payment plans, and, in the past, offered lifetime plans.[22] It is unclear whether respondents who are on such plans would have been able to accurately calculate their effective monthly subscription price while taking Professor Dhar's survey. Academic literature has documented the difficulties individuals face with mathematical computation in general.[23] If respondents were not able to calculate how much they pay on a monthly basis, the monthly subscription prices offered in Professor Dhar's survey might have been confusing to them, and they would not have been able to answer Professor Dhar's Pricing Questions correctly.[24] Respondents who incorrectly calculated a monthly subscription price

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[20] The term "switch price" is used by Professor Dhar in his survey questionnaire. *See* Dhar Survey, Questions 210, 310, and 510. This term is different from the term "Switching Questions" which refers to the specific questions that ask respondents to choose the music options to which they might switch.

[21] SoundExchange Exhibit 37, Sirius XM "2015 Customer Experience Survey Report," SXM_DIR_00023890–4062 at 3904.

[22] "Save with Longer Plans – Sirius Select," *Sirius XM*, https://www.siriusxm.com/packages/siriusselect.

[23] Haipeng (Allan) Chen and Akshay R. Rao, "When Two Plus Two is Not Equal to Four: Errors in Processing Multiple Percentage Changes," *Journal of Consumer Research* 34, no. 3, 2007, pp. 327–340, at p. 328.

[24] Further, some respondents have lifetime subscriptions to Sirius XM Select, which means that they pay a single upfront fee and have access to Sirius XM Select for life, without any additional payment. When responding to Professor Dhar's Pricing Questions, it is not clear how these lifetime subscribers would have conceptualized their effective monthly price. Moreover, lifetime subscribers should not have been eligible to take the Sirius XM survey at all, because they have no real incentive to 'switch out' of Sirius XM Select as a result of an increase in the monthly price of the service. The responses of lifetime subscribers may be meaningless in the context of Professor Dhar's survey.

below their actual pro-rated monthly subscription price may have opted to switch out at lower prices in the Dhar Survey as compared to the prices they would switch out in reality. Because this question is potentially confusing to a large percentage of respondents, it is likely to be unreliable. The added noise is likely to make the survey answers difficult to reproduce.

C. Professor Dhar's Pricing Questions Do Not Accurately Measure Respondents' Switch Prices and Likely Result in Lower Switch Prices than Would Be Observed in the Actual Marketplace

1. Professor Dhar's Choice of the Starting Price Is Arbitrary and His Pricing Questions Likely Suffer from a "Starting-Point Bias" That Leads to Reported Lower Switch Prices

30. Professor Dhar sets the starting price presented to respondents at 30% below what he calls the "standard price" of the service in question.[25] However, the choice of this starting price seems arbitrary. Professor Dhar does not provide justification for *why* he chooses a starting price 30% below the "standard price," and not some other starting price.

31. Professor Dhar's choice of starting price is not innocuous. Academic literature has found that respondents tend to "…make estimates by starting from an initial value that is adjusted to yield the final answer,"[26] and "…different starting points yield different estimates, *which are biased toward the initial values.*"[27]

32. This is confirmed by the findings from the academic literature on "iterative bidding" and "bidding games."[28] In a bidding game, the interviewer "…posit[s] an initial bid (starting bid) to a respondent. If the respondent is willing to pay the initial bid, the interviewer revises the bid upward until a negative response is obtained."[29] Academic research has found that a bidding game is subject to a "starting-point bias."[30] Boyle, et al. (1985) found that "…the

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[25] Dhar Report, ¶13.
[26] Amos Tversky and Daniel Kahneman, "Judgment Under Uncertainty: Heuristics and Biases," *Science* 185, no 4157, 1974, pp. 1124–1131 at p. 1128.
[27] Amos Tversky and Daniel Kahneman, "Judgment Under Uncertainty: Heuristics and Biases," *Science* 185, no 4157, 1974, pp. 1124–1131 at p. 1128 (emphasis added). *See also* Itamar Simonson and Aimee Drolet, "Anchoring Effects on Consumers' Willingness-to-Pay and Willingness-to-Accept," *Journal of Consumer Research* 31, no 3, pp. 681–690 at p. 682.
[28] John C. Whitehead, "Incentive Incompatibility and Starting-Point Bias in Iterative Valuation Questions," *Land Economics* 78, no. 2, 2002, pp. 285–297 at p. 286; Kevin J. Boyle et al., "Starting Point Bias in Contingent Valuation Bidding Games," *Land Economics* 61, no. 2, 1985, pp. 188–194.
[29] Kevin J. Boyle et al., "Starting Point Bias in Contingent Valuation Bidding Games," *Land Economics* 61, no. 2, 1985, pp. 188–194 at p. 188.
[30] John C. Whitehead, "Incentive Incompatibility and Starting-Point Bias in Iterative Valuation Questions," *Land Economics* 78, no. 2, 2002, pp. 285–297 at p. 286.

initial bid may suggest an appropriate range of final bids to the respondent."[31] Therefore, the initial bid can lower the respondent's willingness to pay, and have an impact on the final result. Whitehead (2002) notes that this method of eliciting a respondent's willingness to pay "...was virtually abandoned over a decade ago with the detection of starting-point bias."[32]

33. Professor Dhar's Pricing Questions are similar to a "bidding game." His Pricing Questions likely suffer from starting-point bias, and lower the respondents' willingness to pay. This, in turn, likely lowers the prices at which respondents would switch out of their current music service. If Professor Dhar's Pricing Questions were properly formulated, it is likely that respondents would have switched out of their music services at higher prices.

2. Professor Dhar Does Not Rotate the Order in Which He Presents Prices and This Lack of Rotation Likely Results in Lower Switch Prices

34. Academic literature suggests that one way to mitigate the effects of starting point bias is to vary the starting points across respondents.[33] This may be achieved by rotating the order in which prices are presented. Rotation of the order of prices is also consistent with good survey design. As Shari Diamond points out in her guide to survey research in litigation: "[t]o control for order effects, the order of the questions and the order of the response choices in a survey should be rotated."[34]

35. However, Professor Dhar does not rotate the order in which he provides prices across respondents—he provides prices in ascending order to all respondents. If he had presented prices in descending order to some respondents, and asked whether or not they would opt *to subscribe* at each price point, the literature on starting point bias would suggest that the resulting switch prices may have been *higher* than those which Professor Dhar obtains in his survey.[35] Hence, by not rotating the order in which prices are presented, Professor Dhar may

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[31] Kevin J. Boyle et al., "Starting Point Bias in Contingent Valuation Bidding Games," *Land Economics* 61, no. 2, 1985, pp. 188–194 at p. 189.
[32] John C. Whitehead, "Incentive Incompatibility and Starting-Point Bias in Iterative Valuation Questions," *Land Economics* 78, no. 2, 2002, pp. 285–297 at p. 286.
[33] Robert Cameron Mitchell, and Richard T. Carson, *Using Surveys to Value Public Goods: The CVM Approach* (Washington, DC: Resources for the Future, 1989), p. 7.
[34] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at p. 396.
[35] When prices are presented in descending order, and the respondent ultimately chooses *to subscribe* at a given price point, the switch price would correspond to the last price at which the respondent remains unsubscribed.

be systematically underestimating the prices at which respondents would switch out of their music service.

3. Switching in Professor Dhar's Survey Likely Occurs at Lower Prices than Would Occur in the Actual Marketplace Because He Does Not Consider Switching Costs

36. Consumers in the actual marketplace often face switching costs when moving between products, brands, or services. These switching costs can include, among other things, transaction costs when switching between similar brands or learning costs associated with use of a new product.[36] Switching costs can also give rise to brand loyalty, and increase the price that consumers are willing to pay for products, brands, and services.[37]

37. Professor Dhar's survey does not make respondents aware of the switching costs they may encounter in the actual marketplace. Therefore, switching costs may not be "available" to respondents, i.e., they may not be readily brought to mind, while answering Professor Dhar's questions. As a result, respondents may be willing to switch out of their music service at a lower price in the survey than they would in reality, where switching costs are likely to be more salient to consumers.

38. For example, consider a respondent who cancels his or her subscription to Sirius XM Select at $17.49/month, and opts to switch to an On-Demand service at $9.99/month in Professor Dhar's survey. If he or she primarily listens to music on Sirius XM in the car, switching from Sirius XM to Spotify may require the respondent to have access to a smart device with Spotify, which he or she may need to connect to the car's entertainment system through a cable or Bluetooth, as well as incur additional data costs for using the On-Demand service.

39. There may also be psychological and hassle costs associated with switching. A respondent switching to a new music service may experience the hassle cost of familiarizing himself or herself with the new service. Market research shows that [redacted] of Sirius XM's

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[36] Paul Klemperer, "Markets with Consumer Switching Costs," *Quarterly Journal of Economics* 102, no. 2, 1987, pp. 375–394, at pp. 375–376.
[37] Paul Klemperer, "Markets with Consumer Switching Costs," *Quarterly Journal of Economics* 102, no. 2, 1987, pp. 375–394, at p. 376.

listeners are aged 55 or above.[38] It is possible that some of these consumers may not be familiar with relatively newer music services. For example, a 55-year old Sirius XM user not familiar with Spotify may need to learn how to find the music he or she likes and create playlists on Spotify. While taking Professor Dhar's survey, the respondent may not account for these costs associated with switching to a different music service, and may be willing to switch out of Sirius XM at a lower price than he or she would in the real world. Therefore, the switching prices obtained by Professor Dhar's survey may be artificially lower than those at which consumers would switch in the actual marketplace.

VI. Survey Evidence Demonstrates That the Results of the Pricing Questions in the Dhar Survey Are Unreliable

A. The Results of the Pricing Questions in the Dhar Survey Cannot be Reproduced

40. A requirement of any reliable, scientific study is that it be replicable or reproducible.[39] Results from a study may not be reproducible due to poor study design, inappropriate analysis, insufficient details to replicate the study, or unreliable research practices.[40] Given that Professor Dhar asserts that his survey results are supported with a "high degree of scientific certainty," one should be able to reproduce the results of his Pricing Questions.[41] However, I find that the results from Professor Dhar's Pricing Questions cannot be reproduced, and therefore, they are unreliable.[42]

41. In an attempt to reproduce the results of Professor Dhar's Pricing Questions, I ran an abridged version of the Dhar Survey on a modest sample of Sirius XM Select respondents, employing the same panel used by Professor Dhar, i.e., the panel maintained by Survey Sampling, Inc. (henceforth "SSI").[43] This survey will henceforth be referred to as the "Dhar

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[38] Sirius XM Radio Survey, Edison Research, May 2015. SoundExchange Exhibit 34, SXM_DIR_00023538–610 at 541.
[39] Alexander A. Arts et al., "Estimating the Reproducibility of Psychological Science," *Science* 349, no. 6251, 2015, pp. aac4716-1–8, at pp. 943, 4716-1.
[40] Reproducibility and Reliability of Biomedical Research: Improving Research Practice, Symposium Report, October 2015, p. 5; McNutt M., "Reproducibility," *Science*, 343 (6168), 2014, p. 229.
[41] Dhar Report, ¶17.
[42] I attempted to reproduce the results of Professor Dhar's Pricing Questions based on the information available in his expert report.
[43] Dhar Report, ¶35.

Reproduction." The Dhar Reproduction includes all of the questions in the Dhar Survey up until the Switching Question (i.e. the screening questions and the Pricing Questions). That is, after respondents see the Pricing Questions in the Dhar Reproduction, the survey terminates. Hence, it is identical to the Dhar Survey up until this point.[44]

42. The responses to the survey were recorded between February 7 and 8, 2017. A total of 117 respondents completed the Dhar Reproduction. As Professor Dhar does in his survey, I excluded respondents who took more than 20 minutes or less than one minute to complete the survey. There were four respondents who took more than 20 minutes and no respondent completed the survey in less than one minute. The response rate for the survey was 1.3%.[45]

43. In Figure 1, I compare the proportion of respondents who selected each of the seven switch prices (between $11.49 and $20.49), the option to "Continue at Highest Price," or the "Don't know/unsure" option in the Dhar Reproduction and the Dhar Survey.[46] I find that the results from two surveys across these nine categories differ considerably. For instance, the proportion of respondents who chose to continue with their current paid Sirius XM Select subscription at the highest price of $20.49 is only 9% in the Dhar Reproduction compared to 18% in the Dhar Survey. The responses to the Pricing Questions in the two surveys are statistically significantly different. Based on a chi-squared test of proportions across the nine categories in Figure 1, I find that the responses to the Pricing Questions are marginally statistically significantly different at the 10% level (p value = 0.08) between the Dhar Reproduction and the Dhar Survey. That is, when I ask the same Pricing Questions, I get statistically significantly different answers.[47]

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[44] The only change I made was to add an additional screening question in the Dhar Reproduction in order to eliminate respondents who had taken a survey for a music service or radio in the last six months to exclude any respondents who may have already taken Professor Dhar's or Mr. Boedeker's survey.

[45] In order to obtain a sample comparable to Professor Dhar's sample, I set demographic quotas (on age, gender, and geographic region) to match the demographics of Professor Dhar's sample. In other words, the sample for the Dhar Reproduction was obtained such that the demographics of the sample were similar to the demographics of Professor Dhar's final sample. *See* Dhar Reproduction; SoundX_000154716. The Dhar Reproduction questionnaire is provided as Appendix D, screenshots of the Dhar Reproduction are presented as Appendix E, the text of the invitation email sent to the panelists is provided as Appendix F, and screening statistics for the Dhar Reproduction are provided as Appendix G.

[46] The option "Continue at Highest Price" tallies respondents who opted to continue listening to their music subscription at the highest switch price offered in the Pricing Questions. The option "Don't know/unsure" tallies respondents who selected the "Don't know/unsure" option when asked if they would switch out of their current music subscription at the highest switch price offered in the Pricing Questions. *See* Figure 1; Dhar Survey, Questions 203.6, 303.6, 503.6.

[47] I adopt here the suggested wording from the *Journal of Consumer Research* Style sheet. "Significant: $p < 0.05$. Marginally significant: p is between 0.05 and 0.10 (e.g., $p = 0.06$). Not significant $p > 0.10$." *See* http://www.ejcr.org/newstylesheet.pdf. Normally, when a researcher finds a result to be marginally significant, the researcher seeks a further test of the hypothesis, which is exactly what I did with a second attempted

44. I perform another statistical test in which I group together all respondents who chose to switch across the seven switch prices. That is, instead of the nine categories I describe above, I compare proportions of respondents across three categories–respondents who chose to switch at any price, respondents who chose to continue at the highest price, and respondents who chose "don't know." A chi-squared test shows that the differences in the proportions in these three categories are statistically significantly different at the 5% level (*p* value = 0.05) between the Dhar Reproduction and the Dhar Survey. Taken together, results from these statistical tests provide evidence that responses to the Pricing Questions in Dhar Reproduction are statistically significantly different from those in the Dhar Survey.

B. A Further Replication of the Pricing Questions Confirms That Results in the Dhar Survey Cannot be Reproduced

45. I conducted an additional attempt at replication of Professor Dhar's *full* survey in which I made modifications to Professor Dhar's Switching Questions (hereafter referred to as the "Modified Dhar Survey"). The exact details of this survey, and the modifications I made, are discussed in Section VIII. It is important to note that up until the Switching Questions, the Modified Dhar Survey is identical to both the Dhar Survey and the Dhar Reproduction.[48] In other words, the Modified Dhar Survey attempts to replicate all the questions in the Dhar Survey leading up to the Switching Questions, including the Pricing Questions. I find that the Pricing Questions of the Modified Dhar Survey yield results that are, once again, different from those obtained in the Dhar Survey and are also different from those obtained in the Dhar Reproduction.

46. I first compare the proportion of respondents who selected each of the seven switch prices (between $11.49 and $20.49), the option to "Continue at Highest price," or the "Don't

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reproduction of Professor Dhar's pricing question (the temporal order does not change the conclusions). The researcher might also perform additional statistical tests, which is what I do in the next paragraph. To be reliable the study should pass all reproductions and all reasonable statistical tests. Because Professor Dhar's Pricing Questions fail the additional test and the second reproduction, the overall evidence indicates that we cannot accept Professor Dhar's survey as reliable.

[48] In the Modified Dhar Survey, up until the Switching Questions are asked, the only change I made was to add an additional screening question in order to eliminate respondents who had taken a survey for a music service or radio in the last six months to exclude any respondents who may have already taken Professor Dhar's or Mr. Boedeker's survey. I also note that the Modified Dhar Survey was administered using a different survey panel, the details of which I discuss in Section VIII.

know/unsure" option in the Modified Dhar Survey and the Dhar Survey.[49] Figure 2 shows that the proportions across these nine categories differ between the Modified Dhar Survey and the Dhar Survey. Based on a chi-squared test of proportions across these nine categories, I find that the results of the Pricing Questions in the Modified Dhar Survey and the Dhar Survey are statistically significantly different at the 1% level (p value < 0.01) for both the Sirius XM Select and Trial groups.

47. I perform another statistical test in which I group together all respondents who chose to switch across the seven switch prices. That is, instead of the nine categories I describe above, I compare proportions of respondents across three categories–respondents who chose to switch at any price, respondents who chose to continue at the highest price, and respondents who chose "don't know." A chi-squared test shows that the differences in the proportions in these three categories are statistically significantly different at the 1% level (p value < 0.01) between the Modified Dhar Survey and the Dhar Survey for both the Sirius XM Select and Trial groups.

48. Not only are results of the Pricing Questions in the Modified Dhar Survey different from the results of the Dhar Survey, they are also different from the results of the Dhar Reproduction.[50] Chi-squared tests of proportions across both the nine categories and the three categories described above show that the results of the Pricing Questions are statistically significantly different at the 1% level (p value < 0.01) between the Modified Dhar Survey and the Dhar Reproduction.

49. Another measure that can be used to assess the differences in responses across the three surveys is the root mean squared ("RMS") distance. The advantage of RMS distance is that it can be used to determine whether or not the results of the Pricing Questions in the Dhar Reproduction are closer to the results in the Dhar Survey than the results in the Modified Dhar Survey.[51] To calculate the RMS distance, I sum the squared difference between the

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[49] The option "Continue at Highest Price" tallies respondents who opted to continue listening to their music subscription at the highest switch price offered in the Pricing Questions. The option "Don't know/unsure" tallies respondents who selected the "Don't know/unsure" option when asked if they would switch out of their current music subscription at the highest switch price offered in the Pricing Questions. *See* Figure 2; Dhar Survey, Questions 203.6, 303.6, 503.6.

[50] *See* Figure 3.

[51] Formal statistical tests compare two surveys to one another and do so rigorously. However, the statistical tests cannot be used to say that one set of survey results are closer together or further apart than another set of survey results.

proportion of respondents selecting each of the nine response categories discussed above (also presented in Figure 3) for each pair of the three surveys. I then take the square root of the sum. I find that the RMS distance between responses is substantial for all three pairs (0.129 for Dhar Reproduction vs. Dhar Survey, 0.137 for Dhar Reproduction vs. Modified Dhar Survey, 0.179 for Modified Dhar Survey vs. Dhar Survey). The RMS comparison indicates that the results of the Pricing Questions in the Dhar Reproduction, Modified Dhar Survey, and the Dhar Survey are all different from one another. If the Dhar Survey were properly designed and reproducible, then I would expect the responses to the Pricing Questions to be similar across the three surveys.

50. The empirical finding that the responses of the Pricing Questions in the Modified Dhar Survey, the Dhar Survey, and the Dhar Reproduction are all significantly different from one another provides evidence that Professor Dhar's Pricing Questions are not reproducible. This lack of reproducibility demonstrates that Professor Dhar's survey has serious flaws that render the results from the Pricing Questions unreliable.

C. Results from the Modified Dhar Survey Indicate that Professor Dhar's Pricing Questions May Not Accurately Measure Switch Prices

1. Many Respondents May Not Be Able to Answer Professor Dhar's Pricing Questions Accurately Because They Do Not Know How Much They Pay or Do Not Pay a Monthly Price

51. By comparing the answers to Professor Dhar's Pricing Questions in three different samples, each of which is screened from a representative sample of the US population, I have demonstrated that Professor Dhar's Pricing Questions are unreliable. One reason Professor Dhar's questions are unreliable is that respondents may not have been able to recall or calculate what they pay now for a subscription. This lack of recall and difficulty calculating would add noise to the responses above and beyond any sampling variation.

52. At the end of the Modified Dhar Survey, respondents are asked whether or not they know exactly how much they pay for their subscriptions.[52] Of the 498 Sirius XM Select respondents, 127 (26%) indicated that they *do not* know how much they pay for their service subscription, and of the 500 Paid On-Demand respondents (Apple Music and Spotify

[52] *See* Section VIII.A for details regarding additional questions asked at the end of the Modified Dhar Survey.

Premium users), 97 (19%) indicated that they *do not* know how much they pay.[53] Respondents who do not know what they currently pay would have difficulty answering Professor Dhar's Pricing Questions accurately and their responses would be especially prone to the biases that I cited earlier in this report.

53. Even the respondents who knew how much they pay while taking the Dhar Survey, may not pay on a monthly basis. Another question at the end of the Modified Dhar Survey asks Sirius XM Select respondents how frequently they pay for their subscription.[54] The results of the Modified Dhar Survey show that a low percentage of respondents are monthly subscribers to Sirius XM Select. Of the 498 respondents, only 83 (17%) are monthly subscribers.[55] Most respondents (252 out of 498, or 51%) are annual subscribers. Finally, of the 498 respondents, 8 (2%) are lifetime subscribers.[56] As discussed in Section V.B, respondents who do not pay on a monthly basis are unlikely to have been able to answer Professor Dhar's Pricing Questions accurately because they may have had difficulty calculating or conceptualizing their effective monthly price.[57]

2. Several Respondents in the Modified Dhar Survey Switch At Prices Lower Than the Prices They Currently Pay Suggesting That Professor Dhar's Pricing Questions Lead to Biased Responses

54. The additional data collected at the end of the Modified Dhar Survey enable me to examine the consistency of responses to Professor Dhar's Pricing Questions. Of the 498 Sirius XM Select respondents in the Modified Dhar Survey, 293 chose to switch out at some price in the Pricing Questions *and* at the end of the survey indicated the price that they currently pay for their subscription (in Question 210.5). Of these 293 individuals, 37 (13%) chose switch prices *below* their reported subscription price.[58] In the Modified Dhar Survey for On-Demand Services, of the 500 respondents, 307 chose to switch out at some price in the Pricing Questions *and* indicated the price that they currently pay for their subscription (in

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[53] *See* Figure 4.
[54] *See* Section VIII.A for details regarding additional questions asked at the end of the Modified Dhar Survey.
[55] *See* Figure 5.
[56] *See* Figure 5.
[57] Haipeng A. Chen and Akshay Rao, "When Two Plus Two is Not Equal to Four: Errors in Processing Multiple Percentage Changes," *Journal of Consumer Research* 34, no. 3, 2007, pp. 327–340, at p. 328.
[58] Figure 6.

Question 310A.6 or 310B.6).[59] Of these 307 respondents, 37 (12%) chose switch prices *below* their reported subscription price.[60] The amount these respondents reported to be currently paying for their subscription is greater than the maximum price they would be willing to pay for their subscription. This inconsistency demonstrates the unreliability of Professor Dhar's Pricing Questions.

55. These inconsistent responses may be due to the biases in Professor Dhar's Pricing Questions. As I discussed in Section V.C.1, Professor Dhar's Pricing Questions may induce a starting point bias, which would result in switch prices that are lower than what they would be in the actual marketplace. Further**,** as I discussed in Section V.C.3, consumers in the actual marketplace face switching costs when cancelling a subscription that they may not adequately internalize in Professor Dhar's survey. As a result, respondents may be willing to switch out of their music service at a lower price in a survey than they would in reality. Because of these two phenomena, the switch prices in Professor Dhar's survey may be biased downward, and for many respondents are lower than the prices respondents are currently paying for their subscriptions.

VII. Professor Dhar's Switching Questions Elicit Biased Responses

A. Professor Dhar's Switching Questions

56. Subsequent to the Pricing Questions, if a respondent chooses to cancel his or her subscription at a specific price (i.e., at his or her switch price) the respondent is asked to indicate which other service he or she might switch to. As noted earlier, these follow-up questions are referred to as the Switching Questions.[61]

[59] Figure 6.
[60] Figure 6.
[61] To be precise, the Switching Questions refer to Questions 210, 310, and 510 of the Dhar Survey. *See* Dhar Survey.

a. **Sirius XM Select and Trial Users.** Respondents belonging to these cells are asked the following Switching Question (Question 210 for Sirius XM Select Survey and Question 510 of the Sirius XM Trial Survey):[62]

*You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place of **Sirius XM**? This would only include a new subscription, and would not include a music service that you currently subscribe to. **Please select one answer.***

*1: Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **$9.99** per month…*
*2: Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **$4.99** per month …*
*3: No, I would <u>not</u> subscribe to a paid music service in place of **Sirius XM**…*
4: Don't know/unsure…[63]

b. **Paid On-Demand Users.** Respondents belonging to Paid On-Demand cell (Apple Music or Spotify Premium users) are asked the following Switching Question (Question 310 of the Paid On-Demand Survey):[64]

*You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per month, and you knew that **<u>all</u>** other **On-Demand** music streaming service subscriptions were also **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place*

[62] Sirius XM Free Trial users were asked this question with a slight modification. Since they were asked the aforementioned Pricing Questions as though they were making the decision to subscribe to Sirius XM Select at the end of their trial, this Switching Question was asked only if they chose not to subscribe to Sirius XM Select.
[63] Dhar Survey, Question 210.
[64] Respondents belonging to the Pandora One cell were asked similar questions with a slight modification in the response options (most notably, Pandora One was no longer offered as an alternative to these individuals).

> *of **[INSERT SERVICE]**? This would only include a new subscription, and would not include a music service that you currently subscribe to.* ***Please select one answer.***
>
> *1: Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **$4.99** per month…*
>
> *2: Yes, I would subscribe to **Sirius XM** satellite radio at **$15.99** per month …*
>
> *3: No, I would <u>not</u> subscribe to a paid music service in place of **[INSERT SERVICE]**…*
>
> *4: Don't know/unsure…*[65]

In the Sirius XM Select, Sirius XM Trial Survey, and the Paid On-Demand Survey, if a respondent chooses not to subscribe to a paid music service, the respondent is asked what he or she would do instead.

> *You mentioned that you **<u>would not subscribe</u>** to a paid music service in place of [respondent's service]. What else, if anything, would you do <u>instead of paying for</u> a subscription to [respondent's service]?* ***Please select all that apply.***
>
> *1: I would purchase CDs and/or music downloads…*
>
> *2: I would listen to free music…*
>
> *3: Other…*
>
> *4: None of the Above…*
>
> *5: Don't know/unsure…*[66]

If the respondent selects "I would listen to free music," Professor Dhar asks:

> *You said that you would listen to free music. How would you listen to free music instead of [respondent's service]?* ***Please select all that apply.***

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[65] Dhar Survey, Question 310 (emphasis in original).
[66] Dhar Survey, Questions 210.1, 310.1, and 510.1.

1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)

2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)

3. Free On-Demand music video sites with ads (e.g., YouTube)

4. Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)

5. AM/FM radio or AM/FM HD radio

6. Music obtained through Peer-to-Peer file sharing or free download sites

7. Borrow CDs, vinyl or tapes from friends or a library

8. Continue listening to the music collection I already own

9. Other…

10. Don't know/unsure[67]

57. SoundExchange's economist, Professor Robert Willig, uses the results of Professor Dhar's Switching Questions to interpret substitution between Sirius XM and other music services, and to "quantify the size of the opportunity cost of access to music by Sirius XM."[68] Professor Willig concludes, "[m]ost of that opportunity cost arises from substitution between Sirius XM and paid-interactive and paid-non-interactive services."[69] To be interpreted in this manner, Professor Dhar's Switching Questions should have been worded and presented carefully in order to determine unbiased estimates of the music services to which respondents would switch.

58. Professor Dhar's Switching Questions do not meet this standard, and likely bias respondents towards selecting paid music services over free music options in multiple ways. I first discuss some general survey principles and phenomena that come into play when respondents answer questions such as Professor Dhar's Switching Questions and later demonstrate that Professor Dhar's questions are biased relative to questions that provide reasonable switching options to respondents.

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[67] Dhar Survey, Questions 210.2, 310.2, and 510.2.
[68] Written Direct Testimony of Robert Willig, October 19 2016, ¶ 39.
[69] Written Direct Testimony of Robert Willig, October 19 2016, ¶ 41.

B. General Principles of Good Survey Design Relevant to Professor Dhar's Switching Questions

59. Academic research has found that people are inclined to form judgments that are based on information that is readily available to them or that immediately comes to mind. This phenomenon is referred to as the "availability heuristic."[70] For example, when determining the incidence of heart attacks among middle-aged people, individuals may base their judgment on occurrences of heart attacks among their acquaintances because that information is easily recalled or is "available."[71] In the context of a survey, if a question makes some responses explicit or clear while keeping other responses implicit or unclear, the explicit or clear responses may be more readily "available" to the respondents than the implicit or unclear responses. As a result, respondents may be inclined to choose the explicit responses more often than they otherwise would.

60. Relatedly, in marketing research, it is well-known that respondents can recall more easily when they are provided a cue ("aided recall") as opposed to when they are asked to recall without a cue ("unaided recall").[72] For example, in determining whether respondents read a travel magazine in the past week, an unaided recall question "Which magazines did you read last week?" is likely to yield far fewer responses for travel magazines than a series of aided recall questions "Did you read travel magazine [Name of Magazine] last week?" In a survey, if a question provides cues for only certain response options that aid recall of those response options, and not for others, responses are likely to be biased.[73]

61. How response options are "framed" can also have an impact on how they are interpreted and perceived by respondents, and biased framing can lead to biased responses. Academic literature has widely recognized "framing" effects.[74] For example, Tversky and Kahneman (1986) noted that an equivalent difference in prices framed as a discount (over the

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[70] Amos Tversky and Daniel Kahneman, "Availability: A Heuristic for Judging Frequency and Probability", *Cognitive Psychology* 5, 1973, pp 207–232, at p. 207.
[71] Amos Tversky and Daniel Kahneman "Judgement under Uncertainty: Heuristics and Biases," *Science* 185, no. 4157, pp. 1124–1131, at p. 1124.
[72] Kevin Lane Keller, *Strategic Brand Management: Building, Measuring, and Managing Brand Equity*, 4 ed. (Pearson 2012), pp. 312–314.
[73] In a different context, Professor Dhar has himself found that "people focus only on explicitly presented details and fail to spontaneously 'fill in' the logical consequences of a choice or judgment." Shane Frederick et al., "Opportunity Cost Neglect," *Journal of Consumer Research* 36, no. 4, 2009, pp. 553–561 at p. 554.
[74] Amos Tversky and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice," *Science* 211, no. 30, 1981, pp. 453–458 at p. 453.

higher price) or a surcharge (over the lower price) can have a different impact on consumers.[75] Similarly, in a study conducted by Levin and Gaeth (1988), labeling beef as "75% lean ground beef" or "25% fat ground beef" resulted in drastic differences across consumers' perceptions of the same product.[76]

62. Care must also be taken to avoid "demand artifacts" in a survey. Demand artifacts are features of the experimental environment that "…cause the subject to perceive, interpret, and act upon what he believes is expected or desired of him by the experimenter," and thereby "…confirm what [he] believe[s] to be the experimental hypothesis."[77] Professor Dhar's wording of questions and construction of response options suggest certain "correct" or "desirable" answers to respondents. Professor Dhar's questions could lead respondents to guess the purpose of the survey. If so, the survey would not accurately measure respondents' true preferences.

63. Providing too limited a set of response options can result in biased responses due to the availability heuristic, unaided versus aided recall, and, possibly, demand artifacts. Further, as Shari Diamond points out in her guide to survey research in litigation, "[i]f the respondent is asked to choose one response from among several choices, the response chosen will be meaningful only if the list of choices is exhaustive—that is, if the choices cover all possible answers a respondent might give to the question. If the list of possible choices is incomplete, a respondent may be forced to choose one that does not express his or her opinion."[78] However, in certain situations, providing an exhaustive list of response options may be infeasible, and may lead to respondent fatigue.[79] Given this trade-off, survey researchers must make the decision of providing a reasonably comprehensive set of primary options. Researchers may also include an open-ended category, which would allow

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[75] Amos Tversky and Daniel Kahneman, "Rational Choice and the Framing of Decisions", *The Journal of Business* 59, no.4, part 2, 1986, pp. S251–S278 at S261.
[76] Irwin P. Levin and Gary J. Gaeth, "How Consumers are Affected by the Framing of Attr bute Information Before and After Consuming the Product," *Journal of Consumer Research* 15, no. 3, 1988, pp. 374–378 at pp. 375–376.
[77] Alan G. Sawyer, "Demand Artifacts in Laboratory Experiments in Consumer Research," *Journal of Consumer Research* 1, no 4, 1975, pp. 20–30 at p. 20; Martin T. Orne, "On the Social Psychology of the Psychological Experiment: With Particular Reference to Demand Characteristics and Their Implication," *American Psychologist* 17, no 11, 1962, pp. 776–783 at p. 778.
[78] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence, Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at p. 393.
[79] For example, choice set provided to respondents "should not be too large given the type of data collection procedure used." *See* Vithala R. Rao, "Theory and Design of Conjoint Studies (Ratings Based Methods)," in *Applied Conjoint Analysis* (New York: Springer, 2010), p. 45.

respondents to indicate a response that was not explicitly presented, and would therefore result in questions that are "less leading."[80]

64. In order to avoid biased responses, survey researchers perform qualitative "pretests" prior to launch of a survey. In these pretests, "…the proposed survey is administered to a small sample…of the same type of respondents who would be eligible to participate in the full-scale survey."[81] The pretests can reveal, among other things, additional response options that may need to be included in the survey, indicate whether respondents are fatigued due to too many response options, and provide information that can be useful in rephrasing questions to mitigate misunderstandings and biases.[82]

C. Professor Dhar's Switching Questions Focus Excessively on Paid and Streaming Music Services, Provide Incomplete Response Options, and Likely Suffer from Demand Artifacts

65. Professor Dhar's stated goal is "to measure the preferences of subscribers to certain music services who would choose to cancel their subscription at a given price" and "whether the subscribers would instead prefer to subscribe to another music subscription service."[83] Based on the general survey principles and phenomena outlined above, the wording of Professor Dhar's Switching Questions for Sirius XM Select users (Question 210), Paid On-Demand users (Question 310), and Sirius XM Free Trial users (Question 510) is likely to yield biased results that do not accurately measure the preferences of subscribers, his stated goal.

66. **First**, Professor Dhar formulates the Switching Questions directly in terms of whether respondents would switch to *paid* music services, and only allows respondents to switch to two different kinds of *paid* music services or to none at all. This design may lead to biased responses due to the "availability heuristic" issue described earlier. Respondents may have been inclined to choose paid music service options because, upon reading Professor Dhar's question and the possible options, the paid music service options may have been more readily

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[80] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359-423 at p. 394.
[81] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence, Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at pp. 388–389.
[82] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence, Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at p. 389.
[83] Dhar Report, ¶ 10.

"available" to them as compared to other music options such as free over-the-air AM/FM radio. If, for example, Professor Dhar had formulated the question differently and asked respondents to choose from a more comprehensive list of paid *and* non-paid music services to which they might reasonably switch, respondents would have been less likely to choose paid music services.

67. Moreover, Professor Dhar's Switching Questions follow soon after respondents are shown definitions of three kinds of music services: Sirius XM Satellite radio, On-Demand music streaming services, and Not-On-Demand music streaming services.[84] Again, based on the availability heuristic, respondents may have been more inclined to choose these services, which were readily available to them, as opposed to other viable alternatives (e.g. over-the-air AM/FM radio or a CD collection they already own). For example, in Professor Dhar's survey of Sirius XM Select users, if a more comprehensive list of alternatives were provided, respondents would have been less likely to choose paid On-Demand and paid Not-On-Demand music streaming services.

68. **Second**, Professor Dhar's Switching Questions aid in the recall of paid music services but provide no cues to aid in the recall of other music options (e.g., free over-the-air AM/FM) to which respondents could switch. Aided recall and unaided recall result in different responses. By aiding in the recall of paid music services, but relying on unaided recall for other music options (including free music options), Professor Dhar biases his results in favor of switching to paid music services. If Professor Dhar had formulated questions that also aided recall of non-paid music options, respondents would have been less likely to switch to paid music options his survey.

69. **Third**, while the response options in Professor Dhar's Switching Questions permit respondents to abstain from subscribing to a paid music service, there is no response option that allows respondents to *actively switch* to a non-paid music option or allows respondents to switch to an *existing* subscription to a paid music service. *Not choosing* to subscribe to a paid service is qualitatively different from *choosing* to switch to a non-paid option or listening to an existing subscription to a paid option. Moreover, given the level of specificity provided in the paid music service response options (e.g. "**On-Demand** music streaming service like

[84] Dhar Survey, Questions 201, 301, and 501.

Apple Music or Spotify at **$9.99** per month"), the third option (e.g., "No, I would not subscribe to a paid music service") is not nearly specific enough to capture a wide range of non-paid music options that respondents might consider (e.g., AM/FM radio, free Pandora, free Spotify). The "framing" of response options often has an impact on how the response options are interpreted and perceived by respondents. If, instead of framing the third option as "No, I would not subscribe to a paid music service," Professor Dhar had provided a list of non-paid alternatives or existing paid subscriptions to which respondents might reasonably switch, respondents may have been more likely to select non-paid alternatives or existing paid subscriptions and less likely to select *new* paid subscriptions than they did in Professor Dhar's survey.

70. **Fourth**, Professor Dhar's Switching Questions likely suffer from demand artifacts. The emphasis on paid music services in the response options to the Switching Questions of Professor Dhar's survey may have led respondents to infer that paid services are the options they were expected to select. Hence, respondents in Professor Dhar's survey may have been inclined to select paid music services even if they would opt to listen to free music options such as over-the-air AM/FM in the actual marketplace.

D. Analysis of Professor Dhar's Survey Data Suggests that Response Options in The Switching Questions May Have Led to Biased Responses

71. In Professor Dhar's Sirius XM Select Survey, 101 of the 509 respondents who took the survey have a paid subscription to either Apple Music or Spotify Premium in addition to their Sirius XM Select subscription, *and* were asked Professor Dhar's Switching Question (Question 210).[85] Of these 101 respondents, 63 reported that they would switch to *yet another* Paid On-Demand service; i.e., 62% of respondents who reported switching out of Sirius XM Select *and* also had a subscription to Apple Music or Spotify Premium responded that they would switch to *yet another* Paid On-Demand service.[86] Moreover, 38 of the 509 respondents who took the survey have paid subscriptions to *both* Apple Music and Spotify Premium in addition to their Sirius XM Select subscription, and were asked Professor Dhar's Switching

[85] *See* Figure 7.
[86] *See* Figure 7.

Question (Question 210).[87] Of these 38 respondents, 27 reported that they would switch to yet *another* (i.e., third) paid On-Demand service.[88]

72. It is likely that these respondents were influenced by the format of Professor Dhar's Switching Question. In particular, Professor Dhar does not provide respondents with the option to continue listening to On-Demand services for which they already have a subscription. Such respondents may have chosen the option to switch to a new On-Demand subscription in Professor Dhar's survey even though, in reality, they may not do so. In other words, a respondent with a subscription to Sirius XM Select and Apple Music might in reality switch all listening to Apple Music after cancelling his or her Sirius XM Select subscription rather than keeping the Apple Music subscription while also switching the Sirius XM listening to a *new* Spotify Premium subscription.

73. This effect, arising from the format of Professor Dhar's Survey, is most clearly observed in Professor Dhar's Paid On-Demand Survey. In this survey, 12 of the 504 respondents have a paid subscription to Sirius XM Select *and* were asked Professor Dhar's Switching Question (Question 310). Of these 12 respondents, 4 indicated that they would purchase *yet another* Sirius XM Select subscription upon cancelling their subscription to Apple Music or Spotify Premium.

74. While respondents may pursue alternative music services upon cancelling an existing subscription, it seems highly implausible that a respondent would want to add another Sirius XM Select subscription. A more plausible explanation for the observed behavior is that respondents were influenced by the format of Professor Dhar's Switching Question. In particular, respondents were likely influenced by the absence of the response option that would allow them to listen to their *existing* Sirius XM Select subscription. This likely led respondents to choose to switch to a *new* Sirius XM Select subscription in the survey even though they would not do so in the actual marketplace.

[87] *See* Figure 7.
[88] *See* Figure 7.

VIII. Modifications, Which Address Deficiencies in Professor Dhar's Switching Questions, Demonstrate That the Results of Professor Dhar's Switching Questions are Biased

75. As discussed in Section VII, Professor Dhar's Switching Questions focus on paid music services and do not provide a reasonably comprehensive set of alternatives to which respondents could switch. This likely results in biased responses due to phenomena such as the availability heuristic, aided versus unaided recall, and demand artifacts. In order to scientifically test for the potential of biased responses arising from Professor Dhar's Switching Questions, I conducted a survey that was the same as the Dhar Survey, but with modifications to the Switching Questions (this survey is henceforth referred to as the "Modified Dhar Survey").[89]

76. My objective in conducting this survey was to demonstrate how changing *only one* aspect of Professor Dhar's survey substantially changes his results. This provides evidence that Professor Dhar's survey is unreliable. I closely followed his survey design and survey procedures in all other respects, even though I do not endorse his methods in all other aspects of his survey.

77. It is important to note that while I only made changes to the Switching Questions in Professor Dhar's survey, I have identified several other problems that render his survey unreliable.[90] Had I corrected those problems as well, I would have expected to obtain results even more different from those obtained by Professor Dhar.

78. I note further that data have already demonstrated that Professor Dhar's Pricing Questions are unreliable and cannot be reproduced, even when asked again to two different random samples of respondents, including a random sample of respondents chosen from the same panel used by Professor Dhar. Thus, although Professor Dhar's Pricing Questions are unreliable, I use without modification Professor Dhar's Pricing Questions because they are needed as a precursor to Professor Dhar's Switching Questions and, hence, as a precursor to my modification of Professor Dhar's Switching Questions.

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[89] I reproduced Professor Dhar's sampling frame—I did not correct his sampling flaws. The Modified Dhar Survey was administered only to users of Sirius XM Select, Sirius XM Trial, and users of Paid On-Demand services (Apple Music and Spotify Premium). *See* Modified Dhar Survey, SoundX_000154716.

[90] For example, Professor Dhar's Pricing Questions may suffer from starting point bias as I pointed out in Section V.B but I do not correct this issue in the Modified Dhar Survey *See* Section IX for a discussion of additional problems in Professor Dhar's survey that I do not correct.

A. Modifications to Professor Dhar's Survey

79. In order to reduce the emphasis on paid music services and provide respondents with a more comprehensive set of response options, I made the following changes to Professor Dhar's Switching Question:

a. In his Switching Question, Professor Dhar specifically asks respondents to only consider switching to "a new subscription [and not] a music service that [they] currently subscribe to."[91] However, it is plausible that respondents who cancelled a particular subscription would switch to an existing subscription to a music service instead of switching to a new subscription, but Professor Dhar does not offer them that option.[92] Therefore, I added response options in the Switching Question which allow respondents to explicitly switch to an existing music service subscription.

b. In order to create a more comprehensive set of alternatives to paid subscriptions, I added two music options, "free over-the-air AM/FM radio" and "existing collection of CDs and/or music downloads." I selected these two options because they were the two most commonly selected options among respondents who opted not to switch to a paid music service in the Dhar Survey.[93] For logical consistency, I also added response options that were connected to free over-the-air AM/FM and existing CDs and/or music downloads: "other free music options" and "new CDs and/or music downloads."

c. Unlike Professor Dhar's Switching Questions, in which respondents are required to first select only one paid music service, I do not restrict respondents. Instead, I allow respondents to make multiple selections, because this may more realistically capture their switching behavior. Respondents may

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[91] Dhar Survey, Questions 210, 310, and 510.
[92] As I discuss later, this was confirmed by respondents in the qualitative pretests.
[93] *See* Figure 8; Modified Dhar Survey. 'Switching Questions' here refer to Q210.1, Q210.2, Q310.1, Q310.2, Q510.1, and Q510.2 of the Dhar Survey. I limit my analysis to respondents who took the Dhar Survey as paid Sirius XM users, paid On-Demand music users, and free trial Sirius XM users as these are the survey populations I interviewed.

be likely to substitute their consumption of one music service with several alternatives.

d. In the Paid On-Demand Survey, Professor Dhar asks respondents to choose the music options to which they would switch assuming that the prices of all On-Demand services were to rise in tandem.[94] My understanding from the Sirius XM economics experts in this proceeding is that this is an unrealistic assumption and it is highly unlikely that the prices of all On-Demand services will rise together in the actual marketplace.[95] Therefore, in my modification to the Switching Question in the Paid On-Demand Survey, I removed the condition that the prices of all other On-Demand services are equal to the price of the On-Demand service out of which a respondent is switching.[96]

80. In addition to modifying Professor Dhar's Switching Questions, I also added questions at the end of the survey to obtain more information about respondents' music subscriptions. Adding questions at the end of the survey does not affect respondents' answers to the preceding questions (i.e., the Pricing Questions and the Switching Questions). In total, I added two sets of questions at the end of the Modified Dhar Survey:

a. The first question asks respondents how they primarily listen to their music subscription (e.g., through their smartphone). I provide slightly different response options for Sirius XM users and On-Demand users, which reflect standard ways of listening to the services.

b. The second set of questions relates to the prices respondents pay for their music subscriptions.[97] To paid Sirius XM Select users, I first ask about the frequency of their payment (e.g., monthly, quarterly).[98] To Apple Music or Spotify Premium users, I first ask what type of subscription they have (e.g., individual, family). Next, I ask all respondents a 'full-filter' question: whether they know the price they pay for their subscription. If they do know the price they pay, I ask them to select the price they pay from a list of price ranges. For

[94] Dhar Survey, Question 310.
[95] Based upon information from counsel.
[96] I also remove this condition from the Pricing Question shown to the On-Demand users for logical consistency.
[97] This set of questions does not apply to free trial Sirius XM users as they do not pay for their subscription.
[98] As is appropriate, I use a quasi-filter. Respondents can answer "Other" or "Don't know/unsure." I use a similar quasi-filter for Apple Music and Spotify Premium users in the survey directed to those users.

Sirius XM Select users these prices are tied to their frequency of payment (e.g., monthly price, quarterly price).

B. Qualitative Pretesting of Modifications to Professor Dhar's Survey

81. In order to avoid biased responses, survey researchers perform qualitative "pretests" prior to launch of a survey. In these pretests, "…the proposed survey is administered to a small sample…of the same type of respondents who would be eligible to participate in the full-scale survey."[99] The pretests can reveal, among other things, additional response options that may need to be included in the survey, indicate whether or not respondents are fatigued due to too many response options, and provide information that can be useful in rephrasing questions so as to mitigate misunderstandings and biases.[100]

82. Consistent with good survey practice, the modified questions (and the additional questions) were pretested by Applied Marketing Science ("AMS") under my direction. Pretesting continues until respondents are able to answer the survey questions easily, do not find the questions difficult or ambiguous, and feel that their answers represent their opinions.

83. AMS interviewed a total of 28 respondents across the three target groups (Sirius XM Select subscribers, Sirius XM Trial users, and Paid On-Demand service subscribers) between January 17, 2017 and January 25, 2017. I personally listened to selected pretest interviews. The goal of these pretests was to ensure that respondents could understand and answer questions as the questions were intended to be asked. As is standard and appropriate procedure, the pretest responses are not included in the final survey results. These pretests only focused on the questions that were modified from Professor Dhar's survey and the questions I added at the end of the questionnaires.

84. Based on the findings from the pretests, I fine-tuned the phrasing and words used, and added appropriate response options in the Modified Dhar Survey. For example, results from the qualitative pretests suggested that in the Switching Questions respondents wanted the option to switch to music services for which they already had a subscription. Similarly, based

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[99] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359-423, at pp. 388-389.
[100] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359-423, at p. 389.

on findings from the pretest, I added additional examples of On-Demand and Not-On-Demand music services to the On-Demand and Not-On-Demand switching options.

85. The findings from the pretests, and any changes made to the questionnaire based on those findings, are provided in Appendix H. Pretests concluded when the phrasing of the modified questions and the additional questions (including their response options) was clear, and respondents did not have any difficulty answering those questions.

86. During the pretest respondents were debriefed, at my direction, by experienced interviewers from AMS who tested explicitly for demand artifacts. No demand artifacts were detected in the final phrasing and layout of the questions. Respondents did not find the modified questions to be leading and respondents were not able to guess that any particular result was desired by the designer of the modified questions.

87. Although Professor Dhar claims that his survey was "tested to ensure that respondents understood and could respond accurately to the questions,"[101] he does not describe what pre-testing measures were undertaken to ensure that his response options are comprehensive enough to capture the range of switching preferences consumers might exhibit. I did not pretest those aspects of Professor Dhar's survey that were not modified.

C. Modified Switching Question

88. After the pretests were concluded, I finalized my changes to Professor Dhar's Switching Question. Sirius XM Select users are asked the following modified Switching Question (Sirius XM Trial users were asked a very similar question).[102]

> *(QUESTION 210)*
> *You mentioned that you would cancel your subscription to* ***Sirius XM*** *if you were charged* ***[INSERT SWITCH PRICE]*** *per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using* ***Sirius XM****?*
>
> ***Please select all that apply****.*[103]

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[101] Dhar Report, ¶ 26.

[102] Sirius XM Trial users were asked these questions with a slight modification. Since they are asked Professor Dhar's aforementioned Pricing Questions as though they were making the decision to subscr be to Sirius XM Select at the end of the trial, these Switching Questions were asked only if respondents chose not to subscribe to Select.

1: I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to …
2: I would listen to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to …
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to …
4: I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to …
5: I would purchase and listen to new CDs and/or music downloads …
6: I would listen to my existing collection of CDs and/or music downloads …
7: I would listen to free over-the-air AM/FM radio …
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) …
9: Other …
10: None of the above …
11: Don't know/unsure …

89. Paid On-Demand users are asked a slightly different question. Depending on whether the respondent is taking the survey as an Apple Music or Spotify Premium user, I adjusted the switching options accordingly (that is, a Spotify Premium user would see switching options ***involving*** Apple Music and vice versa). The question below, Question 310A, is directed to an Apple Music subscriber.

(QUESTION 310A)
You mentioned that you would cancel your subscription to ***Apple Music*** *if you were charged* ***[INSERT SWITCH PRICE]*** *per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using* ***Apple Music****?*

Please select all that apply.

1: I would subscribe to Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe …
2: I would listen to Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to…
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-

[103] Response options were rotated to avoid order effects. *See* rotation instructions in the questionnaire in Appendix I and Appendix J.

Demand music streaming service at $4.99 per month that I don't currently subscribe to…
4: I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to…
5: I would purchase new CDs and/or music downloads…
6: I would listen to my existing collection of CDs and/or music downloads…
7: I would listen to free over-the-air AM/FM radio…
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) …
9: I would subscribe to Sirius XM satellite radio at $15.99 per month…
10: I would listen to Sirius XM satellite radio that I already pay to subscribe to…
11: Other …
12: None of the above…
13: Don't know/unsure…

D. Survey Design and Administration

90. For my modifications to Professor Dhar's survey, I followed standard scientific methods to maximize the reliability of the survey responses.[104] I briefly describe the methodology below. The Modified Dhar Survey questionnaires are provided as Appendix I and Appendix J for the Sirius XM and On-Demand surveys, respectively.[105]

91. **Double blind design**. It is standard survey practice to avoid indicating the sponsor and/or purpose of the survey to ensure respondents' objectivity, i.e., to make the respondent "blind" to the sponsor and purpose of the survey.[106] As evidenced by the pretests, the design and administration of the Modified Dhar Survey can be characterized as blind to the respondent. Because the survey was administered via the Internet, it eliminated the possibility of a human interviewer communicating the sponsor or purpose of the survey and influencing the outcome.

92. **Filters.** To avoid influencing respondents' answers and survey results and to minimize answers from uninformed respondents, carefully designed surveys include "filters" and "quasi-filters." Filters are questions and/or answer options that identify respondents who

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[104] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011).
[105] Screenshots of the Modified Dhar Survey are provided as Appendix K.
[106] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 410–411

are not relevant or who do not have opinions.[107] Quasi-filters avoid speculation and guessing that may arise when a respondent is forced to offer an opinion or answer a question on which he or she has no opinion.[108] For example, typical quasi-filters offer answer options such as "don't know" or "no opinion."

93. I used appropriate quasi-filters and full-filters in the Modified Dhar Survey. For example, Question 210 of the Modified Dhar Survey asks respondents which services they would switch to upon cancelling their Sirius XM Select subscription at a given price; the set of response options includes "Don't know/unsure," as respondents may not know how to answer this question. Pretests indicated that this filter was not too restrictive and biased (as the quasi-filters are in Professor Dhar's survey). Additionally, I provide full-filter questions such as Question 210.4, which asks respondents whether or not they know how much they pay for their Sirius XM Select service. Only if respondents reply that they know how much they pay are they then asked to place this number in a range of prices.

94. **Rotation of answer options.** In closed-ended questions with several answer options, respondents might be more likely to choose an option simply because it is first or last on the list. Such phenomena are known as "order effects."[109] To avoid order effects, I rotated answer options so that different respondents see the options in different orders and any possible order effects cancel out across respondents. There are standard exceptions to the rotation rules. For example, certain options – such as "Other," "None of the above," and "Don't know / Unsure" – always come last in order for the question to preserve logical flow. Another exception to answer rotation occurs when answer options follow a logical order. For example, in Question 210 of the Modified Dhar Survey, the seventh option, "I would listen to free over-the-air AM/FM radio…," always precedes the eight option, "I would listen to other free music options(s)…" Here, the word "other" is used in reference to free music sources that are not over-the-air AM/FM radio. In such circumstances, answer options are usually not rotated. Because my modifications were focused on the Switching Questions, I did not correct Professor Dhar's lack of rotation in the Pricing Questions. If I had done so, it is likely that the

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[107] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 391, 420.
[108] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 391, 421.
[109] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 395–396.

(unreliable) answers to Professor Dhar's Pricing Questions would have been different due to the (correct) rotation.

95. **Identification of the Survey Sample.** Similar to Professor Dhar, I used a reliable panel of respondents to invite respondents to take the survey. In this case, I selected Research Now, a well-established international market research service firm that maintains an invitation-only panel of over 3 million consumers in the United States and over 6 million panelists worldwide.[110] I have used Research Now before on a number of projects and found the panel to be reliable. To ensure the representativeness of the survey population the inbound sample was "click-balanced" (i.e., targeting a representative sample from the market research panel based on the distribution of individuals by validated demographics) using data from the U.S. Census. The demographic variables used for balancing were gender, age, and census region.[111] I do not expect that the change in panel alone would lead to any biases in the survey.

96. The target population was a subset of the one surveyed by Professor Dhar. This included three groups of respondents: (a) Subscribers of Sirius XM Select, (b) Users of Sirius XM Free Trial, and (c) Subscribers of Spotify Premium and Apple Music. I followed Professor Dhar's screening questions to obtain a sample from the same target population. I added one additional screening question (Question 49) to identify respondents who may have taken a survey related to radio or music service in the last six months to identify, and screen out, respondents who may have taken Professor Dhar's or Mr. Boedeker's survey. These respondents were terminated.

97. **Survey Implementation.** An invitation to participate in the survey was emailed to 296,036 potential participants for the Sirius XM Select and Free Trial Survey, and to 249,331 potential participants for the Paid On-Demand Survey. The text of the e-mail is provided in Appendix L. The invitation included a link to the actual survey, which was hosted on a website maintained by AMS. The link contained an embedded identification number that assured that only invited respondents could take the survey and the survey could be completed only once. After clicking on the link from the email invitation, respondents were

[110] For panel counts, *see* "Access a World of Opinions," *Research Now*, 2012.
[111] *See* "United States Census 2010," *United States Census Bureau*, http://www.census.gov/2010census/.

prompted to a browser window with a CAPTCHA challenge to ensure that responses were not computer-generated.

98. Similar to Professor Dhar's survey, respondents who qualified and completed the survey were awarded $1.50 in e-Rewards (Research Now) currency.[112] The responses to the survey were recorded between January 26 and 31, 2017.

99. A total of 511 respondents completed the Sirius XM Select Survey, 510 respondents completed the Sirius XM Free Trial Survey, and 526 respondents completed the Paid On-Demand Survey. I did not change Professor Dhar's exclusion criteria: I excluded respondents who completed the survey in under one minute or over twenty minutes. After excluding these respondents, I obtained 498 respondents who completed the Sirius XM Select Survey, 502 respondents who completed the Sirius XM Free Trial Survey, and 500 respondents who completed the Paid On-Demand Survey. This sample size is sufficient to provide statistically reliable estimates. The response rate for the surveys were 5.0% (Sirius XM Select and Sirius XM Free Trial combined) and 3.6% (Paid On-Demand). The screening statistics are provided in Appendix M.

E. Results from the Modified Dhar Survey

1. Respondents in the Modified Dhar Survey Are Less Likely to Switch to Paid Music Services, and More Likely to Use Non-Paid Options Compared to the Dhar Survey, Confirming That Professor Dhar's Results Are Biased

100. The fact that Professor Dhar's results for the Pricing Questions could not be replicated, as I demonstrated in Section VI, casts serious doubt on the reliability of any results from the Dhar Survey. That said, my modifications to Professor Dhar's Switching Questions yield results that confirm that Professor Dhar's Switching Questions bias results in favor of paid music services. I discuss the results of my modifications to Professor Dhar's Switching Questions below.

[112] Respondents who did not qualify for the survey were awarded $0.25 in e-Rewards currency for their participation.

a) Sirius XM Paid Subscribers and Sirius XM Free Trial Users Are Less Likely to Switch to Paid Music Services in the Modified Dhar Survey

101. Table 1 below shows a comparison of responses of Sirius XM Select subscribers and Sirius XM Free Trial users between the Modified Dhar Survey and the Dhar Survey, who, upon being asked the Switching Question, indicated that they would switch to paid On-Demand, paid Not-On-Demand, or not switch to a paid service.[113] For the full set of results, see Figures 9-A and 9-B.[114]

Table 1: Comparison of Responses to Switching Question between Dhar and Modified Dhar Survey

	Sirius XM Select Group		Sirius XM Trial Group	
User Choice	**Modified Dhar Survey**	**Dhar Survey**	**Modified Dhar Survey**	**Dhar Survey**
Subscribe to a new paid On-Demand service [1]	15%	28%	6%	23%
Subscribe to a new paid Not-On-Demand service [2]	10%	14%	7%	14%
Do not subscribe to a paid service [3]	79%	49%	89%	54%
Number of Respondents Cancelling Subscription	**463**	**388**	**489**	**379**

Note:
[1] Differences in responses between surveys are significant at the 1% level for both Sirius XM Select Group (0.000) and Sirius XM Trial Group (0.000)
[2] Differences in responses between surveys are significant at the 10% level for Sirius XM Select Group (0.074) and 1% level for Sirius XM Trial Group (0.002)
[3] Differences in responses between surveys are significant at the 1% level for both Sirius XM Select Group (0.000) and Sirius XM Trial Group (0.000)

[113] Respondents in the Modified Dhar Survey are asked the modified Switching Question. The modified Switching Questions refer to Questions 210, 310, and 510 of the Modified Dhar Survey for Sirius XM Select subscribers, Apple Music or Spotify Premium subscribers, or Sirius XM Trial users, respectively. It is important to note that in the Switching Question of the Modified Dhar Survey, respondents could select multiple response options (both paid and unpaid), while in Professor Dhar's survey, respondents could only elect to purchase one of either a new paid On-Demand subscription or a new paid Not-On-Demand subscription, or elect not to switch to a paid music service at all.
[114] See Figures 10-A and 10-B for responses to the Switching Questions in Professor Dhar's survey.

102. The results of the Modified Dhar Survey indicate that respondents are less likely to switch to *new* paid On-Demand music services upon cancelling an existing subscription to Sirius XM Select as compared to respondents in Professor Dhar's survey. In the Modified Dhar Survey, only 15% of Sirius XM Select subscribers would purchase a *new* paid On-Demand service upon cancelling their existing subscription, while 28% would do so in Professor Dhar's original survey. Likewise, only 6% of Sirius XM Free Trial users in the Modified Dhar Survey would purchase a *new* paid On-Demand music service upon cancelling a Sirius XM Select subscription at the end of the trial period, while 23% would do so in Professor Dhar's original survey. A similar pattern holds for respondents switching to *new* paid Not-On-Demand music services.

103. Further, the results of the Modified Dhar Survey indicate that respondents are more likely *not to* subscribe to a new paid music subscription, as compared to respondents in Professor Dhar's original survey. The third row of Table 1 displays the proportion of respondents who chose not to subscribe to a new paid music service in the Modified Dhar Survey and the Dhar survey. Among Sirius XM Select respondents, 79% chose not to subscribe to a new paid service in the Modified Dhar survey, while only 49% chose not to subscribe to a new paid service in Professor Dhar's survey. Similarly, for Sirius XM Trial users, 89% of respondents in the Modified Dhar Survey chose not subscribe to a new paid service, while only 54% of respondents in Professor Dhar's survey did the same.

104. The differences between the results of the Modified Dhar Survey and Professor Dhar's survey in Table 1 are statistically significant.[115] These results confirm that Professor Dhar's Switching Questions lead to biased responses in favor of paid music services. A simple modification to Professor Dhar's Switching Questions results in a substantial decrease in the proportion of respondents switching to new paid music services.

105. To account for the differences in the results of the Pricing Questions between the Modified Dhar Survey and Professor Dhar's Survey that I discussed in Section VI, I reweight the responses to the Switching Questions in the Modified Dhar Survey. The weights are estimated so that the distribution of responses to the Pricing Questions in the Modified Dhar Survey is the same as the distribution of responses to the Pricing Questions in the Dhar

[115] I conduct a chi-squared test of proportions to evaluate the difference between Professor Dhar's results and results from the Modified Dhar Survey. *See* Table 1 for the results from the statistical test.

Survey. Applying weights obtained in this way does not change any of my conclusions.[116] See Figures 11-A and 11-B.

106. The Modified Dhar Survey also shows that 92% of Sirius XM Select subscribers and 93% of Sirius XM Free Trial users listen to the service "through [their] car's radio/entertainment system."[117] Many vehicles are not equipped with the technology to play On-Demand or Not-On-Demand services (such as Spotify, Apple Music, Google Play, Pandora, etc.) through the car's entertainment system without the use of a smart device. Therefore, it is not surprising that most Sirius XM users will not switch to a *new* On-Demand or Not-On-Demand service.

b) Paid On-Demand Subscribers Are Less Likely to Switch to Paid Music Services in the Modified Dhar Survey

107. Table 2 below shows a comparison of responses of Paid On-Demand users between the Modified Dhar Survey and the Dhar Survey who would switch to a new paid Not-On-Demand service, a new paid Sirius XM subscription, or not switch to a paid service upon cancelling their current On-Demand subscription.[118] For the full set of results, see Figures 9-A and 9-B.[119]

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[116] *See* Figures 11-A and 11-B for a comparison between weighted and unweighted responses to the modified Switching Questions.
[117] Modified Dhar Survey, Question 210.2
[118] Respondents in the Modified Dhar Survey are asked the modified Switching Question. The modified Switching Questions refer to Questions 210, 310, and 510 of the Modified Dhar Survey for Sirius XM Select subscribers, Apple Music or Spotify Premium subscribers, or Sirius XM Trial users, respectively. In the Switching Question of the Modified Dhar Survey, respondents could select multiple response options (both paid and unpaid), while in Professor Dhar's original survey, respondents could only choose one of either a new paid Not-On-Demand subscription or a new Sirius XM Select subscription, or not switch to a paid music service at all. Unlike the modified Switching Question, the Switching Question in the On-Demand portion of the Dhar Survey does not allow respondents to switch from their current music subscription to a new paid On-Demand subscription. Therefore, in Table 2, I do not report results from the Modified Dhar Survey for respondents who choose to switch to a new paid On-Demand subscription.
[119] See Figures 10-A and 10-B for responses to the Switching Questions in Professor Dhar's survey.

Table 2: Comparison of Responses to Switching Question between Dhar and Modified Dhar Survey

	Paid On-Demand Group	
User Choice	**Modified Dhar Survey**	**Dhar Survey**
Subscribe to a new paid Not-On-Demand service [1]	20%	39%
Subscribe to a new Sirius XM satellite radio paid subscription [2]	1%	28%
Do not subscribe to a paid service [3]	60%	28%
Number of Respondents Cancelling Subscription	**391**	**246**

Note:
[1] Differences in responses between surveys are significant at the 1% level (0.000)
[2] Differences in responses between surveys are significant at the 1% level (0.000)
[3] Differences in responses between surveys are significant at the 1% level (0.000)

108. The results of the Modified Dhar Survey indicate that respondents are less likely to switch to *new* paid Not-On-Demand music services upon cancelling an existing subscription to a paid On-Demand music service as compared to respondents in Professor Dhar's survey. In the Modified Dhar Survey, only 20% of On-Demand subscribers would purchase a *new* paid Not-On-Demand service upon cancelling their existing subscription, while 39% would do so in Professor Dhar's original survey.

109. Respondents are also less likely to switch to a *new* paid Sirius XM subscription upon cancelling their existing On-Demand music subscription as compared to respondents in Professor Dhar's survey. In the Modified Dhar Survey, only 1% of survey respondents would purchase a new Sirius XM subscription as compared to 28% in Professor Dhar's original survey.

110. Further, the results of the Modified Dhar Survey indicate that respondents are more likely *not to* subscribe to a new paid music subscription, as compared to Professor Dhar's original survey. 60% of respondents chose not to subscribe to a new paid service in the Modified Dhar survey, while only 28% chose not to subscribe to a new paid service in Professor Dhar's survey.

111. The difference between results from the Modified On-Demand Survey and Professor Dhar's survey are statistically significant.[120] These results confirm that Professor Dhar's Switching Questions lead to biased responses in favor of paid music services. A simple

[120] I conduct a chi-squared test of proportions to evaluate the difference between Professor Dhar's results and results from the Modified Dhar Survey. *See* Table 1 for the results from the statistical test.

modification to Professor Dhar's Switching Questions results in a substantial decrease in the proportion of respondents switching to new paid music services. Had I corrected the other flaws in Professor Dhar's survey, it is likely that the differences would have been greater still (as discussed elsewhere in this report).

112. Similar to the results of the Modified Dhar Survey for the Sirius XM Select users and Sirius XM Free Trial users, I reweight the results to account for the differences in responses to the Pricing Questions between the Modified Dhar Survey and the Dhar Survey. I find that my results and conclusions do not change with the reweighting.[121]

2. Switching Behavior of Respondents with Multiple Paid Subscriptions in the Modified Dhar Survey Provides Further Evidence That Professor Dhar's Switching Questions are Poorly Framed

113. Many respondents who answered the Switching Question in Professor Dhar's Survey chose to purchase a new subscription to a music service for which they already had a subscription. As I discussed in Section VII.D, one possible reason for this is that the Dhar Survey does not provide respondents with the option to switch to an existing music subscription. However, the Modified Dhar Survey allows respondents to switch to an existing music service subscription.

114. In the Modified Dhar Survey for Sirius XM Select users, 50 of the 498 respondents have a paid subscription to either Apple Music or Spotify Premium, *and* were asked the modified Switching Question.[122] Of these 50 respondents, 23 reported that they would switch to an existing On-Demand service. Only 10 (i.e., 20%) reported that they would switch to *yet* another paid On-Demand service.[123] In contrast, more than half of the respondents in the Dhar Survey who had an existing subscription to Apple Music or Spotify *and* were asked Professor Dhar's Switching Question, indicated that they would switch to a new paid On-Demand service.[124]

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[121] *See* Figures 10-A and 10-B for responses to the Switching Questions in Professor Dhar's survey.
[122] *See* Figure 12.
[123] *See* Figure 12.
[124] *See* Figure 7.

115. These results indicate that respondents with *existing* On-Demand subscriptions, when given the option, are more likely to select their *existing* subscription over a *new* paid On-Demand subscription. Because Professor Dhar does not provide the option to switch to existing On-Demand subscriptions, he obtains results that are biased in favor of switching to a new On-Demand subscription.

IX. Professor Dhar's Survey Is Not Incentive-Aligned, Contains Complex Terms of Art, and Uses an Under-Inclusive Sample

A. Professor Dhar's Survey Does Not Have an Incentive-Aligned Design

116. As I discussed in Section V, Professor Dhar's Pricing Questions are confusing and may bias respondents to switch at prices that are lower than the prices at which they would switch in the actual marketplace. One potential solution to mitigate errors and biases is to provide incentives to respondents in the survey so that they respond in a way that is consistent with their behavior in the real world. This form of survey design is called "incentive alignment."

117. Academic literature in marketing has demonstrated the benefits of incentive alignment when designing a hypothetical exercise such as the one conducted by Professor Dhar.[125] Ding, et al. (2005), in their seminal work on incentive-aligned design, found that when experiments are designed with incentive structures that mimic real world decisions, the results are better at predicting real world outcomes.[126] I have reached similar conclusions about the effectiveness of incentive alignment in improving the precision of surveys in my own research.[127]

118. Incentive-aligned design has also been used in non-academic settings. For example, I designed incentive-aligned surveys for my expert testimony in Apple Inc. v. Samsung

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[125] Min Ding et al., "Incentive-Aligned Conjoint Analysis," *Journal of Marketing Research* 42, no 1, 2005, pp. 67–82. *See also* Min Ding, "An Incentive-Aligned Mechanism for Conjoint Analysis," *Journal of Marketing Research* 44, no 2, 2007, pp.214–223; Min Ding et al., "Barter Markets for Conjoint Analysis," *Management Science* 55, no 6, 2009, pp. 1003–1017.

[126] Min Ding et al., "Incentive-Aligned Conjoint Analysis," *Journal of Marketing Research* 42, no 1, 2005, pp. 67–82.

[127] John Hauser et al., "Disjunctions of Conjunctions, Cognitive Simplicity, and Consideration Sets," *Journal of Marketing Research* 48, no 1, 2010, pp. 485–498.

Electronics Co. Ltd.[128] In both the smartphone and tablet surveys I conducted, respondents were told that, in addition to the honoraria they would receive for participation in the survey, 1 in every 20 respondents would be randomly selected to receive either the smartphone or tablet that matched their selections in the survey.[129] Because respondents had a reasonable likelihood of receiving the smartphone or tablet they chose, they would be expected to choose options that would reflect their actual marketplace behavior.

119. In contrast, Professor Dhar's survey is not incentive-aligned. Respondents "who qualified and completed the survey were provided with a reward valued between $1 and $2."[130] Unlike incentive-aligned rewards, these rewards do not depend on the content of respondents' answers. Therefore, respondents in Professor Dhar's survey do not have sufficient incentives to provide responses that reflect how they would act if faced with the decision to subscribe to music services in reality. The results from Professor Dhar's survey may not be reliable reflections of how consumers will act when faced with the actual decision to subscribe or not subscribe to music services.

B. Professor Dhar's Survey Uses Complex Terms of Art when Asking Respondents Questions. Professor Dhar Fails to Adequately Verify Respondents' Comprehension of These Terms

120. A good survey practice is to use words and phrases with which respondents are familiar so that they understand the questions.[131] If respondents do not understand the words and phrases used, they will be confused and their responses will not be accurate. One way to detect ambiguity in words and phrases and to test whether questions are comprehensible is to conduct pretests with a small group of respondents from the target population.[132] To the

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[128] Expert Report of John R. Hauser, *APPLE INC., a California corporation*, *Plaintiff, v. SAMSUNG ELECTRONICS CO. LTD., A Korean corporation; SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation; SAMSUNG TELECOMMUNICATIONS AMERICA LLC, a Delaware limited liability company*, *Defendants*, August 11, 2013, ¶¶ 69–71.
[129] Expert Report of John R. Hauser, *APPLE INC., a California corporation*, *Plaintiff, v. SAMSUNG ELECTRONICS CO. LTD., A Korean corporation; SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation; SAMSUNG TELECOMMUNICATIONS AMERICA LLC, a Delaware limited liability company*, *Defendants*, August 11, 2013, ¶¶ 70–71.
[130] Dhar Report, ¶ 37.
[131] Stanley L. B. Payne, "What's the Good Word,?" in *The Art of Asking Questions* (Princeton, NJ: Princeton University Press, 1980), pp. 138–157.
[132] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence, Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at p. 388.

extent that the words and phrases are not clear to the respondents, pretests can be useful in determining alternative words and phrases that respondents may understand.

121. In contrast to good survey practice, Professor Dhar's survey relies on complex terms of art (e.g. "On-Demand" and "Not-On-Demand"), which may be well known in the music industry but may not be familiar to the respondents. While Professor Dhar asks respondents to read descriptions of these terms, he does not rigorously verify respondents' comprehension after reading the descriptions of the terms of art. Subsequent to providing these descriptions, Professor Dhar asks the following question:

> *Do you understand the descriptions of all three services described above?* ***Please select one answer.***
> *1: Yes, I do understand the descriptions of all three services*
> *2: No, I do not understand the descriptions of all three services*
> *3: Don't know/unsure*[133]

122. Without a more comprehensive pretest, this question alone is not sufficient to test respondents' comprehension. Survey questions of this type may suffer from bias due to "acquiescence," or "yea-saying" bias which is described as the "…tendency [of respondents] to endorse any assertion made in a question regardless of its content."[134] In addition, respondents may indicate that they understand the descriptions because they are "likely to experience *evaluation apprehension*; that is, an active, anxiety-toned concern that [they] win a positive evaluation from the experimenter, or at least that [they] provide no grounds for a negative one."[135] Professor Dhar has not provided any rigorous evidence, pretests or otherwise, that would suggest respondents' comprehension of these terms used in his survey. The responses of any respondents who completed Professor Dhar's survey without an adequate understanding of these terms would be unreliable.

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[133] Dhar Survey, Questions 201, 301, and 501.
[134] Jon A. Krosnick, "Survey Research", *Annual Review of Psychology* 50, 1999, pp. 537–567 at p. 552.
[135] Milton J. Rosenberg, "When Dissonance Fails: On Eliminating Evaluation Apprehension From Attitude Measurement," *Journal of Personality and Social Psychology* 1, no 1, pp. 28-42, at p. 29 (emphasis in original).

C. Professor Dhar's Survey Sample is Under-Inclusive and May Be Biased toward More Switching to Music Streaming Services

123. When outlining his survey methodology, Professor Dhar states that "[o]ne of the first steps in ensuring that the survey results are meaningful is the selection of the appropriate target population or universe."[136] He defines his universe for the Sirius XM subsection of the Dhar Survey as "U.S. adults…who have Sirius XM Satellite Radio…"[137] Yet, when conducting his survey, Professor Dhar only allows respondents who "were current paid subscribers to the Sirius Select package and current users of a free trial subscription to Sirius XM …" to take the Sirius XM survey, therefore excluding Sirius XM users subscribing to any other package.[138]

124. In Question 52.2, Professor Dhar asks respondents who have a paid Sirius XM subscription, which subscription package they have.[139] Respondents can choose from "Select," "All Access," "Mostly Music," "Other," and "Don't know/unsure."[140] Professor Dhar only allows respondents who choose "Select" in Question 52.2 to proceed in the survey. These account for only 27% of respondents who have a paid Sirius XM subscription.[141] The remainder of respondents, accounting for 73% of paid Sirius XM subscribers in Professor Dhar's survey, is eliminated. In other words, Professor Dhar excludes nearly three-quarters of his defined universe. It is noteworthy that Professor Dhar's decision to exclude the vast majority of Sirius XM subscribers from his survey is inconsistent with the decision of SoundExchange's other survey expert, Mr. Stefan Boedeker, who included subscribers to Sirius XM packages such as All Access and Mostly Music in his survey.[142] Professor Dhar does not provide any justification for limiting his sample to Select subscribers and eliminating all other Sirius XM subscribers except stating that he "understand[s] [Sirius XM Select] is one of the most popular subscription packages."[143]

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[136] Dhar Report, ¶ 32.
[137] Dhar Report, ¶ 32.
[138] Dhar Report, ¶ 10.
[139] Dhar Survey, Question 52.2.
[140] Dhar Survey, Question 52.2.
[141] *See* Figure 13.
[142] Written Direct Testimony of Mr. Stefan Boedeker, October 18, 2016 ("Boedeker Report"), ¶ 40.
[143] Dhar Report, footnote 2.

125. In contrast with Professor Dhar's assertion that Select was one of the most popular packages, the All Access package was selected by 43% of all respondents who completed Question 52.2, making All Access the most popular Sirius XM package in Professor Dhar's survey and much more popular than the Select package.[144] All Access has several features that differentiate it from Select.[145] All Access is offered at a higher monthly price, has 10 more channels, includes Internet listening, and provides access to more sports content.[146] It is, therefore, likely that the All Access subscriber base is different from the Select subscriber base.

126. In particular, because All Access is more expensive than Select, if All Access subscribers are asked Professor Dhar's Pricing Questions, they may cancel their Sirius XM subscriptions at higher prices than respondents with Select. All Access subscribers may also choose not to cancel their subscription at all in Professor Dhar's survey, given that the highest available price in Professor Dhar's Pricing Questions for Sirius XM ($20.49) is only $0.50 greater than the monthly subscription price for Sirius XM All Access ($19.99).[147] Moreover, since All Access contains more non-music content than Select, All Access respondents who primarily listen to non-music content may not consider music streaming services to be substitutes for Sirius XM at all, and therefore, may be less likely to switch to music streaming services.[148]

127. Like All Access, the Mostly Music package, selected by 19% of all respondents who completed Question 52.2, differs from Select on price and content.[149] Mostly Music is offered at a lower monthly price, has fewer channels, does not include any premium channels, or contain NFL and NASCAR coverage.[150] It is, therefore, likely that Mostly Music subscriber base is different from the Select subscriber base.

128. Given the differences between these Sirius XM packages (All Access, Mostly Music, and Select), subscribers to one package alone would likely not be representative of Sirius XM subscribers as a whole. All Access subscribers would likely switch at higher prices than

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[144] *See* Figure 13.
[145] Dhar Report, Appendix E.
[146] Dhar Report, Appendix E.
[147] "Our Packages," *Sirius XM,* http://www.siriusxm.com/ourmostpopularpackages; Dhar Survey Questions, 203–203.6.
[148] "Our Packages," *Sirius XM,* http://www.siriusxm.com/ourmostpopularpackages
[149] *See* Figure 13.
[150] Dhar Report, Appendix E.

Select subscribers, and although Mostly Music subscribers may switch at lower prices than Select subscribers, Professor Dhar cannot depend on the possibility that unknown random outcomes may balance out. As a result, the answers that Professor Dhar obtains are not representative of the answers that he would have obtained had he surveyed a random sample of all Sirius XM subscribers.

129. Together, subscribers to All Access and Mostly Music account for nearly two-thirds of all paid Sirius XM users in Professor Dhar's own survey sample.[151] Yet, Professor Dhar excludes these subscribers without any basis. Their preferences are not reflected in Professor Dhar's results. Therefore, Professor Dhar's results do not inform us of the preferences of the Sirius XM subscriber base as a whole. Given the large number of All Access subscribers, Professor Dhar's decision to exclude these subscribers may bias the results of his Switching Questions toward switching away from Sirius XM at lower prices and toward switching to music streaming services.

* * *

130. In summary, Professor Dhar's survey is problematic for several reasons. As discussed in Section VI, the Pricing Questions in the Dhar Survey yield results that are not reproducible, and therefore fall short of a basic scientific standard. The Switching Questions of the Dhar Survey induce bias in switching toward paid music services, as demonstrated by the results of the Modified Dhar Survey. Finally, Professor Dhar's survey is not incentive-aligned, employs complex terms of art that respondents may have difficulty understanding, and relies on a survey sample that is under-inclusive. Because of these issues, results from Professor Dhar's survey cannot be relied upon.

[151] I have not analyzed the 89 "Other" responses to Question 52.2. It is reasonable to assume that respondents who selected "Other" packages should also have been similarly eligible to take the Dhar Survey based on Professor Dhar's definition of the appropriate universe. *See* Figure 13.

X. Survey of Mr. Stefan Boedeker

A. Overview of Mr. Stefan Boedeker's Survey

131. Mr. Stefan Boedeker administers a survey targeting the population of Sirius XM users in the U.S., who are at least 18 years of age, and who subscribe to a paid Sirius XM radio package that contains both music and non-music programming ("the Boedeker Survey").[152] After answering a series of screening questions, respondents are given the following instructions:

> *For the purposes of this survey, SiriusXM satellite radio is categorized into two groups of programming:*
> *A. MUSIC PROGRAMMING - MUSIC CHANNELS ON SATELLITE RADIO*
> *B. NON-MUSIC PROGRAMMING - ALL OTHER PROGRAMMING THAT ISN'T MUSIC INCLUDING TRAFFIC, WEATHER, NEWS, SPORTS, TALK, COMEDY, KIDS, ETC.*[153]

132. Following these instructions, respondents are asked a series of questions that gauge the relative importance they place on music and non-music programming on Sirius XM (Questions 7–11).[154] Finally, Mr. Boedeker asks two questions (Questions 12 and Question 13) involving hypothetical Sirius XM packages that include only music or only non-music content ("the discount questions"). More specifically, Mr. Boedeker asks:[155]

> *Q12A:*
> *Would you continue to subscribe to SiriusXM satellite radio at your current subscription rates if music was no longer offered (i.e., if you could only have a non-music package)?*
>
> - *Yes*
> - *No*

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[152] Boedeker Report, ¶ 21.
[153] Boedeker Report, ¶ 38.
[154] In particular, respondents are asked to "allocate 100 points between Music programming and Non-Music programming to reflect its importance to [their] decision to subscribe to satellite radio." Respondents are then asked to "'allocate 100 points between Music programming and Non-Music programming to reflect its importance to [their] decision to remain a subscr ber to Sirius XM satellite radio.'" Finally, respondents are asked to allocate 100 points between music and non-music programming to reflect the amount of time typically spent listening to each. *See* Boedeker Report, ¶ 42–44 (emphasis in original).
[155] I have only presented "music" questions (Questions 12A and 13A) here. The "non-music" questions (Questions 12B and 13B) are similar with similar response options.

- *Don't know*

Q13A:

If music was not offered (i.e., you could only select a non-music package), what is the minimum level of discount (if any) that could be offered to convince you to still pay for a SiriusXM satellite radio subscription?

- *1%-10%*
- *11 % - 20%*
- *21 % - 30%*
- *31 % - 40%*
- *41%-50%*
- *51 % - 60%*
- *61%-70%*
- *71 % - 80%*
- *81 % - 90%*
- *91 % - 99%*
- *None — I wouldn't need a discount to continue subscribing…*
- *None — no amount of discount would convince me if music was not offered*
- *Don't know* [156]

B. Mr. Boedeker's Survey Elicits Internally Inconsistent Responses, Overvalues Music and Non-Music Content, and Does Not Follow General Principles of Good Survey Design

133. Mr. Boedeker's survey has serious problems. Mr. Boedeker's discount questions are poorly designed and elicit inconsistent responses from more than half of his respondents. Further, his discount questions may have led respondents to overstate their value for music and non-music programming. Mr. Boedeker's survey also does not follow the basic principles of good survey design. Taken together, these shortcomings render Mr. Boedeker's survey results unreliable.

[156] Boedeker Report, Appendix B ("Boedeker Survey") Questions 12A, 12B, 13A, and 13B.

1. Mr. Boedeker's Discount Questions Elicit Internally Inconsistent Responses

134. In Question 12 in Mr. Boedeker's survey, respondents are asked whether they are willing to "continue to subscribe to Sirius XM satellite radio at [their] *current subscription rates*" if music content (or non-music content) were no longer included in the package. Respondents who choose "Yes" in Question 12 are still asked, in Question 13, to report what level of discount they would require to continue their subscription.[157] The only logical response for such respondents is that they would not need a discount because they have already indicated in Question 12 that they would continue their subscription at their current subscription rates if music content (or non-music content) were not offered.

135. Instead, as presented in Figure 14, 168 of the 194 respondents (87%) who answered "Yes" to Question 12A (i.e. that they would continue subscribing at their current price even if music content were no longer offered) indicated in response to Question 13A that they would need a discount to continue subscribing or that no amount of discount would convince them to continue subscribing.[158] In fact, of these 194 respondents, 75 (39%) reported in Question 13A that they would require a discount *greater* than 50% to continue subscribing or that no amount of discount would convince them to continue subscribing.[159] This result is nonsensical.

136. Similarly, as also shown in Figure 14, 76% of the 557 respondents who answered "Yes" to Question 12B (i.e. that they would continue subscribing at their current price even if non-music content were no longer offered), also responded to Question 13B that they would need a discount to continue subscribing.[160] Here, of these 557 respondents, 108 (19%) reported in Question 13B that they would require a discount *greater* than 50%.[161] These responses reveal alarming inconsistencies that indicate that Mr. Boedeker's survey is not reliable.

137. More remarkably, 15 respondents answered "Yes" to Question 12A, confirming that they would continue to subscribe to Sirius XM without music content at their current

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[157] Boedeker Survey, Questions 12A, 12B, 13A, and 13B (emphasis added).
[158] *See* Figure 14.
[159] *See* Figure 14.
[160] *See* Figure 14.
[161] *See* Figure 14.

subscription rate, and in Question 13A answered "…no amount of discount would convince [them to continue their subscription] if music was not offered."[162] Similarly, 5 respondents selected "Yes" in Question 12B and "no amount of discount would convince me if [non-music programming] was not offered" in Question 13B.[163] These contradictory responses to questions regarding the value of music and non-music programming demonstrate that Mr. Boedeker's survey is poorly designed. Consequently, results from his survey cannot be relied upon.

2. Mr. Boedeker's Survey Likely Leads Respondents to Overvalue Music and Non-Music Programming in the Discount Questions

138. Mr. Boedeker's entire survey is focused solely on the music and non-music programming features of Sirius XM. In a previous survey of Sirius XM listeners that I conducted as part of the 'SDARS II' proceedings, I found that respondents valued several Sirius XM features other than music and non-music programming such as 'Ubiquity of Station Availability,' 'Premium Sound Quality,' and 'Freedom from Commercials.'[164] Similarly, in a survey I conducted as part of the 'SDARS I' proceedings, I found that features such as 'Most channels are commercial free' and 'The artist and song title are displayed on my screen' to be among the most important satellite radio features for respondents.[165]

139. However, Mr. Boedeker does not provide respondents with any information regarding these other Sirius XM features. As discussed in Section VII.B, individuals are likely to form judgments based on the information that is readily available to them or easily recalled (i.e., the availability heuristic). Information about music and non-music programming may be more readily "available" to respondents in Mr. Boedeker's survey as compared to information about other Sirius XM features. Therefore, when asked the discount questions (Questions 13A and 13B), respondents may ignore other Sirius XM features because they are

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[162] *See* Figure 14.
[163] *See* Figure 14.
[164] Testimony of John R. Hauser, SC.D., *In the Matter of Determination of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services*, November 28, 2011, Appendix G ("Hauser 2011 Survey").
[165] Rebuttal Testimony and Exhibits Jointly Submitted by Sirius Satellite Radio Inc. and XM Satellite Radio Inc., In the Matter of the Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, July 24, 2007, Exh bit M and ¶105.

not readily available. This may lead respondents to overstate the value of music and non-music programming.

3. Mr. Boedeker's Survey Does Not Follow General Principles of Good Survey Design

140. When describing the "accepted scientific standards of the profession, including as to design, implementation, and analysis" of his survey, Mr. Boedeker cites Shari Diamond's *Reference Guide on Survey Research* in *Reference Manual on Scientific Evidence*.[166] Yet, Mr. Boedeker's survey violates two basic principles that the *Reference Guide* puts forward.

141. **First**, as discussed earlier, responses in a survey may be susceptible to "order effects," i.e., the tendency of respondents to choose options simply because they appear either first or last on the list.[167] To control for such effects, according to the *Reference Guide*, "the order of the questions and the order of the response choices in a survey should be rotated."[168] Yet, Mr. Boedeker does not rotate or randomize the options available to participants for several questions in his survey.

142. For instance, in Question 12A, he asks respondents if they would "continue to subscribe to SiriusXM satellite radio at [their] current subscription rates…"[169] but does not randomize the order of the answer choices—i.e., respondents are always presented with "Yes" as the first option. As a result, respondents may select "Yes" even though that may not reflect their true preferences. A similar order bias could occurs in Questions 7, 9, 12B, 13A, and 13B of the Boedeker Survey because he does not randomize or rotate the order of response options.[170]

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[166] Boedeker Report, ¶ 16.
[167] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423, at pp. 395–396.
[168] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423, at p. 396. Mr. Boedeker himself acknowledges the need to control for primacy effects and claims that "to avoid potential order bias … certain answer choices were shown in a different order, chosen at random…" *See* Boedeker Report, ¶ 45.
[169] Boedeker Survey, Question 12A.
[170] The only caveat Mr. Boedeker provides to his selective use of rotation and randomization is in the case of Question 13, which he claims was not "randomized because the discount categories are already an ordered sequence (i.e., 1-10%, . . . 91-99%), so randomizing the order would have created confusion." However, as I show in Section V.C.2, such ordered sequence questions are also susceptible to order bias as well as anchoring bias. Moreover. there are ways to control for such bias like randomizing the order to be ascending for half the respondents and descending for the other half. *See* Boedeker Report, footnote 18.

143. **Second,** to ensure that respondents do not offer opinions on questions for which they may not know the answer or do not have an opinion, it is a good survey practice to use quasi-filters by providing "don't know" or "no opinion" options. According to the *Reference Guide*, "[b]y signaling to the respondent that it is appropriate not to have an opinion, the question reduces the demand for an answer and, as a result, the inclination to hazard a guess just to comply."[171] Mr. Boedeker does not provide such quasi-filters as part of Question 7 and Question 9 in his survey. In Question 7, for example, he asks respondents if they were "involved in [their] household's decision to subscribe to Sirius XM satellite radio. Respondents can select from "Yes" and "No," but are not allowed to indicate that they "Don't Know."

144. These are basic principles of survey design. The fact that Mr. Boedeker did not follow even the basic principles makes his survey unreliable and casts serious doubt on all of his results.

XI. Conclusion

145. Professor Dhar's Pricing Questions suffer from a starting-point bias and likely underestimate the prices at which respondents would switch from their current subscriptions. As demonstrated by the Dhar Reproduction and the Modified Dhar Survey, the results of Professor Dhar's Pricing Questions cannot be reproduced, and therefore, they are unreliable. As demonstrated by the results of the Modified Dhar Survey, Professor Dhar's Switching Questions induce bias that leads to greater reported switching toward paid music services. In addition, Professor Dhar's survey is not incentive-aligned, employs complex terms of art that respondents may have difficulty understanding, and relies on a survey sample that is under-inclusive. Because of these issues, results from Professor Dhar's survey cannot be relied upon.

146. Mr. Boedeker's survey elicits internally inconsistent responses that are nonsensical. Mr. Boedeker's results also likely overestimate the value of music and non-music programming by ignoring other satellite radio attributes consumers find important. Finally,

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[171] Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence Third Edition* (Washington D.C.: The National Academies Press, 2011), pp. 359–423 at p. 390.

Mr. Boedeker's survey does not follow basic principles of good survey design. Therefore, his survey results are not reliable.

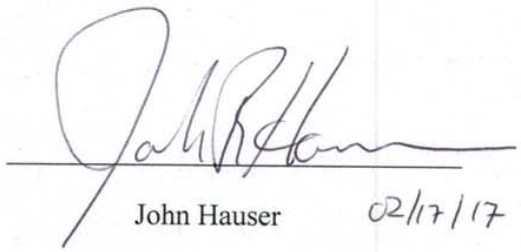
Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION OF JOHN HAUSER

I, John Hauser, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 17th day of February, 2017.



John Hauser 02/17/17

January 2017

APPENDIX A
ACADEMIC VITA (long version)
John R. Hauser

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Education

Sc.D. M.I.T., 1975, Operations Research Dissertation: "A Normative Methodology for Predicting Consumer Response to Design Decisions: Issues, Models, Theory and Use."

Advisor: John D. C. Little. Committee members: Glen L. Urban and Moshe Ben-Akiva.

S.M. M.I.T., 1973, Civil Engineering (Transportation Systems Division)

S.M. M.I.T., 1973, Electrical Engineering

S.B. M.I.T., 1973, Electrical Engineering
Joint Thesis (S.M.'s and S.B.): "An Efficient Method to Predict the Impacts of Operating Decisions for Conventional Bus Systems." Advisor: Nigel Wilson.

Honorary Degree

Doctor Honoris Causa, Erasmus School of Economics, Erasmus University, Dies Natalis 2016.

Lifetime Achievement Awards

Buck Weaver Award 2013, INFORMS Society of Marketing Science (ISMS).This award recognizes lifetime contributions to the theory and practice of marketing science.

Parlin Award 2001, The American Marketing Association describes this award as “the oldest and most distinguished award in the marketing research field.”

Converse Award 1996, the American Marketing Association, for “outstanding contributions to the development of the science of marketing.”

Churchill Award 2011, the American Marketing Association, Market Research Special Interest Group, for “Lifetime achievement in the academic study of marketing research.”

Fellow of the Institute for Operations Research and Management Science (INFORMS)

Inaugural Fellow of the INFORMS Society of Marketing Science (ISMS)

Highly Cited Researcher (ISI Web of Science), Since 2006.

Awards for Published Papers

INFORMS Society of Marketing Science (formerly The Institute of Management Science)	John D.C. Little Best-paper Award, 2015, Finalist ISMS Long Term Impact Award, 2012, Finalist ISMS Long Term Impact Award, 2011, Finalist John D.C. Little Best-paper Award, 2009, Finalist John D.C. Little Best-paper Award, 2003, First Place John D.C. Little Best-paper Award, 1998, Finalist John D.C. Little Best-paper Award, 1994, Finalist John D.C. Little Best-paper Award, 1993, First Place John D.C. Little Best-paper Award, 1990, Honorable Mention Best paper in Marketing Sciences Literature, 1984, Honorable mention. Best Paper in Marketing Sciences Literature, 1983, First Place. Best Paper in Marketing Sciences Literature, 1982, First Place. Two published articles were cited in 2007 as one of "the top 20 marketing science articles in the past 25 years.
American Marketing Association:	Explor Award (Leadership is on-line market research), 2004, First-Place Finalist, Paul Green Award for contributions to marketing research, 2004 MSI Award for Most Significant Contribution to Practice of Marketing in 1996. Finalist, O'dell Award for best paper in the *Journal of Marketing Research*, published in 1986, awarded in 1991. One of the top 50 most prolific marketing scholars (top journals) in the last 25 years (1982-2006). Total articles, rate of publication, and author-adjusted rate.
Product Development Management Assoc.	Best Paper Award, Finalist, 2003. Best Paper Award, Finalist, 2002. One of ten most-cited papers in the *Journal of Product Innovation Management*. One of the top articles in educational citations in the last twenty years.
European Marketing Academy	Best Paper in *IJRM*, Finalist, 2014
Sawtooth Software Conference	Best Presentation and Paper, 2006; Runner-up, 2008, Honorable Mention, 2016.
European Society of Marketing Research	Best Paper at Rome conference, September 1984.
Emerald Management Reviews	2010 Citation of Excellence (top 50 of 15,000 published papers in 2009)
Doctoral Consortia Faculty	American Marketing Association, 1979, 1984, 1985, 1986, 1988, 1989, 1991, 1993, 1995, 1997, 1998, 2001, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2012, 2013, 2014. INFORMS Society of Marketing Science, 2002 (founding member), 2003, 2004, 2012, 2014, 2015, 2017. European Marketing Academy, 1985

Awards, Teaching

MIT Sloan School of Management:	Nominated for Excellence in Teaching Award 2000, 2007, 2008. Named "Outstanding Faculty" by *Business Week Guide to the Best Business Schools* (1995). Excellence in Teaching Award 1994 (Awarded by the Master's Student class).

Awards for Thesis Supervision

American Marketing Association (Ph.D.):	Winner John Howard Dissertation Award (2010, Matt Selove, Committee) Co-winner John Howard Dissertation Award (2005, Olivier Toubia) 1st Place (1981, Ken Wisniewski) Honorable Mention (1979, Patricia Simmie).
INFORMS (Ph.D.)	ISMS Doctoral Dissertation Proposal Award (2016, Artem Timoshenko) Winner of the Frank Bass Award (2004, Olivier Toubia, awarded 2005) Winner of the Frank Bass Award (1989, Abbie Griffin, awarded 1995)
MIT Sloan School of Management (Ph.D.):	1st Place (1987, Peter Fader)
MIT Sloan School of Management (Master's):	1st Place (1991, Jon Silver and John Thompson) 1st Place (1983, Steve Gaskin) Honorable Mention (1982, Larry Kahn).

Awards, Other

Who's Who in America	Since 1997
Who's Who in Management Science	Since 2000
Who's Who in Economics	Since 2003
Who's Who in Finance and Business	Since 2009
Harvard Business School:	Marvin Bower Fellow, 1987 - 1988.
National Science Foundation Fellowship:	1971 - 1974.
M.I.T.	National Scholar, 1967 - 1971.
Honor Societies:	Tau Beta Pi, Eta Kappa Nu, Sigma Xi

Directorships, Trustee, Advisory Board

1988 – Present	Founder, Principal, Board Member, Applied Marketing Science, Inc.
March 2003 – July 2009	Trustee, Marketing Science Institute

Academic Appointments

January 1989 - Present	Kirin Professor of Marketing MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
July 2010 – June 2011	Head, Marketing Group
July 2005 – June 2009	Area Head, Management Science Area
July 1988 – June 2003	Head, Marketing Group
September 1993 - May 2000	co-Director, International Center for Research on the Management of Technology
September 1997 - May 2000	Research Director, Center for Innovation in Product Development

June 2001 – June 2006	Virtual Customer Initiative Leader, Center for Innovation in Product Development
July 1984 - January 1989	Professor of Management Science MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
July 1987 - June 1988	Marvin Bower Fellow Harvard Business School Harvard University Cambridge, Massachusetts 02163
March 1985 - May 1985	Visiting Lecturer European Institute of Business Administration Fontainebleau, FRANCE
September 1980 - June 1984	Associate Professor of Management Science MIT Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
September 1975 - August 1980	Assistant Professor of Marketing and of Transportation (granted tenure and promoted in 1980) Graduate School of Management and Transportation Center Northwestern University Evanston, Illinois 60201

Teaching Interests

Marketing Management, New Product and Service Development, Competitive Marketing Strategy, Marketing Models, Measurement and Marketing Research, Research Methodology, Marketing Analytics.

Research Interests

Consumer decision measurement: conjoint analysis, non-compensatory methods, adaptive methods, machine-learning methods, strategic importance of accuracy. Product forecasting: information acceleration, really-new products, incentive-aligned games. Consumer behavior: cognitive simplicity in decision making and in dynamic models, theory-based models, vivid stimuli. Morphing: website, banner, product assortment. Voice of the customer methods, defensive and competitive strategy, new product development, experimental and quasi-experimental methods.

Books

Hauser, John R. and Glen L. Urban (2016), *From Little's Law to Marketing Science: Essays in Honor of John D. C. Little*, MIT Press: Cambridge MA.

This is an edited volume that serves as a Festschrift to honor the lifetime achievements of John D. C. Little.

Urban, Glen L. and John R. Hauser (1993), *Design and Marketing of New Products, 2E*, Prentice-Hall.

A comprehensive text that integrates advanced, state-of-the-art techniques to provide graduate-level students and marketing professionals with an understanding of the techniques and an operating ability to design, test, and implement new products and services.

This text has been honored by being selected for both the Prentice-Hall International Series in Management and the Series in Marketing. It has been adopted at a number of major universities. In a 1988 survey it was identified the 1980 version as the most widely used new product textbook at the graduate level.

The revision includes new material on designing for quality, reduced cycle times, prelaunch forecasting, quality improvement, defensive and competitive strategy, value mapping, the integration of marketing and engineering, new issues of organization, customer satisfaction, and new international examples. It is available in Korean and is being translated into Japanese and Chinese. Many current texts draw heavily from our material.

Third most cited work in the *Journal of Product Innovation*, 1984-2004. (Cited May 2010.)

Urban, Glen L., John R. Hauser, and Niki Dholakia (1986), *Essentials of New Product Management*, Prentice Hall.

This is an undergraduate textbook which presents the essential concepts but written for a non-technical audience. It has been translated to Japanese and has sold well in Japan.

Hauser, John R. (1986), *Applying Marketing Management: Four Simulations*, Scientific Press.

This mini-text and software package contains four tutorial exercises for marketing management concepts. With this package students learn positioning, competitive strategy, new product development, and life cycle forecasting while using the personal computer to simulate marketing management problems. A detailed instructor's manual and transparency masters are also available. It is available in Japanese.

Hauser, John R. (1989), *ENTERPRISE: An Integrating Management Exercise*, Scientific Press.

This mini-text and software package contains a comprehensive competitive simulation. Students compete in six markets by making marketing and production decisions. A detailed instructor's manual and administrative software is also available. It is available in Japanese.

Journal Editor

Marketing Science, Editor-in-Chief for volumes 8, 9, 10, 11, 12, and 13 (1989-1994). Four issues per year including periodic editorials and journal management. Processed about 120 new papers per year. Special Editor for issues on the Theory and Practice of Marketing (2014) and Big Data (2016).

Journal Publications (Almost all available for download at web.mit.edu/hauser/www.)

Citations Reports: January 6, 2017 Google Scholar; 22,665 citations and an H-index of 54 from http://scholar.google.com/citations?user=N6s8mO4AAAAJ&hl=en. ISI Web of Science (automated, January 6, 2017): 4,923 citations with an H-index of 33. Not included in automatic ISI report: Design and Marketing of New Products (474 2E, 286 1E, 35 UG), Defensive Marketing Strategies (229), Testing Competitive Market Structures (86). Application of Defender (43), Dynamic Markov Application (28). Revised total of 6,081; revised ISI H-index of 36.

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Hauser, John R., Glen L. Urban, Guilherme Liberali, and Michael Braun (2009), "Website Morphing," *Marketing Science.*, 28, 2, (March-April), 202-224. Lead article with commentaries by Andrew Gelman, John Gittins, and Hal Varian. Includes rejoinder.

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2010 Emerald Management Reviews Citation of Excellence for one of best articles published in the top 400 business and management journals in 2009. (Top 50 of 15,000 articles.)

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Hauser, John R., et al. (1974), "The Chemung County Transit Survey." Volunteers in Technical Assistance (a division of VISTA) publication for Chemung County, NY, June. (Includes analysis of transportation options based on the results of the survey designed and implemented by the technical team.)

Hauser, John R. (1974), "A Cost Model for RTS (Rochester, NY) Conventional Bus Routes," M.I.T., Department of Civil Engineering Report, January.

Hauser, John R. (1973), "An Efficient Model for Planning Bus Routes in Communities with Populations Between 20,000 and 250,000," M.I.T., Operations Research Center Working Paper OR-029-993, November.

Research Grants

July 2007 – June 2008	Understanding Non-compensatory Decision Making for Consideration Decisions (under Consortium with MIT Center for eBusiness and General Motors, Inc.)
June 2000 – May 2006	Center for Innovation in Product Development, MIT, Initiative Leader, Virtual Customer.
January 2001 – May 2002	eBusiness Center at MIT. Design and Delivery of Online Promotions. (with John Little, Duncan Simester, and Glen Urban).
January 1997 – May 2000	Center for Innovation in Product Development, Engineering Research Center Grant from the National Science Foundation. Research Director. In addition, research grants for non-monetary incentives, procurement metrics, and virtual customer methods.
June 1999 – May 2000	"Metrics Thermostat," International Center for Research on the Management of Technology (Principal Investigator).
June 1999- May 2001	"New Product Metrics at Ford and the US Navy," Center for Innovation in Product Development
June 1999- May 2001	"Lean Sustainment Metrics at the USAF," Lean Sustainment Initiative at MIT
June 1994 - May 1999	"Metrics to Value R&D," International Center for Research on the Management of Technology (Principal Investigator). General topic. Detailed proposals were for various aspects of the problem.
June 1991 - May 1994	"Customer Needs, Customer Satisfaction, Sales, and Profit: Providing the Right Incentives to Engineering and R&D," International Center for Research on the Management of Technology (co-Principal Investigator with Birger Wernerfelt)
January 1990 - June 1992	"Information Acceleration and Preproduction Forecasting of New Autos, Phases I and II." General Motors Electric Vehicle Project. (Associate)
December 1988 - June 1990	"Improved Methodologies to Measure Consumer Needs," Procter & Gamble Company. (Principal Investigator)
September 1981 - December 1985	"Prelaunch Forecasting System for New Consumer Durables and Its Applications to Auto Purchases," General Motors, Buick Division (co-Principal Investigator with Glen L. Urban).
January 1981 - May 1981	"Marketing Approaches in Travel Demand," United Parcel Service Grant (Faculty Advisor).
January 1979 - August 1980	"Monitoring the Implementation of Innovative Public Transportation Services" from University Research Program of the Urban Mass Transportation Administration (Principal Investigator).
July 1975 - September 1977	"Consumer-Oriented Transportation Service Planning." from the Program of University Research, U.S. Department of Transportation (Faculty Associate).
September 1977 - January 1978	"Consumer-oriented Transportation Service: Modification and Evaluation" from Program of University Research, USDOT (Faculty Associate).

May 1976 - September 1978	"Enhancement of Communications with a Small Scientific Community Using Slow-Scan Televideo Terminals and Voice-Grade Telephone Lines" from the National Science Foundation (Faculty Associate).
January 1976 - December 1976	"A Method for Assessing Pricing and Structural Changes on Transport Mode Use," U.S. Department of Transportation (Faculty Associate).
September 1976 - June 1977	"Prediction of Urban Recreational Demand" from the National Science Foundation (Faculty Consultant).

Invited Lectures (Outside the MIT Sloan School)

Carnegie Mellon University, April 8, 2016, “The Effect of Precision on Strategic Positioning.”

University of North Carolina, Kenan-Flagler Business School, Marketing Department. March 7, 2014. “Learning from Experience, Simply.”

Marketing Science Institute, November 2012, “Panel Discussion: Perspectives on Big Data from Marketing Scholars,” Cambridge, MA.

Wharton School, University of Pennsylvania, April 2009, “Website Morphing”

Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition, Summer Institute on Bounded Rationality in Psychology and Economics, August 2006, “Greedoid-Based Non-Compensatory Consider-then-Choice Inference.”

Northwestern University, Evanston, IL, April 2006, “Greedoid-based Non-compensatory Inference.”

University of Michigan, Seminar Series, October 2004, “Table Stakes: Non-compensatory Consideration-then-Choice Inference.”

Management Roundtable Special Conference on “Taking the Voice of the Customer to the Next Level,” Boston, MA October 2004, “The Virtual Customer.”

Marketing Science Institute Research Generation Conference, Atlanta, GA, May 2004, “New Products/Innovation,” (with Gerry Tellis).

Marketing Science Institute Conference on Emerging Approaches for Successful Innovation, Chicago, IL, May 2003, "'Listening-In' to Find Unmet Customer Needs and Solutions."

University of California at Los Angeles, "Polyhedral CBC (and other fun stuff), February 2003

New York University, "Polyhedral Methods," March 2003.

Industrial Liaison Program – Research Directors' Conference, April 2002, "The Virtual Customer."

University of Maryland, "Polyhedral Methods for Conjoint Analysis," March 2002.

Marketing Science Institute Trustees Meeting on Marketing Outside the Silo, Boston, MA, April 2002, "Challenges and Visions for Marketing's Role in Product Development Processes."

Managing Corporate Innovation -- ILP Symposium celebrating ten years of Management of Technology Research at MIT. “Dealing with the Virtual Customer: Fast Web-based Customer Input.” April 2001

Epoch Foundation, Cambridge, MA, October 2000, “The Virtual Customer.”

Yale University Research Seminar in Marketing, New Haven, CN, March 2000, "Metrics Thermostat."

Analysis Group Economics Seminar, Boston, MA, December 1999, "The Use of Marketing Research in Litigation." Also New York, NY, March 2000 and Washington, D. C., March 2002.

Boston Chapter of the Society for Concurrent Engineering, Waltham, MA, October 1999, "Metrics Thermostat."

University of Michigan DuPont Distinguished Speakers' Series, Ann Arbor, MI, March 1998, "New Product Metrics."

Kirin Brewery Co. Limited, Tokyo, JAPAN, December 1998, "You Are What You Measure!" and "Scientific Studies of the Voice of the Customer."

NEC Corporation, Tokyo, JAPA, December 1998, "Scientific Studies of the Voice of the Customer."

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Stanford University, Stanford, CA, December 1996, "Metrics to Value R,D&E"

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Duke University, Durham, NC, "Internal Customers and Internal Suppliers," Nov. 1995.

University of Minnesota, Minneapolis, MN, "Voice of the Customer," "Internal Customers and Captive Suppliers," May 1995.

Winter Retreat, University of Florida, Gainesville, FL, "Internal Customers and Captive Suppliers," December 1993.

Product Development Association - Boston, "Design and Marketing of New Products II: Advances in Product Development Management over the Last 13 Years," May 1993.

3M, Minneapolis, MN, "Incentives to Encourage a Long-term Perspective and a Customer Focus," Workshop on "Towards a World-class Research, Development, and Engineering Organization," November 1992.

Baxter Health Care, Orange County, CA, "The Voice of the Customer," August 1992.

TIMS College on the Practice of Management Science (*New Directions in Management Science*), Cambridge, MA: "The Voice of the Customer," October 1991.

IBM, Inc., Boca Raton, FL: "Voice of the Customer for Performance Graphics," May 1991.

Kirin Brewery Company, Ltd. Tokyo, JAPAN: "New Product Development" and "Customer Satisfaction and Customer Needs," April 1991.

American Iron and Steel Institute, Detroit, MI: "Satisfying the Customer -- Technical Issues," February 1991.

Warner Lambert, Inc., Mountain Laurel, PA: "Communication Among R&D and Marketing," October 1990.

Digital Equipment Corporation, Maynard, MA: "Voice of the Customer," May 1990.

Life Insurance Marketing and Research Association, Inc.: 31st Research Planning Conference, Boston, MA, "The House of Quality." June 1989.

University of Illinois: "Customer Driven Engineering." April, 1988.

Marketing Science Institute and IBM Thornwood Educational Facility: Quality through Customer Driven Engineering." April, 1988.

Harvard Business School: "Customer Driven Engineering: Integrating Marketing and Engineering." February, 1988.

Vanderbilt University: "Competitive Price and Advertising Strategies" and "Customer Driven Engineering." October, 1988.

Columbia University: "Price, Positioning, and Advertising Games: To Equilibrate of Not, Does it Pay to be Smart?" May, 1987.

New York Marketing Modelers' Club: "Would You Really Rather Have a Buick?: Prelaunch Forecasting of New Automobiles," May 1987.

M.I.T. Applied Economics: "Competitive Product Selection and Advertising Models." April, 1987.

Northwestern University: "Agendas and Consumer Choice," August, 1986.

AMA Faculty Consortium on Marketing Strategy at the University Tennessee, Knoxville. "Defender: Analyses for Competitive Strategy," July, 1986.

Ohio State University: "Defensive and Competitive Strategy." May, 1986.

Boston University: "Research in Competitive Strategy." November, 1985.

Midwest Electronics Association, Minneapolis, MN: "New Products for High-Tech Firms." October, 1985.

University of Pennsylvania: "Agendas and Consumer Choice," August, 1985.

Herstein Institute, Vienna Austria: "Competitive Strategy," May, 1985.

Cadbury-Schweppes, Birmingham, England: "New Product Development and Defensive Strategy." May, 1985.

Rhone-Poulenc and Aluminum Pechiney, Paris, France: "New Product Development." April, 1985.

University of Michigan: "Defensive and Competitive Strategy." February, 1985.

Marketing Science Institute Special Mini-Conference: "Defensive Marketing Strategies for Consumer Firms." September 1983.

University of Chicago, Graduate School of Business, Chicago, IL. "Agendas and Consumer Choice," May 1984.

European Institute for Business Administration (INSEAD), Fontainebleau, FRANCE. "Agendas and Consumer Choice," June 1984.

University of Connecticut. "Defensive Marketing: Theory, Measurement, and Models," April, 1983.

University of Osaka, JAPAN "Defensive Marketing: Theory, Measurement, and Models," August, 1983.

Kao Soap, Ltd., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Johnson & Johnson, K. K., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Analog Devices, Inc., Norwood, MA. "New Product Development," May, 1982.

University of Rochester Research Seminar, "Prelaunch Forecasting of New Consumer Durables," April 1982.

Frito-Lay R & D Laboratory, Dallas, TX, "Marketing and R & D for New Products," October 1981.

University of California at Los Angeles Research Seminar, "Defensive Marketing Strategies," July, 1981.

Purdue University Research Seminar, "Product Realization," October 1979.

Stanford University Research Seminar, "Product Realization," October 1979.

Elrick and Lavidge, Inc., Chicago, Illinois, "Product Realization," October 1979.

Booz, Allen and Hamilton, Inc., Chicago, Illinois, "New Service Planning for Hospitals," April 1979.

Cornell University Research Seminar, "Intensity Measures of Consumer Preference," February 1979.

University of Rochester Research Seminar, "Product Realization: Synthesis of Marketing and Economic Theory," December 1978.

Region VI Center of Health Planning, New Orleans, LA, "Finding the Linkage Through Marketing,: August 1978.

Nebraska Hospital Association, Kearney, NE, "Hospital Marketing Surveys," May 1978.

Executive Development Group, Waterloo Management Education Centre, Toronto, Ontario, Canada, "Designing New Industrial Products," February 1978.

Academic Update, Xavier University Graduate Program in Hospital and Health Administration, Cincinnati, OH, "Designing Hospital Services: A Marketing Approach," October 1977.

The Hospital Marketing Workshop, Ireland Educational Corporation, Chicago, Illinois, "Analyzing the Hospital Markets," January 1977 and May 1977.

Association for College Unions - International, 1976 Fall Conference in Green Bay, WI, Keynote Speech - "Designing Successful Services: A Marketing Approach," October 1976.

University of Chicago, Graduate School of Business, Research Seminar, "Testing Probabilistic Models," April 1976.

Council for the Advancement and Support of Education, Conference on Marketing Alumni Program, New York, NY, Keynote Speech, February 1976.

Presentations at Professional Meetings (No published proceedings, some co-presented or presented by co-author[s])*

INFORMS Doctoral Consortium, University of Southern California, Los Angeles, CA. June 8-10, 2016. “2.Machine learning applications for customer-oriented recommendation systems and the voice of the customer.”

INFORMS Marketing Science Conference, University of Southern California, Los Angeles, CA. June 8-10, 2016.

- Daria Dzyabura and John R. Hauser*, “Recommending Products When Consumers Learn Their Preferences.”
- Felix Eggers* and John R. Hauser, “Precision Matters: How Craft in Conjoint Analysis Affects Price and Positioning Strategies.”
- Artem Timoshenko* and John R. Hauser, “Identifying Customer Needs from User Generated Content.”

Dies Natalis Academic Symposium, Erasmus University, Rotterdam, The Netherlands, November 8, 2016, “Recommending Products When Consumers Learn their Preferences.” Based on research with Daria Dzyabuara.

Erasmus Centre for Marketing and Innovation, Econometric Workshop, Erasmus University, Rotterdam, The Netherlands, “Strategic Implications of Precision in Conjoint Analysis. Based on research with Felix Eggers.

2016 Paul D. Converse Symposium, University of Illinois, Champaign, IL, April 21-23, 2016, "Academic Achievements of Steven M. Shugan, Converse Winner."

INFORMS Marketing Science Conference, Shanghai, China. June 16-18, 2016, Xinyu Cao*, T. Tony Ke, John R. Hauser, Juanjuan Zhang, "Competing for Limited Attention on Social Media."

INFORMS Marketing Science Conference, Baltimore MD, June 2015. Songting Dong, John Hauser*, Min Ding, Lixin Huang, and Holger Dietrich, "The Sleuth Game: Predicting Consumer Response to as-yet-unspecified Product Features for Really New Products."

AMA/Sheth Foundation Doctoral Consortium, Northwestern University, Evanston, IL, June 2014, "Bridging Empircs and Practice."

INFORMS Marketing Science Consortium, Emory University, Atlanta GA, June 2014, "Learning from Experience Simply."

AMA Summer Educators' Conference, San Francisco, CA, August 1-3, 2014. Guilherme Liberali,* Hauser, John R., and Glen L. Urban "Recent Advances in Morphing Theory: Challenges and Opportunities for Research."

INFORMS Marketing Science Conference, Atlanta, GA, June 2014. Aliaa Atwi* and John R. Hauser, "Exploration vs. Exploitation in Rapid Coupon Personalization."

AMA Sheth Foundation Doctoral Consortium 2013, University of Michigan, Ann Arbor, MI, June 6-9. "Managing Your Career (as a Marketing Academic)."

AMA Summer Educators' Conference, Boston MA August 9-11, 2013. Panel on "Academic Integrity in the Publication Process" with Robert Meyer, Richard Lusch, John Hauser.*

10th Marketing Dynamics Conference, The University of North Carolina at Chapel Hill, May 30 – June 1, 2013. Song Lin*, Juanjuan Zhang, and John Hauser, "Learning from Experience, Simply."

Joint Statistical Meetings 2013, Montreal, Ontario, August 2013. Song Lin*, Juanjuan Zhang, and John Hauser, "Learning from Experience, Simply."

2012 AMA Sheth Foundation Doctoral Consortium, Foster School of Business, University of Washington, June 2012, Panel: 10 Steps to Successful Publishing.

INFORMS Marketing Science Conference, Boston, MA, June 2012.

- Song Lin*, Juanjuan Zhang, and John R. Hauser, "Learning from Experience, Simply."
- Glen L. Urban, Guilherme Liberali, Erin MacDonald, Robert Bordley, and John R. Hauser*, "Morphing Banner Advertising"
- Matt Selove* and John R. Hauser, "The Strategic Importance of Accuracy in Conjoint Design."
- Panel: Research Opportunities at the Marketing/Operations Interface

The 2012 Theory & Practice in Marketing (TPM) Conference on Marketing Strategy, Harvard University, Boston, MA. May 2-3, 2012. Glen L. Urban, Guilherme Liberali, Erin MacDonald, Robert Bordley, and John R. Hauser*, "Morphing Banner Advertising."

New England Marketing Conference, Cambridge, MA, October 28, 2011. Gui Liberali, Glen L. Urban and John R. Hauser*, " Providing Unbiased Competitive Information to Encourage Trust, Consideration, and Sales: Two Field Experiments."

Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT, May 12-14, 2011. John R. Hauser and Matthew Selove*, "The Strategic Importance of Accuracy in the Relative Quality of Conjoint Analysis."

INFORMS Marketing Science Conference, Cologne, Germany, June 2010 (*indicates primary presenter if not me)

- Liberali, Guilherme*, John R. Hauser, and Glen L. Urban, "Optimal Time-to-Morph and Cognitive Costs of Morphing."
- Liberali, Guilherme, Glen L. Urban, and John R. Hauser, "Do Competitive Test Drives and Product Brochures Improve Sales?"
- Urban, Glen L.*, Jong Moon Kim, Erin MacDonald, John R. Hauser and Daria Dzyabura, "Developing Consideration Rules for Durable Goods Markets."

2010 Advanced Research Techniques Forum, San Francisco, CA, June 6-9, 2010, "Unstructured Direct Elicitation of Non-compensatory and Compensatory Decision Rules," with Min Ding, Songting Dong*, Daria Dzyabura (listed as Silinskaia), Zhilin Yang, Chenting Su, and Steven Gaskin.

2009 AMA Sheth Foundation Doctoral Consortium, J. Mack Robinson College of Business, Georgia State University, June 2009. E-Commerce and Digital Marketing Topics.

INFORMS Marketing Science Conference, Ann Arbor, MI, June 2009 (* indicates primary presenter if not me)

- "An Empirical Test of Incentive-Compatible Direct Elicitation of Heuristic Decision Rules for Consideration and Choice," with Min Ding, Songting Dong, Daria Dzyabura, Zhilin Yang, Chenting Su, and Steven Gaskin
- "Adaptive Profile Evaluation to Identify Heuristic Decision Rules in "Large" and Challenging Experimental Designs," with Daria Dzyabura (formerly Silinskaia)* and Glen L. Urban..
- "Morphing Websites in the Presence of Switching Costs," with Guilherme Liberali* and Glen L. Urban.
- "Continuous-Time Markov-Process with Misclassification: Modeling and Application to Auto Marketing," with Glen L. Urban* and Guilherme Liberali.
- "An Incentive-Aligned Sleuthing Game For Survey Research," with Min Ding*
- "Would You Consider a Buick Even if It Were #1 in JD Power?" with Erin MacDonald* and Glen Urban
- "Cognitive Simplicity and Consideration Sets," with Rene Befurt*, Daria Dzyabura, Olivier Toubia, and Theodoros Evgeniou
- "John D. C. Little, a Pioneer in Marketing Science (Festschrift paper)," with Glen L. Urban

INFORMS Marketing Science Conference, Vancouver, B.C., June 2008 (* indicates primary presenter if not me)

- "Cognitive Styles and Website Design," with Michael Braun, Glen L. Urban, and Clarence Lee.
- Modeling Cognitive Complexity to Predict Consideration Sets," with Daria Dzyabura (formerly Silinskaia)*, Theodoros Evgeniou, Olivier Toubia, and Rene Befurt.
- "Morphing Websites to Match Individual Cognitive Styles," with Michael Braun*, Glen L. Urban, and Guilherme Liberali

Sawtooth Software Conference, Delray, FL, March 2009, "A Critical Review of Non-compensatory and Compensatory Models of Consideration-Set Decisions," with Min Ding and Steven Gaskin

AMA Doctoral Consortium, Robert J. Trulaske, Sr. College of Business, University of Missouri, June 2007, "Looking Ahead: Directions for Scholarly Research in Marketing" and "Building Teaching Effectiveness: Stimulating Student Interest."

Sawtooth Software Conference, Santa Rosa, CA, October 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, Daniel Bailiff.

AMA Advance Research Technologies Forum, Sante Fe, New Mexico, June 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, and Daniel Bailiff.

AMA Doctoral Consortium, W. P. Carey School of Business, Arizona State University, May 2007, "Consideration The New Battlefield in Product Development."

Agent-based Models of Market Dynamics and Consumer Behaviour, University of Surrey, Guildford, UK, January 2006, “Co-opetition for the Diffusion of Resistant Innovations: A Case Study in the Global Wine Industry using an Agent-based Model.” with Rosanna Garcia. Also presented at the American Marketing Association’s Advanced Research Techniques (ART) Forum in June 2006 at Monterrey CA.

AMA Doctoral Consortium, University of Maryland, College Park, MD, July 2006, “Creating Value: Products and Brands.”

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, “A Truth-telling Sleuthing Game for Survey Research,” with Min Ding.

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, On Managerially Efficient Experimental Designs,: with Olivier Toubia.

Sawtooth Software Conference on Conjoint Analysis, Delray Beach, FL, March 2006, “Must Have” Aspects vs. Tradeoff Aspects in Models of Customer Decisions,” with Michael Yee, James Orlin, Ely Dahan.

AMA Doctoral Consortium, University of Connecticut, Storrs CT, June 2005, “The Virtual Customer.”

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Direct, Nonparametric Product Optimization Using Interactive Genetic Algorithms,” with Kamal Malek and Kevin Karty.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Non-Deterministic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Application to the Diffusion of the New Wine Cork,” with Olivier Toubia and Rosanna Garcia.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, “Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference,” with Michael Yee, Jim Orlin, and Ely Dahan.

Marketing Science Doctoral Consortium, Rotterdam, The Netherlands, June 2004, “Research that Has Impact.”

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “Improving Choice-Based Polyhedral Methods by Taking Response Error into Account,” with Olivier Toubia.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “The Dream Versus Reality of CRM,” with Glen L. Urban, Eric Bradlow, and, Mahesh Kumar.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, “Non-compensatory Consideration-then-Choice Adaptive Conjoint Analysis,” with Michael Yee and James Orlin.

AMA Doctoral Consortium, Texas A&M University, College Station, TX, June 2004, "Virtual Customer Initiative."

AMA Advanced Research Techniques Forum, June 2004, “Conjoint Adaptive Ranking Database System (CARDS),” with Ely Dahan, James Orlin, and Michael Yee.

AMA Doctoral Consortium, University of Minnesota, Minneapolis, MN, June 2003, "The Review Process."

Marketing Science Doctoral Consortium, University of Maryland, June 2003, “Roots of Marketing Science Thought,” with John Little.

Marketing Science Conference, University of Maryland, June 12-15, 2003, "Individual-level Adaptation of Choice-Based Conjoint Questions: More Efficient Questions and More Accurate Estimation," (with Olivier Toubia and Duncan Simester).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Configurators, Utility Balance, and Managerial Use," (with Duncan Simester and Olivier Toubia).

Marketing Science Doctoral Consortium, University of Alberta, Canada, "Helping Managers Structure and Make Decisions," June 27, 2002. (Founding Consortium).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Adaptive Choice-Based Conjoint Analysis with Polyhedral Methods," (with Duncan Simester and Olivier Toubia*).

Advances in Marketing Research and Modeling: The Academic and Industry Impact of Paul E. Green, Wharton, Philadelphia, PA, May 2002, "New Methods of Data Collection and Estimation Using Polyhedral Estimation Techniques."

Production and Operations Management Society (POMS) Conference 2002 - High Tech POM, San Francisco, CA, April 2002, "The Virtual Customer," (with Ely Dahan*).

Product Development Association (PDMA) International Research Conference, Santa Clara, CA, October 2001, "The Virtual Customer," (with Ely Dahan*).

New England Marketing Conference, Cambridge, MA, September 2002, "Fast Polyhedral Adaptive Conjoint Estimation," (with Ely Dahan, Duncan Simester, and Olivier Toubia).

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Empirical Test of Web-based Conjoint Analysis Including ACA, Efficient Fixed Designs, Polyhedral Methods, and Hybrid Methods," (with Ely Dahan, Duncan Simester, and Olivier Toubia*)

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Evaluation of Fast Polyhedral Adaptive Conjoint Estimation," (with Duncan Simester and Olivier Toubia).

The 12th Annual Advanced Research Techniques Forum, Amelia Island, Florida, June 2001, "The Virtual Customer: Communication, Conceptualization, and Computation," (with Ely Dahan*).

AMA Doctoral Consortium, University of Miami, June 2001, "Role of Technology in Marketing."

Marketing Science Conference, UCLA, June 2000, "Applications of the Metrics Thermostat."

Marketing Science Conference, UCLA, June 2000, "The Virtual Customer." (with Ely Dahan and Duncan Simester).

Marketing Science Institute Marketing Metrics Workshop, Washington, D.C. October 1999, "Metrics for New Product Development: Making Agency Theory Practical," Plenary Speaker.

Marketing Science Conference, Syracuse, NY, May 1999, “Balancing Customer Input, Speed to Market, and Reduced Cost in New Product Development: What is the Most Profitable Strategy”

ICRMOT Conference on Technology Alliances and New Product Development: A Cross-cultural Perspective, Mishima, JAPAN, December 1998, “You Are What You Measure!”

AMA Doctoral Consortium, Athens, Georgia, August 1998, “Quantitative Advances in Marketing Models.”

AMA Winter Educators’ Conference, Austin, TX, February 1998 (Plenary Speaker), “New Challenges in the Marketing-Product Development Interface.”

AMA Doctoral Consortium, Cincinnati OH, August 1997, "Working with Industry."

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Marketing Science Institute Conference on Interfunctional Interfaces: The Management of Corporate Fault Zones, Palo

Alto, CA, December 1996, “Multi-Stage Modeling of R&D/Marketing Interfaces in New Product Development.”

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Envisioning the Future on Internet Marketing: Research and Strategy Implications, M.I.T., September 1996, “Agents and Intermediaries: Roles, Trust, and Value.”

"Can R&D be Evaluated on Market-Driven Criteria?," (with Florian Zettelmeyer). Marketing Science Conference, University of Florida, Gainesville, March 1996

"Information Acceleration," (with Glen Urban, William Qualls, Bruce Weinberg, Jon Bohlmann, and Roberta Chicos). Wharton Conference on Innovation in Product Development, Philadelphia, PA, May 1995.

"Metrics by Which Managers Evaluate R&D Groups," (with Florian Zettelmeyer). Association of Consumer Research, Boston, MA, October 1994.

"Satisfying the Internal Customer," (with Birger Wernerfelt and Duncan Simester) Marketing Science Conference, University of Arizona, Tucson, AZ, March 1994.

"Customer-Satisfaction Based Incentive Systems," AMA Educator's Conference, Boston, MA, August 1993.

"Marketing in the 1990s: Emerging Issues," AMA Doctoral Consortium, University of Illinois, August 1993.

"Quality Function Deployment and the Voice of the Customer," Pharmaceutical Management Science Association, Phoenix AZ, May 1993.

"In a World of Active Time-constrained Customers, How Can a Firm be the Great Communicator," (with Birger Wernerfelt), Marketing Science Conference, Washington University, St. Louis, MO, March 1993.

"Customer Needs, Customer Satisfaction, Sales, and Profit," (with Birger Wernerfelt, Ronit Bodner, and Duncan Simester), ORSA/TIMS Joint National Conference, San Francisco, CA, November 1992.

"Customer Satisfaction and Employee Rewards," (with Birger Wernerfelt, Ronit Bodner, and Duncan Semester), Marketing Science Conference, London, England, June 1992.

"Information Acceleration and Preproduction Forecasting of Electric Autos," (with Glen L. Urban and Bruce Weinberg), Marketing Science Conference, London, England, June 1992.

"The Voice of the Customer and Customer Satisfaction," ORSA/TIMS Joint National Meeting, Anaheim, CA, October 1991.

"Modeling Marketing Phenomena," AMA Doctoral Consortium, University of Southern Calif. August 1991.

"Relationship of Satisfaction to Customer Needs and to Market Share," 1st Congress on Customer Satisfaction and Market-Driven Quality, American Marketing Association, Orlando FL, May 1991.

"Time Flies When You're Having Fun: How Consumers Allocate Their Time When Evaluating Products" (with Bruce Weinberg, Glen Urban, and Miguel Villas-Boas), Marketing Science Conference, Wilmington, DL, March 1991.

"Information Acceleration and Preproduction Forecasting of New Autos," (with Glen Urban, and Bruce Weinberg), Marketing Science Conference, Wilmington, DL, March 1991.

"Beyond Quality Function Deployment," ORSA/TIMS Joint National Meeting, Philadelphia, PA October 1990. (Conference-wide Tutorial)

"Competitive Marketing Strategies," Operations Research 1990 (Osterreichische Gesellschaft fur Operations Research), Vienna, Austria, August 1990. (Invited Speaker)

"New Product Development: A Quantitative Analysis of Interfunctional Communication" (with Abbie Griffin), Marketing Science Conference, Urbana, IL, March 1990.

"Integrated Product Development: New Methodological Developments" (with Abbie Griffin), Marketing Science Conference, Durham, N.C., March 1989.

"Customer Driven Engineering" (with Gregory Cirmak and Robert Klein), ORSA/TIMS Joint National Meeting, Washington, D.C., April 1988.

"Competitive Advertising and Pricing in Duopolies" (with Birger Wernerfelt), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Driven Engineering" (with Abbie Griffin), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Needs," Visions of Design Practices for the Future, Newton, MA, October 1987.

"Effective Strategies in Oligopoly" (with Peter Fader), ORSA/TIMS Joint National Meeting, Miami Beach, Florida, November 1986.

"Competitive Strategy Contest: Result and Analysis" (with Peter Fader), Marketing Science Conference, Dallas, TX, March 1986.

"The PC As a Tool to Teach Complex Marketing Science Concepts," Marketing Science Conference, Dallas, TX, March 1986.

"The Coming Revolution in Marketing Theory," Plenary Speaker, European Marketing Conference, Bielefeld, West Germany. April 1985.

"Defensive Strategy" Confer. on Economics of the Firm, Universite de Paris X, Nanterre, France, April 1985.

"Competitive Marketing Strategies" Marketing Science Conference, Nashville, Tennessee, March 1985.

"Developing New Product Management: Past Progress, Current Efforts, Current Needs" (Panel) Marketing Science Conference, Nashville, Tennessee, March 1985.

"Testing Competitive Marketing Structures: Theory and Applications" (with Glen Urban) ORSA/TIMS Joint National Meeting, Dallas, TX November 1984.

"Competitive Strategy," ORSA/TIMS Joint National Meeting, Dallas, Texas, November 1984.

"Forecasting Automobile Sales: An Application of a Value Priority Algorithm," (with Glen Urban), John Roberts and John Dabels), TIMS XXVI International Meeting, Copenhagen, Denmark, June 1984.

"Consumer Durables: The Actual Consumer Budgets Compared to the Value Priority Model," (with Glen Urban), Marketing Science Conference, Chicago, Illinois, March 1984.

"Defensive Strategy Models: Application and Predictive Text," (with Steven Gaskin, and Karl Irons) ORSA/TIMS Joint National Meeting, Orlando, Florida, November 1983.

"New Product Research: Focus on Defensive strategies," Roundtable Program, ORSA/TIMS Joint National Meeting, Orlando, FL, November 1983.

"Intensity of Preference," (with Steven Shugan) ORSA/TIMS Joint National meeting, San Diego, CA, October 1982.

"Measurement Error Theories for von Neumann-Morgenstern Utility Functions," (with Jehoshua Eliashberg) ORSA/TIMS Joint National Meeting, San Diego, CA, October 1982.

"Consumer Preference Models: Axioms and Statistics," ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Economic Models of Consumer Behavior," (panel discussion), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Defensive Marketing Strategies, Part II," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Agendas and Choice Probabilities," (with Amos Tversky), Association of Consumer Research, St. Louis, Missouri, October 1981, and Special Conference on Choice Theory, Durham, North Carolina , June 1981.

"Strategic Response to Competitive New Products," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Toronto, Ontario, Canada, May 1981.

"Applications of a Dynamic Semi-Markov Model of Consumer Choice," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Colorado Springs, Colorado, November 1980.

"Models of Consumer Behavior," (panel discussion), ORSA/TIMS joint National Meetings, Colorado Springs, Colorado, November 1980.

"Dynamic Semi-Markov Models of Consumer Behavior," (with Ken Wisniewski) TIMS International Conference on Marketing, Paris, June 1980.

"Profit Maximizing Perceptual Positioning," (with Patricia Simmie) TIMS International Conference on Marketing, Paris, June 1980.

"An Error Theory for von Neumann-Morgenstern Utility Assessment," (with Jehoshua Eliashberg), ORSA/TIMS Joint National Meeting, Washington, D.C., May 1980.

"Defender: Defensive Strategies Against New Products" (with Steven Shugan), ORSA/TIMS Second Special Interest Conference on Marketing Measurement and Analysis, Austin, Texas, March 1980.

"Adaptive Control of New Product Launches," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Milwaukee, Wisconsin, October 1979.

"The Value of Up-front Research in New Products," (with Glen Urban), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Methods for Computing Probabilities of Choice," (with Steven Shugan), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Forecasting and Improving the Adoption of New High Technology Products," (with Pat Lyon), ORSA/TIMS Joint National Meeting, New Orleans, Louisiana, May 1979.

"A Methodology for Product Realization: Multi-method Procedures," (with Patricia Simmie), ORSA/TIMS Joint National Meeting, Los Angeles, California, November 1978.

"Searching for Marketing Segments" (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, New York, New

York, May 1978.

"P.A.R.I.S.: An Interactive Market Research System," (with Steven Shugan), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"Extended Conjoint Analysis," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Consumer Preference Functions: Theory, Measurement, Estimation , and Application," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Measuring Consumer Preferences for Health Care Plans," (with Glen Urban), ORSA/TIMS Joint National Meeting, San Francisco, California, May 1977.

"Improved Transportation Design with Consumer Response Models: An AMTRAK Example" (with Frank Koppelman), ORSA/TIMS Joint National Meeting, Miami, Florida, November 1976.

"A Comparison of Statistical and Direct Multiattribute Utility Assessment Procedures," (with Glen Urban), ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1985.

"Measuring Consumer Preferences: An Axiomization for Describing Choice," ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1975.

"Modeling Consumer Response to Innovations," (1) Milwaukee Chapter of ORSA/TIMS, November 1985; (2) Chicago Chapter of ORSA/TIMS, December 1975.

"Modeling Decisions of Choice Among Finite Alternatives: Applications to Marketing and to Transportation Demand Theory," ORSA/TIMS Joint National Meeting, San Juan, Puerto, Rico, October 1974.

"An Efficient Model for Planning Bus Routes in Medium Sized Communities," ORSA/TIMS Joint National Meeting, San Diego, CA, November 1973.

Professional Affiliations

The Institute for Operations Research and Management Science (INFORMS)

INFORMS Society of Marketing Science (ISMS)

American Marketing Association

Product Development and Management Association, Certified New Product Development Professional

Professional Services

President, INFORMS Society of Marketing Science (January 2014 –December 2015). President-elect (a board position, January 2012 – December 2013). Past-President (a board position, January 2016 – December 2017).

Secretary, INFORMS Society of Marketing (January 2002 – December 2005). Founding Officer.

Advisory Council, INFORMS College of Marketing (1994 - 2002)

Council of The Institute of Management Sciences (TIMS, 1987 - 1989)

Associate Editor for Marketing, *Management Science*, (1980 - 1981)

Department Editor for Marketing, *Management Science*, (1982 - 1988)

Editor-in-Chief, *Marketing Science*, (1989 - 1994)

Editor, Special Issue on Big Data, *Marketing Science*, 2016. Senior Editor, Practice Papers, *Marketing Science*, 2016. Associate Editor, Special Issue on the Theory and Practice of Marketing, *Marketing Science*, 2014.

Editorial Advisory Board, *Sloan Management Review* (2000-2002).

Associate Editor, *Journal of Marketing Research* (April 2006 – June 2009). First time in journal history that Associate Editors had been appointed.

Senior Advisory Board, *Journal of Marketing Research* (July 2009 – 2016). First time such an advisory board was formed.

Advisory Board, *Marketing Science* (2010 – 2016).

Advisory Board, *Journal of Product Innovation Management* (2011 – 2014)

Emeritus Editorial Board, *Marketing Science* (includes active reviewing of papers).

Editorial Boards, *Marketing Science*, (1980 – 1988, Editor 1989-1995, 2003- 2008, including acting Area Editor), *Journal of Product Innovation Management* (1997 - 2010), *Journal of Marketing* (2005- 2008, outstanding reviewer 2006), *European Management Journal* (advisory, 1998 - 2002), *International Journal for Research in Marketing* (2007 – 2014).

Reviewer: *Advances in Consumer Research, Applications in Management Science, European Journal of Research in Marketing, Journal of the Academy of Marketing Science, Journal of Consumer Research, Journal of Marketing, Journal of Marketing Research, Journal of Mathematical Psychology, Journal of Product Innovation Management, Management Science, Marketing Science, Operations Research, Review of Marketing, Sloan Management Review, Transportation Research Record, Transportation Science, Journal of Business Research,* AMA Dissertation Prize, AMA Educators' Conference, American Institute of Decision Sciences Dissertation Prize, Nicholson Dissertation Prize, Marketing Science Institute Dissertation Award, Product Development Management Association Dissertation Prize, Prentice-Hall Books, National Science Foundation.

Conference Chairman: Conference Chair, Profitable Customer-Driven Organizations: Developing the Blueprint, Management Roundtable, May 1994.

Segment Chairman: Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT. May 12-14, 2011. New Product Innovations.

Non-traditional Models of Consumer Preference and Choice, Adaptive Preference and Estimation, Optimizing Product Design and Customer Targeting, Obtaining Information From or About Consumers (Atlanta, GA, 2005, co-chair four sessions)

TIMS International Meeting, Copenhagen, Denmark, June 1984 (two sessions).

TIMS College of Marketing, Houston, Texas, October 1981 (twelve sessions).

TIMS College of Marketing, Milwaukee, Wisconsin, October 1979 (five sessions).

American Marketing Association Educator's Conference, Chicago, Illinois, August 1978, (three sessions).

INFORMS Marketing Science Conference, Atlanta GA, June 2005 (four sessions)

Session Chairman: *INFORMS (Previously named ORSA or TIMS)*

Virtual Customer Initiative (Rotterdam, The Netherlands, 2004)

New Approaches to Mapping (University of Maryland, 2003)

The Virtual Customer (University of Alberta, Canada 2002)

The Virtual Customer (Wiesbaden, Germany 2001)

Building Competitive Advantage Through Product Quality and R&D (Gainesville, FL 1996)

Customer Satisfaction and Its Role in Global Competition (San Francisco, CA 1992)

Competitive R&D (Washington, D.C., April 1988)

Competitive Marketing Strategy, (St. Louis, Michigan, November 1987)

Competition in Multiattributed Spaces (Atlanta, Georgia, November 1985).

Marketing: Consumer Measurement (Copenhagen, Denmark, June 1984)

Marketing: Dynamic Structures (Copenhagen, Denmark, June 1984)

Product Policy (Orlando, Florida, November 1983)

Product Policy (San Diego, California, October 1982)

New Product Introduction and Defense in Competitive Environments, (Detroit, Michigan, April 1982)

New Product and Product Policy Models, (Houston, Texas, October 1981)

New Product Models (Toronto, Ontario, Canada, May 1981)

Models of Consumer Behavior (Colorado Springs, Colorado, November 1980)

New Product Realization and Selection (Los Angeles, California, November 1978).

Session Chairman: *Association of Consumer Research*

Mathematical Theories of Consumer Behavior (St. Louis, Missouri, October 1981)

Committee Memberships

Editor Selection Committee, *Marketing Science*, INFORMS College of Marketing, 2001 (chair), 2004 (chair), 2007.

Editor Selection Committee, *Journal of Marketing Research*, American Marketing Association, 1999.

Conference Steering Committee, Duke Invitational Symposium on Choice Modeling and Behavior, June 1993.

Editor Selection Committee, *Management Science*, TIMS.

Founding Committee for *Marketing Science*, TIMS College of Marketing, (1979 - 1982).

Management Science Roundtable, TIMS, (1982 - 1988)

Marketing Strategy Steering Committee, Marketing Science Institute, (1983 - 1984).

Organizing Committee for Conference on Economics of the Firm, April 1985, Universite de Paris X Nanterre.

Organizing Committee for 1985 Conference in Bielefeld, West Germany, European Marketing Academy.

Publications Committee (1980 - 1982), Operations Society of America.

Scientific Committee for 1986 Conference in Helsinki, Finland.

Student Affairs Committee (1978 - 1979), Operations Society of America.

*Litigation Consulting (on behalf of, *deposition testimony, †court, commission, or arbitration testimony)*

ABC, Inc., American Broadcasting Company, Inc., and Disney Enterprises, Inc., Plaintiffs, v. Dish Network L.L.C. and Dish Network Corp., (Preliminary Injunction)

Joseph Adinolfe, et al., v. United Technologies Corp., d/b/a Pratt & Whitney (class action, damages)*

Alcatel-Lucent USA Inc. v. Amazon.com, Inc. et al. (Patent Infringement)* †

Allergan, Inc. Engagement. (Off-label Prescriptions)

American Express Travel Related Services, Inc. v. Visa USA, Inc., et. al. (Evaluation of marketing research) *

In Re American Express Anti-Steering Rules Antitrust Litigation (II) (Evaluation of marketing research)*

American Multi-Cinema, Inc. v. American Movie Classics Company, Inc., et. al. (Confusion)

Amway v. Procter & Gamble (Damages)*

Apple, Inc. v. Samsung Electronics Company, Ltd, et al. (Patent infringement, two cases) ** †††

Atlantic Recording Corporation, et. al. v. XM Satellite Radio, Inc. (Copyright infringement).

Axcan Scandipharm, Inc. V. Global Pharmaceuticals And Impax Laboratories, Inc. (False Advertising)

Avaya Inc. v. SNMP Research International, C.A. (Damages)*

Berlex v. Biogen, Inc. (Damages)*

Blue Mountain Arts, Susan Polis Schutz, and Stephen Schutz v. Hallmark Card, Inc. (Trade Dress)

James And Lisa Camenson, et al.; v. Milgard Manufacturing Inc., et. al. (Class action)

CBS Corporation, CBS Broadcasting Inc., CBS Studios Inc., and Survivor Productions, LLC. v. and DISH Network Corporation, DISH Network L.L.C. (damages).

Clearchannel Communications, Inc. in the Webcasting IV. (Damages)

Comm-Tract Corp. v. Northern Telecom, Inc. (Advice only)

Comcast Cable Communications. LLC v. Sprint Communications Company (Patent Infringement)*

Computer Aid, Inc. v. Hewlett Packard (damages)*

Creative Laboratories, Inc. v. Apple Computer, Inc. (Intellectual Property)

CTC Communications Corporation v. Bell Atlantic Corporation (Damages)

Dayna Craft, et al. v. Philip Morris Companies, Inc. and Philip Morris Inc. (Class Action).*

Eagle Harbor Holdings LLC, and Mediustech LLC, v. Ford Motor Company (Patent infringement).

Anne Elkind And Sharon Rosen, et al. v. Revlon Consumer Products Corporation, Inc. (Class Action)

EPD v. Curtis (Product Confusion)†

Fox Broadcasting Company, Inc., Twentieth Century Fox Film Corp., and Fox Television Holdings. Inc., Plaintiffs, v. Dish Network L.L.C. and Dish Network Corp., (Preliminary Injunction, Damages)*

Stephen S. Gallagher, et. al. v. State Farm Mutual Automobile Insurance Company, et al. (Class Action)

Geico v. Google and Overture Services (Yahoo), Inc. (Trademark Infringement)

Gillette v. S. C. Johnson (Patent Infringement)

Gyrodata, Inc. v. Atlantic Inertial Systems Inc ("AIS"), et al. (consulting expert)

Heublein vs. Seagrams and Gallo (Liability)

Hewlett-Packard, Inc. v. Factory Mutual Insurance Company (Insurance Coverage)*

IMS Health Incorporated v. Symphony Health Solutions Corporation, Source Healthcare Analytics, LLC, and ImpactRx, Inc., C.A. No. 1:13-cv-2071-GMS (D. Del.). (Patent infringement, technical expert.)

Intel v. Advanced Micro Devices (Damages)*

J. B. D. L. Corp. d/b/a, Beckett Apothecary v. Wyeth-Ayerst Laboratories, Inc. and American Home Products Corporation, (Class Action)

Jerry Jacobs, et. al. v. Osmose Inc., et. al. (Class Action)*

Jay Kordich, et. al. v. Salton Maxim Housewares, Inc., et. al. (Trademark)†

Michael Kors, Inc. v. Costco Wholesale Corporation (False Advertising)*

In RE J.P. Morgan Chase Cash Balance Litigation (Class Action)*

L.A. Taxi Cooperative, Inc. et al. v. Uber Technologies, Inc.; Rasier, LLC; and Rasier-CA, LLC. (False Advertising).

Lending Tree, Inc. v. The Gator Corporation (Intellectual Property)

Lotus v. Borland (Damages)*

Louis Vuitton Malletier, S. A. v. Hyundai Motor America (Trademark Infringement)*

Marvin Lumber and Cedar Company v. PPG Industries, Inc., et. al. (Survey Design)

MasterCard International, Inc. v. First National Bank of Omaha (Product Confusion)*

Mayo Foundation v. Mayo Health Facilities (Product Confusion)†

Mead Johnson Nutritionals v. unnamed party (False Advertising)

Merck & Co. (Lanham Act Advice)

Michael Kors (USA), Inc. and Michael Kors, L.L.C. v. Costco Wholesale Corporation, Civil Action No. 13-CV-4832, the United States District Court Southern District of New York. (Damages)*

In Re Microsoft Corporation Antitrust Litigation (Multi-district Litigation)*

Millennium Laboratories, Inc. v. Ameritox, Ltd. (False Advertising)

Scott Miller, et al. v. Fuhu, Inc. and Fuhu Holdings, Inc. (Class Certification)*

Pacific Bell Telephone Company in New Regulatory Framework Review of Customer Satisfaction before the California Public Utility Commission†

Luciano F. Paone v. Microsoft Corporation (Patent Infringement)*

Pfizer Consumer Healthcare (Lanham Act Advice)

Playtex v. Procter & Gamble (Claims Substantiation)*†

Procter & Gamble v. Amway (Liability and Damages)*†

Procter & Gamble v. Haugan, et. al. (Liability and Damages)†

Putnum Fund Trustees, (Investment Fraud, advice on market research)

Ram Broadcasting, Inc. (Cellular Telephone Filings)

RealPlayer, Inc. v. Microsoft Corporation (Anti-trust)

Roberts et. al. v. Enterprise Rent-a-Car Company of Boston, Inc. (Class Action)

The Republic of Columbia v. Diageo North America, et al. (Anti-trust).

Sprint Communications Company L.P. et al. v. Comcast Cable Communications, LLC. et al. (Damages)*

St. Clair Intellectual Property Consultants, Inc. v. Research in Motion, Ltd. and General Imaging Co. (Patent infringement)

Barbara Schwab, et. al. v. Philip Morris, USA (Class Action)*

Curt Schlesinger and Peter Lore, on behalf themselves and the Certified Class, Plaintiffs, v. Ticketmaster (Class action, false advertising, confusion)*

SoundExhange, Inc. vs. Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.: In the Matter of Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Radio Services. 2007*†. 2012†*

State of Colorado, et. al. v. Warner Chilcott Holdings Company III, Ltd., et. al. (Anti-trust)*

State of Florida and Plaintiff States Antitrust Litigation for Disposable Contact Lenses (Survey Analysis)†

Stipic, et. al. v. Behr Process Corporation and Masco International (Class Action)*

Straumann Company v. Lifecore Biomedical, Inc. (Product Confusion)*

Sun Microsystems, Inc. v. Microsoft Corporation (Anti-trust).

Symphony Health Solutions Corporation v. IMS Medical Radar (Technical Expert)*.

Takada Pharmaceuticals USA, Inc. v. Par Pharmaceutical Companies, Inc. Par Pharmaceutical, Inc., Amneal Pharmaceuticals, LLC, Watson Laboratories, Inc. West-Ward Pharmaceutical Corp., Hikma Americas PLC. (Patent Infringement).

Tivo, Inc. v. Echostar Communications Corporation, et. al*

Tropicana Products, Inc. v. Vero Beach Groves, Inc. (Lanham Act)† (Declaration accepted as court testimony.)

Wal-Mart Stores, Inc (and other retailers) v. Mastercard International, Inc. (Liability and Damages, Anti-trust)*

We Media, Inc. v. We: Women's Entertainment, LLC. (Product Confusion)*.

Olua Zakaria, et al. v. Gerber Products Co. d/b/a Nestle Nutrition, Nestle Infant and Nestle Nutrition North America (class action, damages)*.

Marketing, Marketing Research, and Product Development Consulting Not Otherwise Listed

American Home Foods, Inc.; American Airlines; American Hospital Supply Corporation; Analog Devices, Inc; Andersen Consulting, Inc. (Accenture), Applied Marketing Science, Inc.; A.T.&T.; Avon; Barton-Aschmann Associates; Baxter Cardiovascular Group, Booz Allen Hamilton, Inc., Cambridge Systematics, Inc.; Chrysler, LLC; Colgate-Palmolive; Costello Associates, Inc.; Economics' Laboratories, Inc.; Elrick and Lavidge, Inc.; Evanston Hospital; Evanston, Illinois and Schaumburg, Illinois (Transportation Planning); Fiat Chrysler Automobiles, Fidelity Investments; Ford Motor Company; French's Inc., G.D. Searle, Inc.; General Foods, Inc.; General Motors, Inc., Buick Division, Chevrolet Division, Marketing and Product Planning; Gillette; IBM, Inc.; Information Resources, Inc.; Intel, Inc., Johnson & Johnson; Kodak; Macromedia, Inc., Management Decision Systems, Inc.; M/A/R/C, Inc.;

Merck, Inc., Navistar International, Inc.; Pacific Gas and Electric Company, Pepsi-Cola, Inc.; Polaroid; Procter & Gamble Company; Product Genesis, Inc.; RAM Broadcasting, Inc.; Regional Transportation Authority; Richardson-Vicks, Inc.; Southern Company Services, Inc.; Time-Life Books; Volunteers in Technical Assistance, and Wyeth-Ayerst Laboratories, Inc. Co-founder, principal, and board member, Applied Marketing Science, Inc., Advisory Board (former), Affinnova, Inc.

M.I.T. or MIT Sloan Committee Work

Associated Faculty Committee to Review the Organizational Learning Center (MIT Sloan), 1995.

Building Committee for the E51 Expansion, MIT Sloan, 1992, Ad Hoc.

Center for Innovation in Product Development

Leader, Virtual Customer Initiative, 2000 - 2006

Research Director, 1997 – 2000

Center for Transportation Studies, 1981 - 1982.

Master of Science in Transportation Committee.

Committee on the Masters in Analytics, 2014-2016.

Committee on the Undergraduate Program, 2003 – 2005.

Committee to Investigate Sloan-Logo Research Notes (MIT Sloan, chair), 2001-2002.

Dean's Consultation Committee (MIT Sloan), 2008-2009.

Dean Search Committee (MIT Sloan), 1993.

Executive Educational Programs Committee (MIT Sloan), 1983 – 1985, 1998-1999, 2007.

Faculty Admissions Committee, 2004-2009.

Faculty Council (MIT Sloan), 1999.

International Center on Research for the Management of Technology (MIT Sloan).

Co-Director, (1993 - 2000).

Joint Steering Committee (1990 - 1993).

Management Science Area, MIT Sloan School of Management.

Area Head, (2005- 2009).

Chairman of Subcommittee on Peer Group Comparisons, (1981 - 1982).

Committee on Management Science Curriculum Redesign, (1982 - 1983).

Marketing Group Head (1986, 1988 – 2003, 2010-2011).

Marketing PhD Admissions, Head (2015, 2016)

Management of Technology Program Committee (MIT Sloan), (2001- 2003).

Master's Program Committee, MIT Sloan, (1980 – 1987, 2007 – 2015).

Ad hoc committee to develop a Marketing, Operations and Strategy Track (2011-2012).

Ad hoc committee to understand gender issues in class participation (2015-2016)

Chairman: Subcommittee On Placement, (1981 - 1982).

Core Curriculum Implementation Committee (1992-1994).

Core Curriculum Reassessment Committee (1991-1992).

Subcommittee on Admissions, Special Consideration, (2007 – 2009).

Subcommittee on Course Ratings (2011).

Subcommittee on Entrepreneurship and Innovation Evaluation (Chair, 2008).

Subcommittee on Fellowship Awards (2014-2015)

Subcommittee on the Management Science Core, (1982 - 1983).

Subcommittee on Tracks (2008-2009).

Subcommittee on Strategy Curriculum (2009).

MIT Sloan Committee on Educational Technology, 2004 – 2006.

Operations Research Center

Admissions Committee, (1981 - 1982).

Associated Faculty (1980 – 2000).

Operations Research Committee (2001- 2003).

President's Committee (1984).

Organization Committee for the New MIT Sloan Building, E62, (2007- 2009).

Personnel and Policy Committee, MIT Sloan (Executive Committee, 2005 – 2009, 2013-2014).

Chair of ad hoc committees for reappointment, promotion, and tenure (1983 - 2014).

Member of ad hoc committees for reappointment, promotion, and tenure (1981 - 2014).

Sloan Appreciation Awards Committee (2013-2014)

Symposium Director, Marketing Center, MIT Sloan School, M.I.T., (1981 - 1982).

Zannetos Dissertation Award Committee, MIT Sloan, (1981-82, 1996-97, chair 1997-1998).

M.I.T. Subjects Taught (often multiple sections)

15.810, Marketing Management (Core)	Spring 1990, 1991, 1992, 1993, 1994, 1995, 1997, 1998, 1999, 2001, 2004, 2005. 2006. Fall 1999, 2006, 2007, 2008, 2011, 2012, 2013, 2014, 2015. (Teaching awards listed on page 2 of vita.)
15.812, Marketing Management (UG)	Fall 1981, 1982, 1984, 1985, 1986. Spring 1981, 1984, 2006.
15.813, Marketing Management in Public Sector	Fall 1980.
15.814, Marketing Mgmt (Mgmt of Technology)	Fall 1988, 1993, 1999, 2001.
15.820, Advanced Marketing Management	Spring 1990
15.828, New Product Development	Spring 1981, 1982, 1989; Fall 1982, 1984; 1985.
15.838, Ph.D. Seminar (Various Topics)	Spring 1986, 1997, 2002, 2006, 2011, 2013, 2014, 2015, 2016.
15.839, Marketing and Statistics Workshop	Spring 1982; Fall 1982, 1984.
15.TH4. Thesis Project on Competitive Strategy	Spring 1985, 1986
CS.113 A Core Ethics: Ethics in Marketing	Fall 2014, 2015.

Summer Session, ILP, and External Executive

A.T.&T Course on New Product Development, 1986.

European Institute for Business Administration (INSEAD) European Marketing Programme, 1985.

Greater Boston Area Executive Program, 1982, 1983.

M.I.T. Civil Engineering, Demand Theory, 1980, 1981, and 1982.

M.I.T. ILP, Marketing Strategy and Models in the Information age, 1983.

M.I.T., Management of R&D, 1989, 1990, 1991, 1992, 1993, 1994. 1995, 1996, 1997, 1998, 1999.

M.I.T. Marketing Science Symposium, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988.

M.I.T./M.I.P. Executive Program, 1992.

M.I.T. New Product Development, 1997.

Pedagogical Developments.

In 2012, I redesigned the core curriculum in marketing to reflect new developments in marketing analytics, big data, and new media.

In 1990 and 1991, Prof. John D. C. Little and I redesigned the core curriculum in Marketing Management and taught the course to the entire Master's class.

In the 1991-1992 I was part of a committee of six faculty members that redesigned the core curriculum at the Sloan School. I supervised the voice-of-the-customer analyses of students and recruiters and encouraged the committee to design a program that these customers would find exciting. The new core was implemented in the 1993-1994 academic year. Student satisfaction increased significantly.

Teaching Notes

Note on Defensive Marketing Strategy (2005, for 15.810, Marketing Management)

Note on Product Development (2105, for 15.810, Marketing Management)

Note on the Voice of the Customer (2013, for 15.810, Marketing Management)

Note on Consumer Behavior (2015, for 15.810, Marketing Management)

Note on Life Cycle Diffusion Models (2005, for 15.810, Marketing Management)

Note on Engineering Product Design (2006, for 15.810, Marketing Management)

Note on Conjoint Analysis (2015, for 15.810, Marketing Management)

M.I.T. Thesis Supervision

(a) *MIT Sloan School of Management, Master's Theses*

Hafiz Adamjee (joint with John Scaife), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). This product was subsequently commercialized and was a finalist for the *New Media* Invision 1994 Multimedia award at COMDEX/Spring '94.

Ramay Akras, "Competitive Strategy in the Marketing of Small DDP Computers: an Analysis of Emerging Price and Product Position Patterns," - (1986).

Frederic Amerson, "Strategic Marketing Simulation: Improvements to the Enterprise Integrating Exercise," - (1989).

Sébastien Andrivet (Sloan Fellows Program), “Customer research, customer-driven design, and business strategy in Massively Multiplayer Online Games,” – (2007)

Andrew Anagnos (joint with Karen Van Kirk), "A Framework for Analyzing Quality in the News Media," - (1991)

Allen Aerni, "Measurement of Customer Satisfaction," - (1994).

Joel Berez, "An Investigation of Decision Hierarchies" - (1981).

Harel Beit-on, "Competitive Strategy for Small Business Jet Aircraft," - (1985).

Willy Biberstein (SDM Program), "Framework for Customer Interaction Throughout the Automotive Product Development Process," (February 2002).

Andre Borschberg (joint with Webb Elkins), "Defensive Marketing Strategy: Its Application to a financial Decision Support System" - Reader (1983).

Philippe Bosquet, "European Airline Deregulation: Defining Air France's Strategy for the 1990's," - Reader (1989)

Jill A. Christians, (joint with Cheryl M. Duckworth), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Poh-Kian Chua (MOT Program), “R,D&E Metrics: Shaping the Outcomes of Your R,D&E Investment,” – (1998).

Leslie K. Cooper, "The Structure of Recruiter Needs at the Sloan School of Management: A Quantitative

Assessment," - (1992).

Teruyuki Daino (Sloan Fellows Program), “How a Leading Company Can Overcome a Competitive Challenge: A Case Study of Anheuser-Busch Company.” – (1998).

Laura E. Donohue, "Software Product Development: An Application of the Integration of R&D and Marketing via Quality Function Deployment" - (1990)

Cheryl M. Duckworth (joint with Jill A. Christians), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Webb Elkins (joint with Andre Borschberg), "Defensive Marketing Strategy: Its Application to a Financial Decision Support System" - Reader (1983).

Rasheed El-Moslimany (LFM Program), "Getting Value from the Value Chain: Comfort Choice," Co-Advisor. (June 2002)

Merve Ergez (Master of Science in Management Studies), Strategic Scent Selection: A Marketing Research Study for Olivita Brand,” (June 2014).

Julio Faura (MOT Program), "Contribution to Web-based Conjoint Analysis for Market Research," (2000).

Richard Feldman, "Decision Support Systems for Forecasting Communications in the Home," - Reader (1985).

Anders T. Fornander, "The Continuing Operating System Battle in the Personal Computer Industry," - Reader (1994).

Carl Frank (MOT Program), "Metrics Thermostat for Strategic Priorities in Military System Acquisition Projects," (2000).

Mihaela Fulga, "Competitive Pricing and Positioning Strategies in the Dating Service Market," - (1986).

Steven P. Gaskin, "Defender: Test and Application of a Defensive Marketing Model" - (1986). 1st Place, Brooks Award.

Peter N. Goettler, "A Pre-market Forecasting Model of New Consumer Durables: Development and Application," - Reader (1986).

Patti N. Goldberger, "Competitive Strategy in the Market for Running Shoes," - (1985).

Akhil Gupta, "The Personal Computer Industry: Economic and Market Influences on Product Positioning Strategies," - (1986).

Michael Halloran (joint with Marc Silver), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Carla Heaton, "Competitive Strategy in the Facsimile Market," - (1985).

Judith Hee, "Determining Manufacturer's Coupon Strategies" - Reader (1981).

Jonathan E. Higginson, “Understanding Dependencies in Research and Development at the Charles Stark Draper Laboratory.” - (1997).

Scott D. Hill, "Correlation of Core Competencies with Market-Driven or Self-Guided Research," - (1995).

Dan Isaacs, "Competitive Pricing and Positioning Strategies in the Imported Beer Marketing," - (1986).

Francois Jacques, "Marketing Strategies in Innovative Industries: The Case of Package/Document Delivery Services," - Co-Advisor (1985).

Lawrence Kahn, "Competitive Positioning: A Study of Recruiter's and Employer's Perceptions of the Sloan School of Management" - (1982). Honorable mention Brooke's Thesis Prize.

D. Darcy Kay, "Competitive Strategy for Anti-arthritic Drugs" - (1985).

Young Joo Kim (MOT Program), "R&D Management Applications of The Dynamic Metrics Framework" – (1998)

Sidney A. Kriger, "The Effect of Quality Function Deployment on Communications of the New Product Development Teams," - (1989)

Yasuke Kume, "New Marketing Strategy of Telecommunications in Japan" - Reader (1981).

Elvind Lange, "Measuring Market Response to Marketing Mix Variables Using Dynamic Modeling and Its Implications for Brand Strategy" - Reader (1981).

Stephen P. Langhans, "Defensive Marketing Strategy: A Consumer Semi-Durable Case Example" - (1983).

In-Kyu Lee, "Evaluating System for the Upstream Center of R&D for being Market-Oriented in a Consumer Electronics Company," - (1995).

Michael Leslie (joint with Joel Wachtler), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Kit Mee Lim, "Competitive Strategy among Companies Offering Credit Cards," - Reader (1985).

James A. Lutz, "Competitive Marketing Strategy in the CAD Marketplace," - (1985).

Larry D. Lyons, "Forecasting the Impact of Competitive Entries on Sales of a New Consumer Durable" - Reader (1984).

Arpita Majundar (SDM Program), "Strategic Metrics for Product Development at Ford Motor Company," - (2000).

Catherine E. Manion, "A Survey of Customer Satisfaction Incentive Systems for Salespersons," - (1993).

Maureen E. Matamoros, "Information Overload," – Reader (1986).

Meghan McArdle (LFM Program), "Internet-based Rapid Customer Feedback for Design Feature Tradeoff Analysis," – co-Advisor (2000)

Fernando Motta, "Competitive Strategy Among Panamanian Banks," - (1985).

Neil Novich, "Price and Promotion Analysis Using Scanner Data" - Reader (1981).

Kenji Nozaki, "Marketing and Technology Strategy for the Japanese Architectural Design Company," - (1989).

Seiji Nozawa, "Voice of the Customer Analysis in the Japanese Beer Market." - (1997).

Minho Park (MOT Program), "R&D Matrix at LG Electronics." - (1997)

Stephen Pearse, "Production and Sales Forecasting: A Case Study and Analysis" - Reader (1982).

Ning P. Peng, "An Exploration of the Impact and Success of Customer Satisfaction Programs," - (1994).

Homer Pien (MOT Program), "Competitive Advantage through Successful Management of R&D." - (1997)

Susan B. Poulin, "Defensive Strategy in the Automatic Test Equipment Industry" (1984).

Jill W. Roberts, "MBA Recruiters' Needs: Voice of the Customer Analysis," - (1992).

Lisa Gayle Ross, "A Voice of the Customer Analysis of M.B.A. Schools: The Student Segment," - (1992). Lisa was a runner-up for the George Hay Brown Marketing Scholar of the Year in 1992.

Tamaki Sano, "Strategy for Kirin as a Global Brand" – (2009) Sloan Fellow.

John Scaife (joint with Hafiz Adamjee), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). See award listed under Adamjee.

Paul E. Schoidtz, "Advertising, Price, and Positioning Equilibria," - (1986).

Hongmei Shang, "A Simulation Analysis of Optimal Task Assignment for Growing Managers from R&D Labs," – (February 2000).

Rosemarie Shield, "Competitive Pricing and Positioning Strategies in the Chromatographic Instruments Market," - , (1986).

Jon Silver (joint with John C. Thompson, Jr.), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Prize, Brooks Award.

Marc Silver (joint with Michael Halloran), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Lisa Silverman, "An Application of New Product Growth Modeling to Automobile Introductions" - (1982).

Sheryl Sligh, "An Assessment of the Analog Modem Market," - (1991).

Jamie Smith, "Industrial Buying Process of Pension Funds for Real Estate," - (1982).

Yoshihito Takahashi (MOT), "Analysis of Strategy in an Ethical Drug Industry," – Reader (2000).

Genevieve Tchang, "A Methodology for Planning and Evaluating External Relations at Business Schools" - Reader (1982).

John C. Thompson, Jr. (joint with Jon Silver), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Place, Brooks Award.

V. Mullin Traynor, "The Dissemination and Adoption of New Technology: Control Data's Computer-Based Training System, Plato, and the Electric Utilities" - (1982).

Karen Van Kirk (joint with Andrew Anagnos), "A Framework for Analyzing Quality in the News Media," - (1991)

Joel Wachtler (joint with Michael Leslie), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Tamao Watanabe, "Customer Analysis of the U.S. Cardiovascular Drug Market: Focusing on Physician's Drug Choice" - (1991)

Stephen L. Weise, "Expert Decision Support Systems for Marketing Management," – Reader (1986).

Nancy Werner, "Competitive Price and Positioning in the Integrated Office Automation Systems Market" - (1986).

Julie Wherry, "Pre-Test Marketing: Its Current State in the Consumer Goods Industry and Its Effect on Determining a Networked Good." - (2006).

Ali Yalcin, "The Potentials and Limitations of Customer Satisfaction Indices in Captive Customer-Supplier Environments," - (1995)

Sandra Yie, "The Core Curriculum at Sloan: Establishing a Hierarchy of Needs," - (1992).

Judy Young, "Responsive Marketing Strategy at AT&T" - (1982).

(b) *Aeronautics S.M. Theses*

Keith Russell (LSI), "Reengineering Metrics Systems for Aircraft Sustainment Teams: A Metrics Thermostat for Use in Strategic Priority Management," (February 2001).

(c) *Electrical Engineering, S.B. and M.Eng. Theses*

Chan, Christine W. Y. (M. Eng), "Measuring Non-Monetary Incentives Using Conjoint Analysis," Co-Advisor (1999).

Emily Hui (M.Eng.), "Application of Polyhedral Conjoint Analysis to the Design of Sloan's Executive Education Programs." June 2003.

Brian T. Miller (S. B.), "A Verification of Price Equilibria Based on Non-Zero Conjectural Variation," (1986).

(d) *Mechanical Engineering, Master's Theses*

Burt D. LaFountain, "An Empirical Exploration of Metrics for Product Development Teams" – (1999)

Tina Savage, "The Virtual Customer: A Distributed Methodology for Linking Product Design and Customer Preferences." Co-Advisor (1998).

(e) *Operations Research Center, Master's Theses*

Jeffrey Moffit (ORC), " Applying the Metrics Thermostat to Naval Acquisitions for Improving the Total Ownership Cost – Effectiveness of New Systems," (2001)

Olivier Toubia (ORC), "Interior-point Methods Applied to Internet Conjoint Analysis," (February 2001), Co-Advisor.

(f) *Urban Studies, Master's Theses*

Marijoan Bull, "Affirmative Fair Housing Marketing" - Committee Member (1982).

Barry Cosgrove, "Marketing Analysis for the Brockton Area Transportation Authority" – Committee Member (1981).

(g) *Sloan School of Management, Ph.D. Theses*

Makoto Abe, "A Marketing Mix Model Developed from Single Source Data: A Semiparametric Approach." Committee member (August 1991). Abe is on the faculty at the University of Tokyo.

Daria Dzyabura, "Essays on Machine Learning in Marketing (tentative title)," Chairman (June 2012). Dzyabura is now on the faculty at New York University.

Peter Fader, "Effective Strategies in Oligopolies," Chairman (February 1987). Sloan School of Management, Zannetos Prize, 1st Place. Fader is on the faculty at the University of Pennsylvania.

Fred Feinberg, "Pulsing Policies for Aggregate Advertising Models" Committee Member (August 1988). Feinberg

is on the faculty of the University of Michigan.

Dave Godes, " Friend or Foe?: The Relationship Between Learning and Incentives and two additional essays in marketing," (June 2000), Committee Member. Primary advisor on listed essay. Zannetos Prize, 1st Place. Godes is on the faculty of the University of Maryland.

Abbie Griffin, "Functionally Integrated New Product Development: Improving the Product Development Process Through Linking Marketing and Technology Development," Chairman. (June 1989). Griffin is on the faculty at the University of Utah and was editor of *Journal of Product Innovation Management* from 1997-2003 Frank Bass Dissertation Award (INFORMS).

Gurumurthy Kalyanaram, "Empirical Modeling of the Dynamics of the Order of Entry Effect on Market Share, Trial Penetration and Repeat Purchases for Frequently Purchased Consumer Goods," Committee Member (March 1989). G. K. was on the faculty at the University of Texas, Dallas.

Eriko Kitazawa, "Customer Satisfaction at Japanese Utility Franchises," Committee Member (1996).

Li, Xitong, "Using Web Data and Services: Technology, Theory, and Evidence," Co-chairman (2014). Li is on the faculty at HEC Paris.

Eleanor (Nell) Putnam-Farr, "The Effects of Framing on Enrollment and Participation – Field Experiments Using Different Recruitment Language." June 2015. Putnam-Farr will begin a post doc at Yale in July 2015.

John H. Roberts, "A Multiattributed Utility Diffusion Model: Theory and Application to the Prelaunch Forecasting of Autos". Committee Member (February 1984). Roberts is on the faculty at the London Business School.

Matt Selove, "The Strategic Importance of Accuracy in Conjoint Design," Committee Member (June 2010). Selove is on the faculty at the University of Southern California. John Howard Dissertation Award (AMA), 2010.

Duncan I. Simester, "Analytical Essays on Marketing," Committee Member, (June 1993). Sloan School of Management, Zannetos Prize, Honorable Mention. Simester is on the faculty of M.I.T.

Olivier Toubia, "New Approaches to Idea Generation and Consumer Input in the Product Development Process," (June 2004). Toubia is on the faculty of Columbia University. Frank M. Bass Dissertation Award (INFORMS), 2005, John Howard Dissertation Award (AMA), 2005. ISMS Long-term Impact Award 2016.

Miguel Villas-Boas, "On Promotions and Advertising Policies: A Strategic Approach." Committee member (February 1991). Villas-Boas is on the faculty at the University of California, Berkeley.

Bruce Weinberg, "An Information-Acceleration-Based Methodology for Developing Preproduction Forecasts for Durable Goods: Design, Development, and Initial Validation." Committee Member. (August 1992). Weinberg was on the faculty at Boston University.

Florian Zettelmeyer, "Three Essays on Strategic and Organizational Uses of Information in Marketing." Committee Member. Zettelmeyer is on the faculty of Northwestern University.

(h) *Civil Engineering, Ph.D. Thesis*

Karla Karash (Ph.D.), "An Application of the Lens Model in Measuring Retail Attractiveness and the Effects of Transportation Programs" - Committee Member (August 1983). Karash was at the MBTA.

(j) *Mechanical Engineering, Ph.D. Thesis*

Javier Gonzalez-Zugasti (Mechanical Engineering, Ph.D.), "Models for Product Family Design and Selection," (June 2000), Committee Member.

(k) Operations Research Center, Ph.D. Thesis

Yee, Michael (Operations Research, Ph.D.), “Inferring Non-Compensatory Choice Heuristics,” (June 2006), Co-Advisor. Yee is at MIT’s Lincoln Laboratories.

Northwestern University Ph.D. Thesis Supervision (1975 - 1980 Academic Years)

Steven M. Shugan, "A Descriptive Stochastic Preference Theory and Dynamic Optimization: Applications Toward Predicting Consumer Choice' Chairman (September 1977). Shugan is on the faculty at the University of Florida and was editor of *Marketing Science* for six years.

Patricia Simmie, "Product Realization: Theory, Models, and Application" - Chairman (June 1979), American Marketing Association Dissertation Prize, Honorable Mention. Simmie was at York University.

Ken J. Wisniewski, "A Semi-Markov Theory of Consumer Response: New Theoretical Properties, Simulation Testing, and Empirical Application" Chairman (June 1981). American Marketing Association Dissertation Prize, First Place. Wisniewski was on the University of Chicago.

Appendix B

John R. Hauser
Expert Testimony in the Past Four Years

Oula Zakaria vs. Gerber Products Co., a Corporation, d/b/a Nestle Nutrition, Nestle Infant Nutrition, and Nestle Nutrition North America, No. 2:15-cv- 0200-JAK, United States District Court, Central District of California. Deposition testimony, November 17, 2016.

Joseph Adinolfe, et al., v. United Technologies Corp., d/b/a Pratt & Whitney, Case No. 10-80840-CIV-KAM, In the United States District Court, Southern District of Florida, West Palm Beach Division. Deposition testimony, July 12, 2016.

Sprint Communications Company L.P. et al. v. Comcast Cable Communications, LLC. et al., Case No. 2:12-cv-00859-JD, United States District Court for the Eastern District of Pennsylvania. Deposition testimony, April 5, 2016.

Scott Miller v. Fuhu, Inc. and Fuhu Holdings, Inc, Case No. 14-cv-6119 CAS-AS, United States District Court for the Central District of California, Western Division. Deposition testimony, October 20, 2015.

Symphony Health Solutions Corporation v. IMS Medical Radar, Case CBM2014-00188, United States Patent and Trademark Office. Deposition testimony, June 15, 2015.

In the Matter of Determination Of Rates And Terms For Digital Performance In Sound Recordings And Ephemeral Recordings (Web IV) before Copyright royalty Board, Library of Congress, Washington, DC, Docket No. 14-CRB-0001-WR. Deposition testimony, March 25, 2015. Trial testimony, May 22, 2015.

Fox Broadcasting Company, Inc. v. Dish Network LLC, Civil Action No. 12-04536-DMB-SHx, United States District Court for the Central District of California. Deposition testimony, December 15, 2014.

Michael Kors, Inc. v. Costco Wholesale Corporation, Civil Action No. 13-CV-4832, United States District Court for the Southern District of New York. Deposition testimony, June 9, 2014.

Apple Inc. v. Samsung Electronics Co. Ltd. et al., Case No. 12-CV-00630, United States District Court for the Northern District of California San Jose Division. Deposition testimony, September 27, 2013. Trial Testimony, April 8, 2014.

In Re American Express Anti-Steering Rules Antitrust Litigation (II), United States District Court for the Eastern District of New York, Master File No. 11-MD-02221 (NGG)(RER). Deposition testimony, August 12, 2013.

Apple Inc. v. Samsung Electronics Co. Ltd. et al., Case No. 11-CV-01846-LHK, United States District Court Northern District of California San Jose Division. Deposition testimony, April 27, 2012. Trial Testimony, August 10, 2012. Deposition Testimony, November 29, 2012. Trial Testimony, November 14, 2013.

APPENDIX C
MATERIALS RELIED UPON

ACADEMIC LITERATURE

- Alan G. Sawyer, "Demand Artifacts in Laboratory Experiments in Consumer Research," *Journal of Consumer Research* 1, no 4, 1975, pp. 20–30 at p. 20
- Alexander A. Arts et al., "Estimating the Reproducibility of Psychological Science," *Science* 349, no. 6251, 2015, pp. aac4716-1–8
- Amos Tversky and Daniel Kahneman, "Availability: A Heuristic for Judging Frequency and Probability", *Cognitive Psychology* 5, 1973, pp 207–232.
- Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases," *Science* 185, no 4157, 1974, pp. 1124–1131.
- Amos Tversky and Daniel Kahneman, "Rational Choice and the Framing of Decisions", *The Journal of Business* 59, no.4, part 2, 1986, pp. S251–S278.
- Amos Tversky and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice," *Science* 211, no. 30, 1981, pp. 453–458.
- Ely Dahan and John R. Hauser, "The Virtual Customer," *Journal of Product Innovation Management* 19, no. 5, 2002, pp. 332–353
- Haipeng (Allan) Chen and Akshay R. Rao, "When Two Plus Two is Not Equal to Four: Errors in Processing Multiple Percentage Changes," *Journal of Consumer Research* 34, no. 3, 2007, pp. 327–340.
- Irwin P. Levin and Gary J. Gaeth, "How Consumers are Affected by the Framing of Attribute Information Before and After Consuming the Product," *Journal of Consumer Research* 15, no. 3, 1988, pp. 374–378
- Itamar Simonson and Aimee Drolet, "Anchoring Effects on Consumers' Willingness-to-Pay and Willingness-to-Accept," *Journal of Consumer Research* 31, no 3, pp. 681–690 at p. 682.
- John C. Whitehead, "Incentive Incompatibility and Starting-Point Bias in Iterative Valuation Questions," *Land Economics* 78, no. 2, 2002, pp. 285–297.
- John Hauser et al., "Disjunctions of Conjunctions, Cognitive Simplicity, and Consideration Sets," *Journal of Marketing Research* 48, no 1, 2010, pp. 485–498.
- Jon A. Krosnick, "Survey Research", *Annual Review of Psychology* 50, 1999, pp. 537–567.
- Kevin J. Boyle et al., "Starting Point Bias in Contingent Valuation Bidding Games," *Land Economics* 61, no. 2, 1985, pp. 188–194.
- Marcia McNutt, "Reproducibility," *Science* 343, no. 6168, 2014, p. 229.
- Martin T. Orne, "On the Social Psychology of the Psychological Experiment: With Particular Reference to Demand Characteristics and Their Implication," *American Psychologist* 17, no 11, 1962, pp. 776–783 at p. 778.
- Michael Yee et al.,"Greedoid-Based Noncompensatory Inference," *Marketing Science* 26, no. 4, 2007, pp. 532–549
- Milton J. Rosenberg, "When Dissonance Fails: On Eliminating Evaluation Apprehension From Attitude Measurement," *Journal of Personality and Social Psychology* 1, no 1, pp. 28-42.

- Min Ding et al., "Barter Markets for Conjoint Analysis," *Management Science* 55, no 6, 2009, pp. 1003–1017.
- Min Ding et al., "Incentive-Aligned Conjoint Analysis," *Journal of Marketing Research* 42, no 1, 2005, pp. 67–82.
- Min Ding, "An Incentive-Aligned Mechanism for Conjoint Analysis," *Journal of Marketing Research* 44, no 2, 2007, pp.214–223.
- Olivier Toubia et al., "Fast Polyhedral Adaptive Conjoint Estimation," *Marketing Science* 22, no. 3, 2003, pp. 273–303
- Olivier Toubia et al., "Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis," *Journal of Marketing Research* 41, no. 1, 2004, pp. 116–131
- Olivier Toubia et al., "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," *Marketing Science* 26, no. 5, 2007, pp. 596–610.
- Paul Klemperer, "Markets with Consumer Switching Costs," *Quarterly Journal of Economics* 102, no. 2, 1987, pp. 375–394.
- Shane Frederick et al., "Opportunity Cost Neglect," *Journal of Consumer Research* 36, no. 4, 2009, pp. 553–561.

BATES STAMPED DOCUMENTS

- CLOSED Deact NON-PAY Tracking Summary.xlsx, SXM_DIR_00027956.
- CLOSED Deact VOLUNTARY Tracking Summary.xlsx, SXM_DIR_00027954.
- Deact NON-PAY Tracking Summary.xlsx, SXM_DIR_00027958.
- Deact VOLUNTARY Tracking Summary.xlsx, SXM_DIR_00027957.
- INTENDED Deact NON-PAY Tracking Summary.xlsx, SXM_DIR_00027955.
- SC-EST2015-AGESEX-CIV.csv, SOUNDX_000154698.
- SoundExchange Exhibit 34, Sirius XM Radio Survey, Edison Research, May 2015, SXM_DIR_00023538–610.
- SoundExchange Exhibit 37, Sirius XM "2015 Customer Experience Survey Report," SXM_DIR_00023890–4062.
- Weighted Full Survey Responses.csv, SoundX_000154716.

BOOKS

- Kevin Lane Keller, *Strategic Brand Management: Building, Measuring, and Managing Brand Equity*, 4 ed. (Pearson 2012), pp. 312–314.
- Robert Cameron Mitchell, and Richard T. Carson, *Using Surveys to Value Public Goods: The CVM Approach* (Washington, DC: Resources for the Future, 1989), p. 7.
- Shari Seidman Diamond, "Reference Guide on Survey Research," in *Reference Manual on Scientific Evidence* Third Edition (Washington D.C.: The National Academies Press, 2011), pp. 359–423.
- Stanley L. B. Payne, "What's the Good Word,?" in *The Art of Asking Questions* (Princeton, NJ: Princeton University Press, 1980), pp. 138–157.

- Vithala R. Rao, "Theory and Design of Conjoint Studies (Ratings Based Methods)," in *Applied Conjoint Analysis* (New York: Springer, 2010), p. 45.

REPORTS

- "Reproducibility and Reliability of Biomedical Research: Improving Research Practice, Symposium Report," October 2015

LEGAL DOCUMENTS

- Expert Report of John R. Hauser, *APPLE INC., a California corporation, Plaintiff, v. SAMSUNG ELECTRONICS CO. LTD., A Korean corporation; SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation; SAMSUNG TELECOMMUNICATIONS AMERICA LLC, a Delaware limited liability company, Defendants*, August 11, 2013.
- Rebuttal Testimony and Exhibits Jointly Submitted by Sirius Satellite Radio Inc. and XM Satellite Radio Inc., *In the Matter of the Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services*, July 24, 2007.
- Testimony of John R. Hauser, SC.D., *In the Matter of Determination of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services*, November 28, 2011.
- Written Direct Testimony of Mr. Stefan Boedeker, October 18, 2016 and Appendices and Backup Materials.
- Written Direct Testimony of Ravi Dhar, October 18, 2016 and Appendices and Backup Materials.
- Written Direct Testimony of Robert Willig, October 19 2016.

WEBSITES

- "Buck Weaver Award," *INFORMS*, https://www.informs.org/Recognize-Excellence/Community-Prizes-and-Awards/Marketing-Science-Society/Buck-Weaver-Award.
- "Charles Coolidge Parlin Marketing Research Award," *American Marketing Association*, https://www.ama.org/AboutAMA/Pages/Parlin-Award.aspx.
- "JCR Style Sheet," *Journal of Consumer Research*, http://www.ejcr.org/newstylesheet.pdf.
- "Our Packages," *Sirius XM*, http://www.siriusxm.com/ourmostpopularpackages.
- "The Paul D. Converse Awards," *American Marketing Association*, https://archive.ama.org/Archive/Community/ARC/Pages/Career/Awards/Converse.aspx.
- "Save with Longer Plans – Sirius Select," *Sirius XM*, https://www.siriusxm.com/packages/siriusselect.
- "United States Census 2010", *United Sates Census Bureau*, http://www.census.gov/2010census.

APPENDIX D

DHAR REPRODUCTION (SIRIUS XM)

CELL 1: **Sirius XM** paid subscribers (max N=100)

NOTE: QUESTIONNAIRE WILL BE PROGRAMMED.
INTERVIEWING WILL BE SELF-ADMINISTERED ON-LINE.
ALL INSTRUCTIONS SHOULD BE LEFT JUSTIFIED ON SCREEN.

SCREENER - INTRODUCTION
(QUESTION 10)
Thank you for your willingness to participate in this study. The responses you give to these questions are very important to us. If you don't know an answer to a question or if you are unsure, please indicate this in your response. It is very important that you do not guess.

Your answers will be kept in confidence. The results of this study will not be used to try to sell you anything.

When you are ready to get started, please click on the "NEXT" button below.
This survey should take between 5 and 7 minutes to complete.

QS0. Please enter the code exactly as it appears in the image above, and then click "NEXT" to continue.
[INSERT CAPTCHA]

SCREENING SECTION
(QUESTION 25)
In what state do you live?
Please select one answer.

{INSERT DROP DOWN LIST OF 50 STATES + DC + MY AREA IS NOT LISTED HERE; TERMINATE IF MY AREA IS NOT LISTED HERE IS SELECTED}

{PROGRAMMER: GENDER DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 30)
Are you…
Please select one answer.

1: Male
2: Female

{PROGRAMMER: AGE DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 35)
Which of the following includes your age?

Please select one answer.

1: Under 18 ***{TERMINATE}***
2: 18-34
3: 35-44
4: 45-54
5: 55+
6: Prefer not to answer ***{TERMINATE}***

{PROGRAMMER: RANDOMIZE FIRST FOUR CHOICES}
(QUESTION 40)
What type of electronic device are you using to complete this survey?
Please select one answer.

1: Desktop computer
2: Laptop computer
3: Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom)
4: Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One) ***{ON HOLD}***
5: Other mobile or electronic device ***{ON HOLD}***

DISPLAY A MESSAGE TO ON-HOLD RESPONDENTS AND ASK THEM TO RE-ENTER USING AN APPROPRIATE DEVICE (USING THE SAME LINK): This survey is not formatted for viewing on smartphones and other mobile or electronic devices. Please return to the survey, using the same link, from a desktop, laptop or tablet computer.

{PROGRAMMER: RANDOMIZE CHOICES 1-10; IF ITEM 1 OR 11 IS SELECTED, TERMINATE.} **(QUESTION 49)**
Have you taken a survey relating to any of the following products or services in the past 6 months?
Please select all that apply.
1: Music Services
2: eCommerce
3: Agriculture
4: Insurance
5: Pharmaceutical
6: Advertising
7: Food & Beverage
8: Sports
9: Video Games
10: Chemicals

11. Radio
12. None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: RANDOMIZE CHOICES 1-6; IF ANY ITEM 1-5 SELECTED, TERMINATE. RESPONSE MUST BE EITHER PUNCH 7 "NONE OF THE ABOVE" OR PUNCH 6 SELECTED EXCLUSIVELY TO CONTINUE}
(QUESTION 50)
Do you or does anyone in your household work in any of the following areas? **Please select all that apply.**

1: For a Satellite Radio company?
2: For a Streaming Music company, such as Pandora or Spotify?
3: For Apple, Google or Amazon?
4: For a company that creates music such as a Recording Studio, Record Company, or a Music Publisher?
5: For a Market Research Company or Public Relations Agency?
6: For an Internet Service Provider?
7: None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: ROTATE CHOICES 1, 2, AND 3, ANCHOR CHOICES 4 AND 5}
{PROGRAMMER: IF CHOICE 1 IS NOT SELECTED, TERMINATE}
(QUESTION 51)
Which, if any, of the following services do you currently have? This includes all subscriptions – free, trial or introductory, or paid. **Please select all that apply.**

1: Satellite Radio (Sirius XM)
2: Music Streaming Service (e.g., Apple Music, Spotify or Pandora)
3: Broadband Internet (e.g., cable, fiber optic or DSL)
4: None of the above ***{SINGLE RESPONSE}***
5: Don't know/unsure ***{SINGLE RESPONSE}***

(QUESTION 52)
Which of the following Sirius XM satellite radio subscriptions do you currently have? **Please select all that apply.**

1: A paid subscription to Sirius XM satellite radio **—Cell 1**
2: A subscription to Sirius XM as part of a package from DISH network **[TERMINATE IF OPTION 1 NOT SELECTED]**
3: A free Trial Period subscription to Sirius XM satellite radio (e.g., available with the purchase of some new cars)**— [TERMINATE IF OPTION 1 NOT SELECTED]**
4: Don't know/unsure ***{SINGLE RESPONSE}*** **[TERMINATE]**

{PROGRAMMER: ASK Q52.1 IF OPTION 1 SELECTED IN Q52}
(QUESTION 52.1)
If you have more than one paid subscription to Sirius XM satellite radio, please

answer the following questions based on the one you have had the **longest**.

{PROGRAMMER: INCLUDE IMAGE FROM
http://www.siriusxm.com/ourmostpopularpackages
TOGETHER WITH Q52.2}

(QUESTION 52.2)
Which of the following is your Sirius XM Satellite Radio subscription package?
Please select one answer.

1: Select
2: All Access **[TERMINATE FROM CELL 1]**
3: Mostly Music **[TERMINATE FROM CELL 1]**
4: Other (Please specify—you will not be constrained by the size of the box)
_____**[TERMINATE FROM CELL 1]**
5: Don't know/unsure **[TERMINATE FROM CELL 1]**

{PROGRAMMER: ASK Q53 IF OPTION 1 SELECTED IN Q52.2}
(QUESTION 53)
Who made the decision to get this paid subscription to Sirius XM satellite radio?
Please select one answer.

1: I made the decision myself**—Cell 1**
2: I played a major role in the decision**—Cell 1**
3: I played a minor role in the decision **[TERMINATE FROM CELL 1]**
4: I was not involved in the decision at all **[TERMINATE FROM CELL 1]**
5: Don't know/unsure **[TERMINATE FROM CELL 1]**

{PROGRAMMER: ASK Q54 IF OPTION 2 SELECTED IN Q51}
{ROTATE SPOTIFY, APPLE AND PANDORA, BUT KEEP PAID AND FREE IN TANDEM, ANCHOR 6 AND 7}
(QUESTION 54)
Which, if any, of the following streaming music services do you currently have?
Please select all that apply.

1: Paid subscription to Apple Music
2: Paid subscription to Spotify Premium
3: Free version of Spotify
4: Paid subscription to Pandora One
5: Free version of Pandora
6: Other (Please specify—you will not be constrained by the size of the box)
_____
7: Don't know/unsure ***{SINGLE RESPONSE}***

{PROGRAMMER: ASK Q55 FOR EACH OPTION 1, 2, 4 IF SELECTED IN Q54}

(QUESTION 55)

Who made the decision to get a **(INSERT SELECTED OPTION FROM Q54)**?
Please select one answer.

1: I made the decision myself
2: I played a major role in the decision
3: I played a minor role in the decision
4: I was not involved in the decision at all
5: Don't know/unsure

(QUESTION 140)
Before continuing, please carefully read these instructions.

- Please take the survey in one session without interruption.
- While taking the survey, please do not consult any other websites or other electronic or written materials.
- Please answer all questions on your own without consulting any other person.
- If you normally wear glasses or contact lenses when viewing a computer screen, please wear them for the survey.

Please select one answer.

1: I understand and agree to the above instructions
2: I do not understand or do not agree to the above instructions
{TERMINATE}

QUALIFICATIONS FOR EACH CELL:
CELL 1: **Sirius XM** paid subscribers **[PUNCH 1 OR 2 IN Q53 FOR OPTION 1 IN Q52.2]**

(QUESTION 150—CELL ASSIGNMENT CRITERIA FOR INCLUSION)

IF DO NOT QUALIFY FOR CELL 1, TERMINATE.

Music Survey

CELL 1: SXM subscribers--ASK Q200 THROUGH Q220

(QUESTION 201)
There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others**.

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio**.

Do you understand the descriptions of all three of these services described above?

Please select one answer.

1: Yes, I do understand the descriptions of all three services →**(ASK Q202)**
2: No, I do not understand the descriptions of all three services→ **(TERMINATE)**
3: Don't know/unsure → **(TERMINATE)**

(QUESTION 202)
The next few questions will be about your Satellite Radio subscription. If you have more than one paid subscription to Sirius XM Satellite Radio, please answer the following questions based on the one you have had the **longest.**

You will be presented with several different monthly prices for a single Sirius XM Satellite Radio subscription. **This amount may be higher or lower than the amount you currently pay for your Sirius XM Satellite Radio subscription.**

Appendix D

SERVICE	PRICE	AMOUNT
Sirius XM	1	$11.49
	2	$12.99
	3	$14.49
	4	$15.99
	5	$17.49
	6	$18.99
	7	$20.49

{PROGRAMMER: RANDOMIZE ANSWER CHOICES 1 AND 2. ANCHOR OPTION 3. KEEP THIS ORDER FOR ALL "CONTINUE/CANCEL" QUESTIONS}

(QUESTION 203)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio →**(ASK Q203.1)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 1}**
3: Don't know/unsure →**(ASK Q203.1)**

(QUESTION 203.1)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.2)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 2}**
3: Don't know/unsure →**(ASK Q203.2)**

(QUESTION 203.2)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.3)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 3}**

3: Don't know/unsure →**(ASK Q203.3)**

(QUESTION 203.3)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.4)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 4}**
3: Don't know/unsure →**(ASK Q203.4)**

(QUESTION 203.4)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.5)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 5}**
3: Don't know/unsure →**(ASK Q203.5)**

(QUESTION 203.5)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.6)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 6}**
3: Don't know/unsure →**(ASK Q203.6)**

(QUESTION 203.6)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(SKIP TO Q220)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q220) {SET SWITCH PRICE=PRICE 7}**

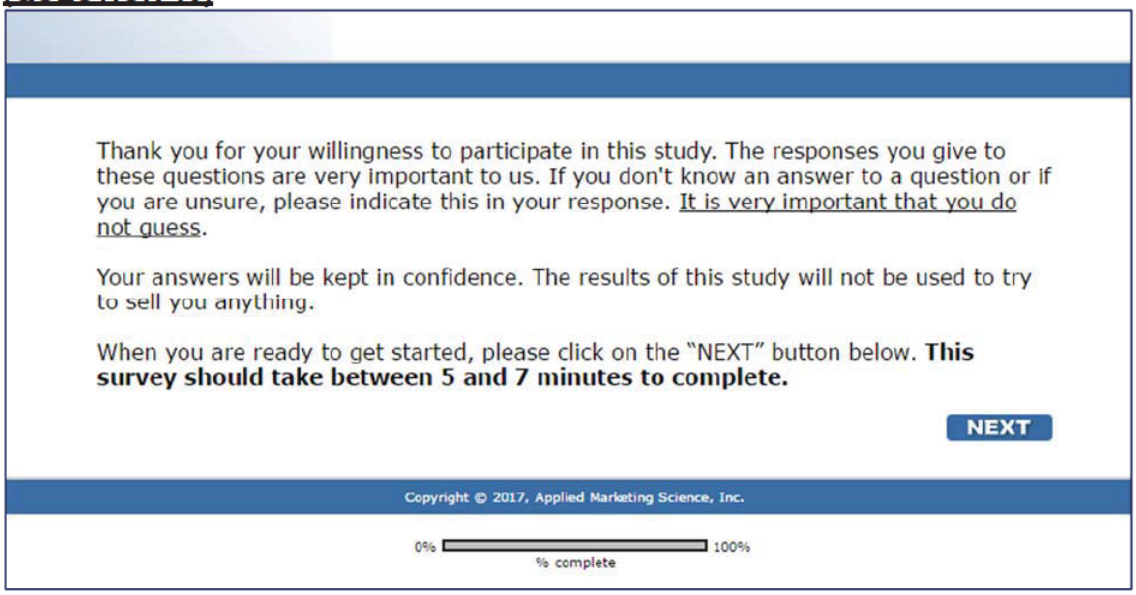
3: Don't know/unsure →**(SKIP TO Q220)**

(QUESTION 220)
Those are all the questions I have. Thank you for your time.

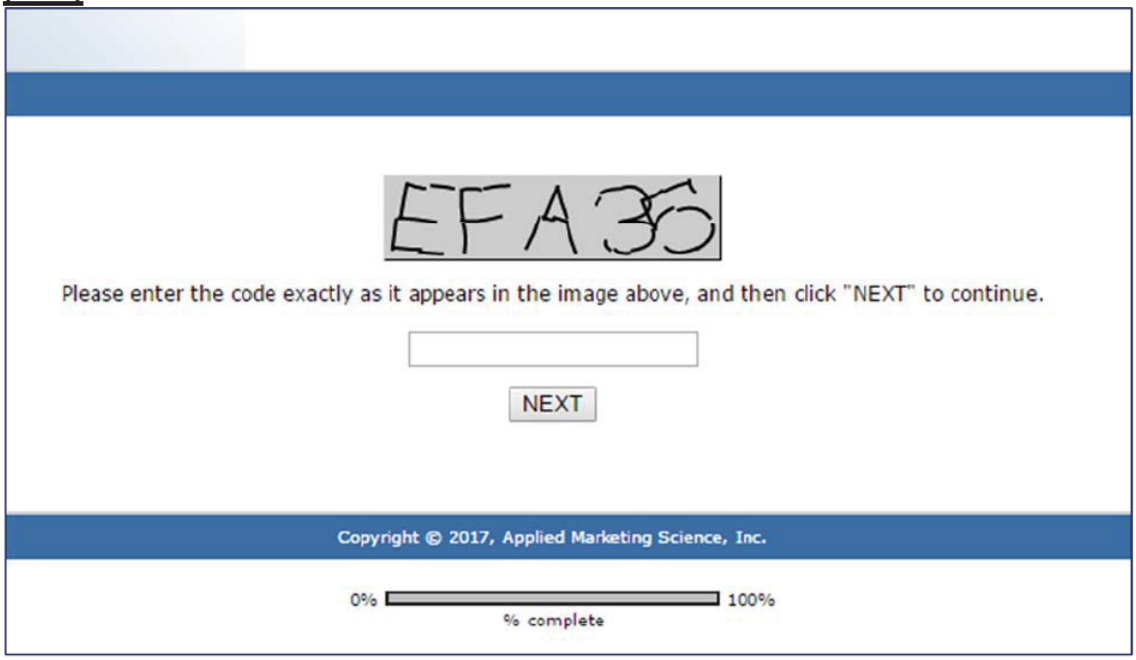
APPENDIX E

DHAR REPRODUCTION (SIRIUS XM)

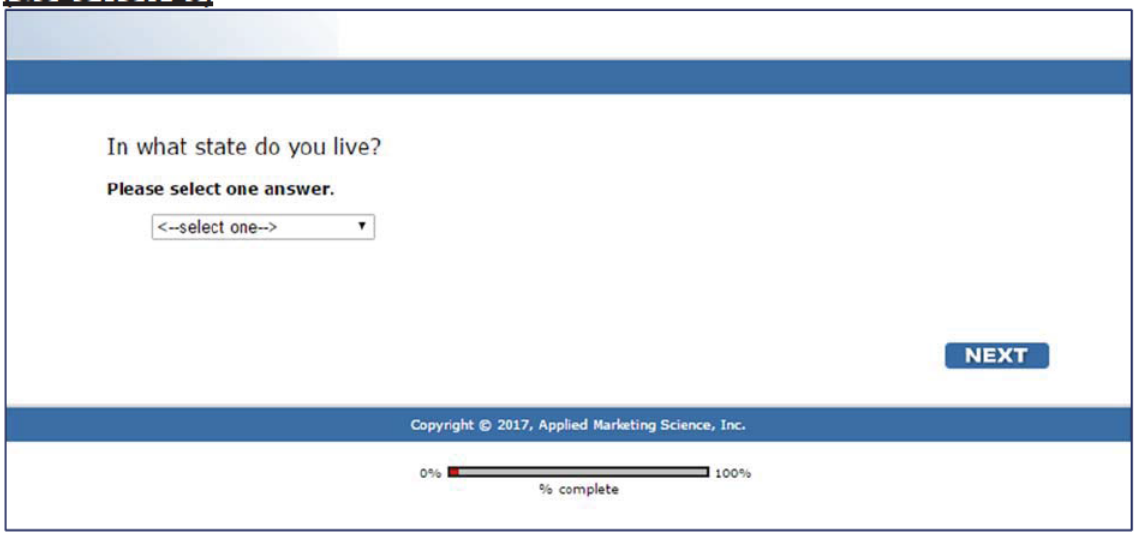
(QUESTION 10)



(QS0)



(QUESTION 25)

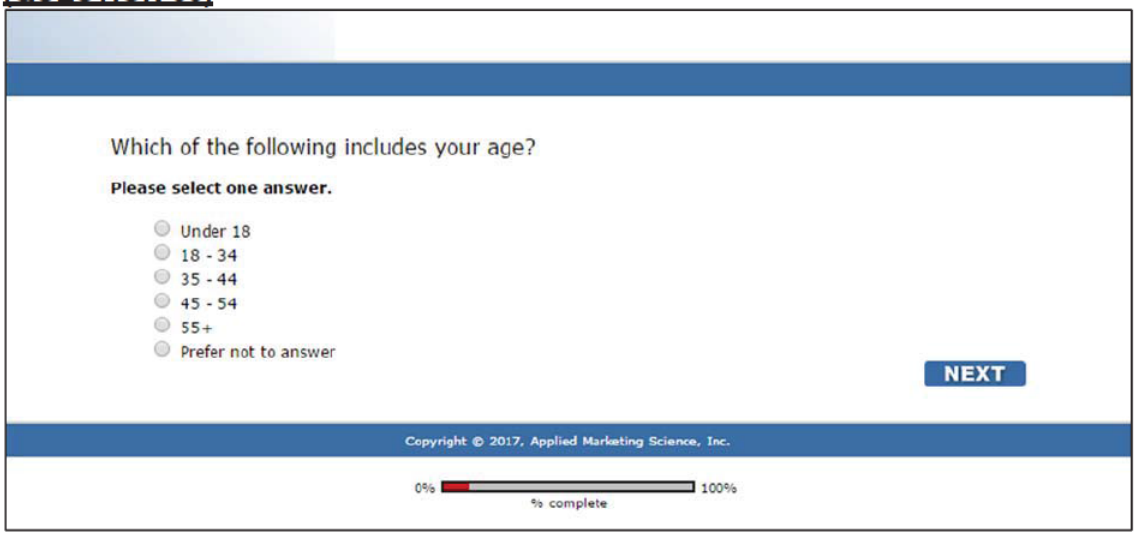


(QUESTION 30)

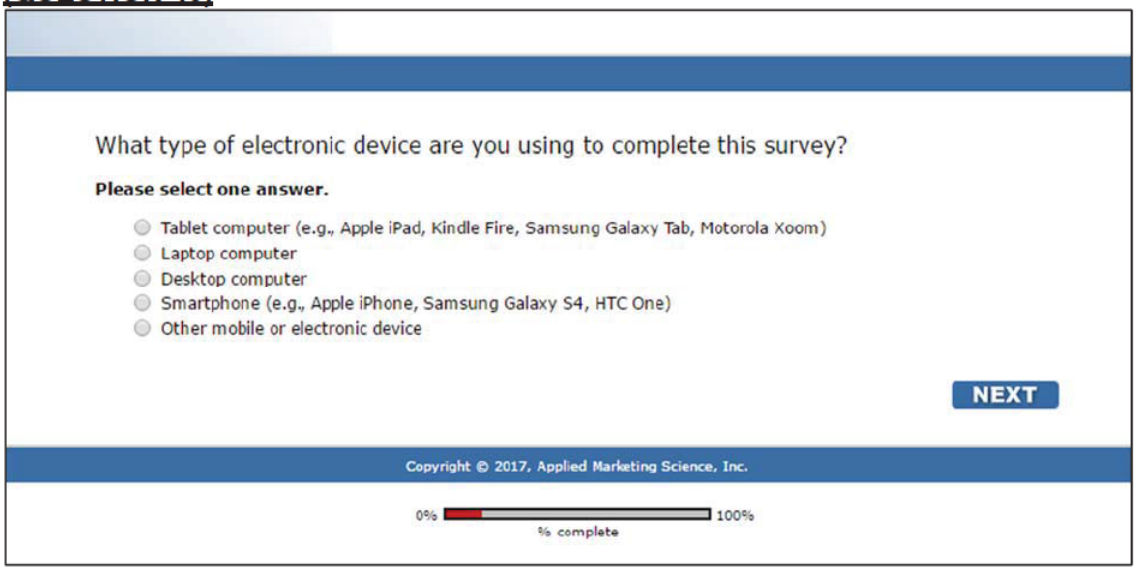


Appendix E

(QUESTION 35)



(QUESTION 40)

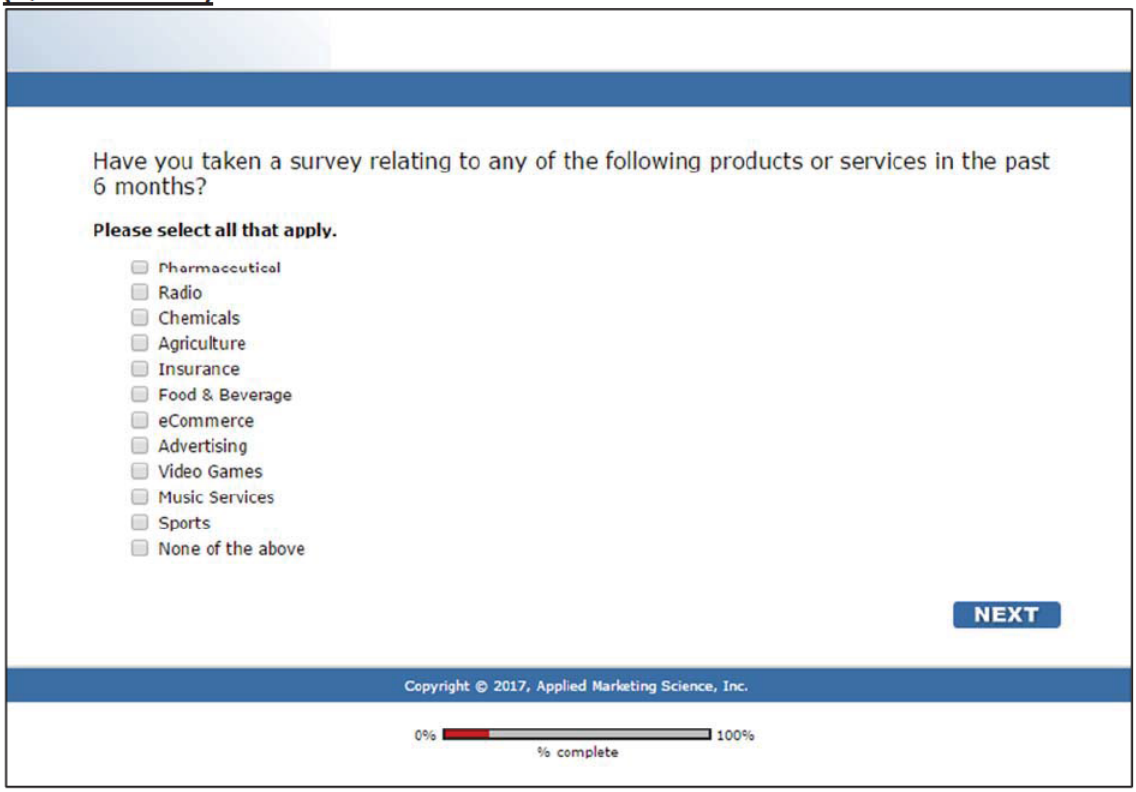


Appendix E

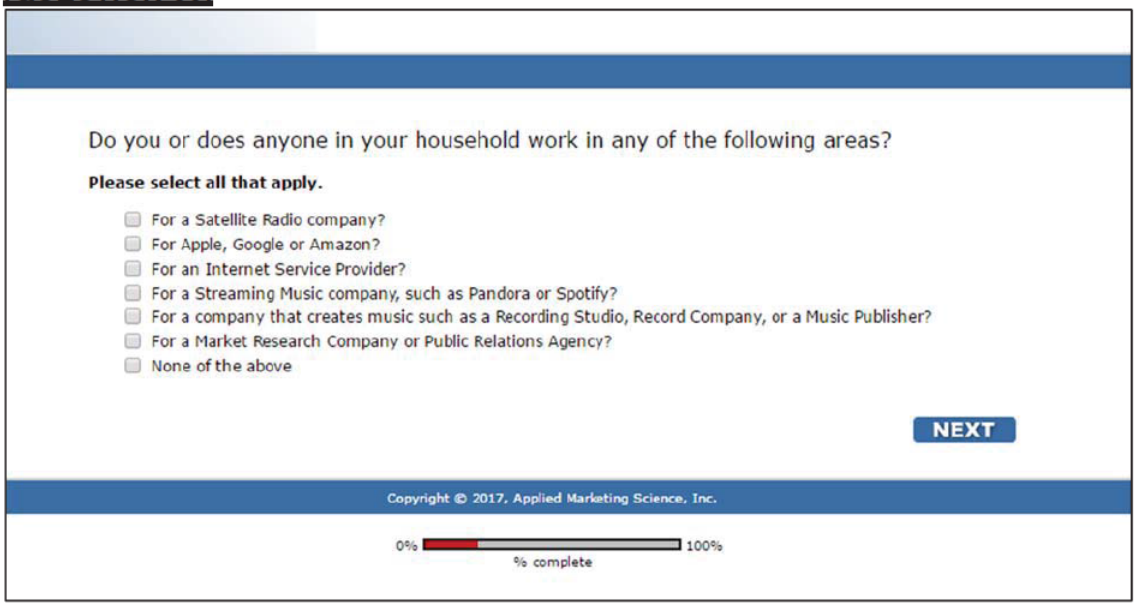
(SMARTPHONE AND OTHER MOBILE RESPONDENTS)



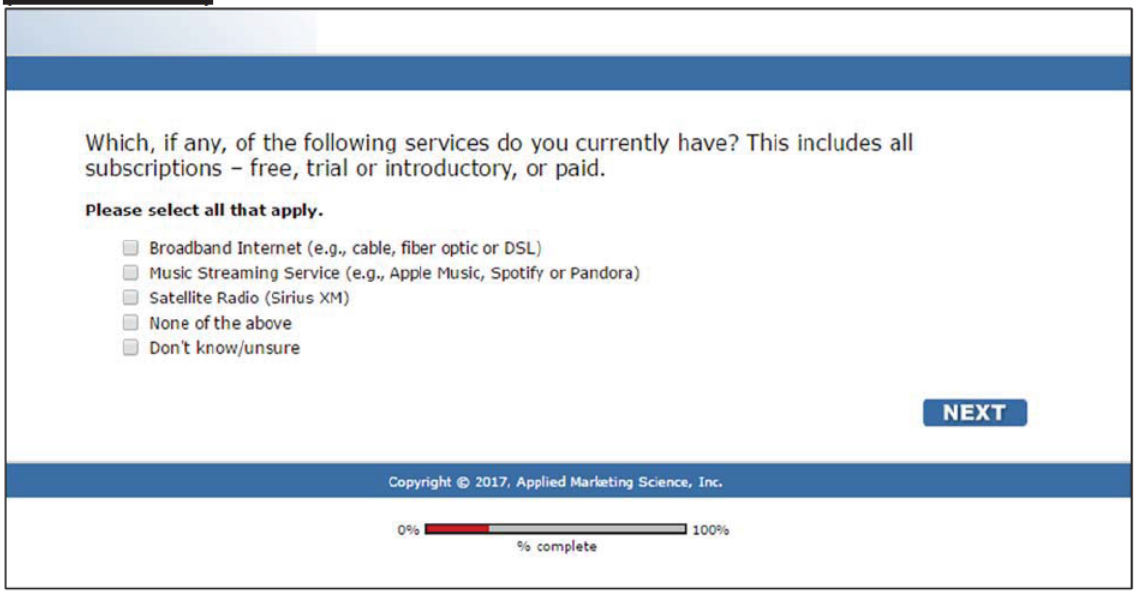
(QUESTION 49)



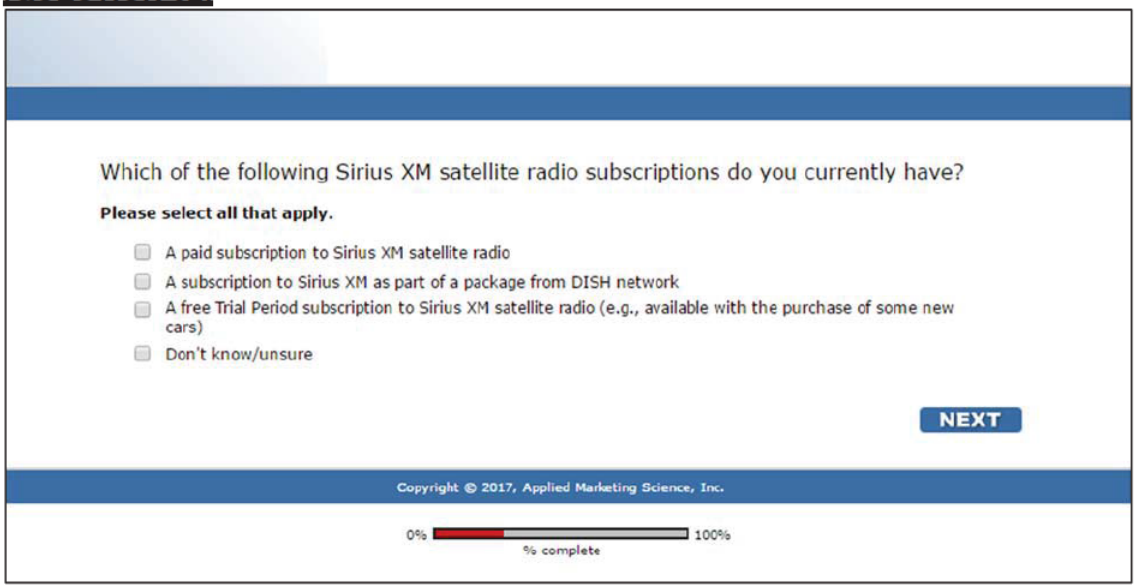
(QUESTION 50)



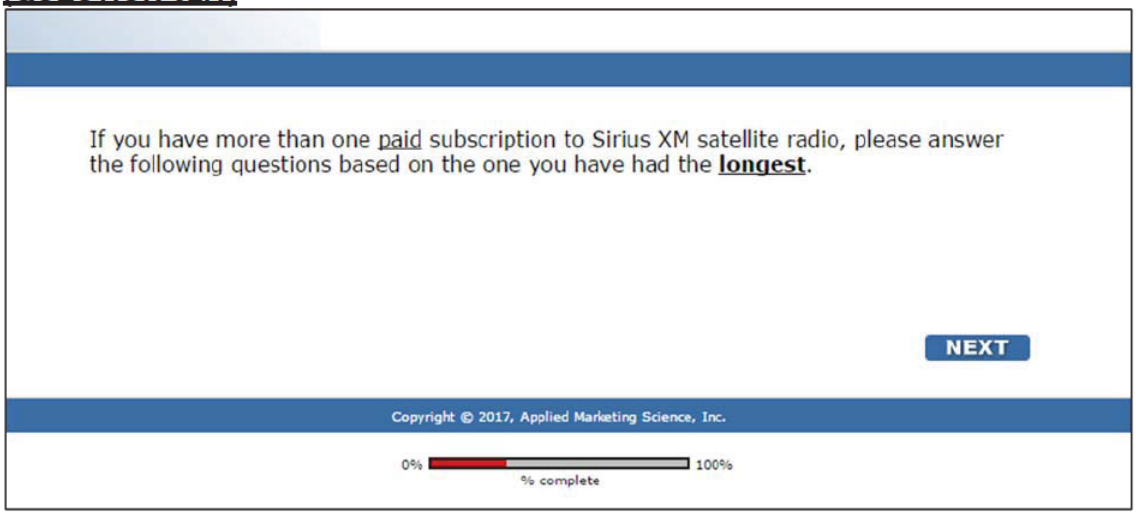
(QUESTION 51)



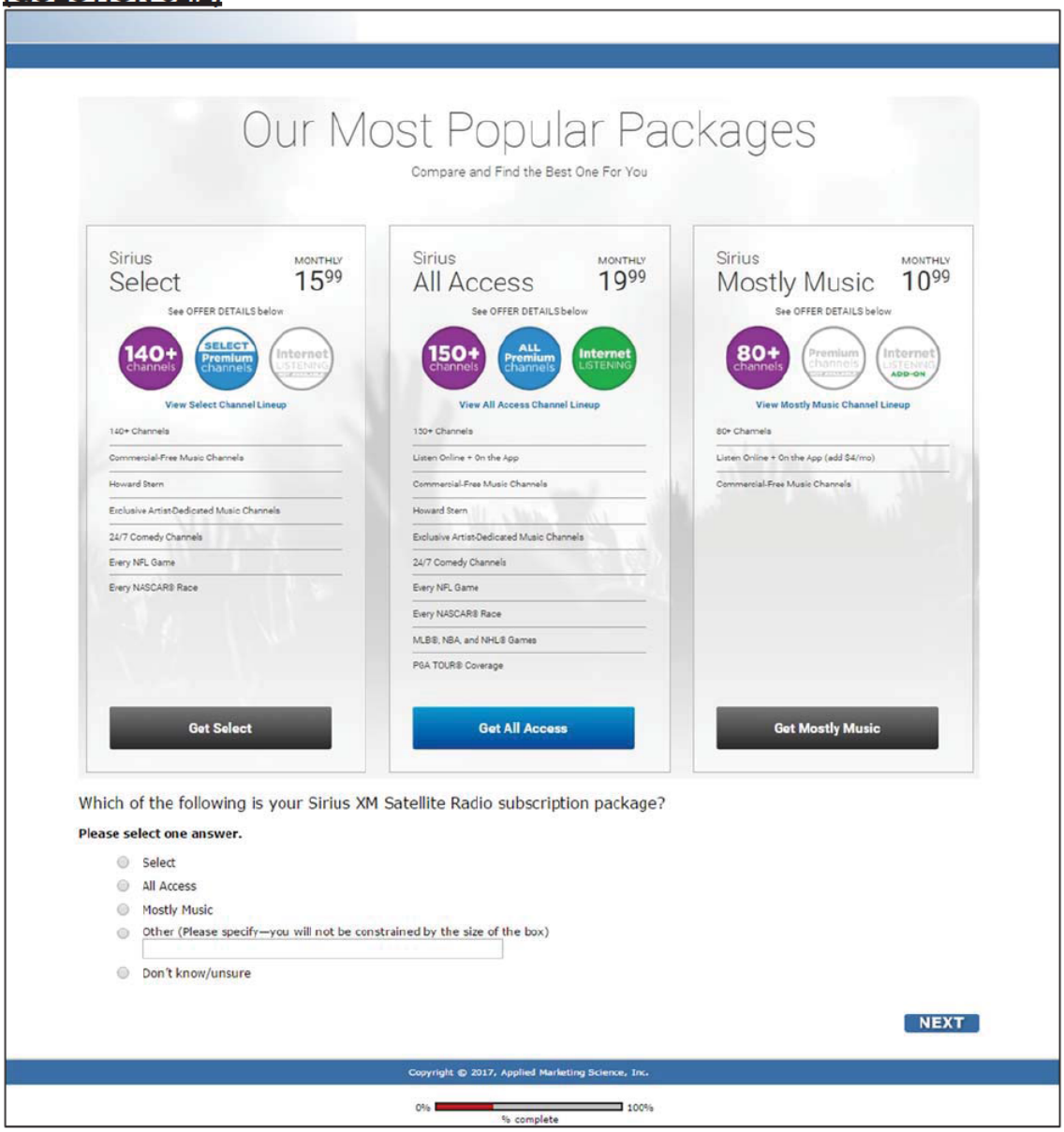
(QUESTION 52)



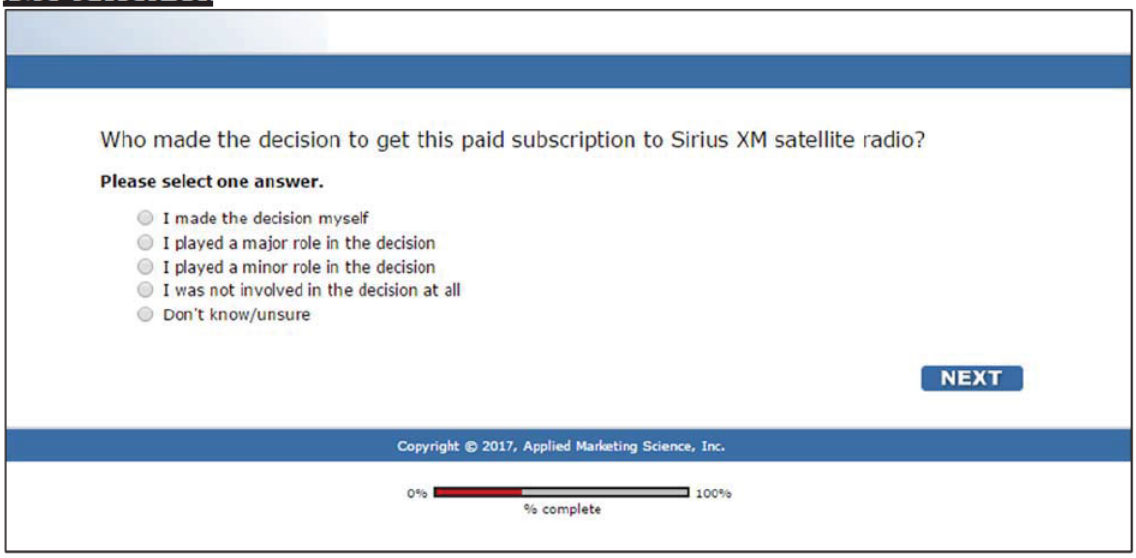
(QUESTION 52.1)



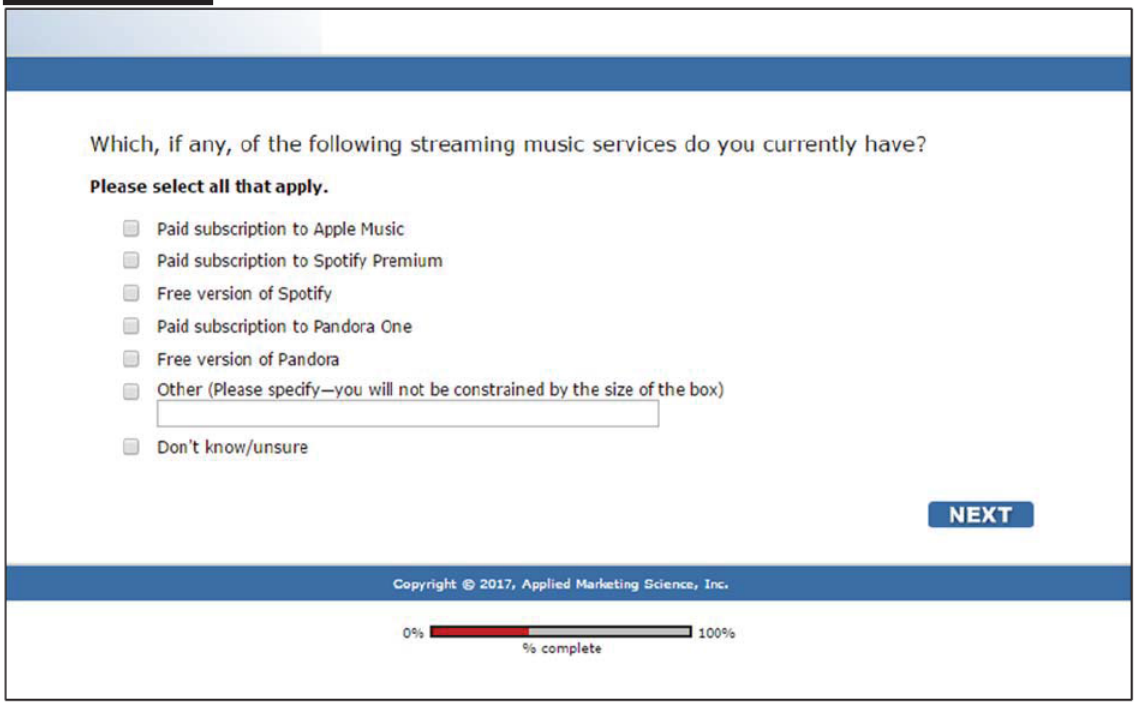
(QUESTION 52.2)



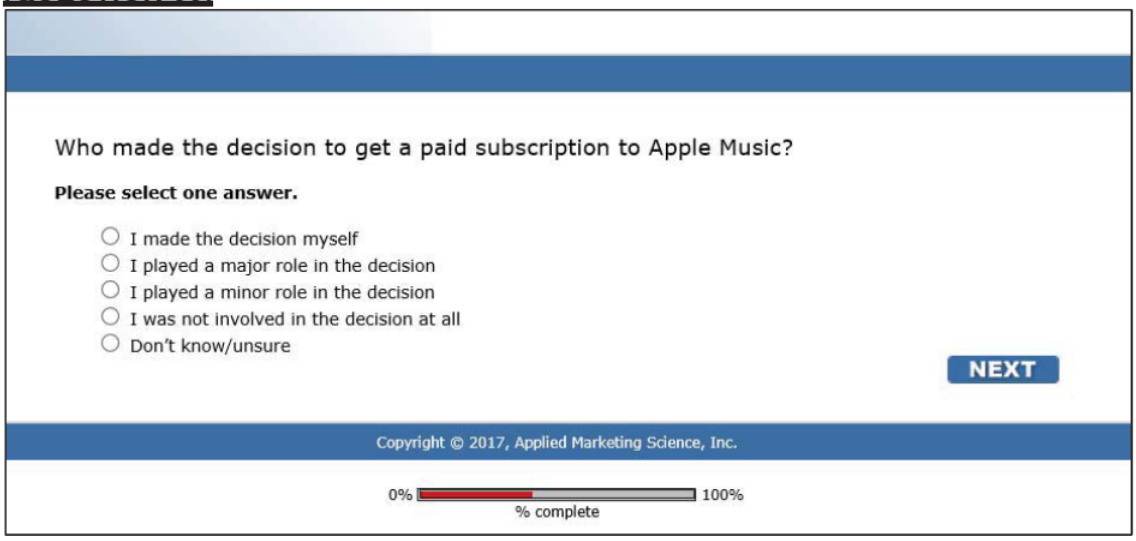
(QUESTION 53)



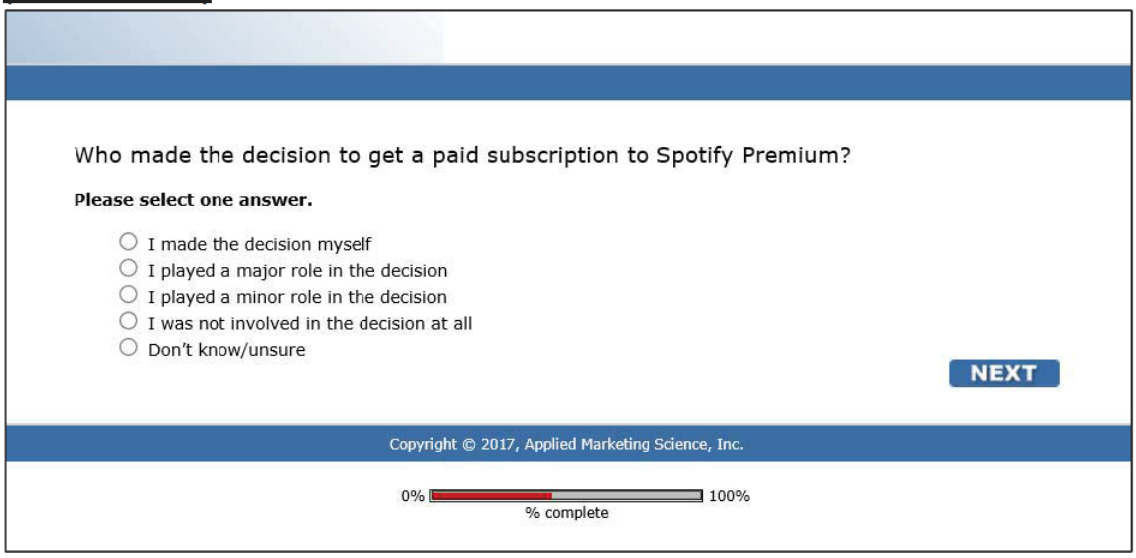
(QUESTION 54)



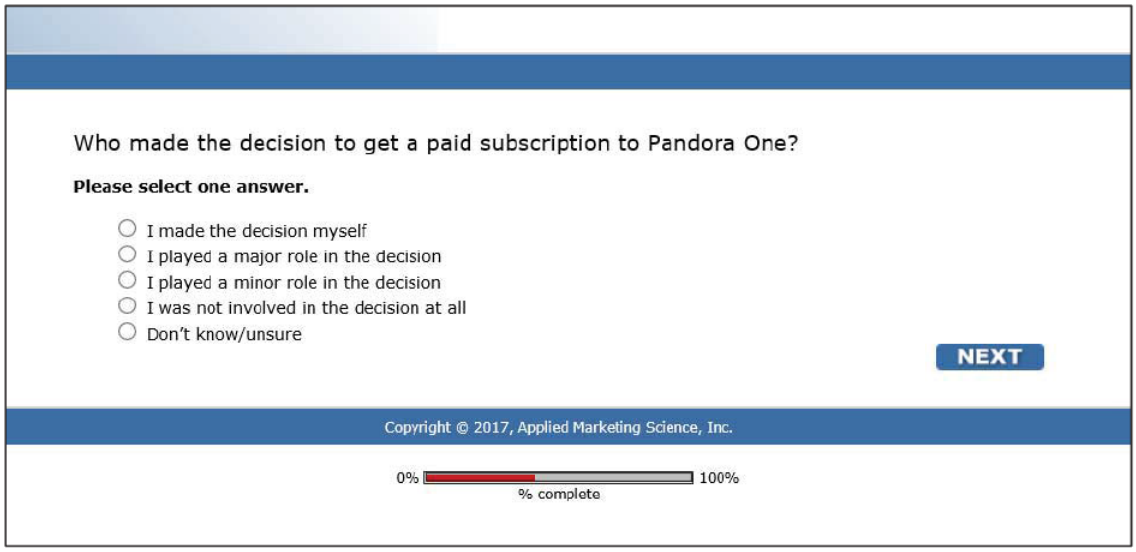
(QUESTION 55)



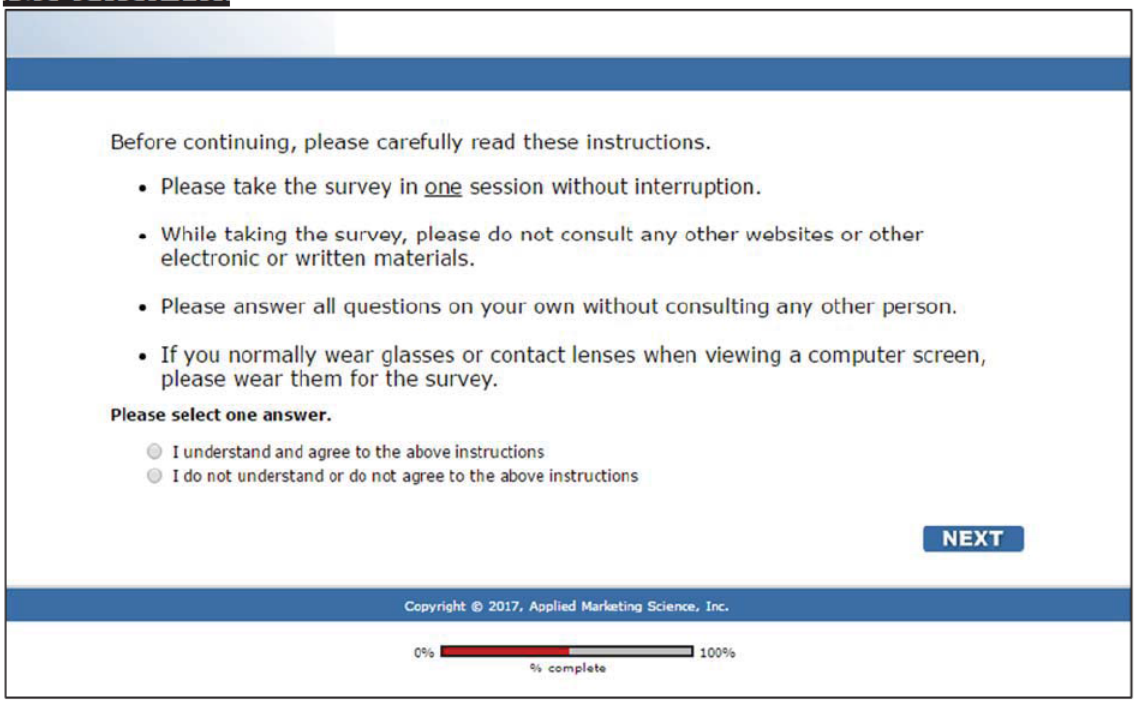
(QUESTION 55)



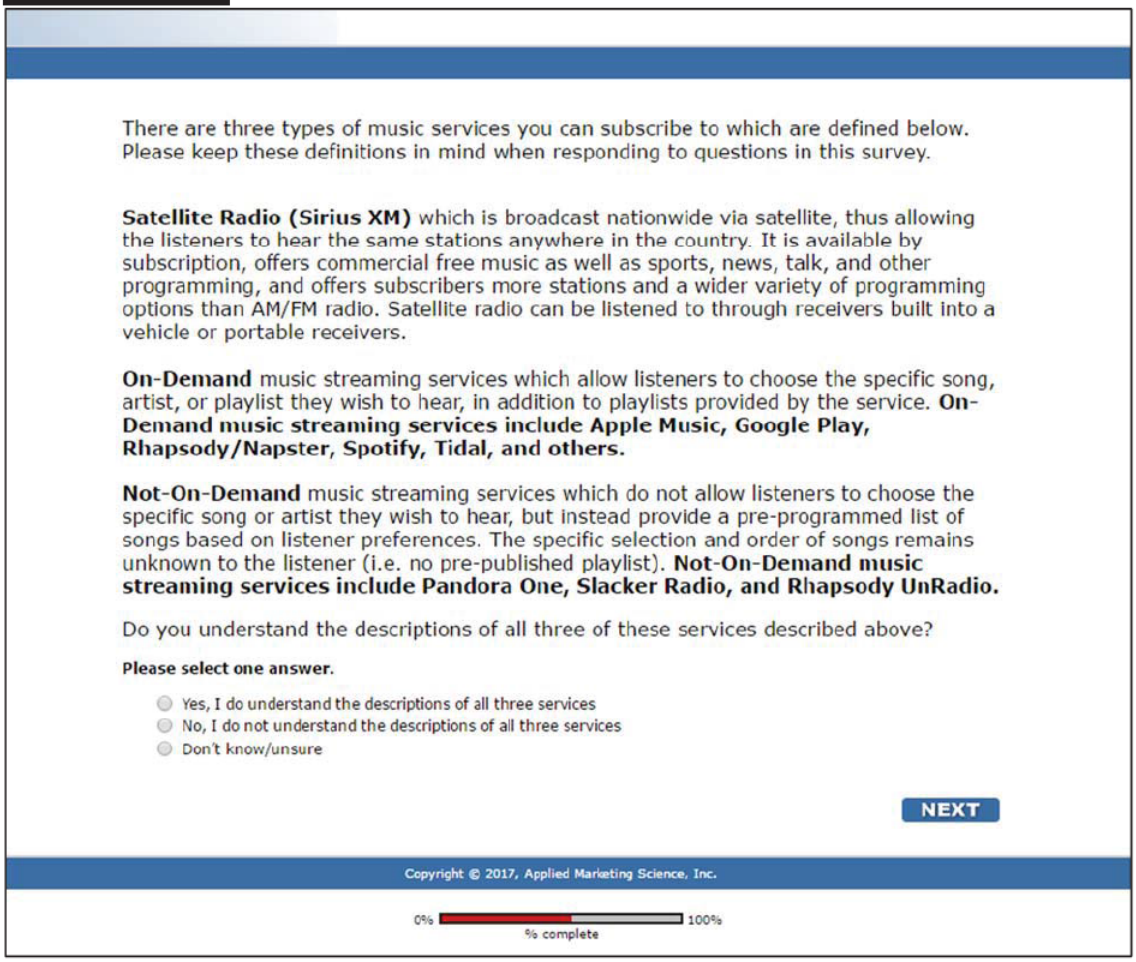
(QUESTION 55)



(QUESTION 140)



CELL 1: SXM PAID SUBSCRIBERS (QUESTION 201)



There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others.**

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.**

Do you understand the descriptions of all three of these services described above?

Please select one answer.

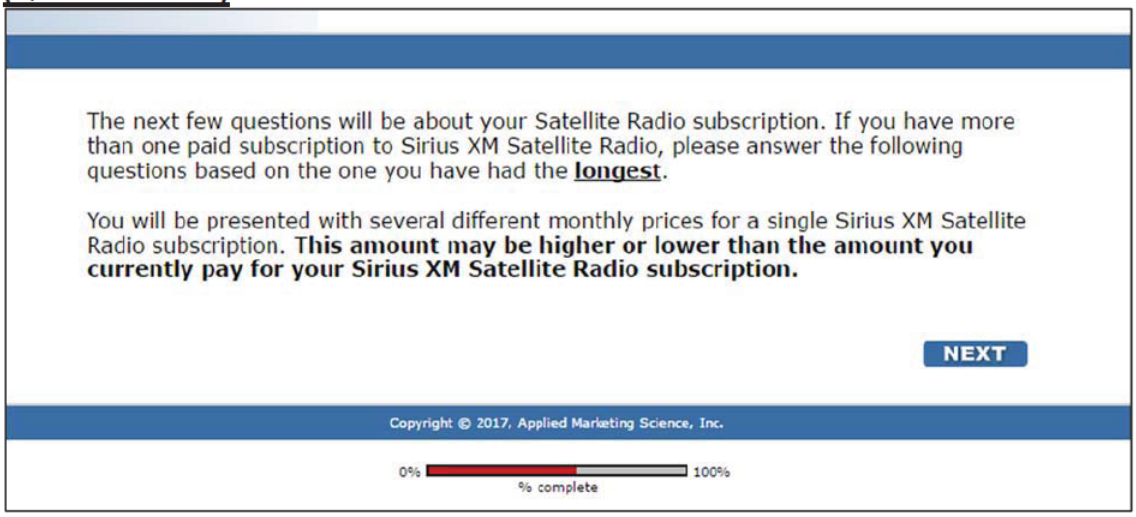
- Yes, I do understand the descriptions of all three services
- No, I do not understand the descriptions of all three services
- Don't know/unsure

NEXT

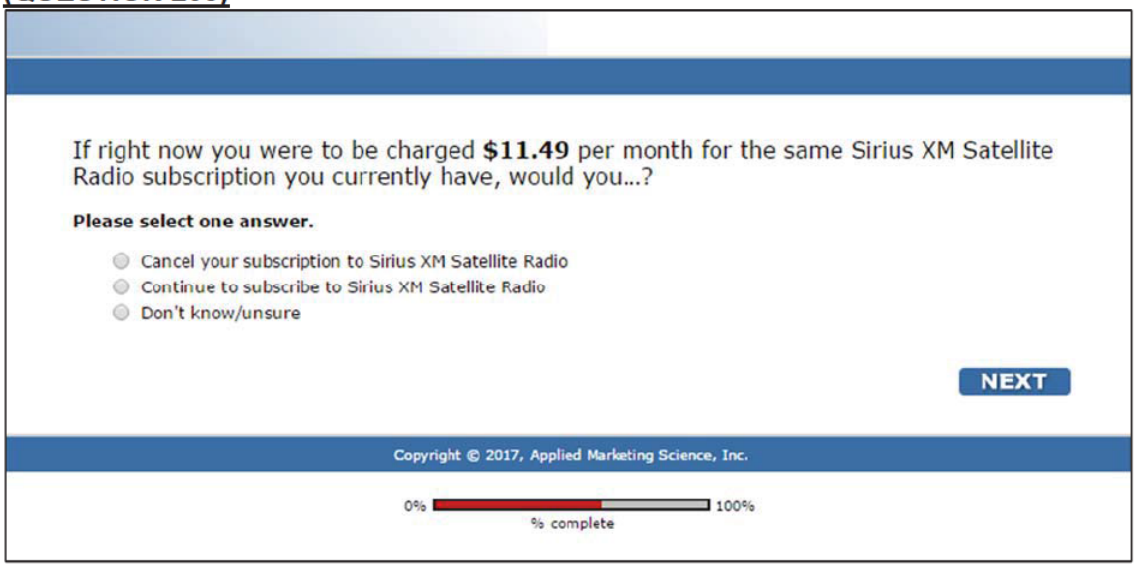
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0% 100%
% complete

(QUESTION 202)



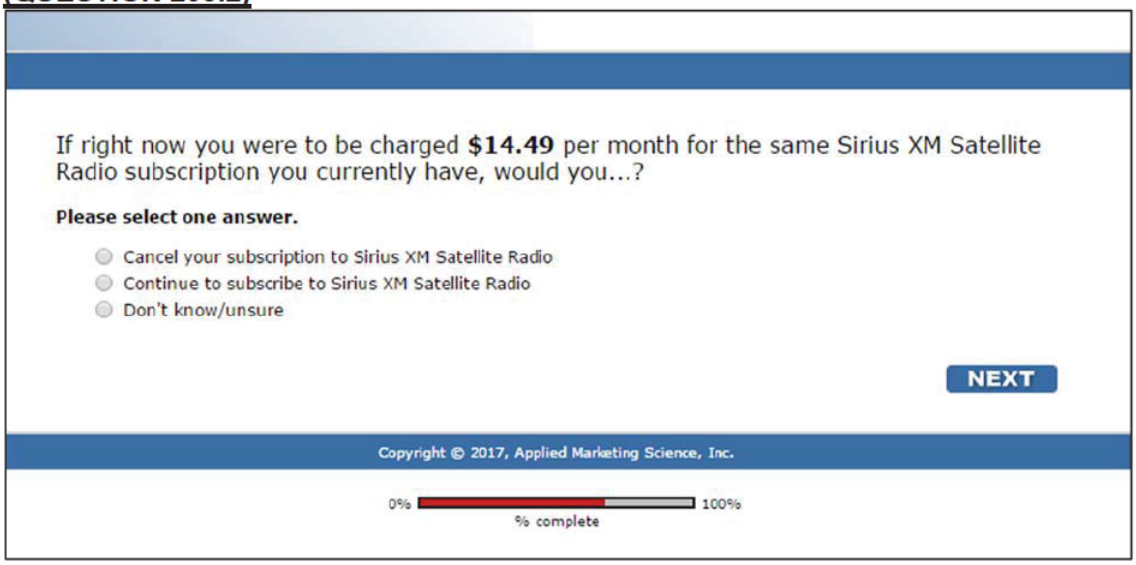
(QUESTION 203)



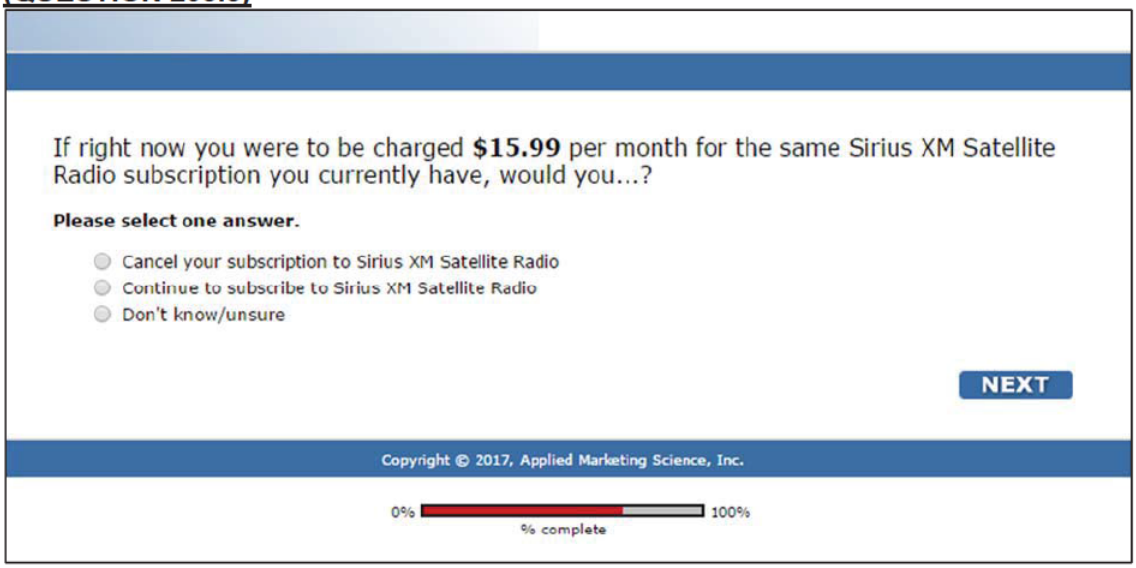
(QUESTION 203.1)



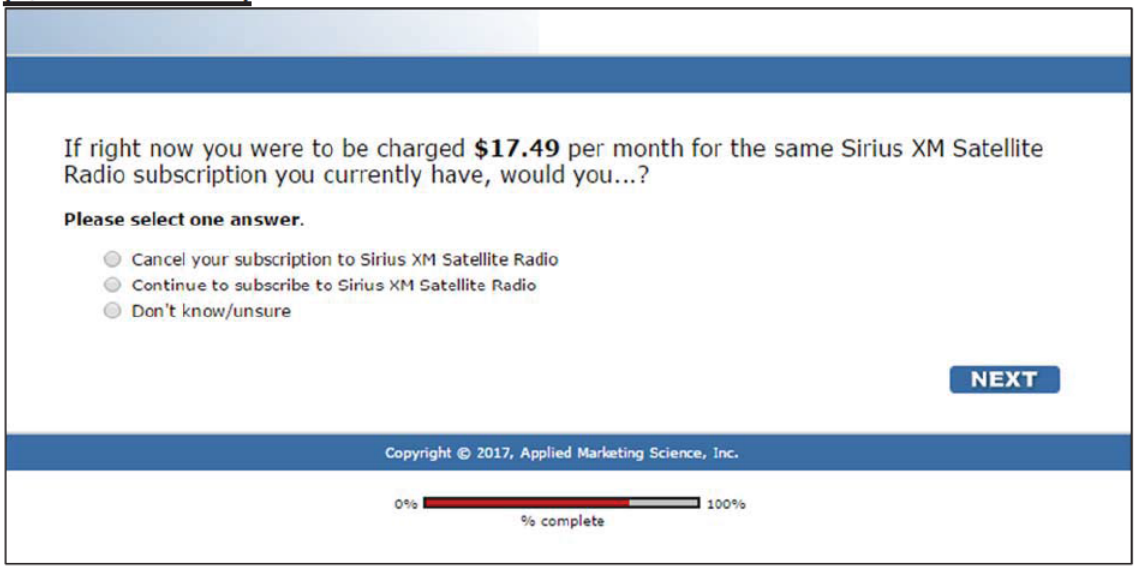
(QUESTION 203.2)



(QUESTION 203.3)



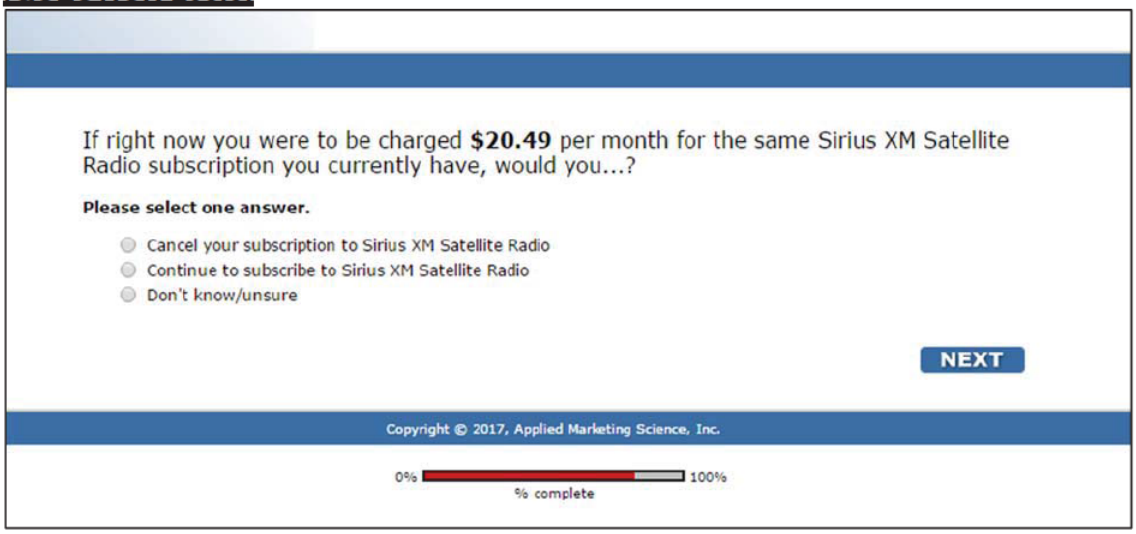
(QUESTION 203.4)



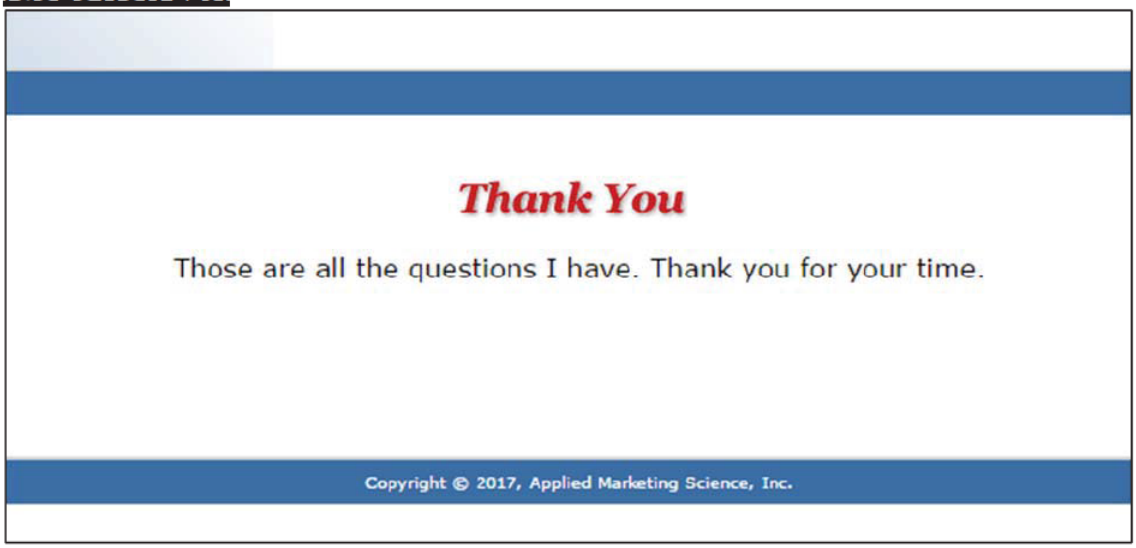
(QUESTION 203.5)



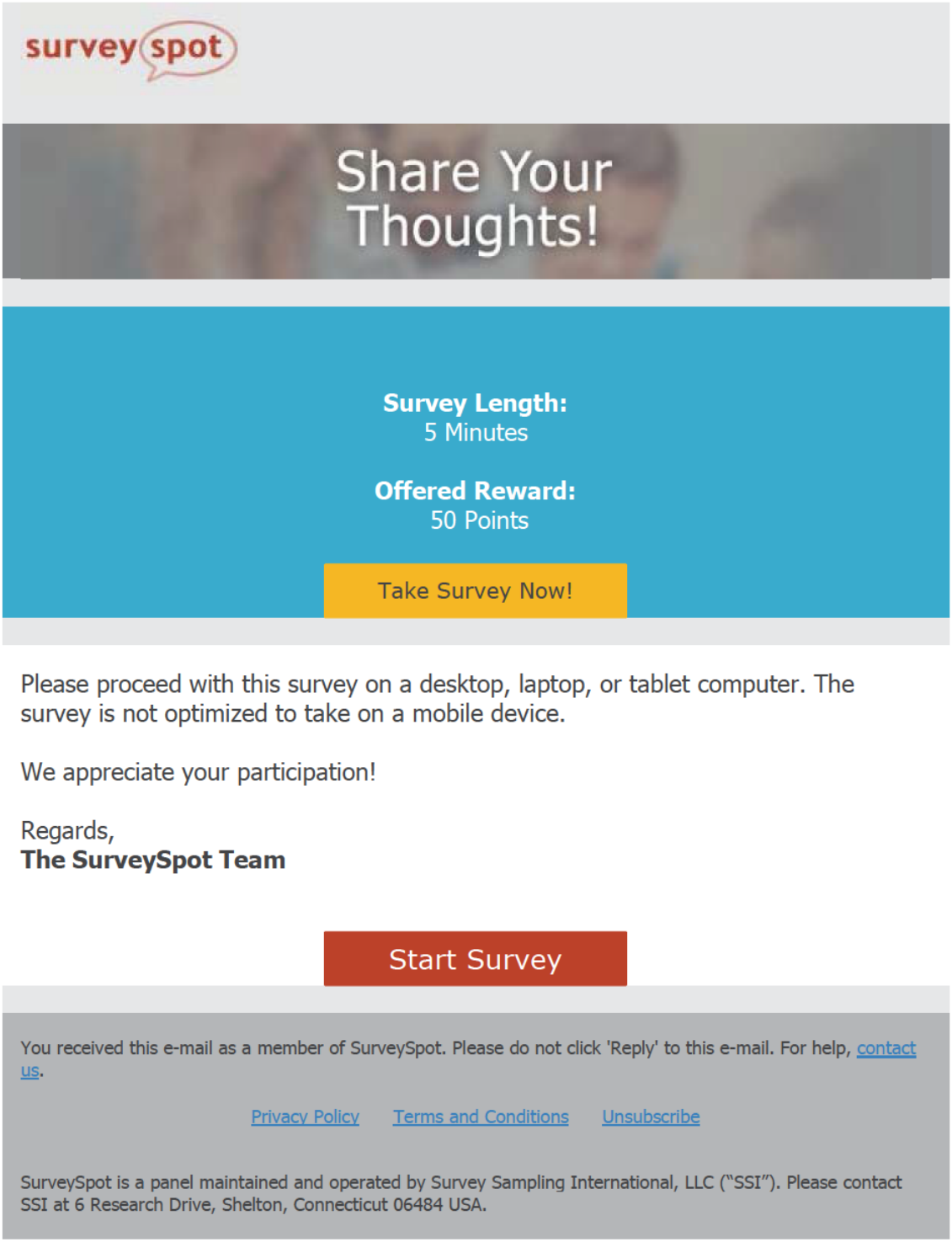
(QUESTION 203.6)



(QUESTION 220)



Appendix F


survey spot
Share Your Thoughts!
Survey Length:
5 Minutes
Offered Reward:
50 Points
Take Survey Now!
Please proceed with this survey on a desktop, laptop, or tablet computer. The survey is not optimized to take on a mobile device.
We appreciate your participation!
Regards,
The SurveySpot Team
Start Survey
You received this e-mail as a member of SurveySpot. Please do not click 'Reply' to this e-mail. For help, contact us.
Privacy Policy
Terms and Conditions
Unsubscribe
SurveySpot is a panel maintained and operated by Survey Sampling International, LLC ("SSI"). Please contact SSI at 6 Research Drive, Shelton, Connecticut 06484 USA.

APPENDIX G

Screening Statistics – Dhar Reproduction Sirius XM Survey

Total Click-ins: 4,322
Total Completes: 117
Overall incidence: 2.7%

Question	Description	Total Screened Out	Percentages of total click-ins.*
	Logged on, but didn't continue	15	0.3%
	Self-terminated	52	1.2%
	Termed for over-quota	347	8.0%
Q25	State: Indicated their area was not listed	2	0.0%
Q30 and Q35	Panel Gender or Age mismatch	140	3.2%
Q35	Age: Under age 18 or indicated they would prefer not to say	25	0.6%
Q40	People who received an on-hold message for device and never returned with a proper device	1009	23.3%
Q49	Taken a survey on Radio or Music Services in the past 6 months	276	6.4%
Q50	Industry Screening Question	43	1.0%
Q51	Service Subscription Question (did not have Satellite Radio Service)	1902	44.0%
Q52	Indicated that they have a subscription as part of a package from DISH network or indicated that they didn't know/were unsure	110	2.5%
Q52.2	Indicated they did not have a Select subscription package	272	6.3%
Q53	Indicated they had a minor role or no role in the decision to get a paid subscription to Sirius XM	12	0.3%
	Total Completes	117	2.7%

*Percentage may not sum to 100% due to rounding.

Qualitative Pretest Findings

- 28 people took the full survey and were interviewed during survey completion
  - Respondents included 14 females and 14 males from 14 different states nationwide
  - Respondents included 9 Sirius XM paid subscribers, 9 Sirius XM free trial subscribers, 5 Apple Music subscribers, and 5 Spotify Premium subscribers
  - Respondents aged 18+
  - Interviews took place January 17th, 2017 through January 25th, 2017
- Respondents were emailed a link to the survey at the start of the interview and took the survey while on the phone with the interviewer.
- Interviewers asked questions to evaluate whether respondents understood certain specific questions in the survey, to evaluate what respondents thought the purpose of the survey was, and to evaluate whether any demand artifacts existed within the specific survey questions or response options that were tested.
- Potential issues identified during the pretests and solutions to address those issues are provided in the table below. No issues were found with respondent comprehension of questions or response options and there was no evidence of demand artifacts.
- Pretests conducted after implementation of the solutions revealed no further issues.

Sirius XM and On-Demand Music Subscribers (n=28)	
Issue	**Solutions**
Questions 210/510/310A/310B: Response options may not be comprehensive.	Sirius XM survey • Potential issue: Respondents asked whether music channels through cable subscription were covered by the response options in Q210. • Solution: Added "cable music channels" as an example in option 8 (other free music options) in Q210, Q310A, Q310B, and Q510. • Potential Issue: Respondents asked whether On-Demand services such as Amazon Music and Google Play were covered by the response options in Q210. • Solution: Added these two services to the examples of On-Demand services in the On-Demand response options in Q210, Q310A, Q310B, and Q510: "I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month…" On-Demand Music survey • Potential issue: Respondents asked which response option allowed them to indicate that they listen to Sirius XM with a subscription they already have. • Solution: Added "I would listen to Sirius XM satellite radio that I already pay to subscribe to" as a response option in Q310A and Q310B. • Potential Issue: Respondents asked whether On-Demand services such as Amazon Music and Google Play were covered by the response options in Q310. • Solution: Add these two services to the examples of On-Demand services in the On-Demand response options: "I would subscribe to Apple Music / Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to…" in Q210, Q310A, Q310B, and Q510.

Questions 210.2/510.2/310A.3/310B.3: Response options may not be comprehensive.	Sirius XM survey • Potential issue: Respondents noted that they could use external devices (e.g. smartphone, tablet) to listen to music in their houses or their cars. • Solution: Added "In your car through your computer, smartphone or tablet (e.g., using the Sirius XM "app")" as a response option in Q210.2 and Q510.2. • Potential issue: Respondents noted that they could use "Smart TV" to listen to Sirius XM satellite radio. • Solution: Added "Smart TV" to response option 3 in Q210.2 and Q510.2. On-Demand Music survey • Potential issue: Respondents noted they could listen to music on their smartphones through external speakers (e.g., in their car through their smartphone). • Solution: Response options were framed in terms of the source device for the music rather than the speaker (e.g., "through your smartphone" rather than "in your car") in Q310A.3 and Q310B.3.

APPENDIX I

MODIFIED DHAR SURVEY (SIRIUS XM)

CELL 1: **Sirius XM** paid subscribers (max N=500)

CELL 7: Free **trial** subscription to **Sirius XM** (e.g., new car buyers) (max N=500)

NOTE: QUESTIONNAIRE WILL BE PROGRAMMED.
INTERVIEWING WILL BE SELF-ADMINISTERED ON-LINE.
ALL INSTRUCTIONS SHOULD BE LEFT JUSTIFIED ON SCREEN.

SCREENER - INTRODUCTION
(QUESTION 10)

Thank you for your willingness to participate in this study. The responses you give to these questions are very important to us. If you don't know an answer to a question or if you are unsure, please indicate this in your response. It is very important that you do not guess.

Your answers will be kept in confidence. The results of this study will not be used to try to sell you anything.

When you are ready to get started, please click on the "NEXT" button below.
This survey should take between 5 and 7 minutes to complete.

QS0. Please enter the code exactly as it appears in the image above, and then click "NEXT" to continue.
[INSERT CAPTCHA]

SCREENING SECTION
(QUESTION 25)

In what state do you live?
Please select one answer.

{INSERT DROP DOWN LIST OF 50 STATES + DC + MY AREA IS NOT LISTED HERE; TERMINATE IF MY AREA IS NOT LISTED HERE IS SELECTED}

{PROGRAMMER: GENDER DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 30)

Are you…
Please select one answer.

1: Male
2: Female

{PROGRAMMER: AGE DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 35)

Which of the following includes your age?
Please select one answer.

1: Under 18 ***{TERMINATE}***
2: 18-34
3: 35-44
4: 45-54
5: 55+
6: Prefer not to answer ***{TERMINATE}***

{PROGRAMMER: RANDOMIZE FIRST FOUR CHOICES}
(QUESTION 40)
What type of electronic device are you using to complete this survey?
Please select one answer.

1: Desktop computer
2: Laptop computer
3: Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom)
4: Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One) ***{ON HOLD}***
5: Other mobile or electronic device ***{ON HOLD}***

DISPLAY A MESSAGE TO ON-HOLD RESPONDENTS AND ASK THEM TO RE-ENTER USING AN APPROPRIATE DEVICE (USING THE SAME LINK): This survey is not formatted for viewing on smartphones and other mobile or electronic devices. Please return to the survey, using the same link, from a desktop, laptop or tablet computer.

{PROGRAMMER: RANDOMIZE CHOICES 1-10; IF ITEM 1 OR 11 IS SELECTED, TERMINATE.} **(QUESTION 49)**
Have you taken a survey relating to any of the following products or services in the past 6 months?
Please select all that apply.
1: Music Services
2: eCommerce
3: Agriculture
4: Insurance
5: Pharmaceutical
6: Advertising
7: Food & Beverage
8: Sports
9: Video Games

10: Chemicals
11. Radio
12. None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: RANDOMIZE CHOICES 1-6; IF ANY ITEM 1-5 SELECTED, TERMINATE. RESPONSE MUST BE EITHER PUNCH 7 "NONE OF THE ABOVE" OR PUNCH 6 SELECTED EXCLUSIVELY TO CONTINUE}
(QUESTION 50)
Do you or does anyone in your household work in any of the following areas? **Please select all that apply.**

1: For a Satellite Radio company?
2: For a Streaming Music company, such as Pandora or Spotify?
3: For Apple, Google or Amazon?
4: For a company that creates music such as a Recording Studio, Record Company, or a Music Publisher?
5: For a Market Research Company or Public Relations Agency?
6: For an Internet Service Provider?
7: None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: ROTATE CHOICES 1, 2, AND 3, ANCHOR CHOICES 4 AND 5}
{PROGRAMMER: IF CHOICE 1 IS NOT SELECTED, TERMINATE}
(QUESTION 51)
Which, if any, of the following services do you currently have? This includes all subscriptions – free, trial or introductory, or paid. **Please select all that apply.**

1: Satellite Radio (Sirius XM)
2: Music Streaming Service (e.g., Apple Music, Spotify or Pandora)
3: Broadband Internet (e.g., cable, fiber optic or DSL)
4: None of the above ***{SINGLE RESPONSE}***
5: Don't know/unsure ***{SINGLE RESPONSE}***

(QUESTION 52)
Which of the following Sirius XM satellite radio subscriptions do you currently have? **Please select all that apply.**

1: A paid subscription to Sirius XM satellite radio **—Cell 1**
2: A subscription to Sirius XM as part of a package from DISH network **[TERMINATE IF OPTION 1 OR 3 NOT SELECTED]**
3: A free Trial Period subscription to Sirius XM satellite radio (e.g., available with the purchase of some new cars)**—Cell 7 [SKIP TO QUESTION 54 ONLY IF OPTION 2 SELECTED IN QUESTION 51]**
4: Don't know/unsure ***{SINGLE RESPONSE}*** **[TERMINATE]**

{PROGRAMMER: ASK Q52.1 IF OPTION 1 SELECTED IN Q52}
(QUESTION 52.1)
If you have more than one paid subscription to Sirius XM satellite radio, please answer the following questions based on the one you have had the **longest**.

{PROGRAMMER: INCLUDE IMAGE FROM
http://www.siriusxm.com/ourmostpopularpackages
TOGETHER WITH Q52.2}

(QUESTION 52.2)
Which of the following is your Sirius XM Satellite Radio subscription package?
Please select one answer.

1: Select
2: All Access **[TERMINATE FROM CELL 1]**
3: Mostly Music **[TERMINATE FROM CELL 1]**
4: Other (Please specify—you will not be constrained by the size of the box)
_____**[TERMINATE FROM CELL 1]**
5: Don't know/unsure **[TERMINATE FROM CELL 1]**

{PROGRAMMER: ASK Q53 IF OPTION 1 SELECTED IN Q52.2}
(QUESTION 53)
Who made the decision to get this paid subscription to Sirius XM satellite radio?
Please select one answer.

1: I made the decision myself**—Cell 1**
2: I played a major role in the decision**—Cell 1**
3: I played a minor role in the decision **[TERMINATE FROM CELL 1]**
4: I was not involved in the decision at all **[TERMINATE FROM CELL 1]**
5: Don't know/unsure **[TERMINATE FROM CELL 1]**

{PROGRAMMER: ASK Q54 IF OPTION 2 SELECTED IN Q51}
{ROTATE SPOTIFY, APPLE AND PANDORA, BUT KEEP PAID AND FREE IN TANDEM, ANCHOR 6 AND 7}
(QUESTION 54)
Which, if any, of the following streaming music services do you currently have?
Please select all that apply.

1: Paid subscription to Apple Music
2: Paid subscription to Spotify Premium
3: Free version of Spotify
4: Paid subscription to Pandora One
5: Free version of Pandora
6: Other (Please specify—you will not be constrained by the size of the box)
_____
7: Don't know/unsure ***{SINGLE RESPONSE}***

{PROGRAMMER: ASK Q55 FOR EACH OPTION 1, 2, 4 IF SELECTED IN Q54}
(QUESTION 55)

Who made the decision to get a **(INSERT SELECTED OPTION FROM Q54)**?
Please select one answer.

1: I made the decision myself
2: I played a major role in the decision
3: I played a minor role in the decision
4: I was not involved in the decision at all
5: Don't know/unsure

(QUESTION 140)
Before continuing, please carefully read these instructions.

- Please take the survey in one session without interruption.
- While taking the survey, please do not consult any other websites or other electronic or written materials.
- Please answer all questions on your own without consulting any other person.
- If you normally wear glasses or contact lenses when viewing a computer screen, please wear them for the survey.

Please select one answer.

1: I understand and agree to the above instructions
2: I do not understand or do not agree to the above instructions
{TERMINATE}

QUALIFICATIONS FOR EACH CELL:
CELL 1: **Sirius XM** paid subscribers **[PUNCH 1 OR 2 IN Q53 FOR OPTION 1 IN Q52.2]**
CELL 7: Free **trial** subscription to **Sirius XM** (e.g., new car buyers) **[OPTION 3 SELECTED IN Q52]**

(QUESTION 150—CELL ASSIGNMENT CRITERIA FOR INCLUSION)

IF ONLY ONE CELL QUALIFIED FOR, APPLY TO THAT CELL.

IF MORE THAN ONE CELL QUALIFIED FOR, APPLY RANDOMLY TO A CELL QUOTA.

> **IF THE RANDOMIZATION ASSIGNS A CELL THAT IS ALREADY FILLED/CLOSED, THEN ASSIGN RANDOMLY TO ANOTHER OPEN CELL THAT RESPONDENT IS ALSO QUALIFIED FOR.**
>
> **ONCE A CELL IS FILLED/CLOSED, IT SHOULD BE REMOVED FROM THE RANDOMIZATION ASSIGNMENT.**

IF DO NOT QUALIFY FOR ANY OF THE 2 CELLS, TERMINATE.

Music Survey

CELL 1: SXM subscribers--ASK Q200 THROUGH Q220

(QUESTION 201)
There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others**.

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio**.

Do you understand the descriptions of all three of these services described above?

Please select one answer.

1: Yes, I do understand the descriptions of all three services →**(ASK Q202)**
2: No, I do not understand the descriptions of all three services→ **(TERMINATE)**
3: Don't know/unsure → **(TERMINATE)**

(QUESTION 202)
The next few questions will be about your Satellite Radio subscription. If you have more than one paid subscription to Sirius XM Satellite Radio, please answer the following questions based on the one you have had the **longest.**

You will be presented with several different monthly prices for a single Sirius XM Satellite Radio subscription. **This amount may be higher or lower than the amount you currently pay for your Sirius XM Satellite Radio subscription.**

SERVICE	PRICE	AMOUNT
Sirius XM	1	$11.49
	2	$12.99
	3	$14.49
	4	$15.99
	5	$17.49
	6	$18.99
	7	$20.49

{PROGRAMMER: RANDOMIZE ANSWER CHOICES 1 AND 2. ANCHOR OPTION 3. KEEP THIS ORDER FOR ALL "CONTINUE/CANCEL" QUESTIONS}

(QUESTION 203)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio →**(ASK Q203.1)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 1}**
3: Don't know/unsure →**(ASK Q203.1)**

(QUESTION 203.1)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.2)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 2}**
3: Don't know/unsure →**(ASK Q203.2)**

(QUESTION 203.2)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.3)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 3}**

3: Don't know/unsure →**(ASK Q203.3)**

(QUESTION 203.3)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.4)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 4}**
3: Don't know/unsure →**(ASK Q203.4)**

(QUESTION 203.4)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.5)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 5}**
3: Don't know/unsure →**(ASK Q203.5)**

(QUESTION 203.5)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(ASK Q203.6)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(SKIP TO Q210) {SET SWITCH PRICE=PRICE 6}**
3: Don't know/unsure →**(ASK Q203.6)**

(QUESTION 203.6)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q203]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…?

Please select one answer.

1: Continue to subscribe to Sirius XM Satellite Radio→**(SKIP TO Q210.2)**
2: Cancel your subscription to Sirius XM Satellite Radio→ **(ASK Q210) {SET SWITCH PRICE=PRICE 7}**

3: Don't know/unsure →**(SKIP TO Q210.2)**

{PROGRAMMER: GROUP OPTIONS 1 and 2, 3 and 4, 5 and 6, 7 and 8. RANDOMIZE GROUPS. RANDOMIZE OPTIONS WITHIN GROUPS SUCH THAT OPTIONS 1, 3, and 5 ROTATE TOGETHER. OPTION 7 ALWAYS APPEARS BEFORE OPTION 8.}
{ANCHOR OPTION 9,10, AND 11. KEEP OPTIONS 10 AND 11 EXCLUSIVE}
{INSERT link to definitions provided in Q200. It should say, "Click here if you want to review the music services definitions."}
(QUESTION 210)
You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using **Sirius XM**?

Please select all that apply.

1: I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to →**(SKIP TO Q210.2)**
2: I would listen to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q210.2)**
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to →**(SKIP TO Q210.2)**
4: I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q210.2)**
5: I would purchase and listen to new CDs and/or music downloads →**(SKIP TO Q210.2)**
6: I would listen to my existing collection of CDs and/or music downloads →**(SKIP TO Q210.2)**
7: I would listen to free over-the-air AM/FM radio **(SKIP TO Q210.2)**
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) →**(GO TO Q210.1)**
9: Other (Please specify—you will not be constrained by the size of the box)

_____
(SKIP TO Q210.2)
10: None of the above →**(SKIP TO Q210.2)**
11: Don't know/unsure →**(SKIP TO Q210.2)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-6. ANCHOR 7 AND 8. KEEP OPTION 8 EXCLUSIVE}
(QUESTION 210.1)
You mentioned that you would listen to free music option(s) other than over-the-

air AM/FM radio in place of Sirius XM Satellite Radio. Which free music option(s) would you use instead of Sirius XM Satellite Radio?

Please select all that apply.

1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
3. Free music video sites with ads (e.g., YouTube)
4. Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
5. Music obtained through peer-to-peer file sharing or free download sites
6. Borrow CDs, vinyl or tapes from friends or a library
7. Other (Please specify—you will not be constrained by the size of the box)

_____

8. Don't know/unsure **{SINGLE REPONSE}**

{PROGRAMMER: ANCHOR 5-7, GROUP OPTIONS 1 AND 2, 3 AND 4, RANDOMIZE WITHIN GROUP AND ACROSS GROUPS}
(QUESTION 210.2)
How do you primarily listen to Sirius XM satellite radio?
Please select one answer.

1. In your car through your car's radio/entertainment system
2. In your car through your computer, smartphone or tablet (e.g., using the Sirius XM "app")
3. Outside your car through your computer, smartphone, tablet, or Smart TV (e.g., using the Sirius XM "app")
4. Outside your car through a Sirius XM radio device
5. Other (Please specify—you will not be constrained by the size of the box)

_____

6. None of the above
7. Don't know/unsure

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1-6, ANCHOR 7-8, }
(QUESTION 210.3)
Which of the following best describes how often you pay for your Sirius XM Select subscription?
Please select one answer.

1. Monthly
2. Quarterly
3. Upfront for one-year subscription
4. Upfront for a two-year subscription
5. Upfront for a three-year subscription
6. Upfront for a lifetime subscription **(SKIP TO Q220)**

7. Other (Please specify—you will not be constrained by the size of the box) _____**(SKIP TO Q220)**
8. Don't know/unsure**(SKIP TO Q220)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-2}
(QUESTION 210.4)
You indicated that you are paying for your Sirius XM Select subscription every **[INSERT {MONTH/QUARTER/YEAR/TWO YEARS/THREE YEARS} DEPENDING ON THE PAYMENT PLAN CHOSEN IN Q210.3]**. Do you or do you not know how much you pay every **[INSERT {MONTH/QUARTER/YEAR/TWO YEARS/THREE YEARS} DEPENDING ON THE PAYMENT PLAN CHOSEN IN Q210.3]**?
Please select one answer.

1. Yes, I know how much I pay every **[INSERT {MONTH/QUARTER/YEAR/TWO YEARS/THREE YEARS} DEPENDING ON THE PAYMENT PLAN CHOSEN IN Q210.3]**
2. No, I do not know or I am unsure of how much I pay every **[INSERT {MONTH/QUARTER/YEAR/TWO YEARS/THREE YEARS} DEPENDING ON THE PAYMENT PLAN CHOSEN IN Q210.3] [SKIP TO Q220]**

(QUESTION 210.5)

[IF MONTHLY PLAN SELECTED IN QUESTION 210.3]
Monthly prices could vary depending upon when you signed the contract. How much do you pay every month?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than or equal to $11.49 every month
2. Greater than $11.49 but less than or equal to $12.99 every month
3. Greater than $12.99 but less than or equal to $14.49 every month
4. Greater than $14.49 but less than or equal to $15.99 every month
5. Greater than $15.99 but less than or equal to $17.49 every month
6. Greater than $17.49 but less than or equal to $18.99 every month
7. Greater than $18.99 but less than or equal to $20.49 every month
8. Greater than $20.49 every month

[IF QUARTERLY PLAN SELECTED IN QUESTION 210.3]
Quarterly prices could vary depending upon when you signed the contract. How much do you pay every quarter?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than or equal to $34.47 every quarter
2. Greater than $34.47 but less than or equal to $38.97 every quarter
3. Greater than $38.97 but less than or equal to $43.47 every quarter

4. Greater than $43.47 but less than or equal to $47.97 every quarter
5. Greater than $47.97 but less than or equal to $52.47 every quarter
6. Greater than $52.47 but less than or equal to $56.97 every quarter
7. Greater than $56.97 but less than or equal to $61.47 every quarter
8. Greater than $61.47 every quarter

[IF ANNUAL PLAN SELECTED IN QUESTION 210.3]
Annual prices could vary depending upon when you signed the contract. How much do you pay every year?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than $137.88 every year
2. Greater than $137.88 but less than or equal to $155.88 every year
3. Greater than $155.88 but less than or equal to $173.88 every year
4. Greater than $173.88 but less than or equal to $191.88 every year
5. Greater than $191.88 but less than or equal to $209.88 every year
6. Greater than $209.88 but less than or equal to $227.88 every year
7. Greater than $227.88 but less than or equal to $245.88 every year
8. Greater than $245.88 every year

[IF TWO YEAR PLAN SELECTED IN QUESTION 210.3]
Two year plan prices could vary depending upon when you signed the contract. How much do you pay every two years?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than $275.76 every two years
2. Greater than $275.76 but less than or equal to $311.76 every two years
3. Greater than $311.76 but less than or equal to $347.76 every two years
4. Greater than $347.76 but less than or equal to $383.76 every two years
5. Greater than $383.76 but less than or equal to $419.76 every two years
6. Greater than $419.76 but less than or equal to $455.76 every two years
7. Greater than $455.76 but less than or equal to $491.76 every two years
8. Greater than $491.76 every two years

[IF THREE YEAR PLAN SELECTED IN QUESTION 210.3]
Three year plan prices could vary depending upon when you signed the contract. How much do you pay every three years?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than $413.64 every three years
2. Greater than $413.64 but less than or equal to $467.64 every three years
3. Greater than $467.64 but less than or equal to $521.64 every three years
4. Greater than $521.64 but less than or equal to $575.64 every three years

5. Greater than $575.64 but less than or equal to $629.64 every three years
6. Greater than $629.64 but less than or equal to $683.64 every three years
7. Greater than $683.64 but less than or equal to $737.64 every three years
8. Greater than $737.64 every three years

(QUESTION 220)
Those are all the questions I have. Thank you for your time.

Cell 7: SXM Trial Subscription holders--ASK Q500 THROUGH Q520

(QUESTION 500)
The next few questions will be about your **Trial Period** subscription to Sirius XM Satellite Radio.

(QUESTION 500.1)
You indicated that you currently have a **Trial Period** subscription to Sirius XM Satellite Radio. How long have you had your **Trial Period** subscription to Sirius XM Satellite Radio?

Please select one answer.

1: Less than 1 month
2: More than 1 month but less than 3 months
3: More than 3 months but less than 6 months
4: More than 6 months but less than 12 months
5: More than 12 months **[TERMINATE]**
6: Don't know/unsure

(QUESTION 501)
There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others**.

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre- programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio**.

Do you understand the descriptions of all three of these services described above?

Please select one answer.

1: Yes, I do understand the descriptions of all three services →**(ASK Q502)**
2: No, I do not understand the descriptions of all three services→ **(TERMINATE)**
3: Don't know/unsure → **(TERMINATE)**

(QUESTION 502)
The next few questions will be about what interest, if any, you may have in purchasing a paid subscription to **Sirius XM** Satellite Radio at the end of your **Trial Period** subscription to **Sirius XM** Satellite Radio. You will be presented with several different monthly prices for a paid subscription to **Sirius XM** Satellite Radio**.**

SERVICE	Price	AMOUNT
Sirius XM	1	$11.49
	2	$12.99
	3	$14.49
	4	$15.99
	5	$17.49
	6	$18.99
	7	$20.49

{PROGRAMMER: RANDOMIZE ANSWER CHOICES 1 AND 2. ANCHOR OPTION 3. KEEP THIS ORDER FOR ALL "YES/NO" QUESTIONS}
(QUESTION 503)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 1 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(ASK Q503.1)**
2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 1}**
3: Don't know/unsure →**(ASK Q503.1)**

(QUESTION 503.1)

At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 2 FROM CHART BEFORE Q503]** per month**,** would you or would you not subscribe to the service? **Please select one answer.**

1: Yes, I would subscribe to the service →**(ASK Q503.2)**
2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 2}**
3: Don't know/unsure →**(ASK Q503.2)**

(QUESTION 503.2)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 3 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(ASK Q503.3)**
2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 3}**
3: Don't know/unsure →**(ASK Q503.3)**

(QUESTION 503.3)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 4 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(ASK Q503.4)**
2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 4}**
3: Don't know/unsure →**(SKIP TO Q503.4)**

(QUESTION 503.4)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 5 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(ASK Q503.5)**

2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 5}**
3: Don't know/unsure →**(SKIP TO Q503.5)**

(QUESTION 503.5)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 6 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(ASK Q503.6)**
2: No, I would not subscribe to the service→ **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 6}**
3: Don't know/unsure →**(SKIP TO Q503.6)**

(QUESTION 503.6)
At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE 7 FROM CHART BEFORE Q503]** per month, would you or would you not subscribe to the service?

Please select one answer.

1: Yes, I would subscribe to the service →**(SKIP TO Q510.2)**
2: No, I would not subscribe to the service→ **(ASK Q510) {SET SWITCH PRICE=PRICE 7}**
3: Don't know/unsure →**(SKIP TO Q510.2)**

{PROGRAMMER: GROUP OPTIONS 1 and 2, 3 and 4, 5 and 6, 7 and 8. RANDOMIZE GROUPS. RANDOMIZE OPTIONS WITHIN GROUPS SUCH THAT OPTIONS 1, 3, and 5 ROTATE TOGETHER. OPTION 7 ALWAYS APPEARS BEFORE OPTION 8.}
{ANCHOR OPTION 9,10, AND 11. KEEP OPTIONS 10 AND 11 EXCLUSIVE}
{INSERT link to definitions provided in Q500. It should say, "Click here if you want to review the music services definitions."
(QUESTION 510)
You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you do in place of using **Sirius XM**?

Please select all that apply.

1: I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to →**(SKIP TO Q510.2)**
2: I would listen to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q510.2)**
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to →**(SKIP TO Q510.2)**
4: I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q510.2)**
5: I would purchase and listen to new CDs and/or music downloads →**(SKIP TO Q510.2)**
6: I would listen to my existing collection of CDs and/or music downloads →**(SKIP TO Q510.2)**
7: I would listen to free over-the-air AM/FM radio →**(SKIP TO Q510.2)**
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) →**(GO TO Q510.1)**
9: Other (Please specify—you will not be constrained by the size of the box)

_____
→**(SKIP TO Q510.2)**
10: None of the above →**(SKIP TO Q510.2)**
11: Don't know/unsure →**(SKIP TO Q510.2)**

{PROGRAMMER: ASK Q510.1 IF OPTION 8 SELECTED IN Q510
RANDOMIZE OPTIONS 1-6. ANCHOR 7 AND 8. KEEP OPTION 8 EXCLUSIVE}
(QUESTION 510.1)
You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of a paid subscription to Sirius XM Satellite Radio. Which free music option(s) would you use instead of Sirius XM Satellite Radio?

Please select all that apply.

1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
3. Free music video sites with ads (e.g., YouTube)
4. Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
5. Music obtained through Peer-to-Peer file sharing or free download sites

6. Borrow CDs, vinyl or tapes from friends or a library
7. Other (Please specify—you will not be constrained by the size of the box)

_____

8. Don't know/unsure **{SINGLE RESPONSE}**

{PROGRAMMER: ANCHOR 5-7. GROUP OPTIONS 1 AND 2, 3 AND 4. RANDOMIZE WITHIN GROUP AND ACROSS GROUPS}
(QUESTION 510.2)
How do you primarily listen to Sirius XM satellite radio?
Please select one answer.

1. In your car through your car's radio/entertainment system
2. In your car through your computer, smartphone or tablet (e.g., using the Sirius XM "app")
3. Outside your car through your computer, smartphone, tablet, or Smart TV (e.g., using the Sirius XM "app")
4. Outside your car through a Sirius XM radio device
5. Other (Please specify—you will not be constrained by the size of the box)

_____

6. None of the above
7. Don't know/unsure

(QUESTION 520)
Those are all the questions I have. Thank you for your time.

APPENDIX J

MODIFIED DHAR SURVEY (ON-DEMAND STREAMING)

CELL 2: **Apple Music:** Interactive music streaming service paid subscribers

CELL 3: **Spotify Premium:** Interactive music streaming service paid subscribers

NOTE: QUESTIONNAIRE WILL BE PROGRAMMED.
INTERVIEWING WILL BE SELF-ADMINISTERED ON-LINE.
ALL INSTRUCTIONS SHOULD BE LEFT JUSTIFIED ON SCREEN.

SCREENER - INTRODUCTION
(QUESTION 10)

Thank you for your willingness to participate in this study. The responses you give to these questions are very important to us. If you don't know an answer to a question or if you are unsure, please indicate this in your response. It is very important that you do not guess.

Your answers will be kept in confidence. The results of this study will not be used to try to sell you anything.

When you are ready to get started, please click on the "NEXT" button below.
This survey should take between 5 and 7 minutes to complete.

QS0. Please enter the code exactly as it appears in the image above, and then click "NEXT" to continue.
[INSERT CAPTCHA]

SCREENING SECTION
(QUESTION 25)

In what state do you live?
Please select one answer.

{INSERT DROP DOWN LIST OF 50 STATES+ DC + MY AREA IS NOT LISTED HERE; TERMINATE IF MY AREA IS NOT LISTED HERE IS SELECTED}

{PROGRAMMER: GENDER DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 30)

Are you…
Please select one answer.

1: Male
2: Female

{PROGRAMMER: AGE DESIGNATION MUST MATCH PANEL DATA—IF NOT, TERMINATE}
(QUESTION 35)

Which of the following includes your age?
Please select one answer.

1: Under 18 ***{TERMINATE}***
2: 18-34
3: 35-44
4: 45-54
5: 55+
6: Prefer not to answer ***{TERMINATE}***

{PROGRAMMER: RANDOMIZE FIRST FOUR CHOICES}
(QUESTION 40)
What type of electronic device are you using to complete this survey?
Please select one answer.

1: Desktop computer
2: Laptop computer
3: Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom)
4: Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One) ***{ON HOLD}***
5: Other mobile or electronic device ***{ON HOLD}***

DISPLAY A MESSAGE TO ON-HOLD RESPONDENTS AND ASK THEM TO RE-ENTER USING AN APPROPRIATE DEVICE (USING THE SAME LINK): This survey is not formatted for viewing on smartphones and other mobile or electronic devices. Please return to the survey, using the same link, from a desktop, laptop or tablet computer.

{PROGRAMMER: RANDOMIZE CHOICES 1-10; IF ITEM 1 OR ITEM 11 SELECTED, TERMINATE.} **(QUESTION 49)**
Have you taken a survey relating to any of the following products or services in the past 6 months?
Please select all that apply.
1: Music Services
2: eCommerce
3: Agriculture
4: Insurance
5: Pharmaceutical
6: Advertising
7: Food & Beverage
8: Sports
9: Video Games

10: Chemicals
11. Radio
12. None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: RANDOMIZE CHOICES 1-6; IF ANY ITEM 1-5 SELECTED, TERMINATE. RESPONSE MUST BE EITHER PUNCH 7 "NONE OF THE ABOVE" OR PUNCH 6 SELECTED EXCLUSIVELY TO CONTINUE}
(QUESTION 50)
Do you or does anyone in your household work in any of the following areas?
Please select all that apply.

1: For a Satellite Radio company?
2: For a Streaming Music company, such as Pandora or Spotify?
3: For Apple, Google or Amazon?
4: For a company that creates music such as a Recording Studio, Record Company, or a Music Publisher?
5: For a Market Research Company or Public Relations Agency?
6: For an Internet Service Provider?
7: None of the above ***{SINGLE RESPONSE}***

{PROGRAMMER: ROTATE CHOICES 1, 2, AND 3, ANCHOR CHOICES 4 AND 5}
{PROGRAMMER: IF CHOICE 2 IS NOT SELECTED, TERMINATE}
{PROGRAMMER: IF CHOICE 1 IS NOT SELECTED, SKIP TO Q54}
(QUESTION 51)
Which, if any, of the following services do you currently have? This includes all subscriptions – free, trial or introductory, or paid.
Please select all that apply.

1: Satellite Radio (Sirius XM)
2: Music Streaming Service (e.g., Apple Music, Spotify or Pandora)
3: Broadband Internet (e.g., cable, fiber optic or DSL)
4: None of the above ***{SINGLE RESPONSE}***
5: Don't know/unsure ***{SINGLE RESPONSE}***

(QUESTION 52)
Which of the following Sirius XM satellite radio subscriptions do you currently have?
Please select all that apply.

1: A paid subscription to Sirius XM satellite radio
2: A subscription to Sirius XM as part of a package from DISH network
[SKIP TO Q54]
3: A free Trial Period subscription to Sirius XM satellite radio (e.g., available with

the purchase of some new cars) **[SKIP TO Q54]**
4: Don't know/unsure ***{SINGLE RESPONSE}*** **[SKIP TO Q54]**

{PROGRAMMER: ASK Q52.1 IF OPTION 1 SELECTED IN Q52}
(QUESTION 52.1)
If you have more than one paid subscription to Sirius XM satellite radio, please answer the following questions based on the one you have had the **longest**.

{PROGRAMMER: INCLUDE IMAGE FROM
http://www.siriusxm.com/ourmostpopularpackages
TOGETHER WITH Q52.2}

(QUESTION 52.2)
Which of the following is your Sirius XM Satellite Radio subscription package?
Please select one answer.

1: Select
2: All Access
3: Mostly Music
4: Other (Please specify—you will not be constrained by the size of the box)

5: Don't know/unsure

{PROGRAMMER: ASK Q53 IF OPTION 1 SELECTED IN Q52.2}
(QUESTION 53)
Who made the decision to get this paid subscription to Sirius XM satellite radio?
Please select one answer.

1: I made the decision myself
2: I played a major role in the decision
3: I played a minor role in the decision
4: I was not involved in the decision at all
5: Don't know/unsure

{TERMINATE IF OPTION 1 OR 2 NOT SELECTED;
TERMINATE IF OPTION 2 ONLY SELECTED IN Q51 AND OPTIONS 6 OR 7 SELECTED IN Q54} {ROTATE SPOTIFY, APPLE AND PANDORA, BUT KEEP PAID AND FREE IN TANDEM, ANCHOR 6 AND 7}
{IF OPTIONS 2 AND 3 BOTH CHOSEN, TERMINATE FROM CELL 3 AND DO NOT ASK Q55}

(QUESTION 54)
Which, if any, of the following streaming music services do you currently have?
Please select all that apply.

1: Paid subscription to Apple Music – **Cell 2**
2: Paid subscription to Spotify Premium – **Cell 3**

3: Free version of Spotify
4: Paid subscription to Pandora One
5: Free version of Pandora
6: Other (Please specify—you will not be constrained by the size of the box)

_____
7: Don't know/unsure ***{SINGLE RESPONSE}***

{PROGRAMMER: ASK Q55 FOR EACH OPTION 1, 2, 4 IF SELECTED IN Q54}

(QUESTION 55)
Who made the decision to get a **(INSERT SELECTED OPTION FROM Q54)**?
Please select one answer.

1: I made the decision myself
2: I played a major role in the decision
3: I played a minor role in the decision **[TERMINATE FROM CELLS 2-3]**
4: I was not involved in the decision at all **[TERMINATE FROM CELLS 2-3]**
5: Don't know/unsure **[TERMINATE FROM CELLS 2-3]**

(QUESTION 140)
Before continuing, please carefully read these instructions.

- Please take the survey in one session without interruption.
- While taking the survey, please do not consult any other websites or other electronic or written materials.
- Please answer all questions on your own without consulting any other person.
- If you normally wear glasses or contact lenses when viewing a computer screen, please wear them for the survey.

Please select one answer.

1: I understand and agree to the above instructions
2: I do not understand or do not agree to the above instructions ***{TERMINATE}***

QUALIFICATIONS FOR EACH CELL:
CELL 2: **Apple Music** : Interactive music streaming service paid subscribers **[PUNCH 1 OR 2 IN Q55 FOR OPTION 1 IN Q54]**
CELL 3: **Spotify Premium** : Interactive music streaming service paid subscribers **[PUNCH 1 OR 2 IN Q55 FOR OPTION 2 IN Q54]**

(QUESTION 150—CELL ASSIGNMENT CRITERIA FOR INCLUSION)

IF ONLY ONE CELL QUALIFIED FOR, APPLY TO THAT CELL.

IF MORE THAN ONE CELL QUALIFIED FOR, APPLY RANDOMLY TO A CELL QUOTA.

> **IF THE RANDOMIZATION ASSIGNS A CELL THAT IS ALREADY FILLED/CLOSED, THEN ASSIGN RANDOMLY TO ANOTHER OPEN CELL THAT RESPONDENT IS ALSO QUALIFIED FOR.**
>
> **ONCE A CELL IS FILLED/CLOSED, IT SHOULD BE REMOVED FROM THE RANDOMIZATION ASSIGNMENT.**

IF DO NOT QUALIFY FOR ANY OF THE 2 CELLS, TERMINATE.

CELLS 2 AND 3: ON-DEMAND (INTERACTIVE) SUBSCRIBERS (SPOTIFY PREMIUM OR APPLE MUSIC) -- ASK Q300 THROUGH Q320

(QUESTION 301)

There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others**.

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio**.

Do you understand the descriptions of all three of these services described above?
Please select one answer.

1: Yes, I do understand the descriptions of all three services →**(ASK Q302)**
2: No, I do not understand the descriptions of all three services→ **(TERMINATE)**
3: Don't know/unsure → **(TERMINATE)**

(QUESTION 302)
The next few questions will be about your **[INSERT SERVICE]** streaming service subscription. You will be presented with several different monthly prices for a subscription to **[INSERT SERVICE]. This amount may be higher or lower than the amount you currently pay for your subscription to [INSERT SERVICE].**

SERVICE	PRICE	AMOUNT
Spotify Premium	**1**	**$6.99**
	2	**$7.99**
	3	**$8.99**
	4	**$9.99**
	5	**$10.99**
	6	**$11.99**
	7	**$12.99**
Apple Music	**1**	**$6.99**
	2	**$7.99**
	3	**$8.99**
	4	**$9.99**
	5	**$10.99**
	6	**$11.99**
	7	**$12.99**

{PROGRAMMER: RANDOMIZE ANSWER CHOICES 1 AND 2. ANCHOR OPTION 3. KEEP THIS ORDER FOR ALL "CONTINUE/CANCEL" QUESTIONS}

(QUESTION 303)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.1)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 1}**
3: Don't know/unsure →**(ASK Q303.1)**

(QUESTION 303.1)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.2)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 2}**
3: Don't know/unsure →**(ASK Q303.2)**

(QUESTION 303.2)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.3)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 3}**
3: Don't know/unsure →**(ASK Q303.3)**

(QUESTION 303.3)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.4)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 4}**
3: Don't know/unsure →**(ASK Q303.4)**

(QUESTION 303.4)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.5)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 5}**
3: Don't know/unsure →**(ASK Q303.5)**

(QUESTION 303.5)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(ASK Q303.6)**

2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 6}**
3: Don't know/unsure →**(ASK Q303.6)**

(QUESTION 303.6)
If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q303]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…?
Please select one answer.

1: Continue to subscribe to **[INSERT SERVICE]** →**(SKIP TO Q310A.3 if respondent is Apple Music subscriber, and Q310B.3 if respondent is Spotify subscriber)**
2: Cancel your subscription to **[INSERT SERVICE]** → **(SKIP TO Q310A if respondent is Apple Music subscriber, and Q310B if respondent is Spotify subscriber) {SET SWITCH PRICE=PRICE 7}**
3: Don't know/unsure →**(SKIP TO Q310A.3 if respondent is Apple Music subscriber, and Q310B.3 if respondent is Spotify subscriber)**

{PROGRAMMER: GROUP OPTIONS 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10, RANDOMIZE GROUPS, RANDOMIZE OPTIONS WITHIN GROUPS SUCH THAT OPTIONS 1, 3, and 5, and 9 ROTATE TOGETHER. OPTION 7 ALWAYS APPEARS BEFORE OPTION 8.}
{ANCHOR OPTIONS 11,12, AND 13. KEEP OPTIONS 11 and 12 EXCLUSIVE}
{INSERT link to definitions provided in Q300. It should say, "Click here if you want to review the music services definitions."}
(QUESTION 310A) (IF RESPONDENT IS APPLE MUSIC SUBSCRIBER)

You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using **[INSERT SERVICE]**?

Please select all that apply.

1: I would subscribe to Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to →**(SKIP TO Q310A.3)**
2: I would listen to Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to →**(SKIP TO Q310A.3)**
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to →**(GO TO Q310A.3)**

4: I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q310A.3)**
5: I would purchase new CDs and/or music downloads →**(SKIP TO Q310A.3)**
6: I would listen to my existing collection of CDs and/or music downloads →**(SKIP TO Q310A.3)**
7: I would listen to free over-the-air AM/FM radio **(SKIP TO Q310A.3)**
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) →**(GO TO Q310A.2)**
9: I would subscribe to Sirius XM satellite radio at $15.99 per month →**(SKIP TO Q310A.3)**
10: I would listen to Sirius XM satellite radio that I already pay to subscribe to →**(SKIP TO Q310A.3)**
11: Other (Please specify—you will not be constrained by the size of the box)

_____
(SKIP TO Q310A.3)
12: None of the above →**(SKIP TO Q310A.3)**
13: Don't know/unsure →**(SKIP TO Q310A.3)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-6. ANCHOR 7 AND 8. KEEP OPTION 9 EXCLUSIVE}
(QUESTION 310A.2)
You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of **[INSERT SERVICE]**. Which free music option(s) would you use instead of **[INSERT SERVICE]**?

Please select all that apply.

1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
3. Free music video sites with ads (e.g., YouTube)
4. Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
5. Music obtained through Peer-to-Peer file sharing or free download sites
6. Borrow CDs, vinyl or tapes from friends or a library
7. Other (Please specify—you will not be constrained by the size of the box)

_____
8. Don't know/unsure ***{SINGLE RESPONSE}***

{PROGRAMMER: ANCHOR 3-6. RANDOMIZE OPTIONS 1 AND 2.

(QUESTION 310A.3)
How do you primarily listen to **[INSERT SERVICE]**?
Please select one answer.

1. Through your computer
2. Through your smartphone or tablet
3. Through another electronic device (e.g., Smart TV, Gaming Console)
4. Other (Please specify—you will not be constrained by the size of the box)

_____

5. None of the above **{SINGLE REPONSE}**
6. Don't know/unsure **{SINGLE REPONSE}**

{PROGRAMMER: RANDOMIZE OPTIONS 1-3. ANCHOR 4-5}
(QUESTION 310A.4)
Which of the following best describes the type of paid **[INSERT SERVICE]** subscription you have?

Please select one answer.

1. I have an individual subscription
2. I have a subscription through a family plan
3. I have a student subscription
4. Other (Please specify—you will not be constrained by the size of the box)

_____

5. Don't know/unsure

{PROGRAMMER: RANDOMIZE OPTIONS 1-2}
(QUESTION 310A.5)
Do you or do you not know how much you pay every month for your **[INSERT SERVICE]** subscription?
Please select one answer.

1. Yes, I know how much I pay every month
2. No, I do not know or I am unsure how much I pay every month **[SKIP TO Q320]**

(QUESTION 310A.6)
How much do you pay every month?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

1. Less than or equal to $6.99 every month
2. Greater than $6.99 but less than or equal to $7.99 every month
3. Greater than $7.99 but less than or equal to $8.99 every month

4. Greater than $8.99 but less than or equal to $9.99 every month
5. Greater than $9.99 but less than or equal to $10.99 every month
6. Greater than $10.49 but less than or equal to $11.99 every month
7. Greater than $11.99 but less than or equal to $12.99 every month
8. Greater than $12.99 every month

{PROGRAMMER: GROUP OPTIONS 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10, RANDOMIZE GROUPS, RANDOMIZE OPTIONS WITHIN GROUPS SUCH THAT OPTIONS 1, 3, and 5, and 9 ROTATE TOGETHER, OPTION 7 ALWAYS APPEARS BEFORE OPTION 8.}
{ANCHOR OPTION 11,12, AND 13. KEEP OPTIONS 11 and 12 EXCLUSIVE}
{INSERT link to definitions provided in Q300. It should say, "Click here if you want to review the music services definitions."}
(QUESTION 310B) (IF RESPONDENT IS SPOTIFY SUBSCRIBER)

You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using **[INSERT SERVICE]**?

Please select all that apply.

1: I would subscribe to Apple Music, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to →**(SKIP TO Q310B.3)**
2: I would listen to Apple Music, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to →**(SKIP TO Q310B.3)**
3: I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to →**(GO TO Q310B.3)**
4: I would listen to Pandora, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to→**(SKIP TO Q310B.3)**
5: I would purchase new CDs and/or music downloads →**(SKIP TO Q310B.3)**
6: I would listen to my existing collection of CDs and/or music downloads →**(SKIP TO Q310B.3)**
7: I would listen to free over-the-air AM/FM radio **(SKIP TO Q310B.3)**
8: I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels) →**(GO TO Q310B.2)**
9: I would subscribe to Sirius XM satellite radio at $15.99 per month →**(SKIP TO Q310B.3)**
10: I would listen to Sirius XM satellite radio that I already pay to subscribe to →**(SKIP TO Q310B.3)**
11: Other (Please specify—you will not be constrained by the size of the box)

_____
(SKIP TO Q310B.3)
12: None of the above →**(SKIP TO Q310B.3)**
13: Don't know/unsure →**(SKIP TO Q310B.3)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-6. ANCHOR 7 AND 8. KEEP OPTION 10 EXCLUSIVE}
(QUESTION 310B.2)

You mentioned that you would listen to free music other than over-the-air AM/FM radio in place of **[INSERT SERVICE]**. Which free music option(s) would you use instead of **[INSERT SERVICE]**?

Please select all that apply.

1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
3. Free music video sites with ads (e.g., YouTube)
4. Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
5. Music obtained through Peer-to-Peer file sharing or free download sites
6. Borrow CDs, vinyl or tapes from friends or a library
7. Other (Please specify—you will not be constrained by the size of the box)

_____
8. Don't know/unsure ***{SINGLE RESPONSE}***

{PROGRAMMER: ANCHOR 3-6. RANDOMIZE OPTIONS 1 AND 2.
(QUESTION 310B.3)
How do you primarily listen to **[INSERT SERVICE]**?
Please select one answer.

1. Through your computer
2. Through your smartphone or tablet
3. Through another electronic device (e.g., Smart TV, Gaming Console)
4. Other (Please specify—you will not be constrained by the size of the box)

_____
5. None of the above **{SINGLE REPONSE}**
6. Don't know/unsure **{SINGLE REPONSE}**

{PROGRAMMER: RANDOMIZE OPTIONS 1-3. ANCHOR 4-5}
(QUESTION 310B.4)
Which of the following best describes the type of paid **[INSERT SERVICE]** subscription

you have?

Please select one answer.

1. I have an individual subscription
2. I have a subscription through a family plan
3. I have a student subscription
4. Other (Please specify—you will not be constrained by the size of the box)

   _____

5. Don't know/unsure

{PROGRAMMER: RANDOMIZE OPTIONS 1-2}
(QUESTION 310B.5)
Do you or do you not know how much you pay every month for your **[INSERT SERVICE]** subscription?
Please select one answer.

1. Yes, I know how much I pay every month
2. No, I do not know or I am unsure how much I pay every month **[SKIP TO Q320]**

(QUESTION 310B.6)
How much do you pay every month?

Please select one answer. [ROTATE RESPONSE OPTIONS 1-8]

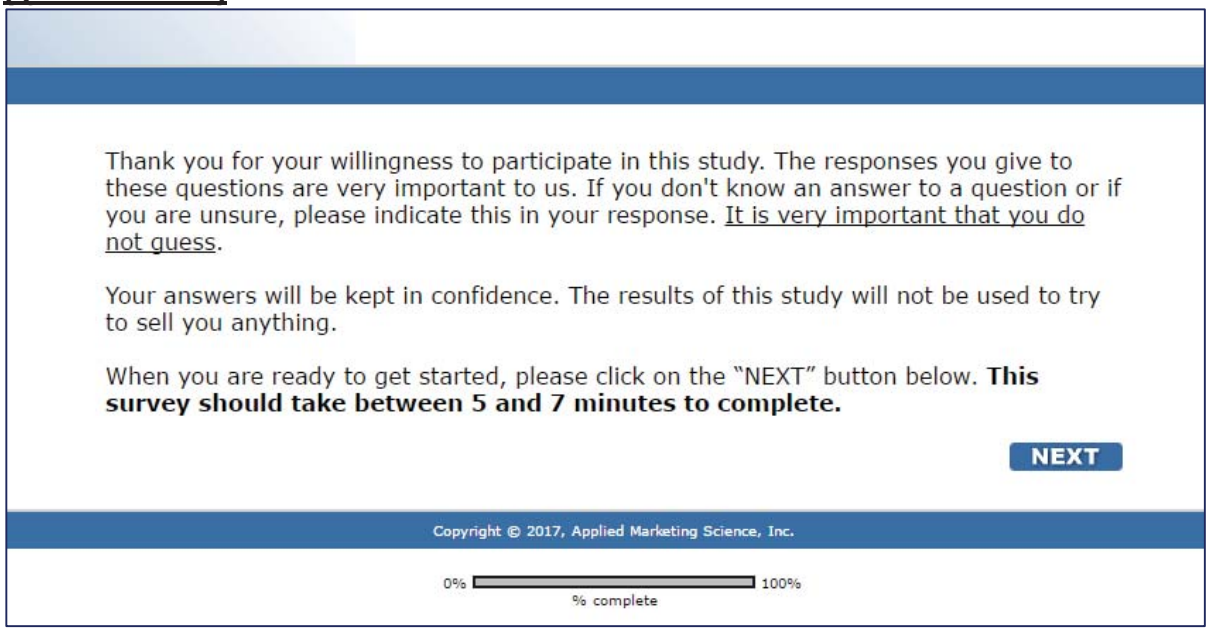
1. Less than or equal to $6.99 every month
2. Greater than $6.99 but less than or equal to $7.99 every month
3. Greater than $7.99 but less than or equal to $8.99 every month
4. Greater than $8.99 but less than or equal to $9.99 every month
5. Greater than $9.99 but less than or equal to $10.99 every month
6. Greater than $10.49 but less than or equal to $11.99 every month
7. Greater than $11.99 but less than or equal to $12.99 every month
8. Greater than $12.99 every month

(QUESTION 320)
Those are all the questions I have. Thank you for your time.

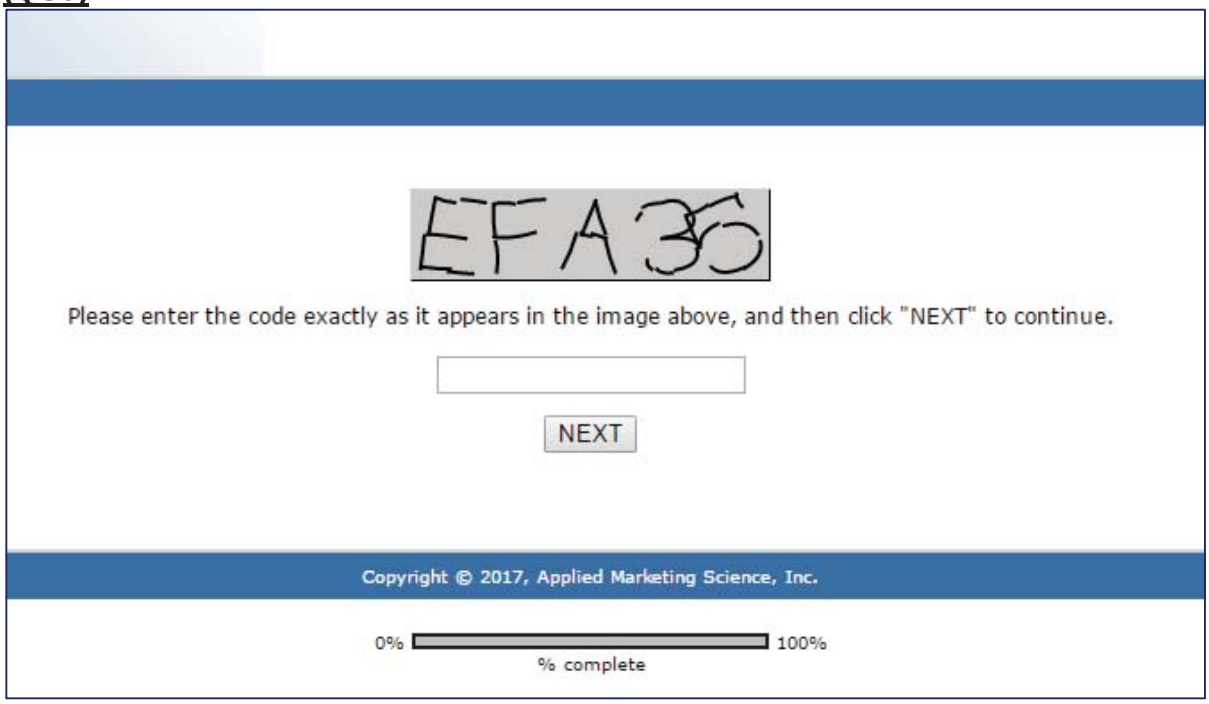
APPENDIX K

MODIFIED DHAR SURVEY (SIRIUS XM)

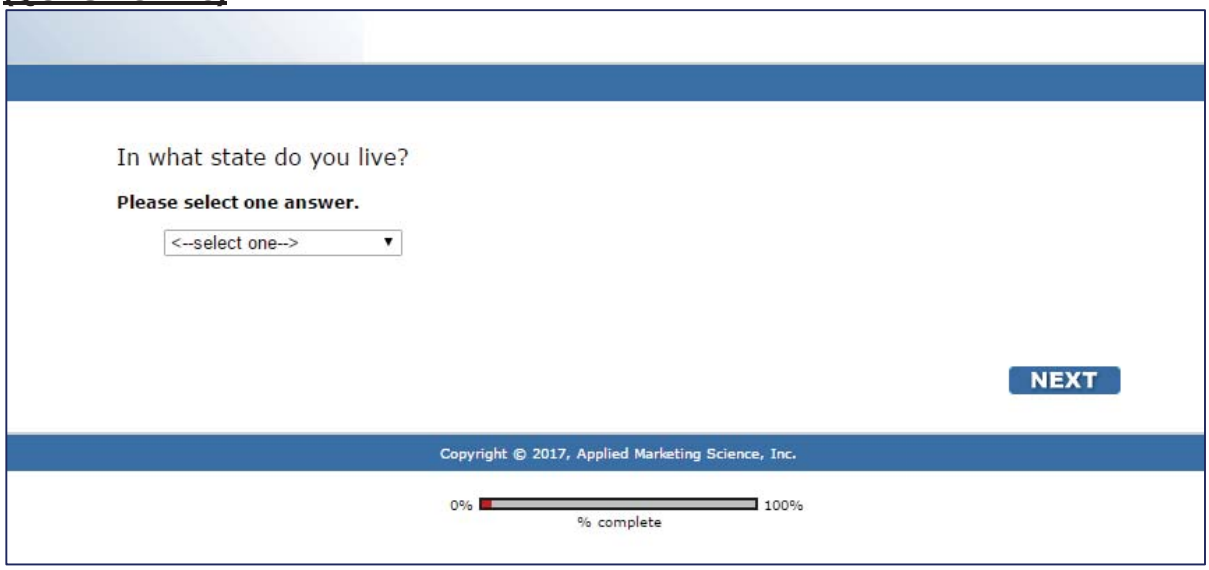
(QUESTION 10)



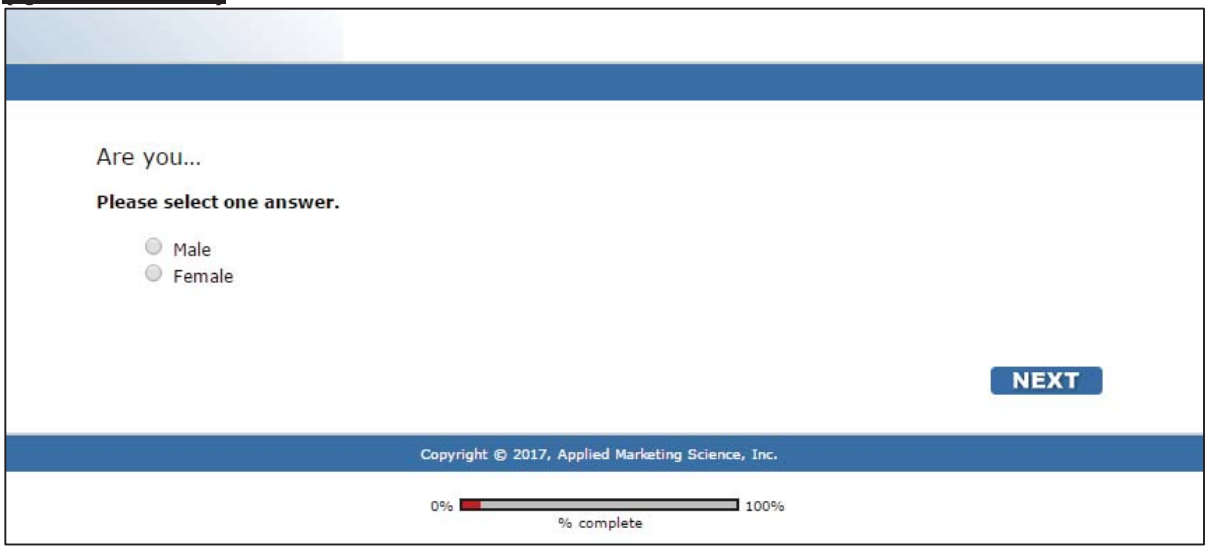
(QS0)



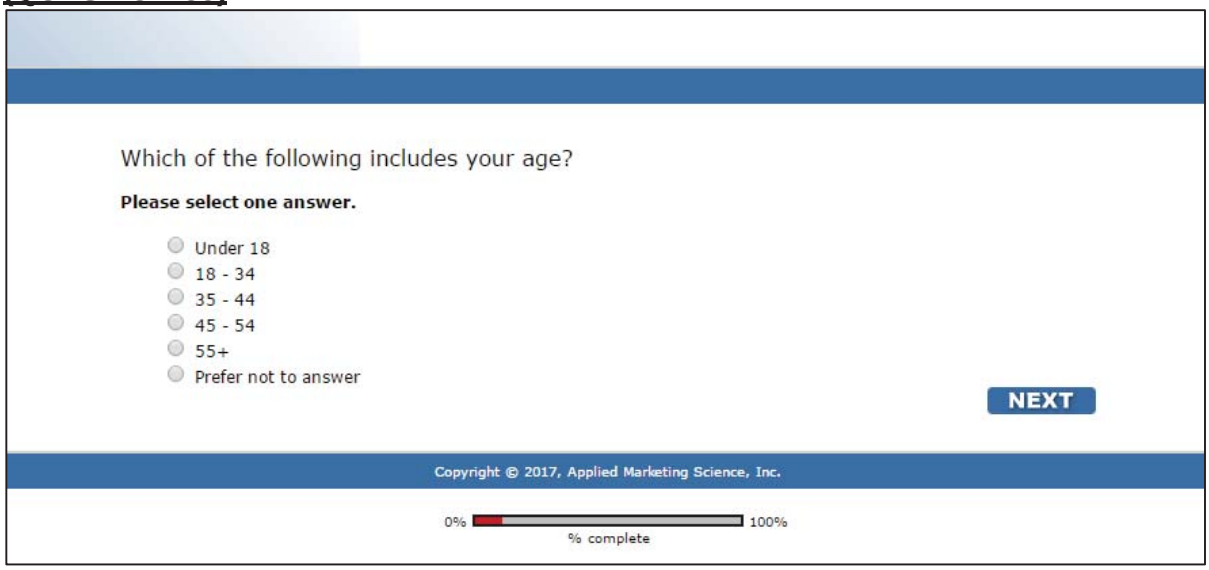
(QUESTION 25)



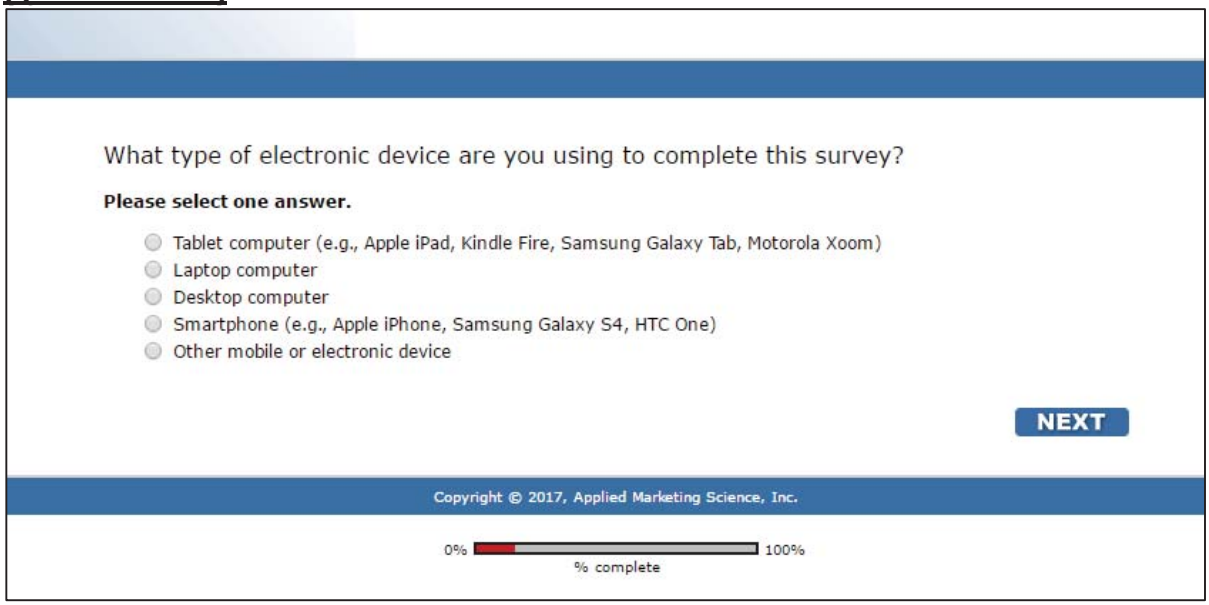
(QUESTION 30)



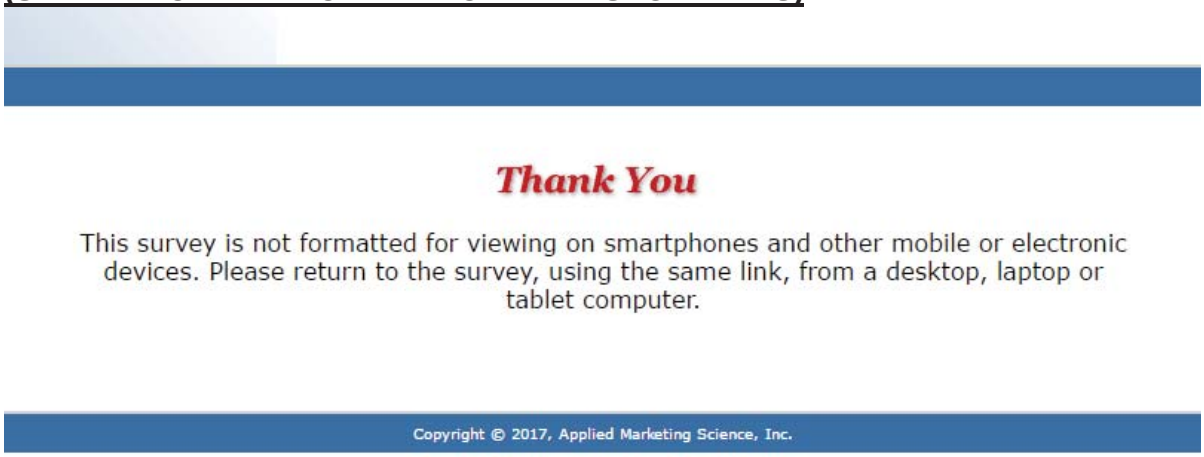
(QUESTION 35)



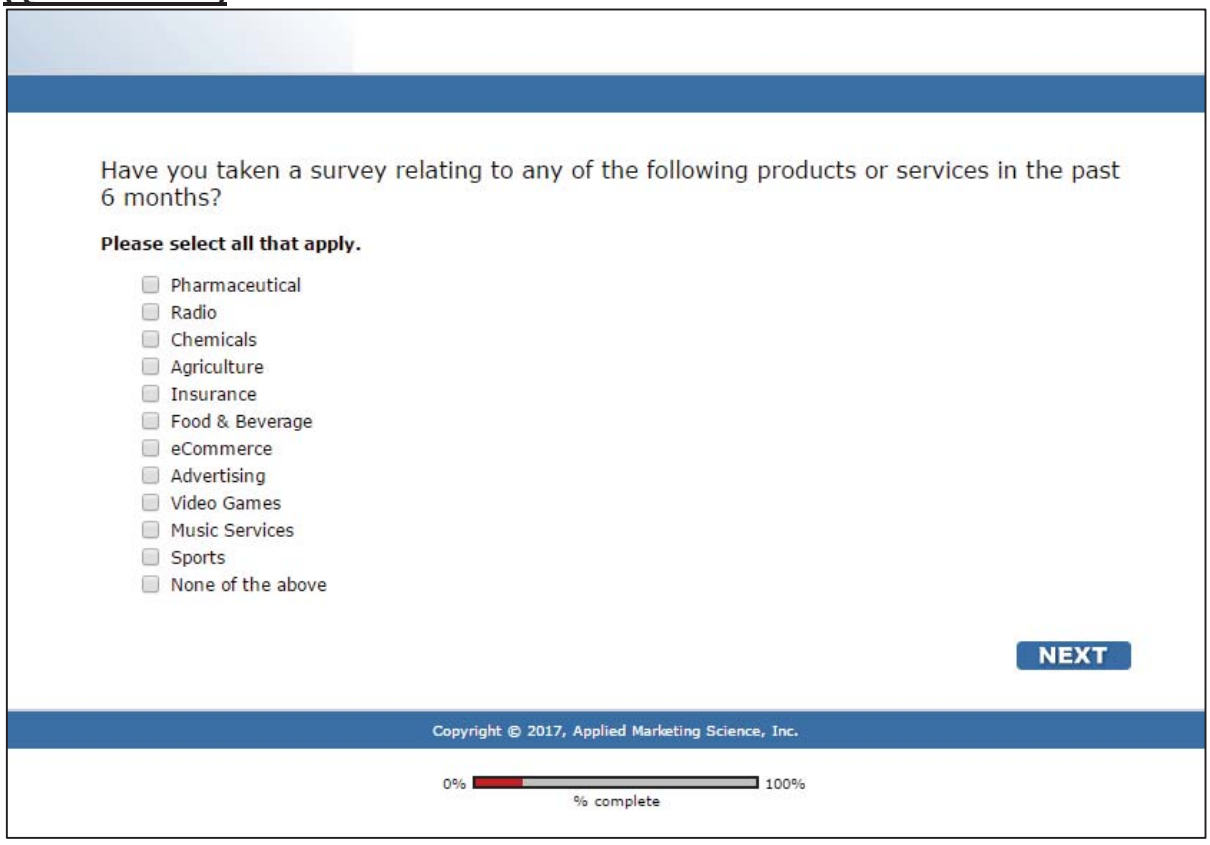
(QUESTION 40)



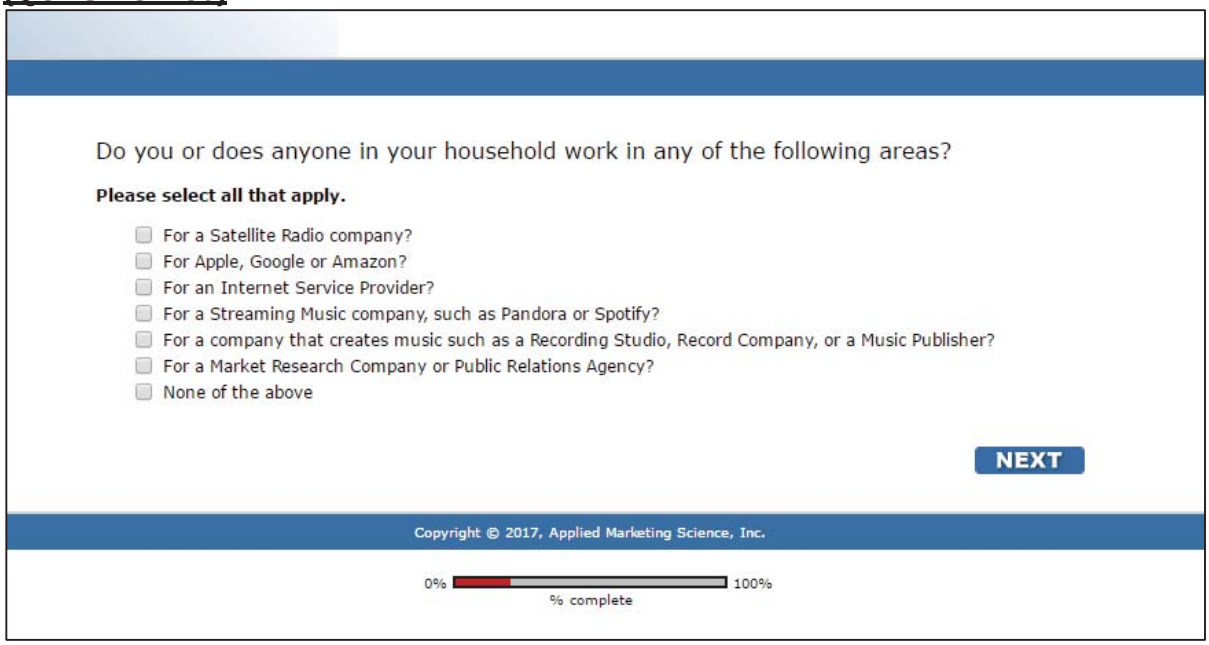
(SMARTPHONE AND OTHER MOBILE RESPONDENTS)



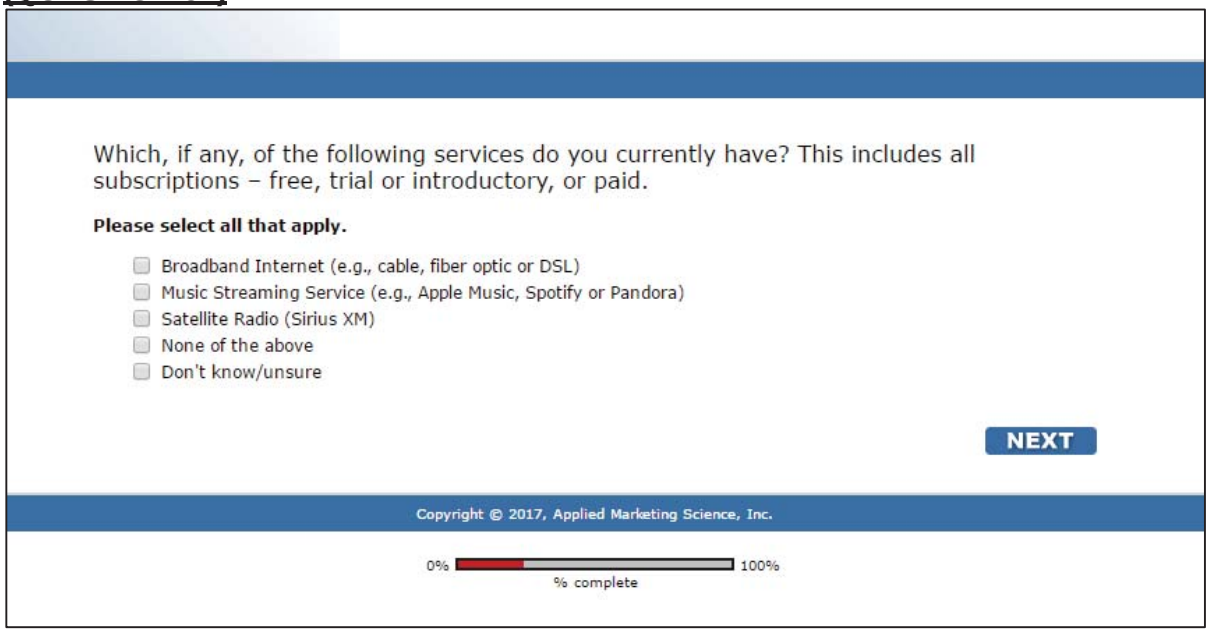
(QUESTION 49)



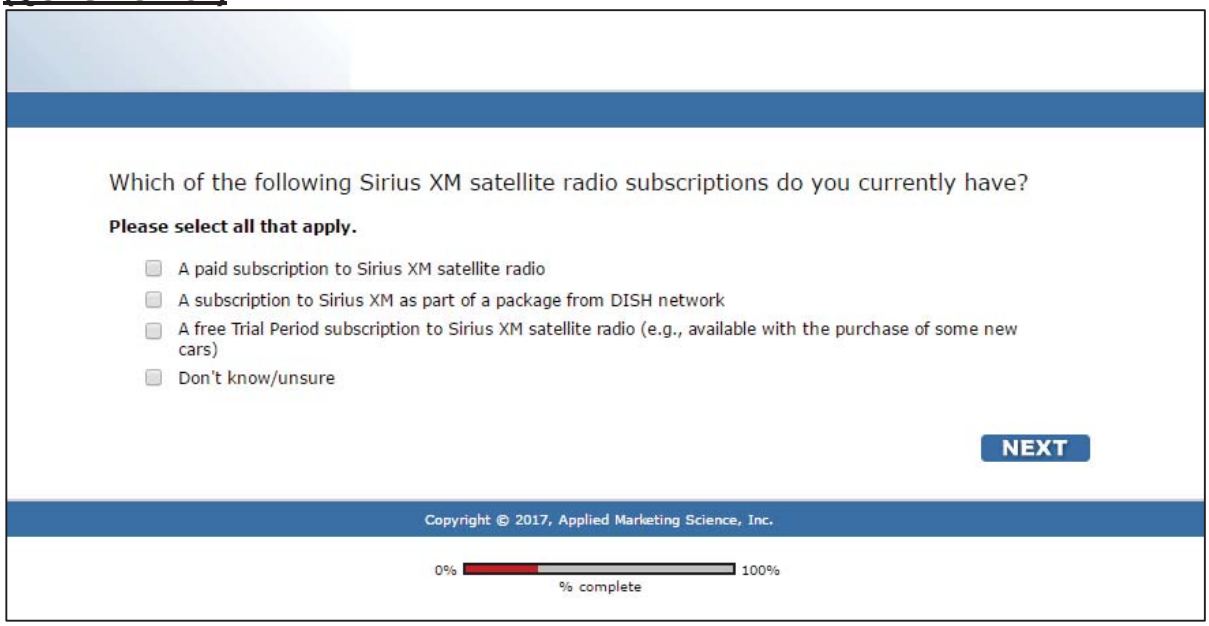
(QUESTION 50)



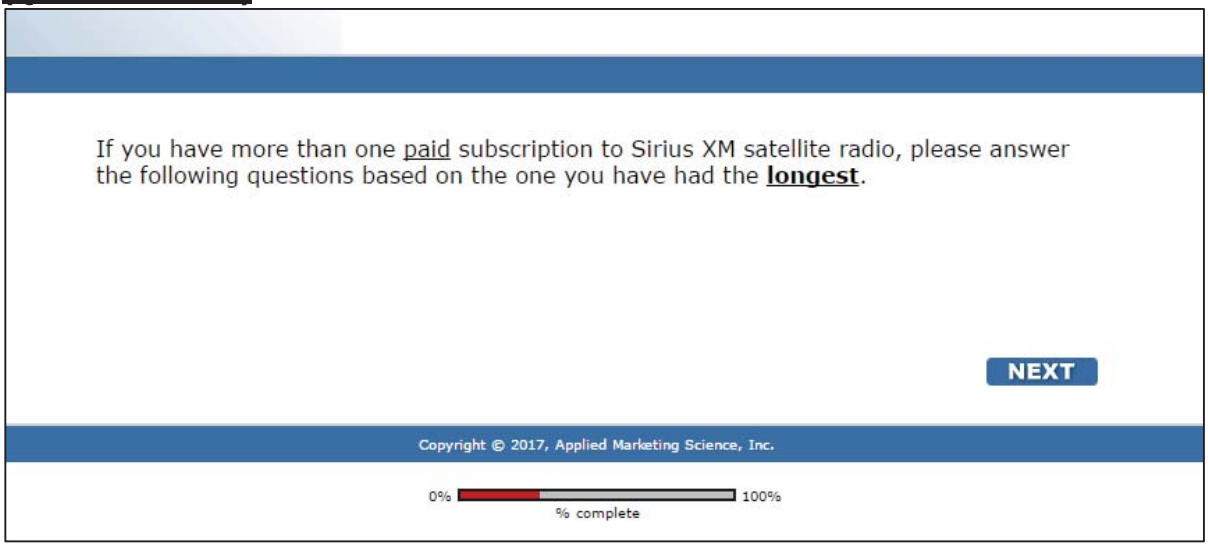
(QUESTION 51)



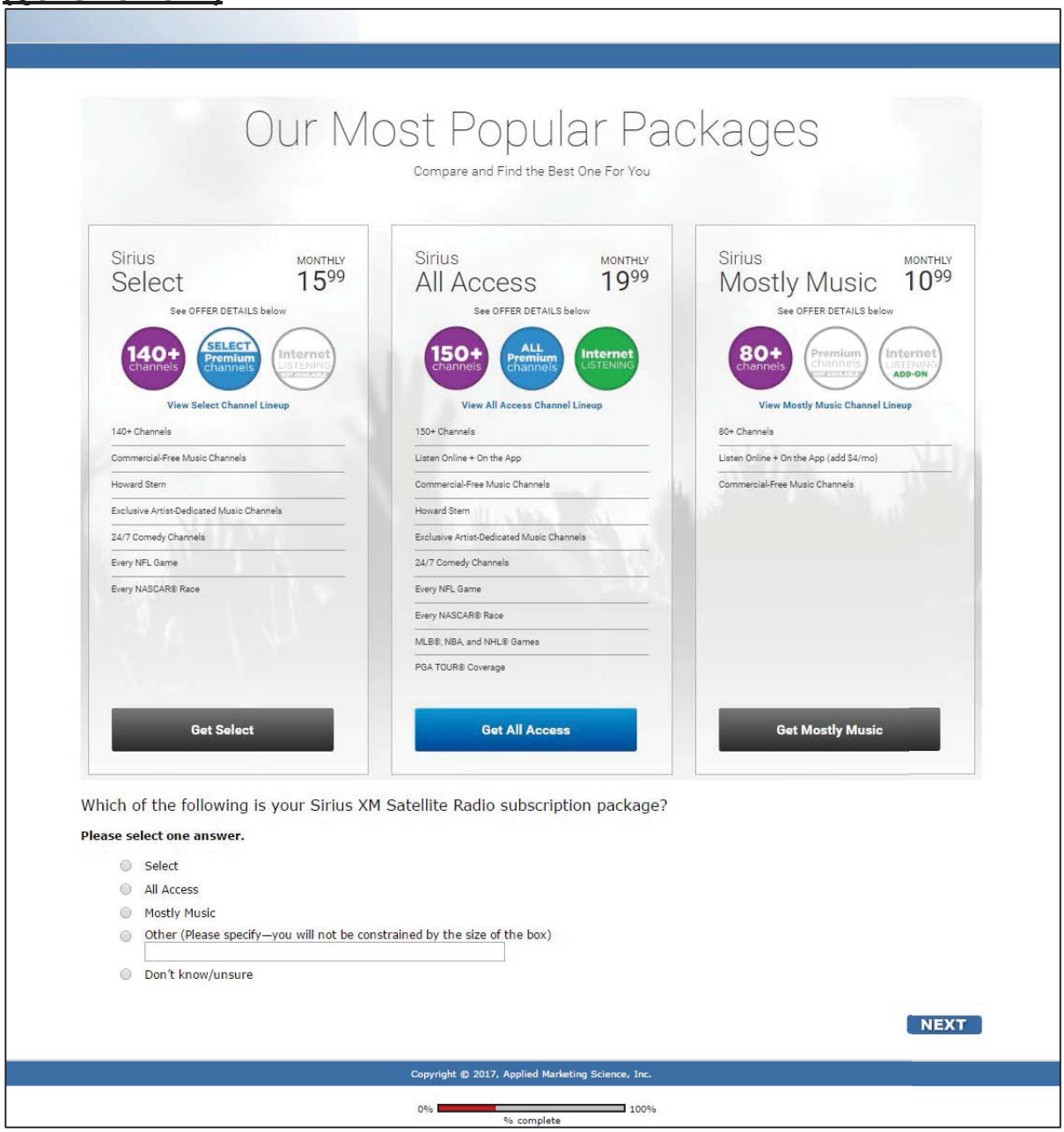
(QUESTION 52)



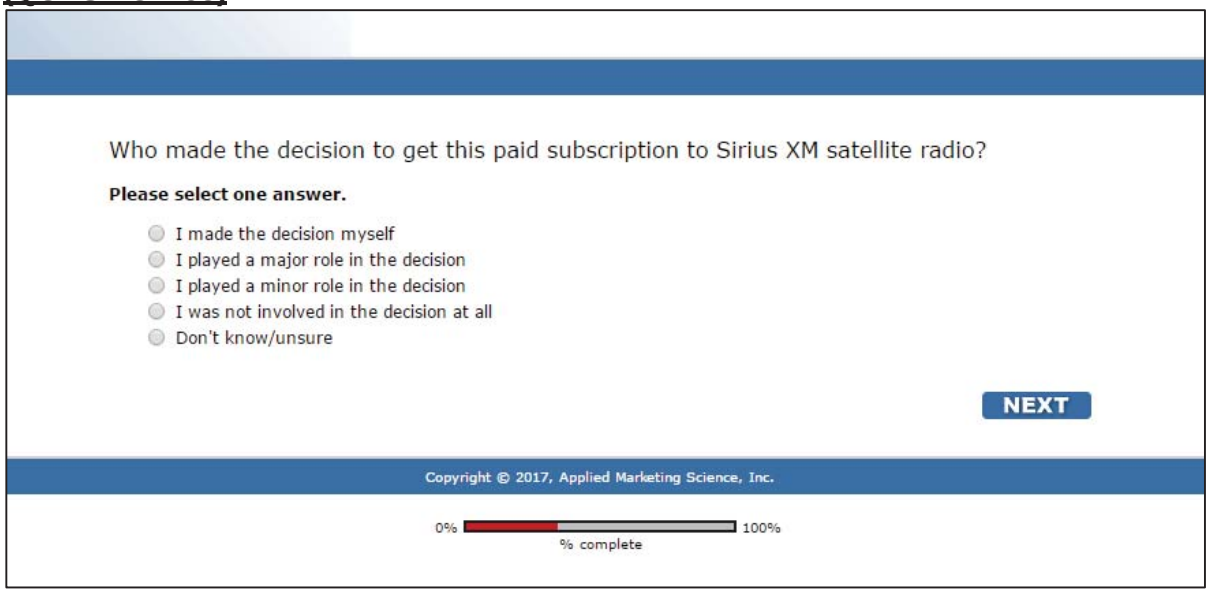
(QUESTION 52.1)



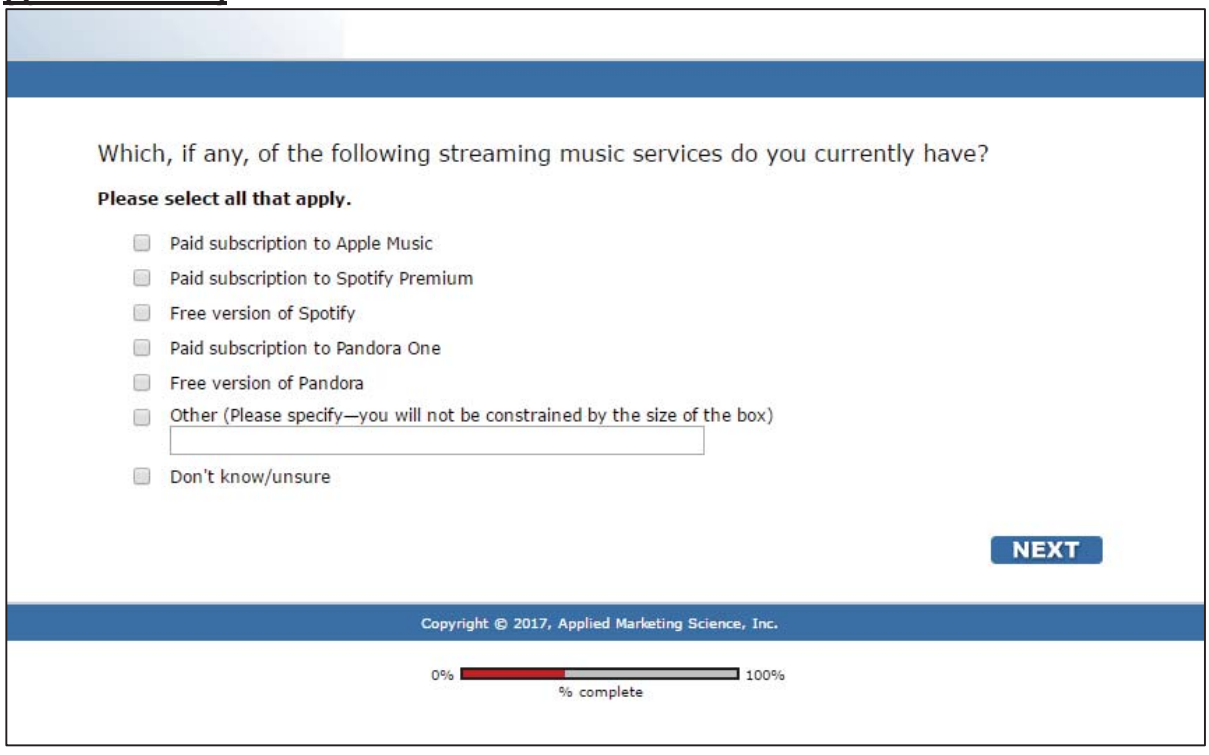
(QUESTION 52.2)



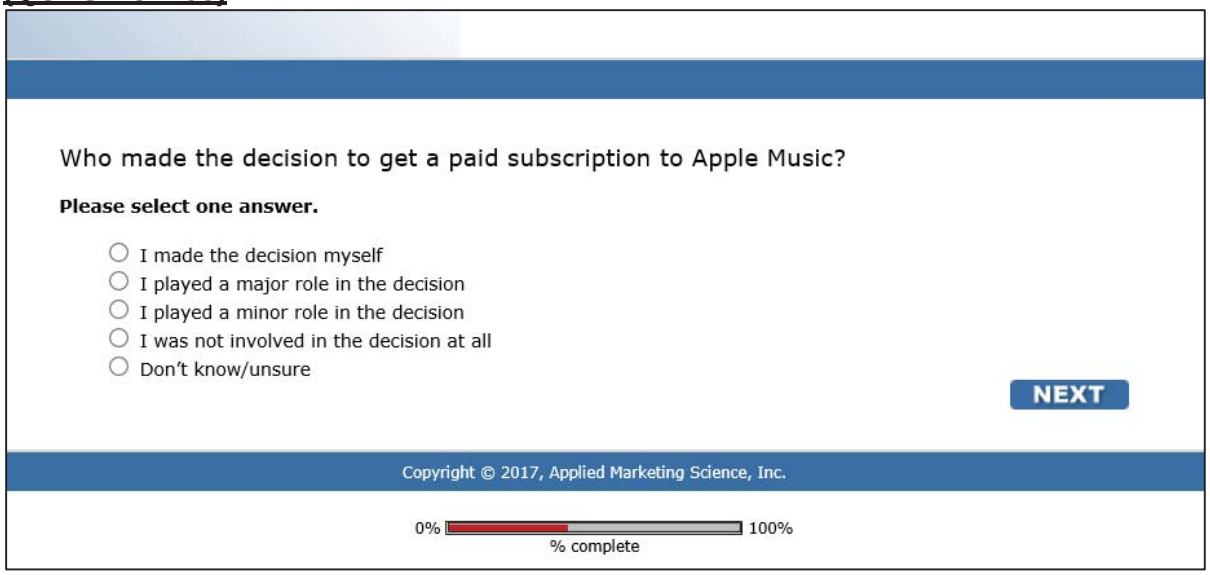
(QUESTION 53)



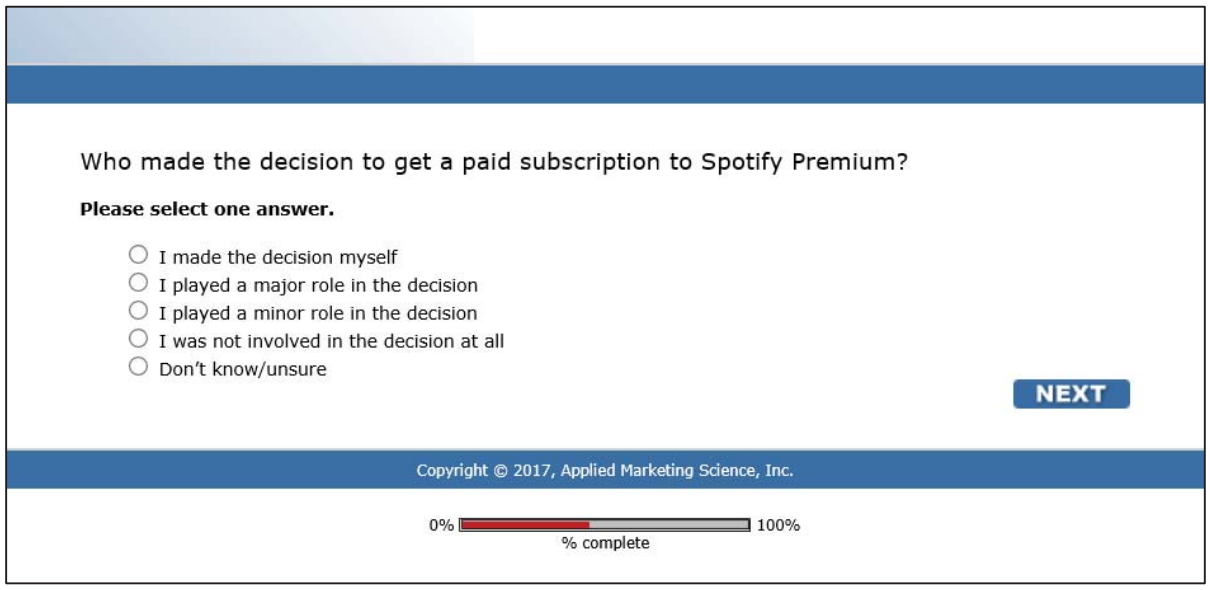
(QUESTION 54)



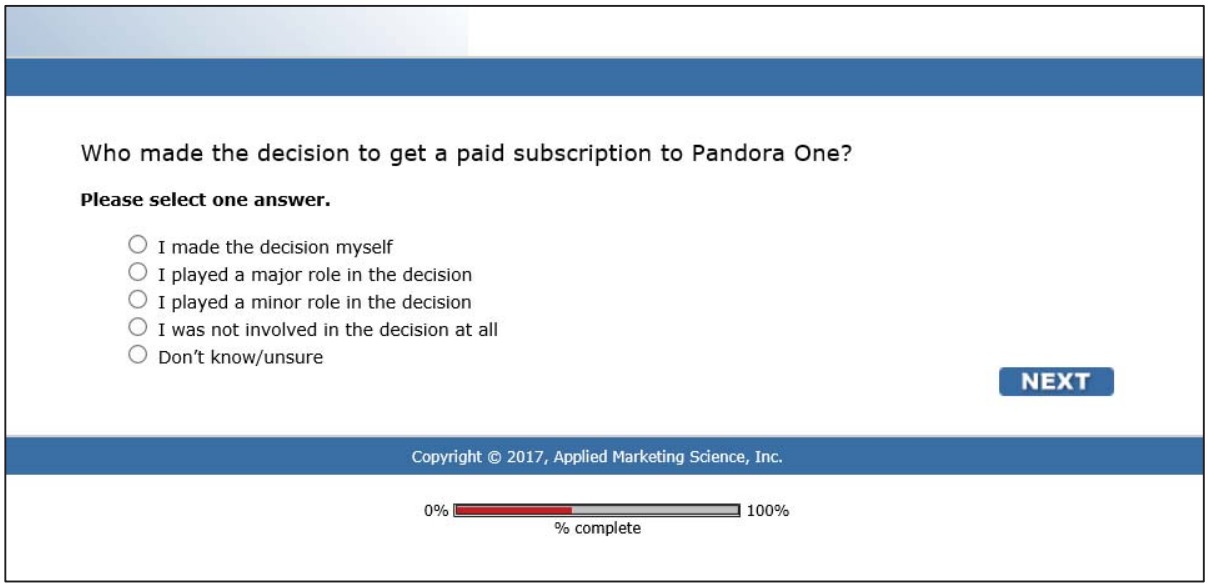
(QUESTION 55)



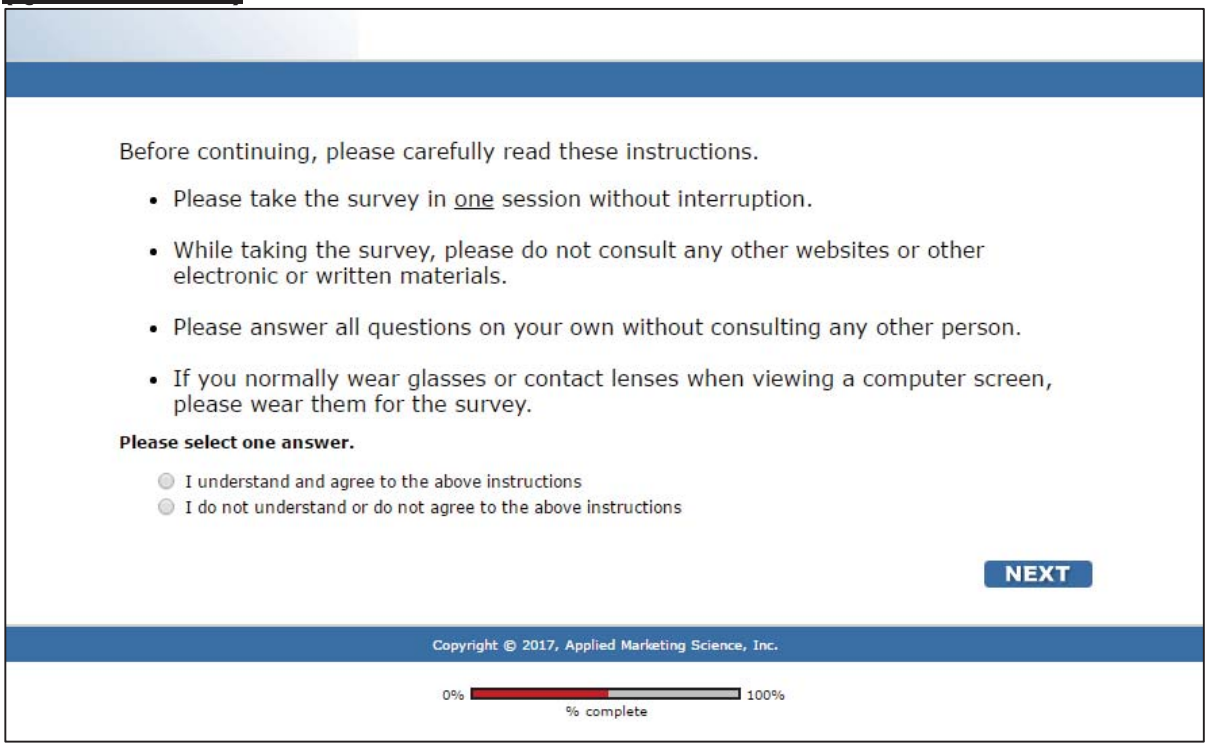
(QUESTION 55)



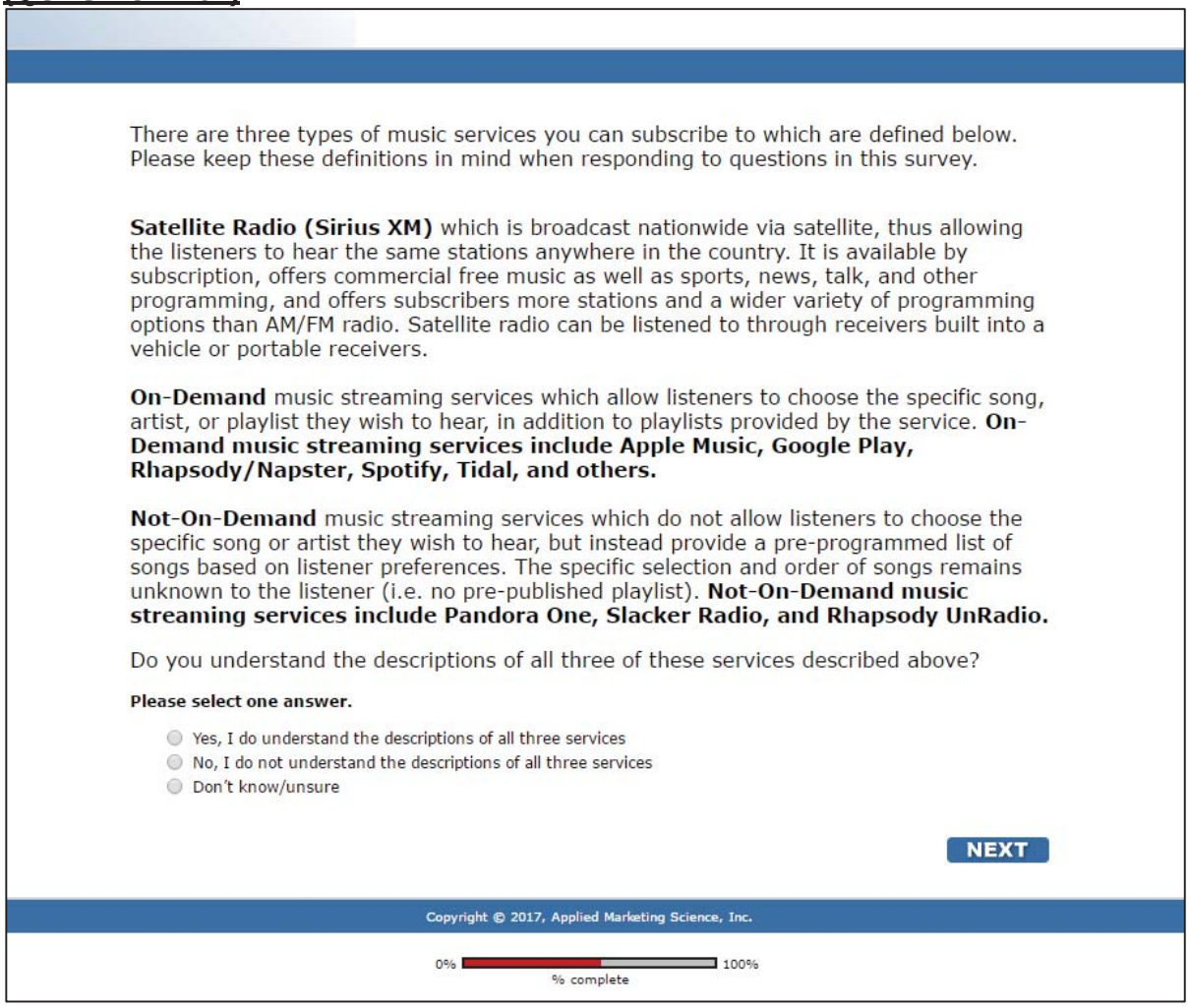
(QUESTION 55)



(QUESTION 140)



CELL 1: SXM PAID SUBSCRIBERS (QUESTION 201)



There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others.**

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.**

Do you understand the descriptions of all three of these services described above?

Please select one answer.

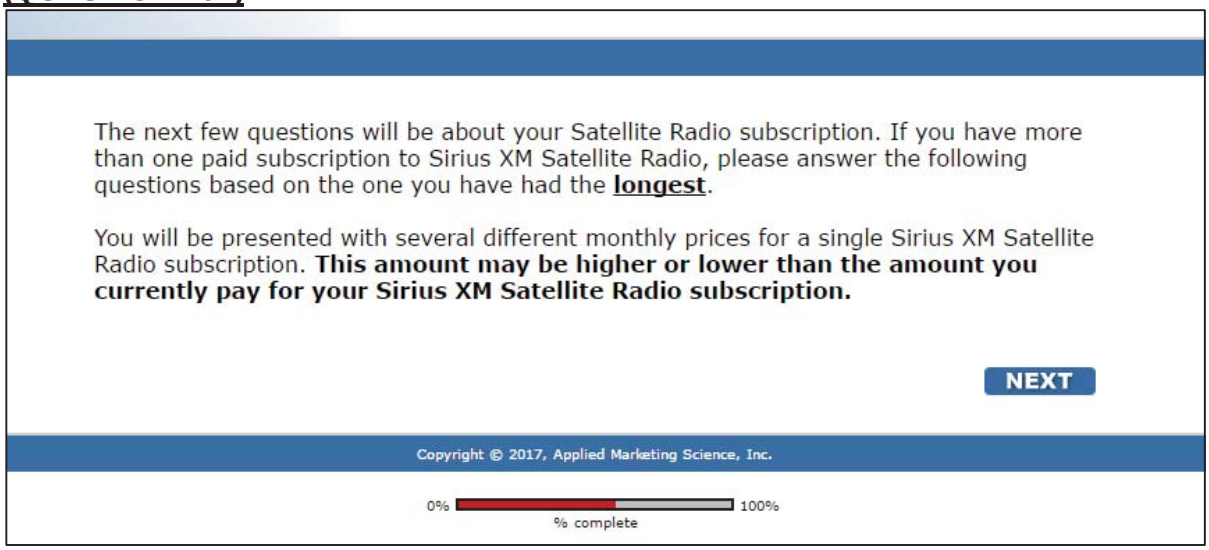
- Yes, I do understand the descriptions of all three services
- No, I do not understand the descriptions of all three services
- Don't know/unsure

NEXT

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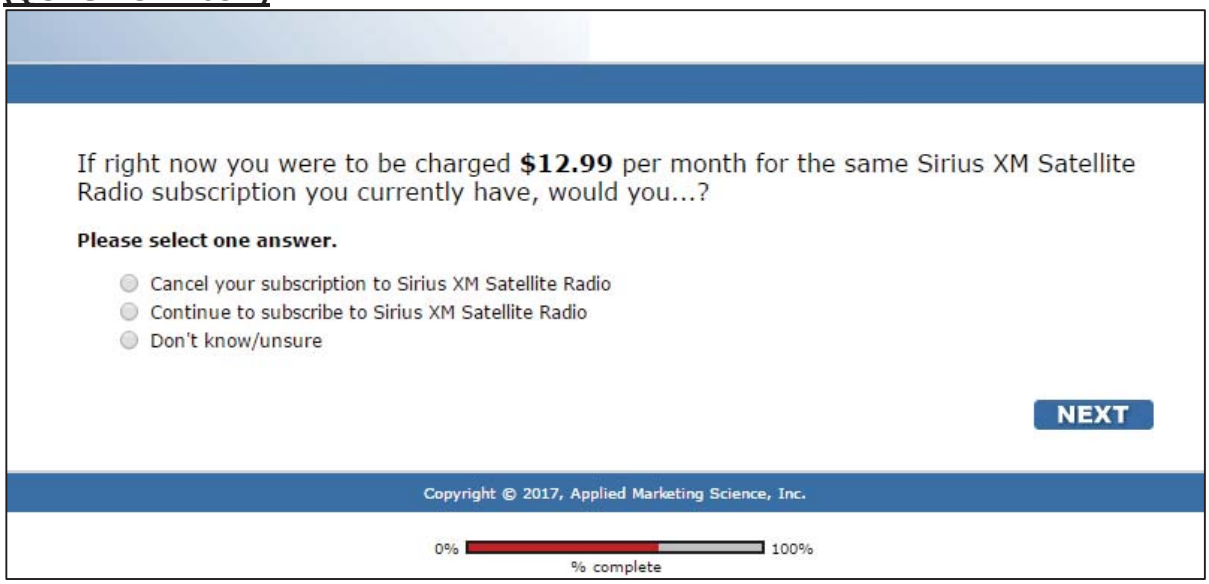
(QUESTION 202)



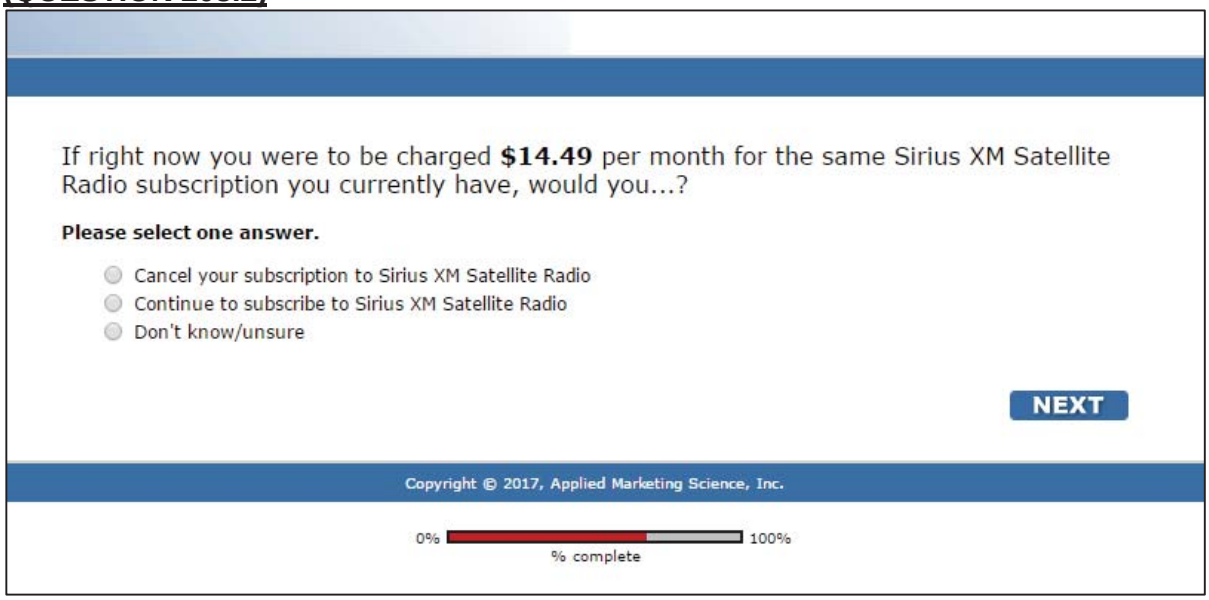
(QUESTION 203)



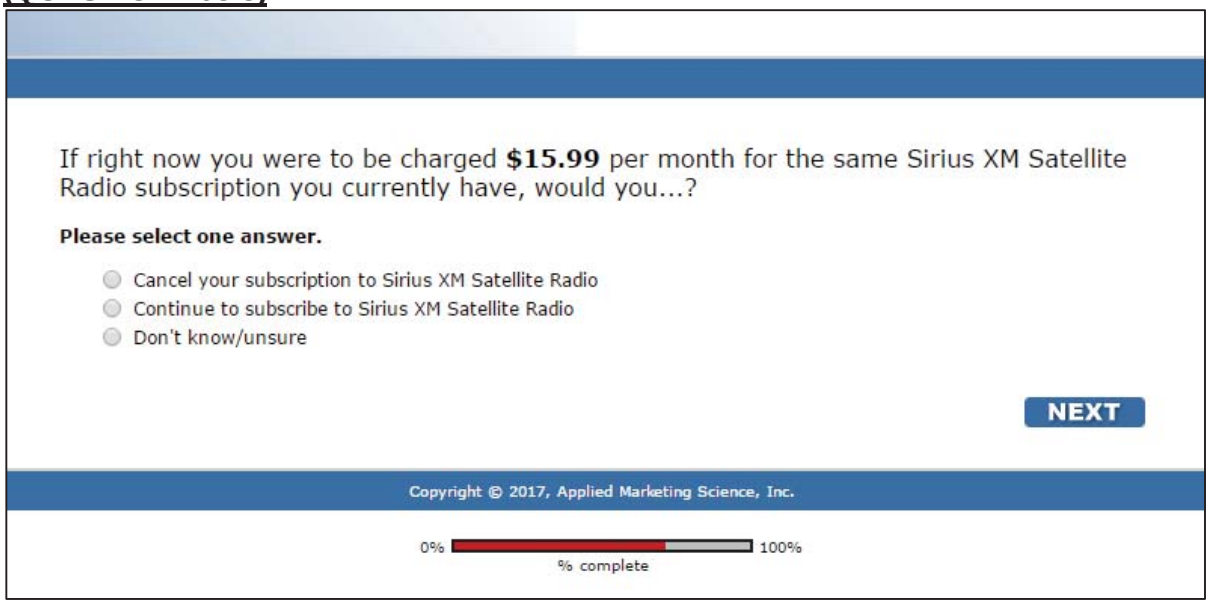
(QUESTION 203.1)



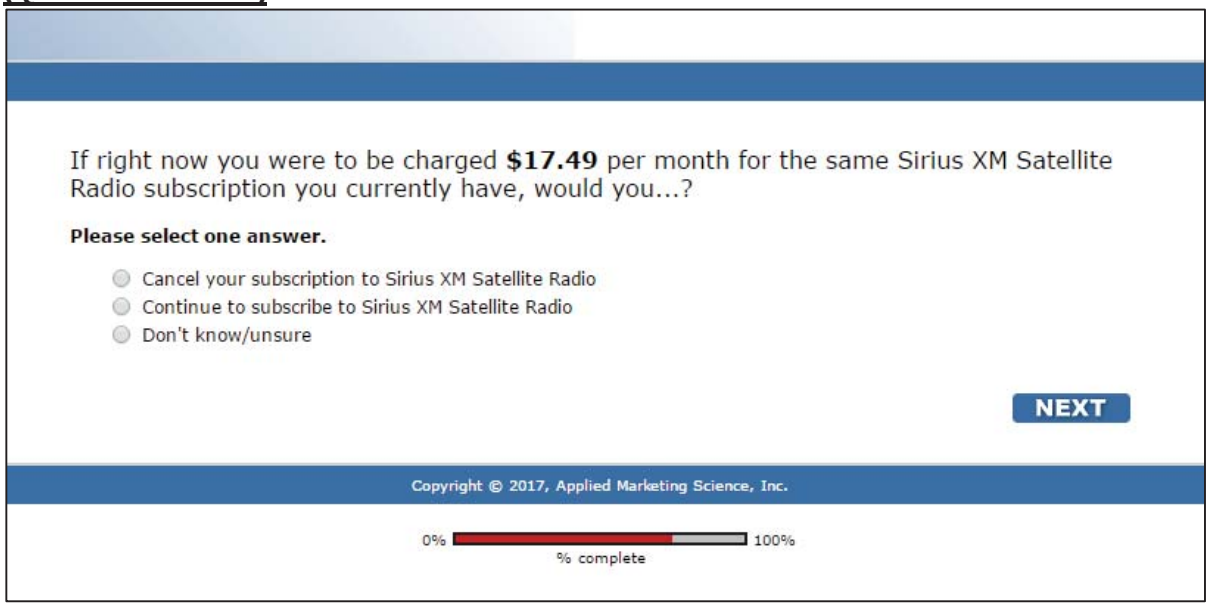
(QUESTION 203.2)



(QUESTION 203.3)



(QUESTION 203.4)



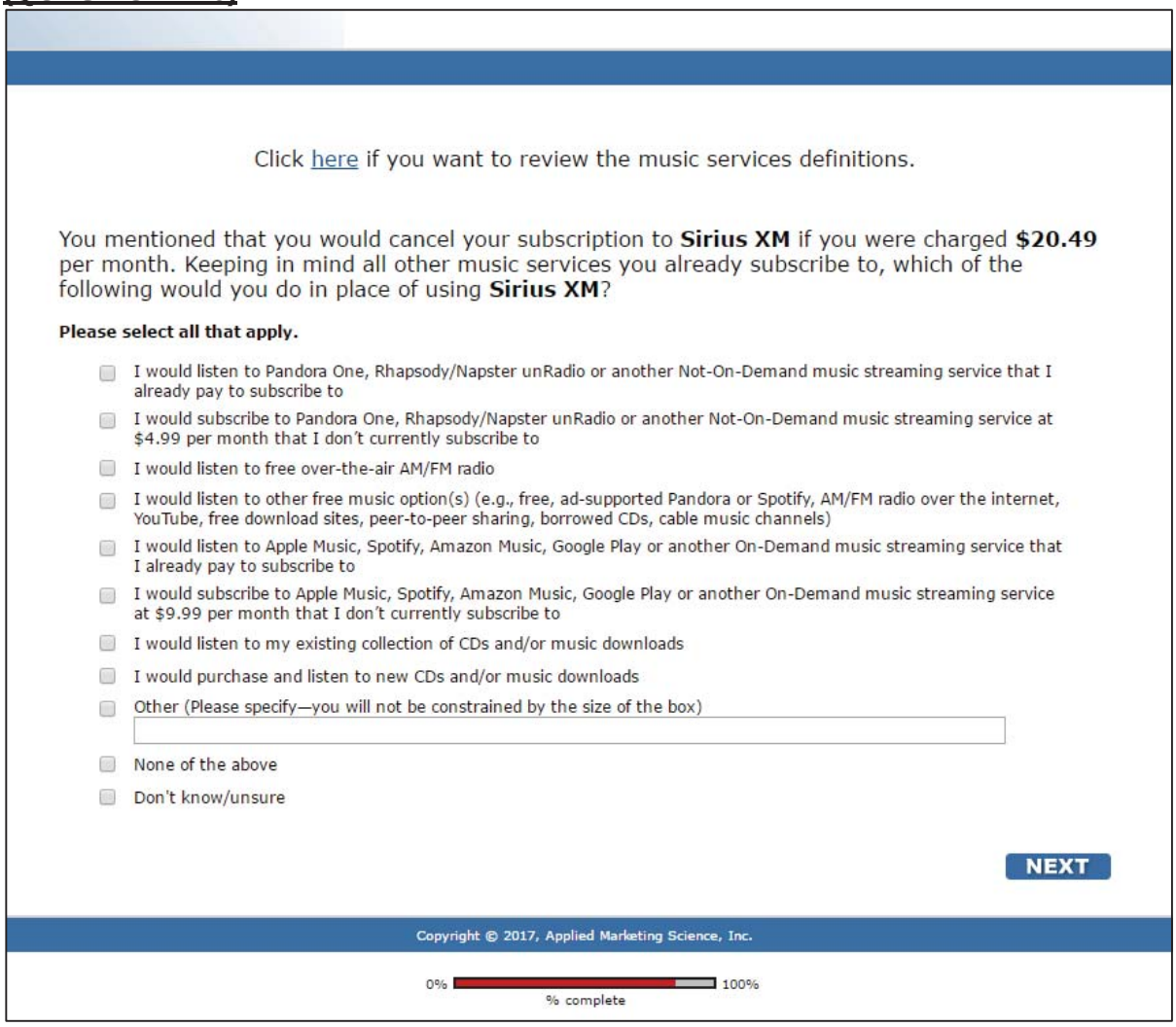
(QUESTION 203.5)



(QUESTION 203.6)



(QUESTION 210)



Click here if you want to review the music services definitions.

You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **$20.49** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using **Sirius XM**?

Please select all that apply.

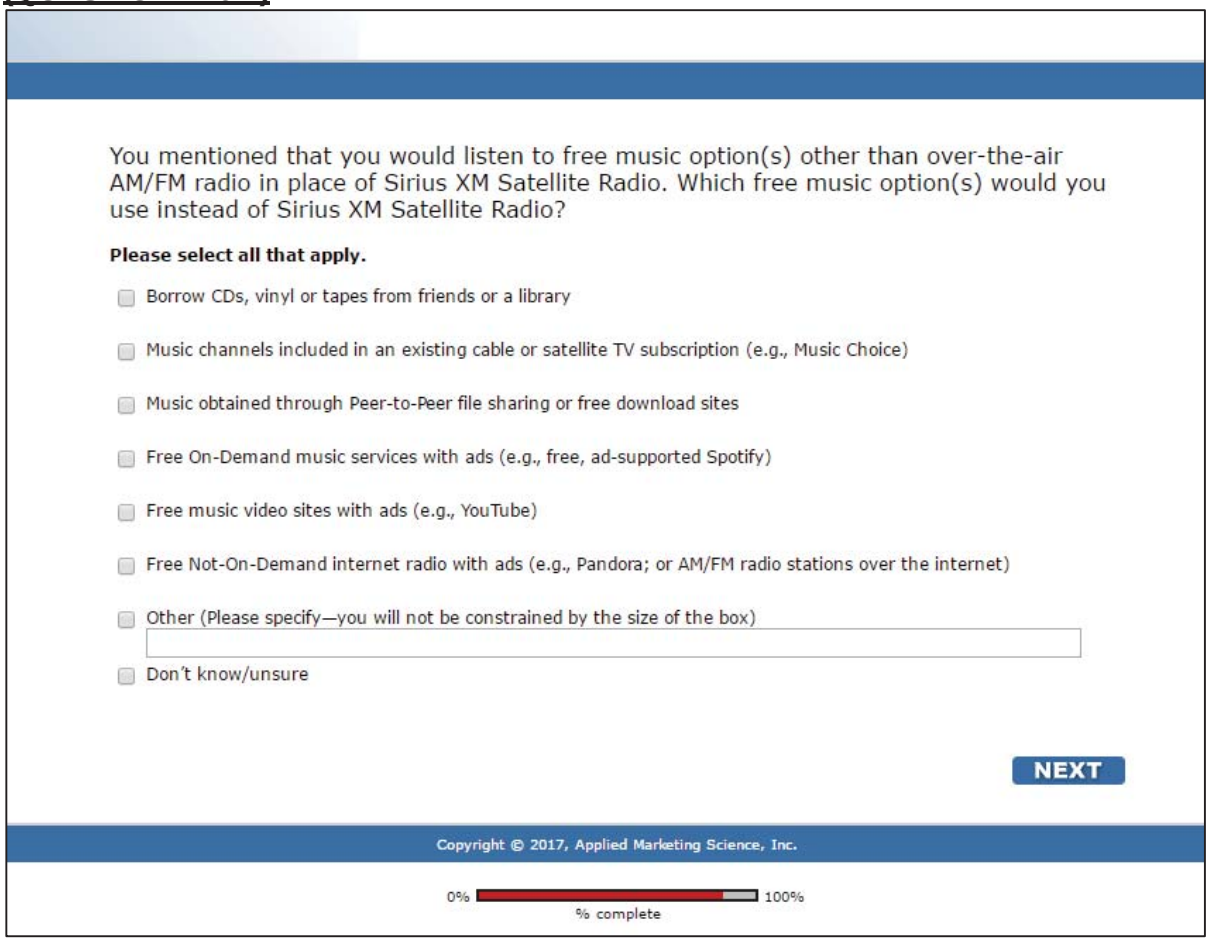
- ☐ I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to
- ☐ I would listen to free over-the-air AM/FM radio
- ☐ I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels)
- ☐ I would listen to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to
- ☐ I would listen to my existing collection of CDs and/or music downloads
- ☐ I would purchase and listen to new CDs and/or music downloads
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ None of the above
- ☐ Don't know/unsure

NEXT

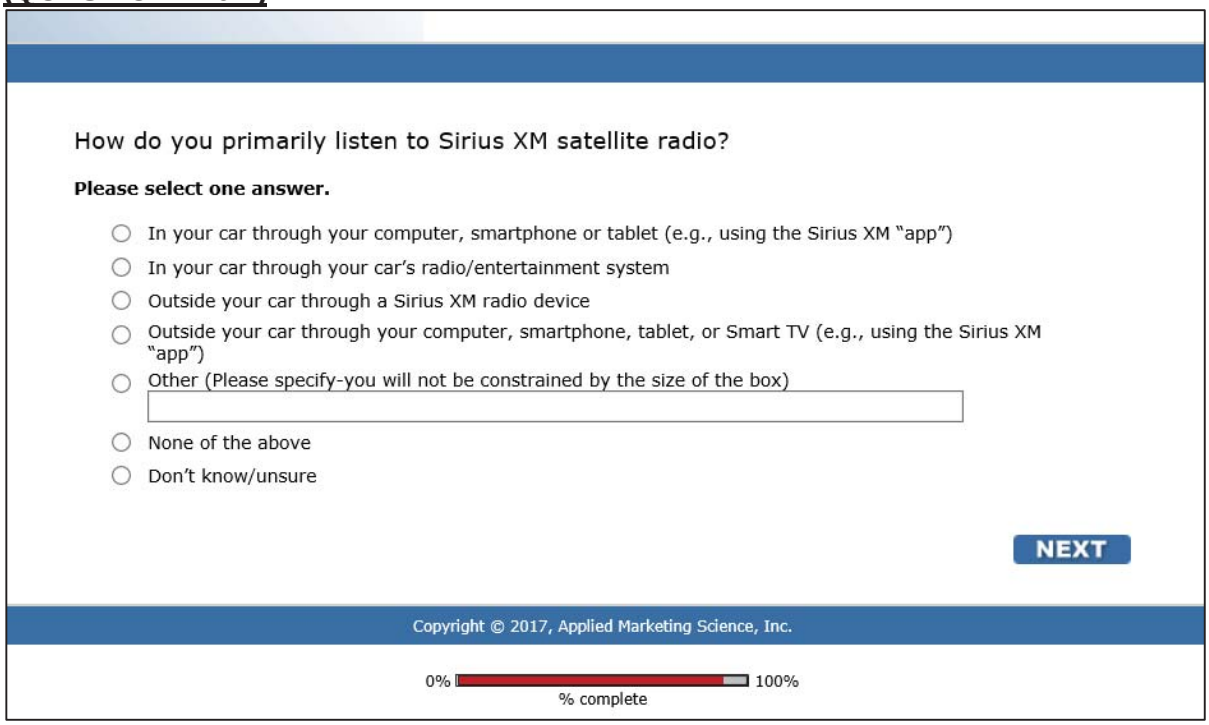
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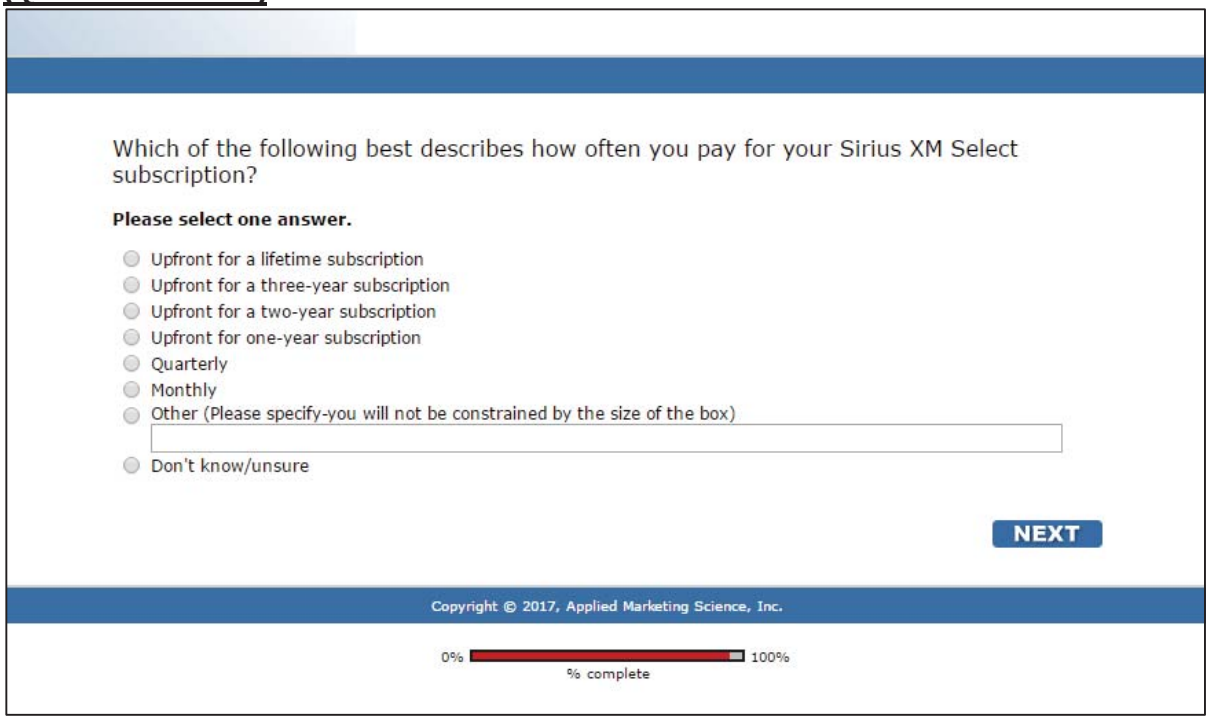
(QUESTION 210.1)



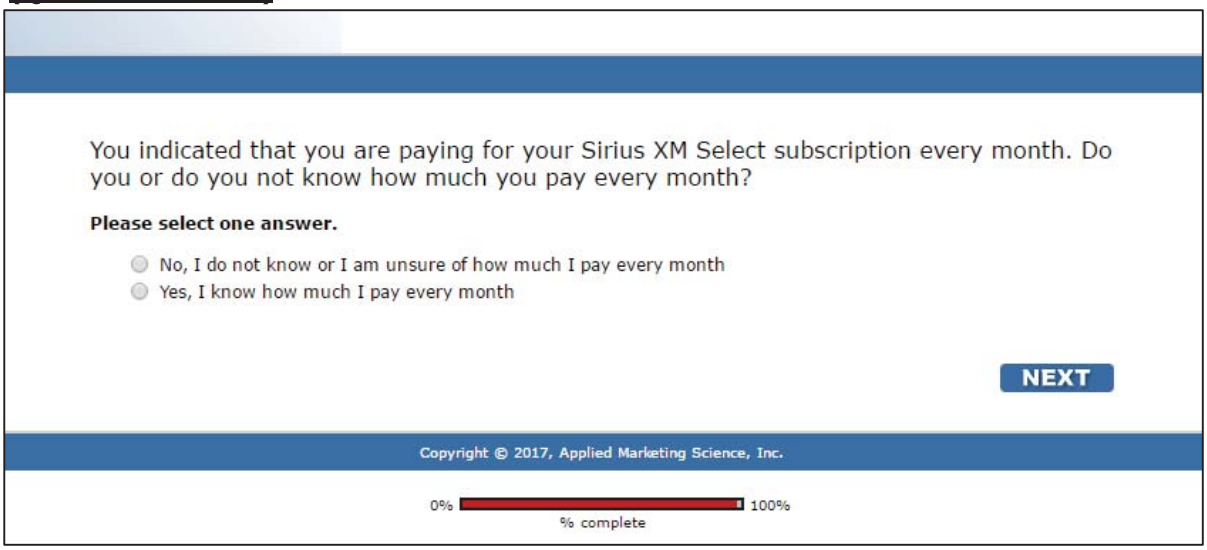
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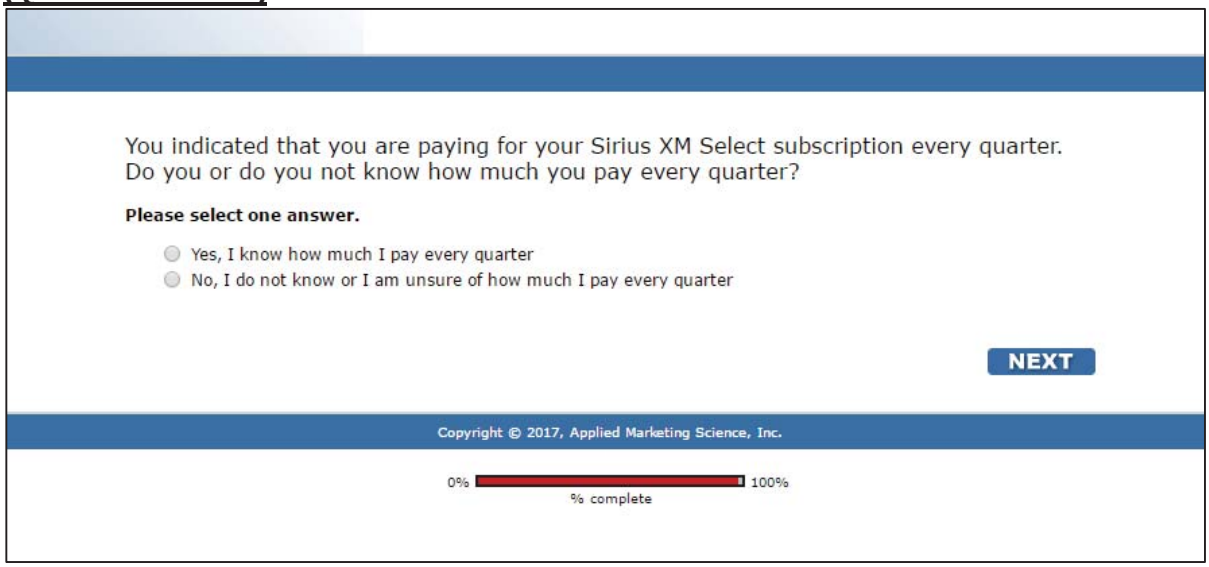
(QUESTION 210.3)



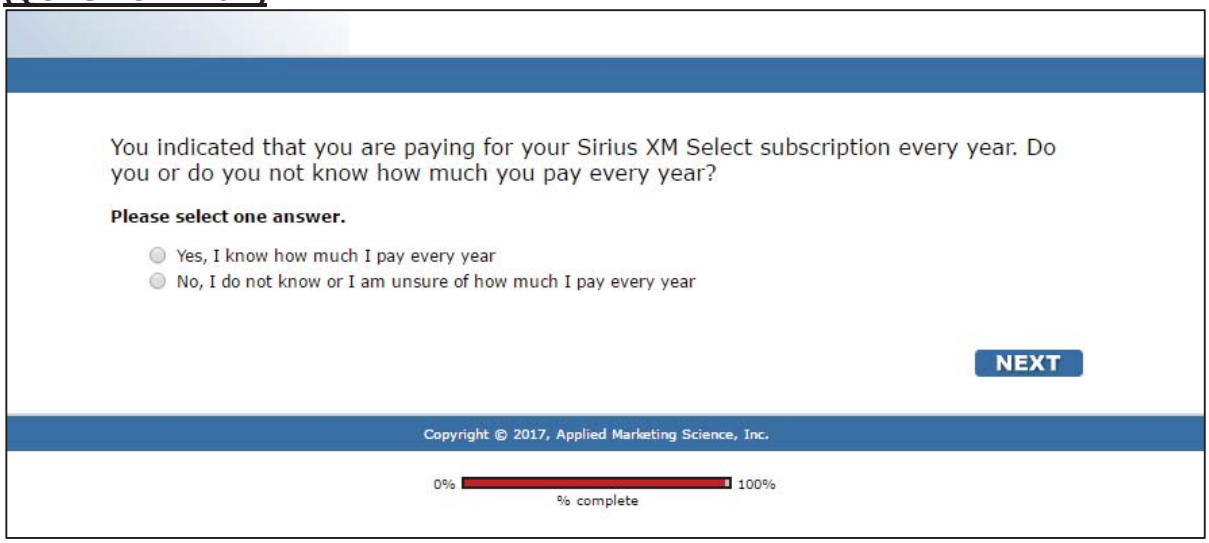
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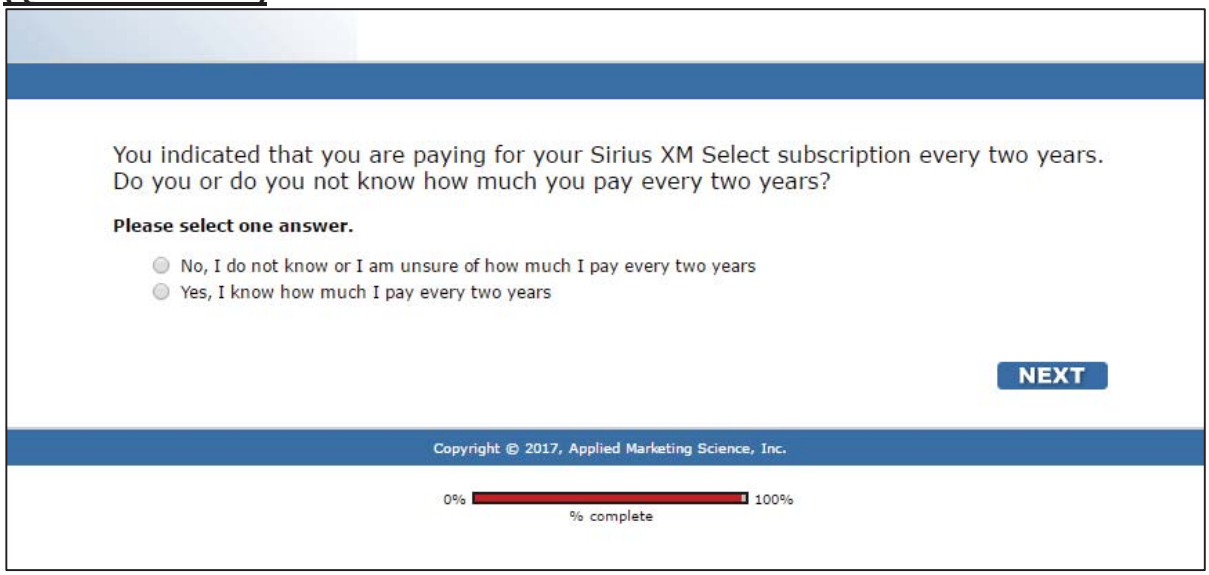
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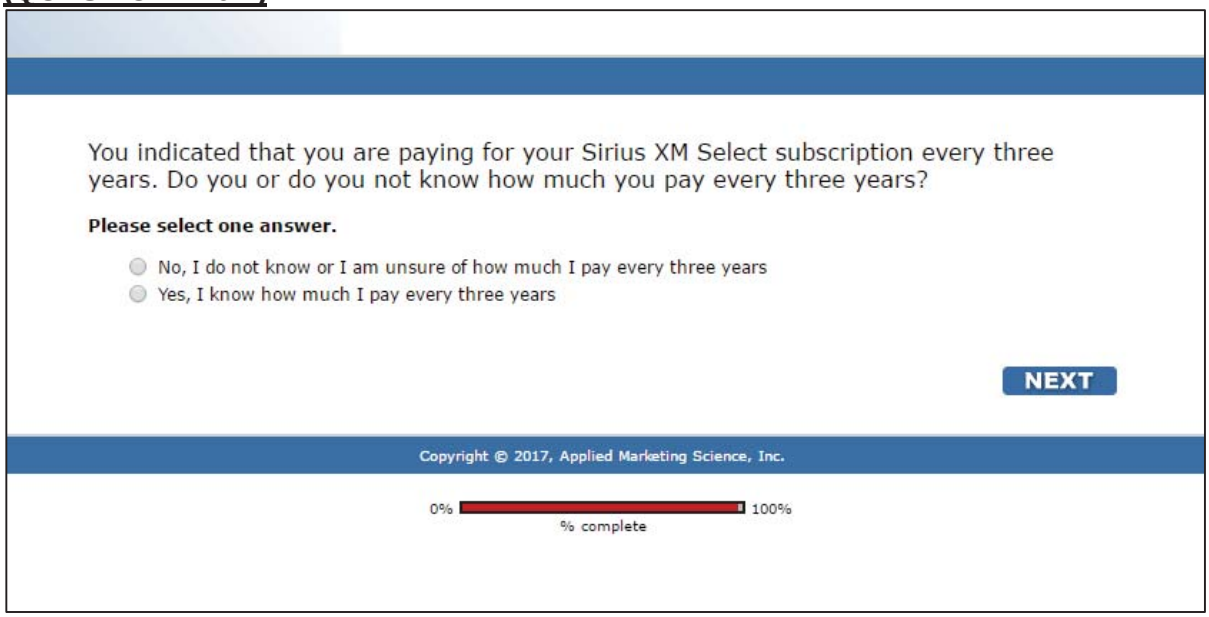
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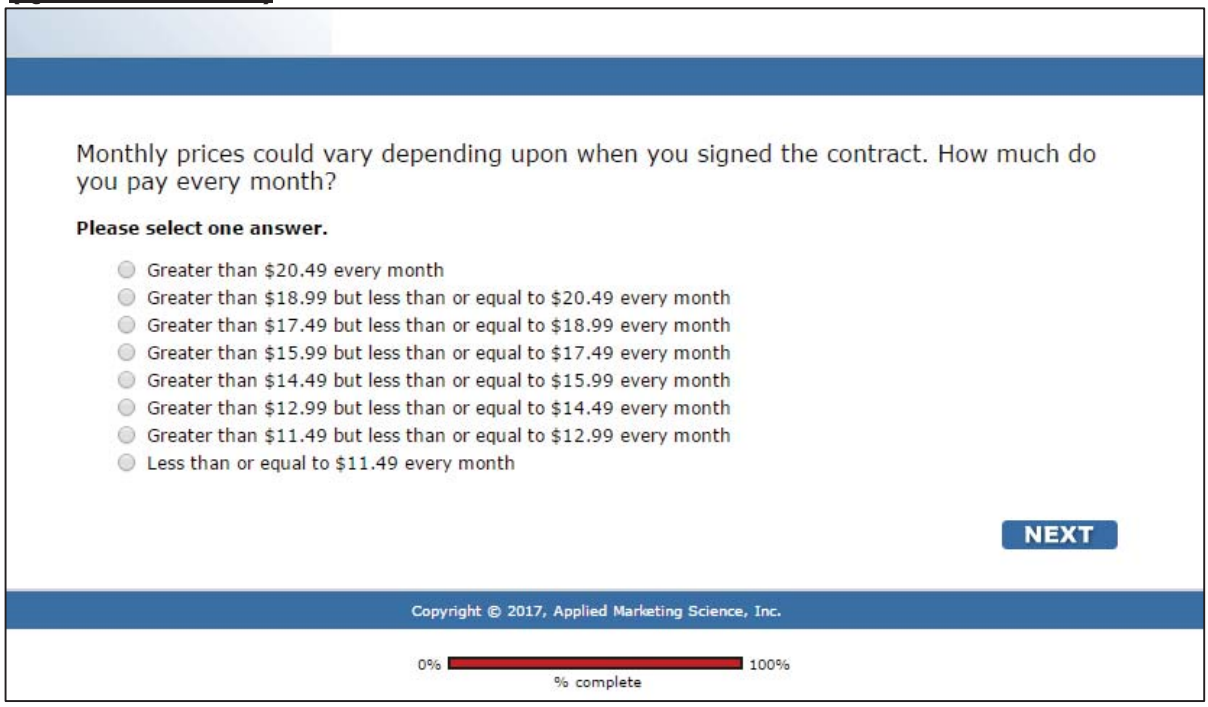
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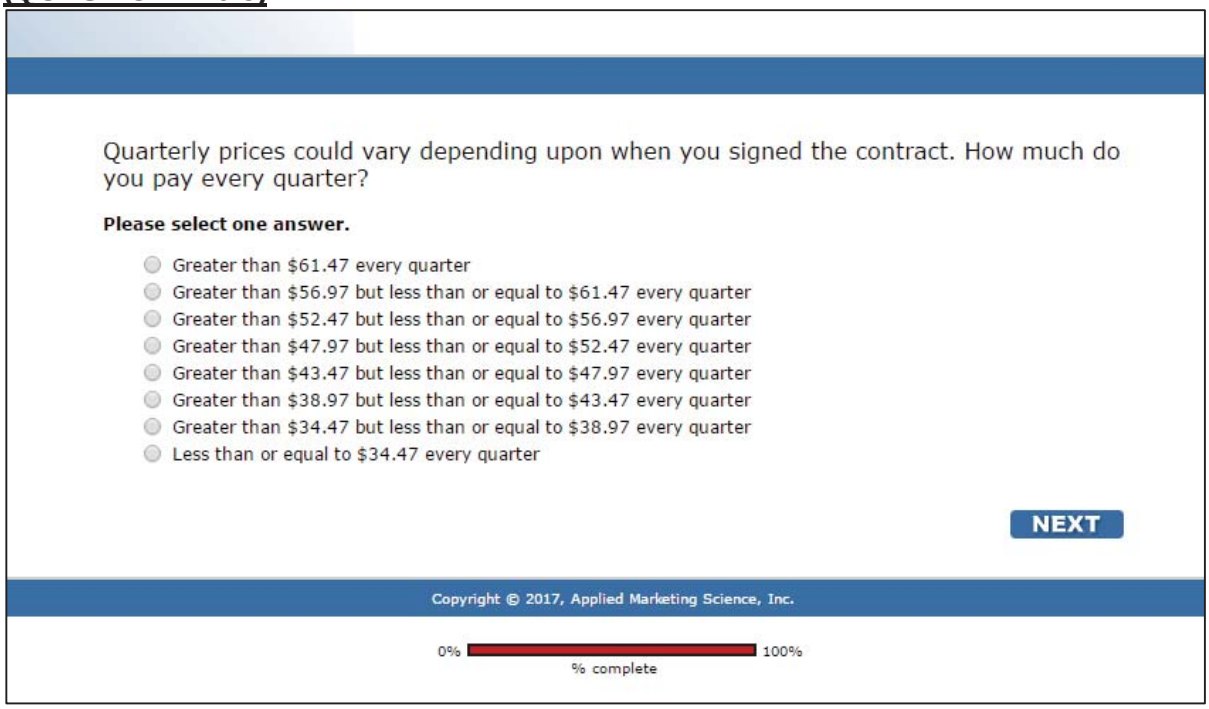
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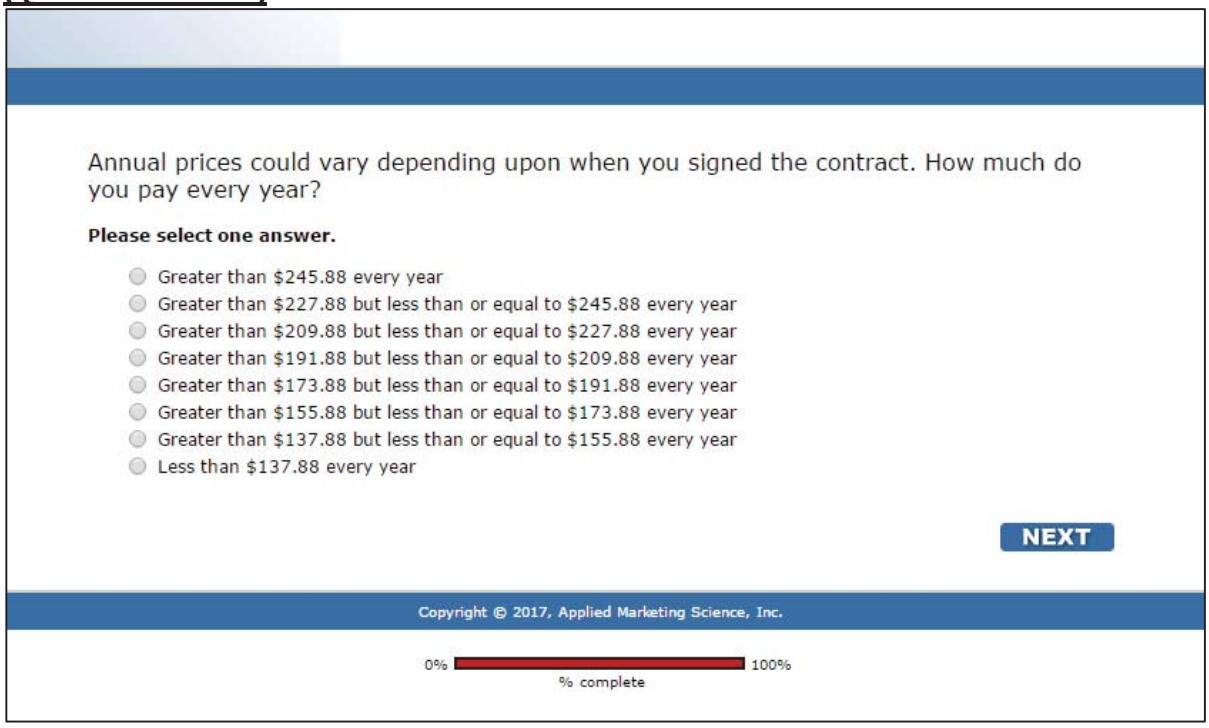
(QUESTION 210.5)



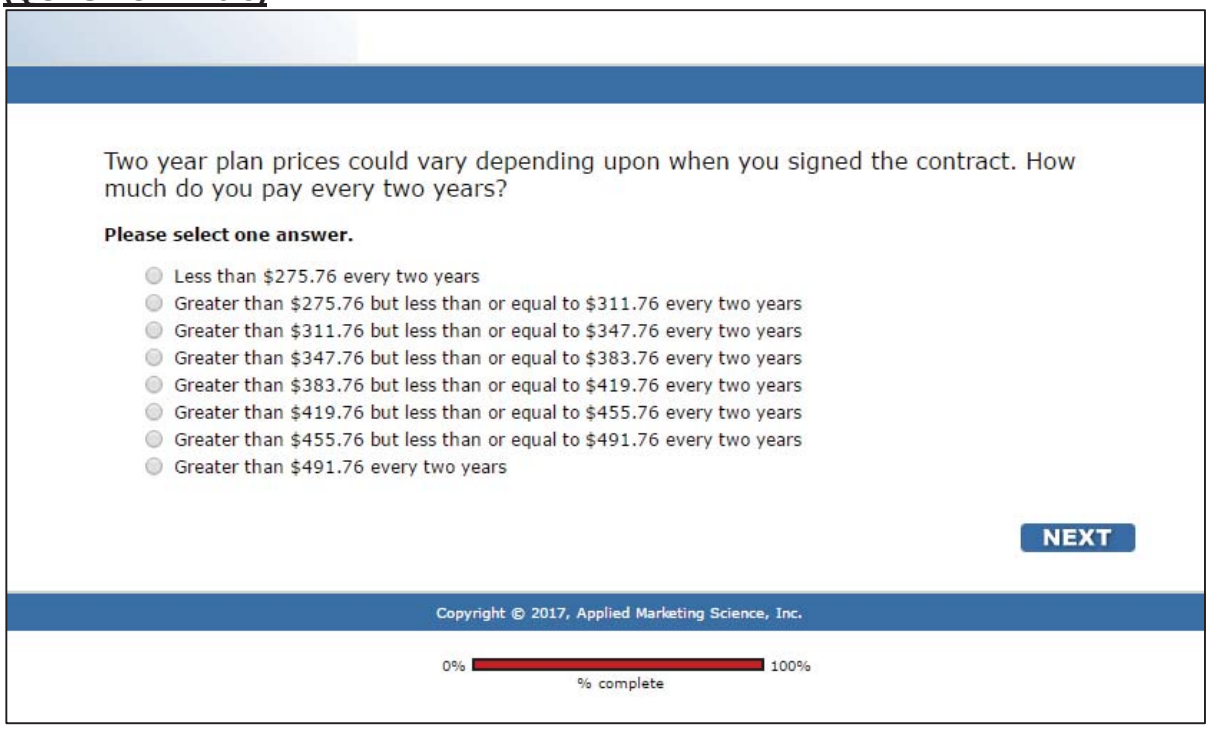
(QUESTION 210.5)



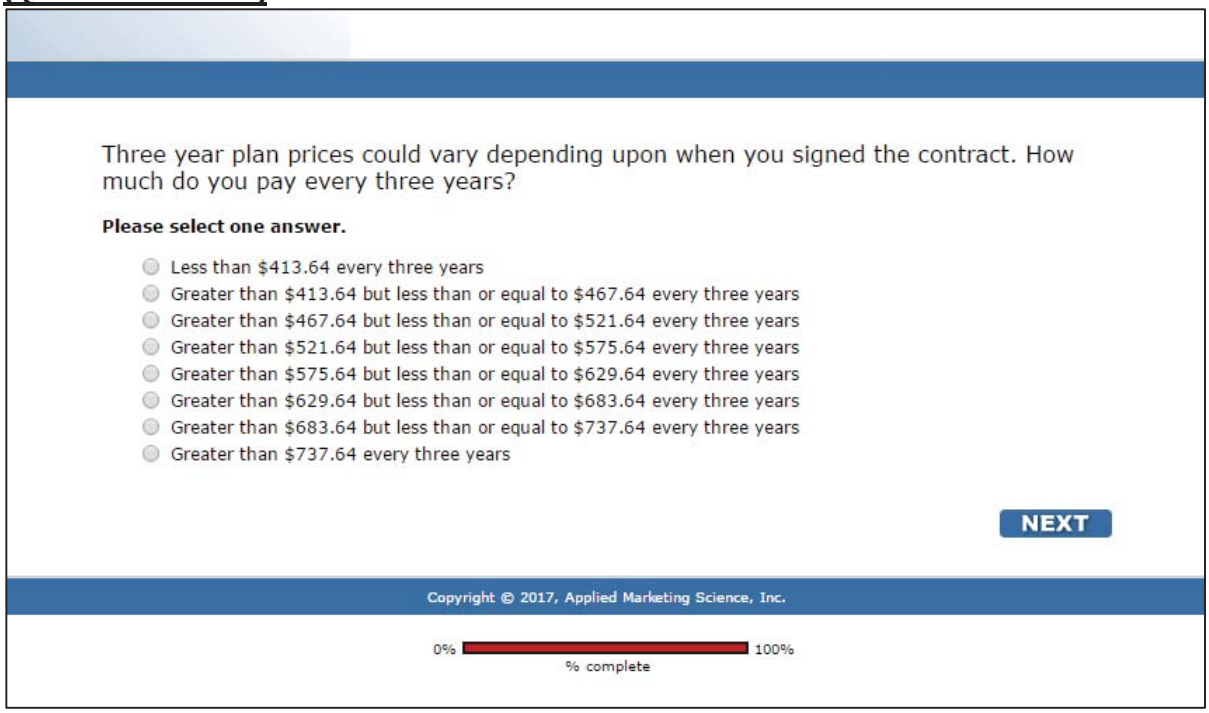
(QUESTION 210.5)



(QUESTION 210.5)



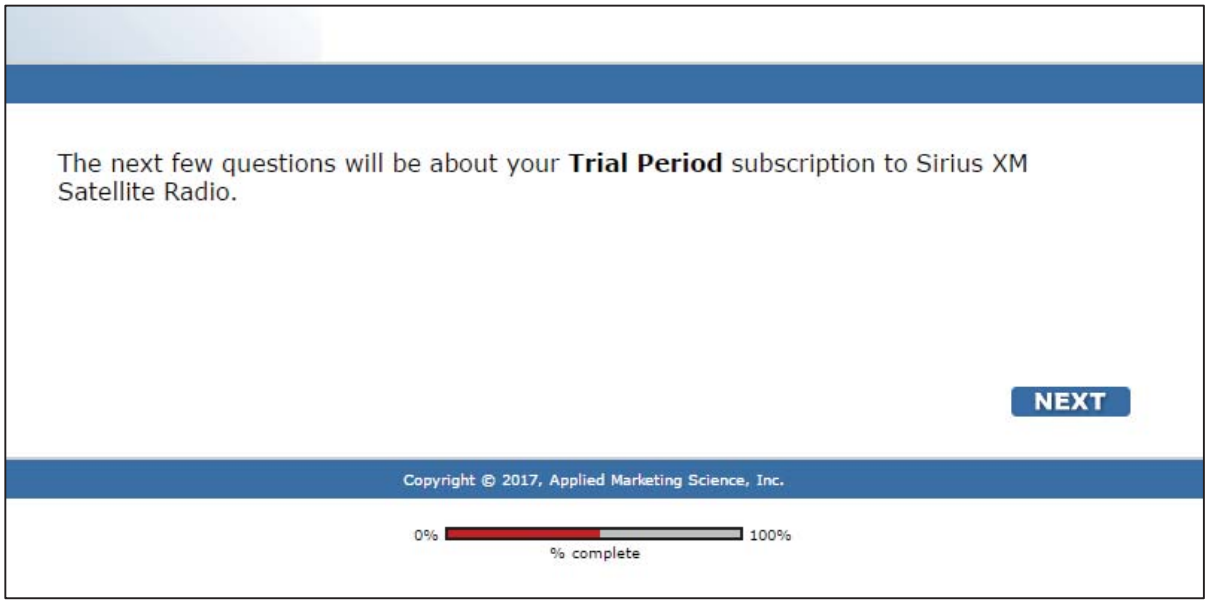
(QUESTION 210.5)



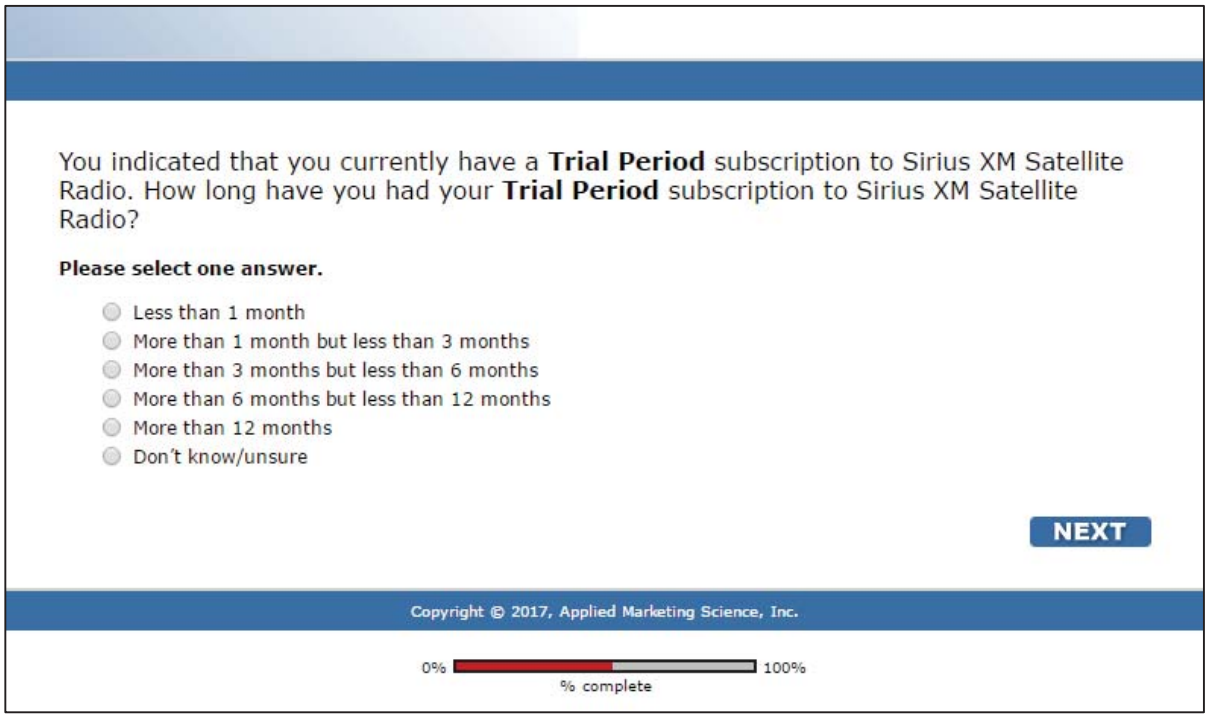
(QUESTION 220)



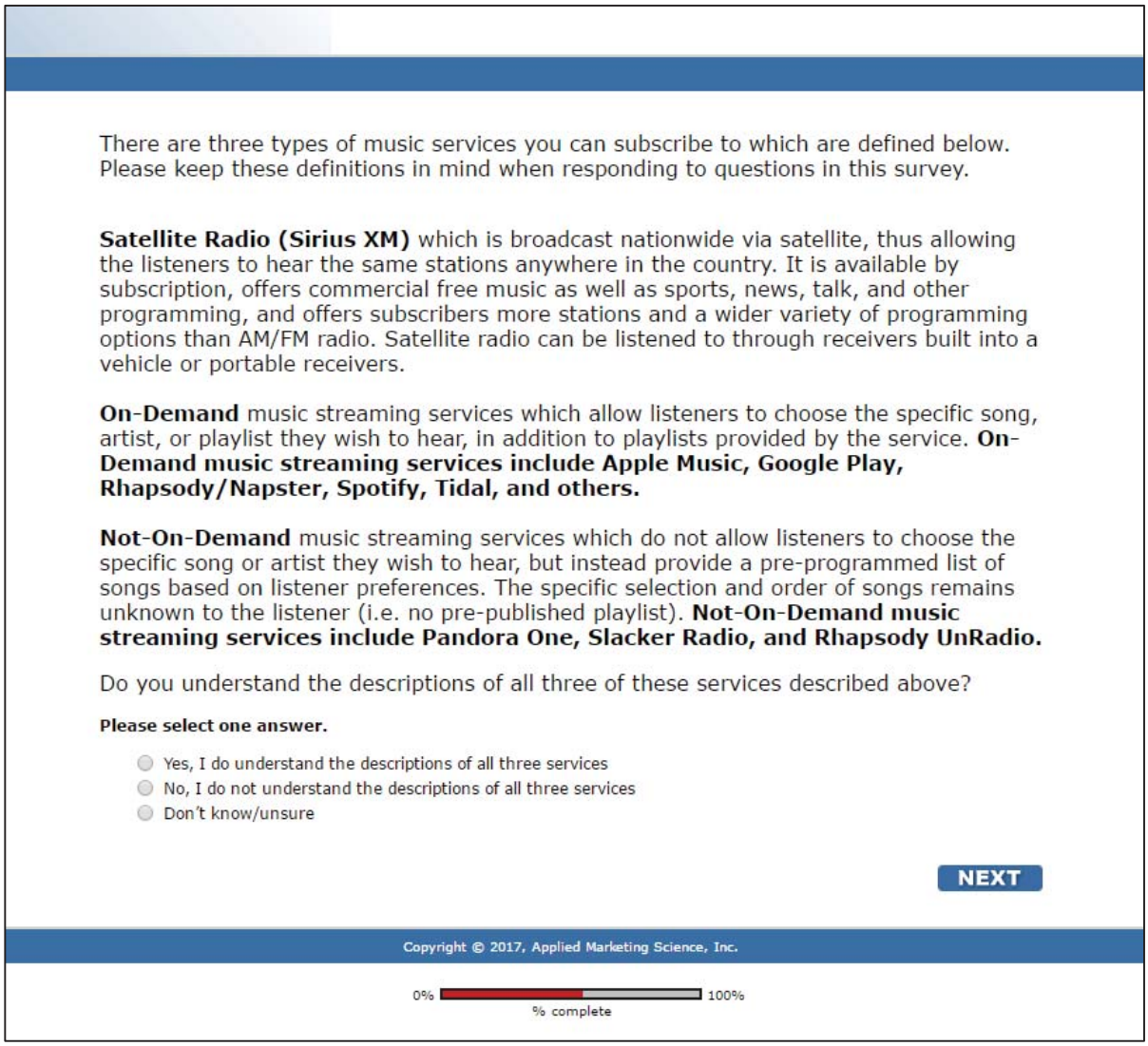
CELL 7: SXM FREE TRIAL SUBSCRIBERS
(QUESTION 500)



(QUESTION 500.1)



(QUESTION 501)



There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

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Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.**

Do you understand the descriptions of all three of these services described above?

Please select one answer.

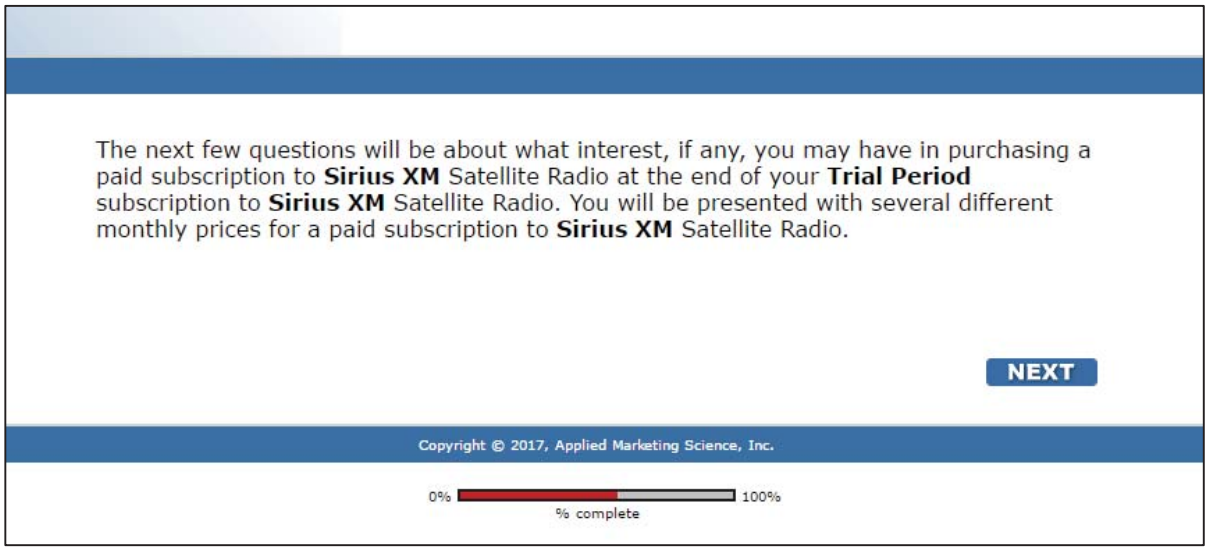
- Yes, I do understand the descriptions of all three services
- No, I do not understand the descriptions of all three services
- Don't know/unsure

NEXT

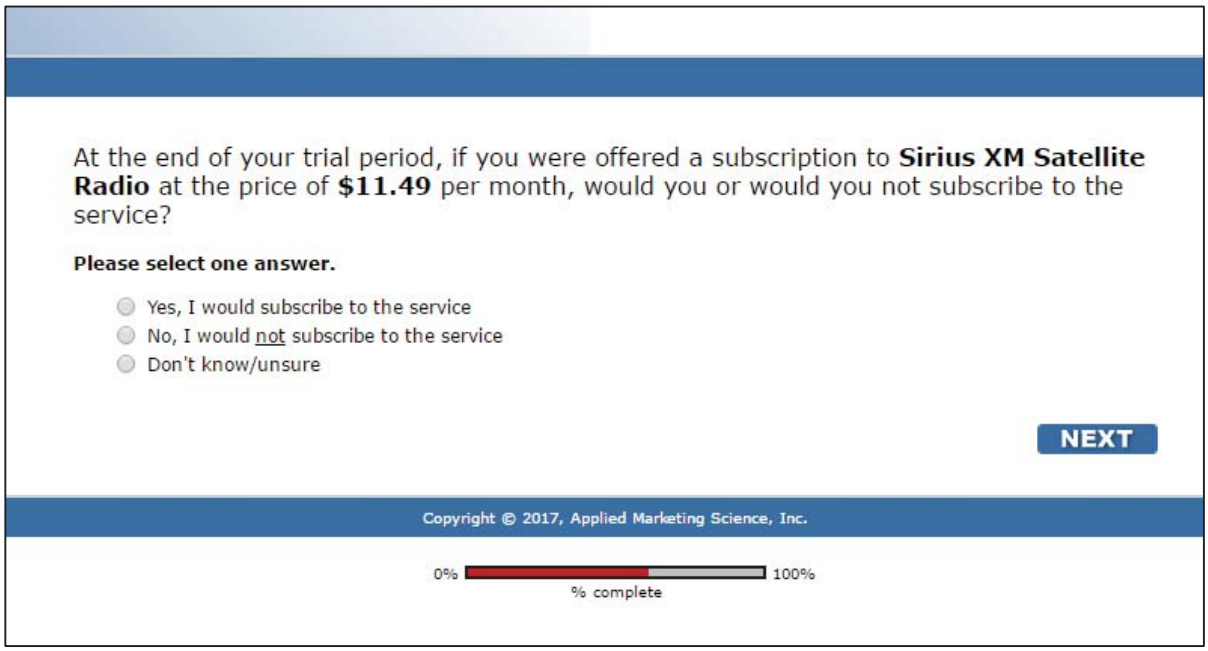
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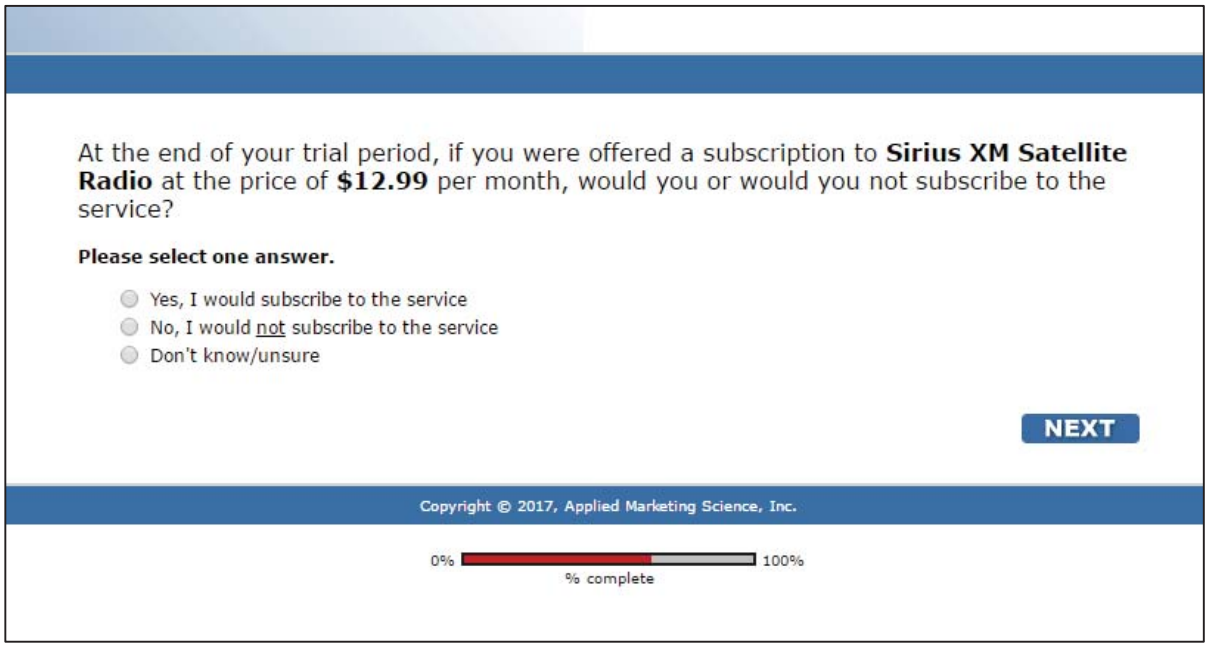
(QUESTION 502)



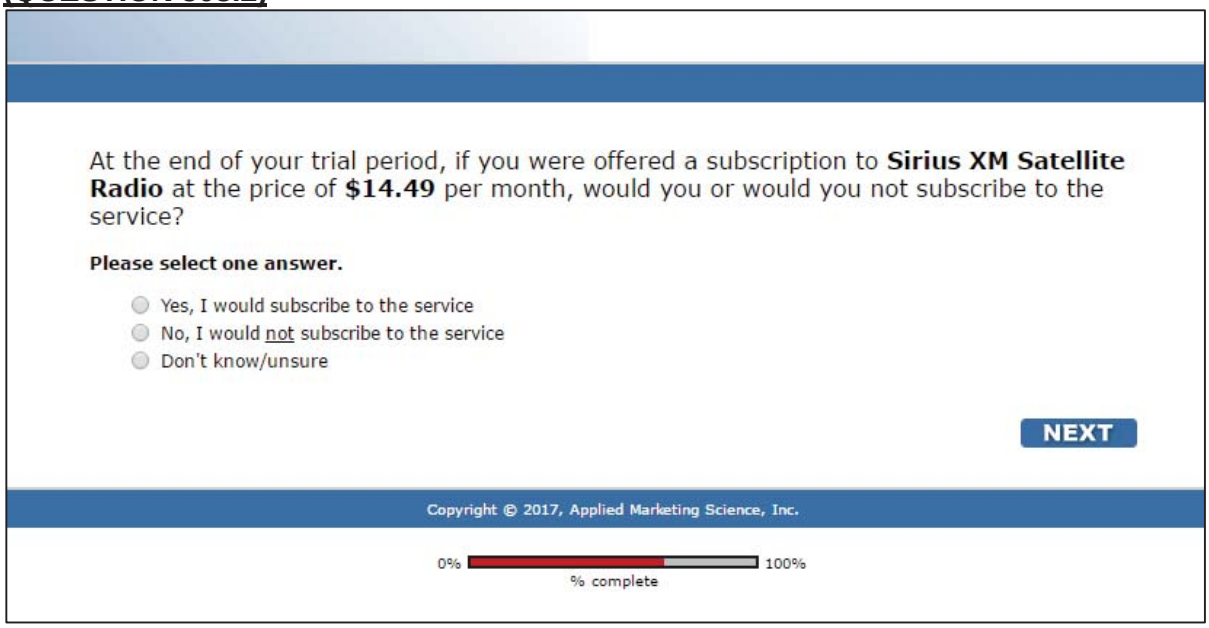
(QUESTION 503)



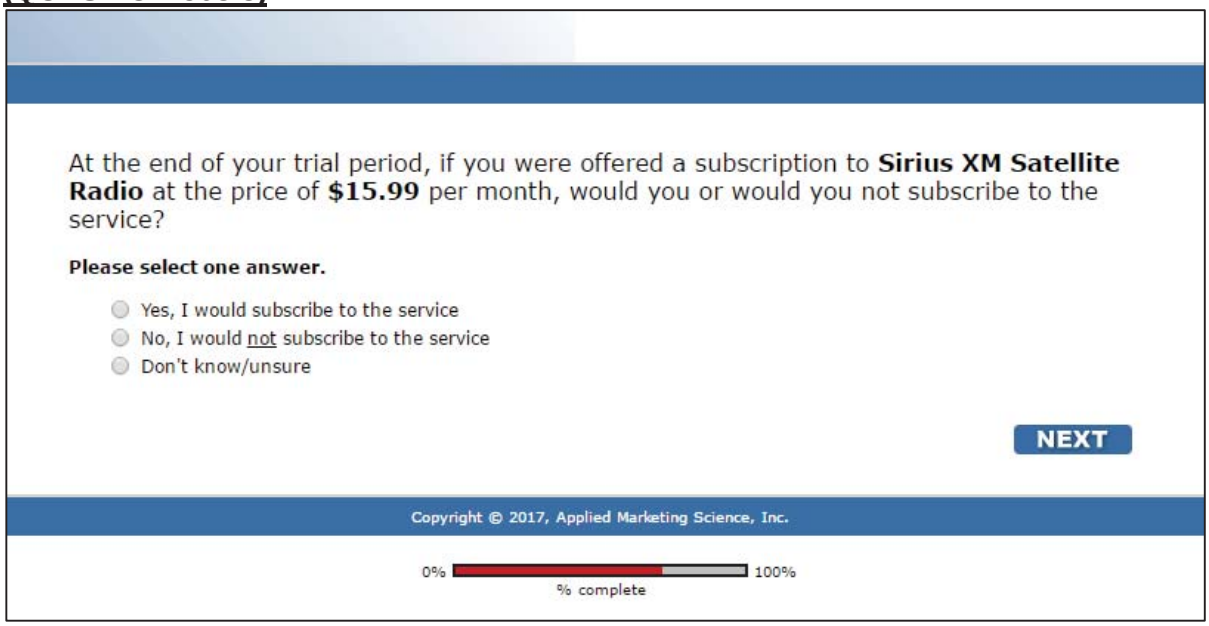
(QUESTION 503.1)



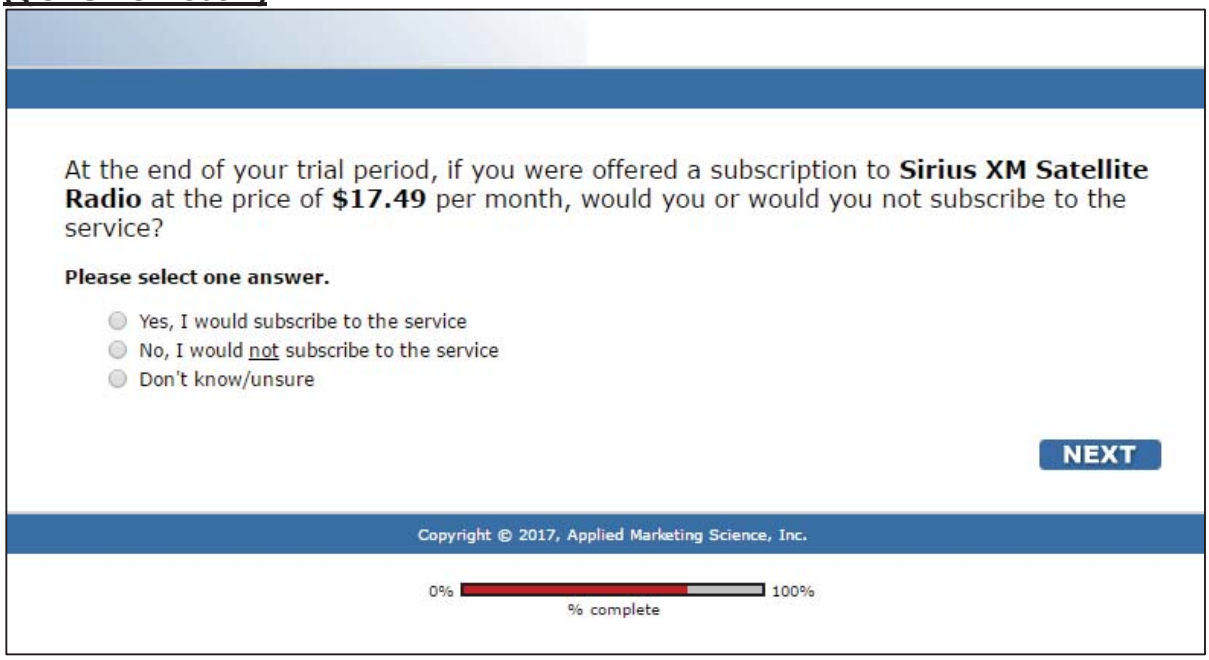
(QUESTION 503.2)



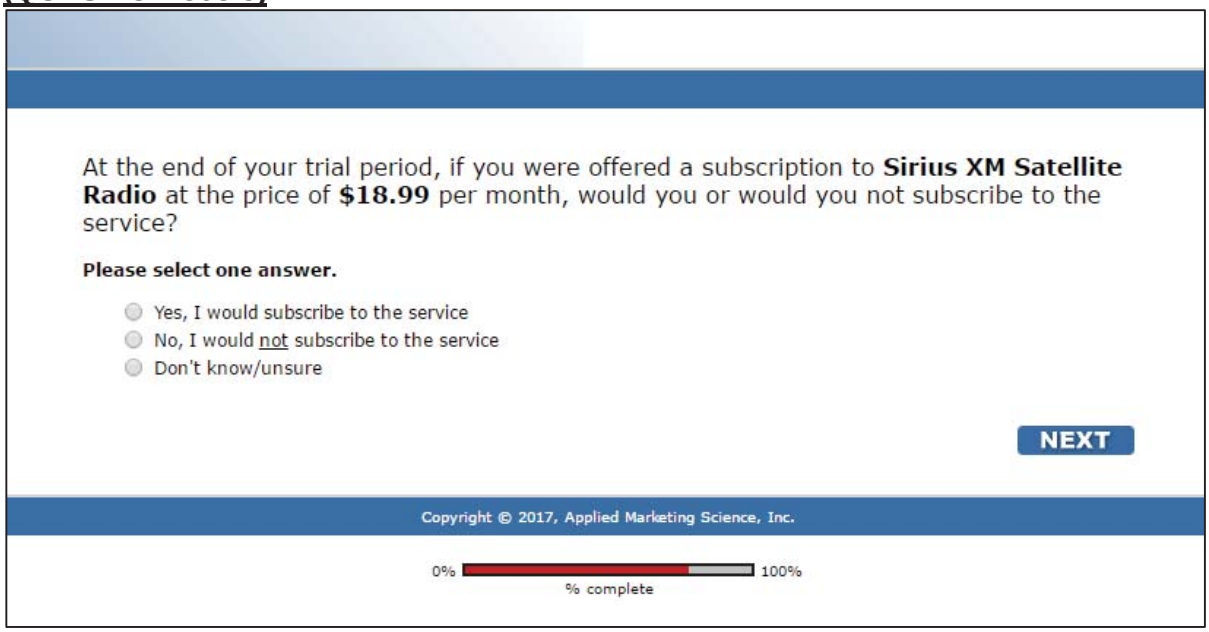
(QUESTION 503.3)



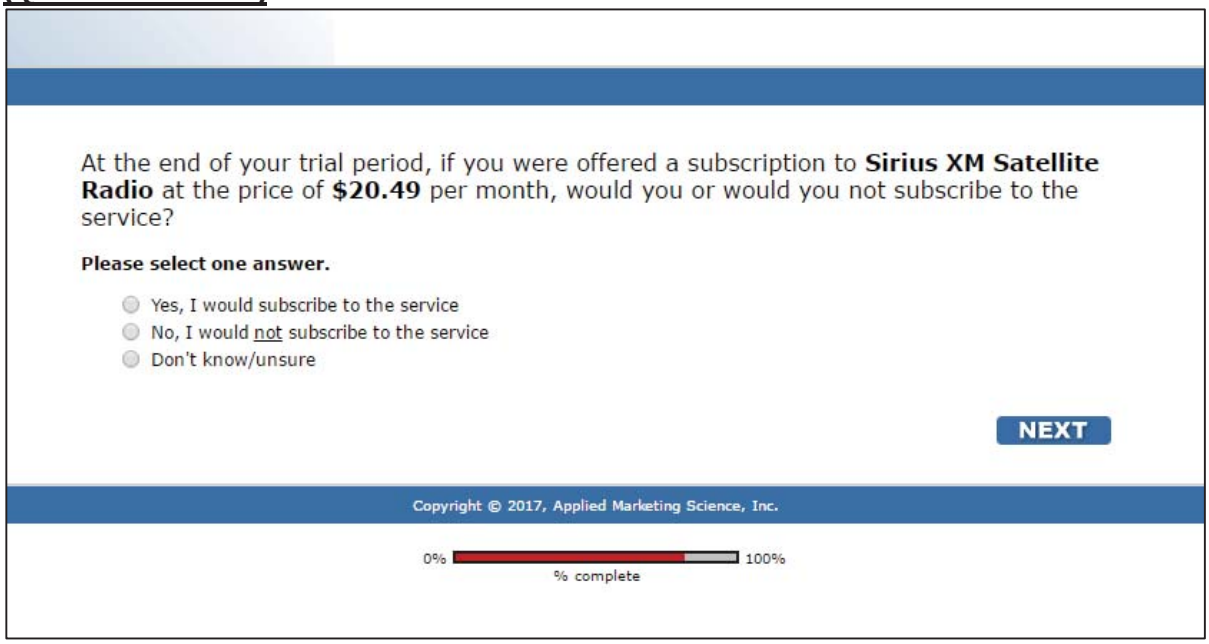
(QUESTION 503.4)



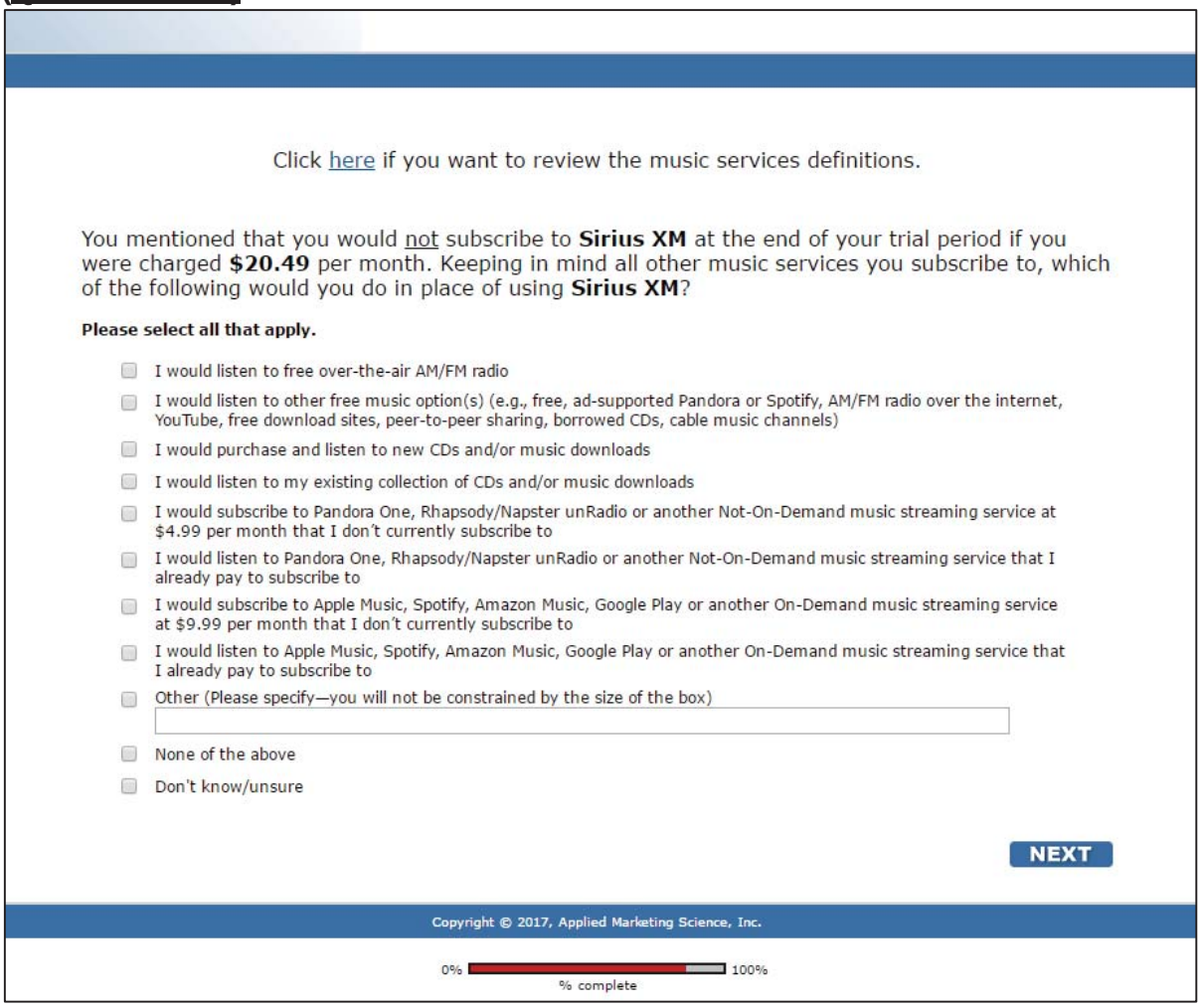
(QUESTION 503.5)



(QUESTION 503.6)



(QUESTION 510)



Click here if you want to review the music services definitions.

You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged **$20.49** per month. Keeping in mind all other music services you subscribe to, which of the following would you do in place of using **Sirius XM**?

Please select all that apply.

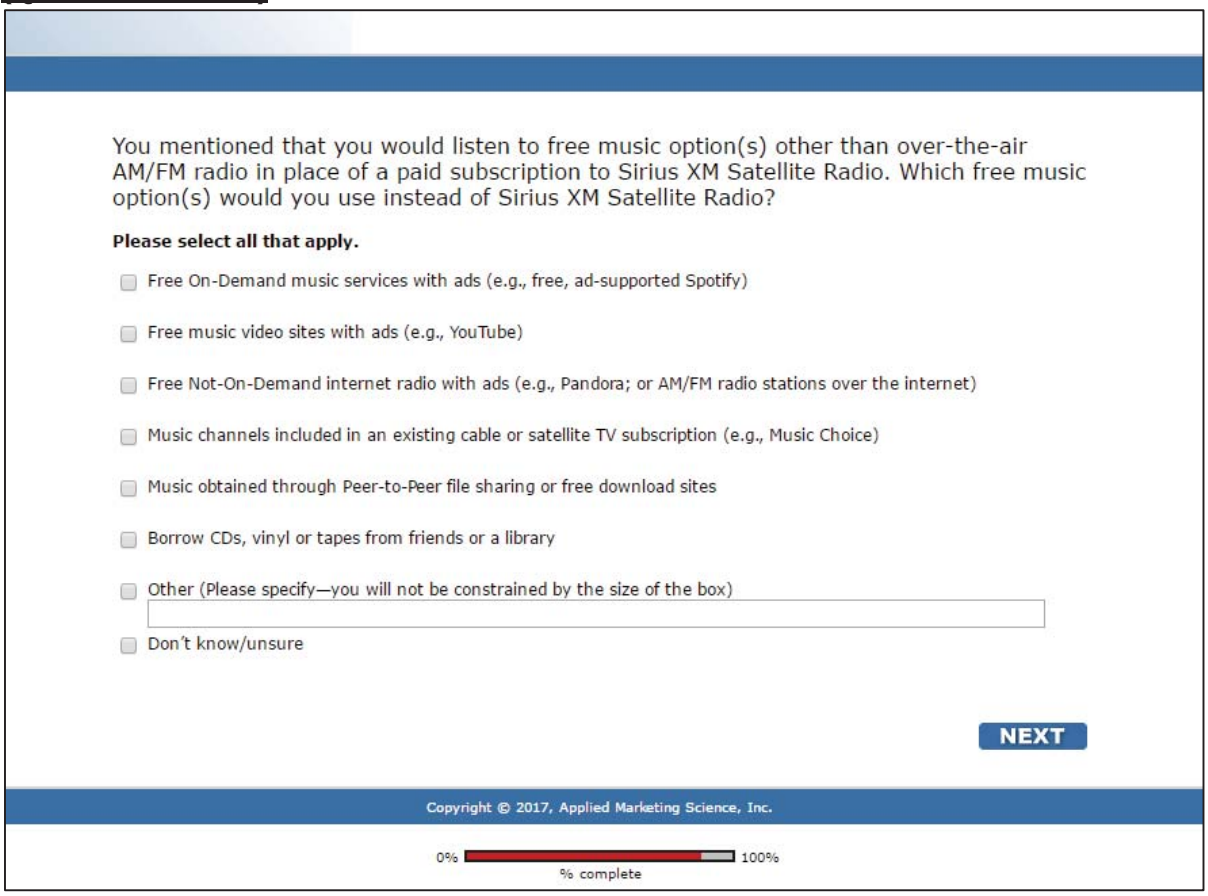
- ☐ I would listen to free over-the-air AM/FM radio
- ☐ I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels)
- ☐ I would purchase and listen to new CDs and/or music downloads
- ☐ I would listen to my existing collection of CDs and/or music downloads
- ☐ I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to
- ☐ I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to
- ☐ I would listen to Apple Music, Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ None of the above
- ☐ Don't know/unsure

NEXT

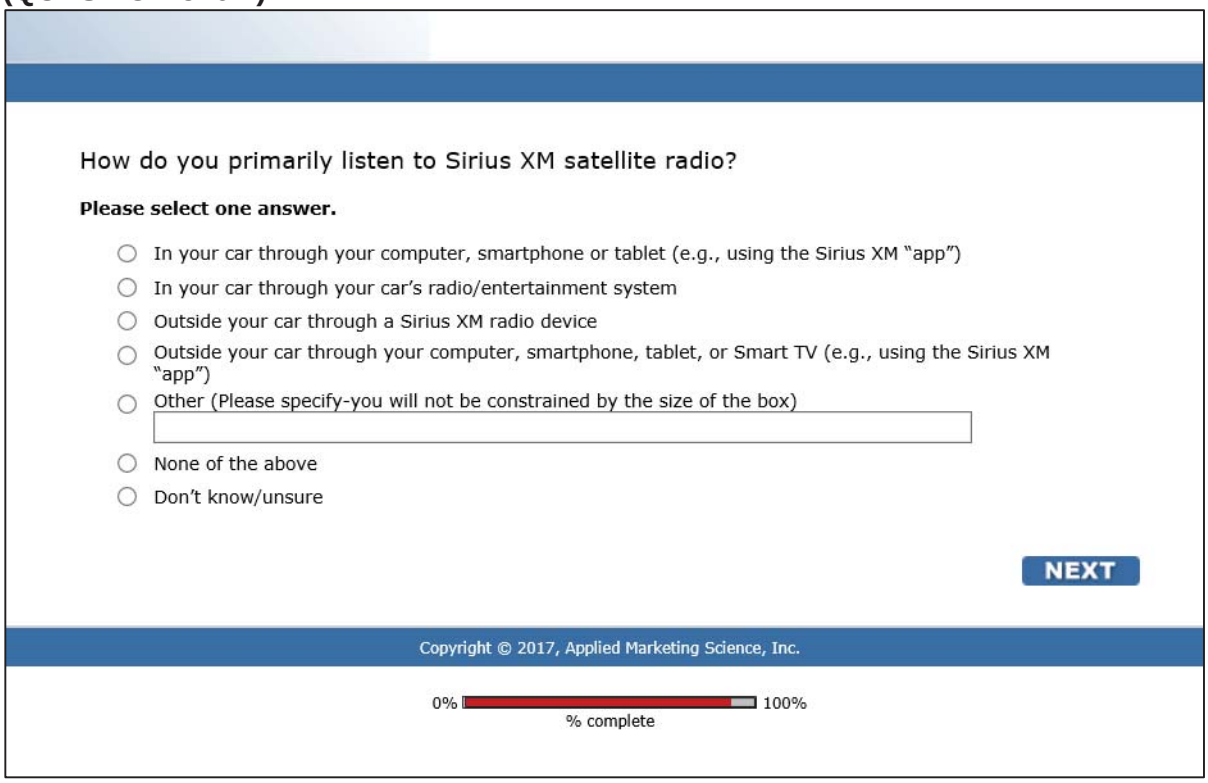
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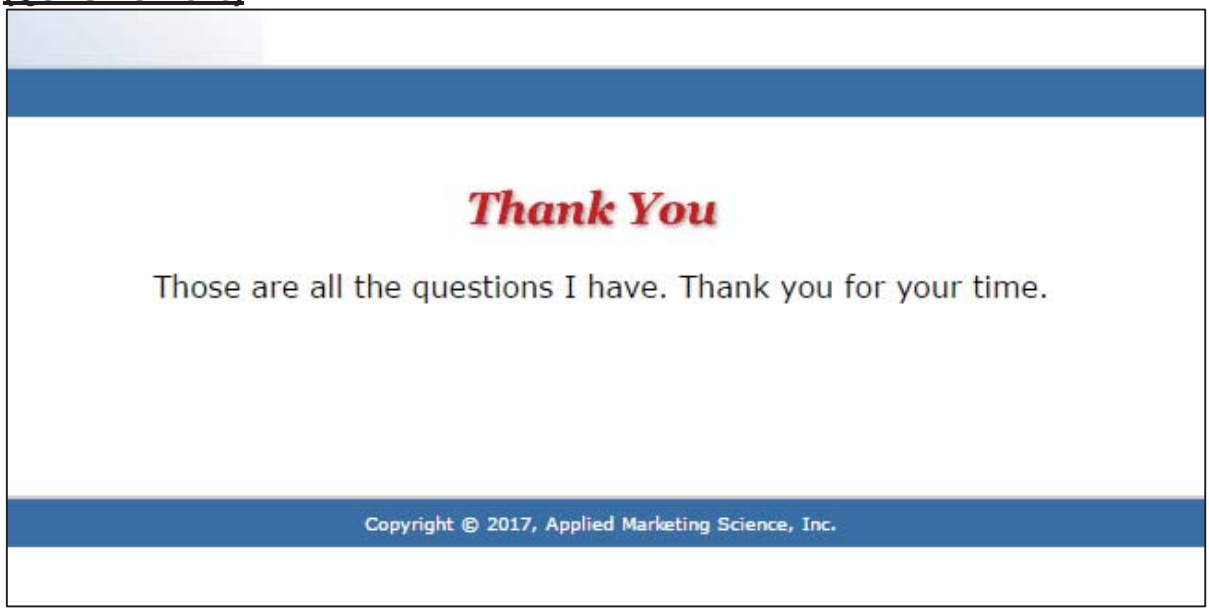
(QUESTION 510.1)



(QUESTION 510.2)

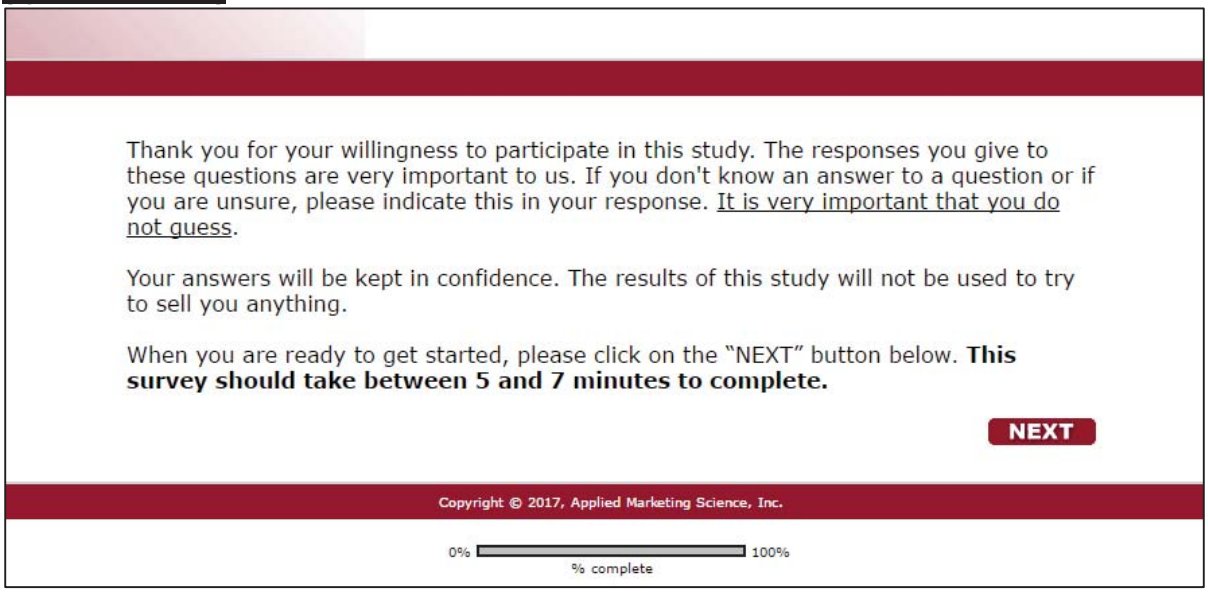


(QUESTION 520)

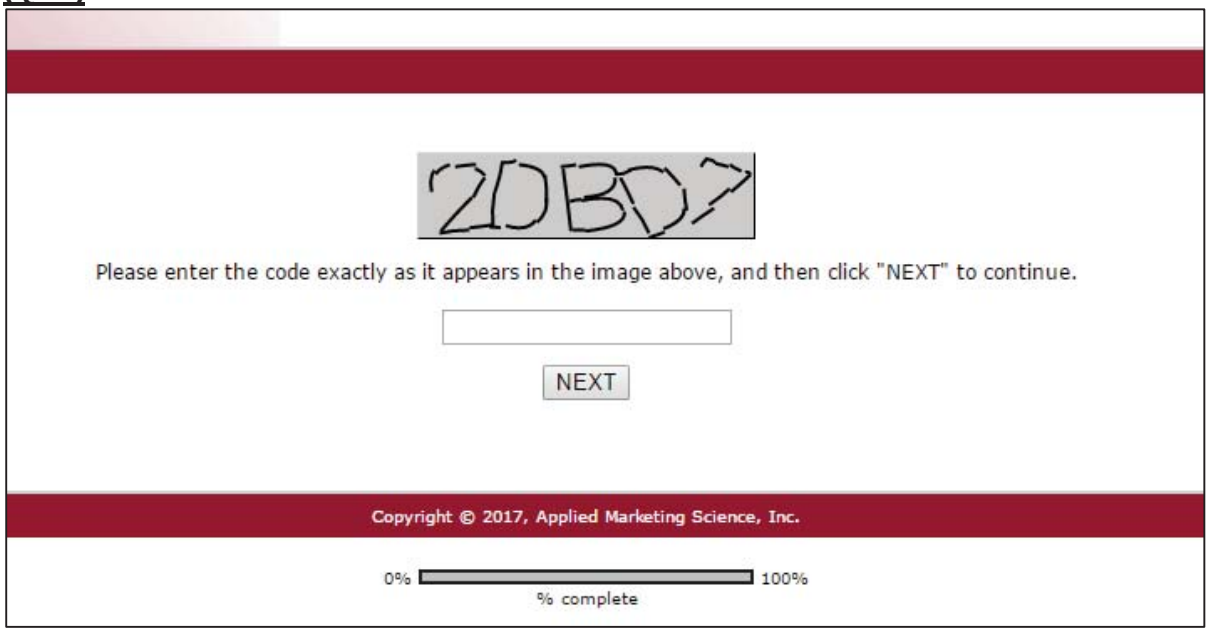


MODIFIED DHAR SURVEY (ON-DEMAND STREAMING)

(QUESTION 10)



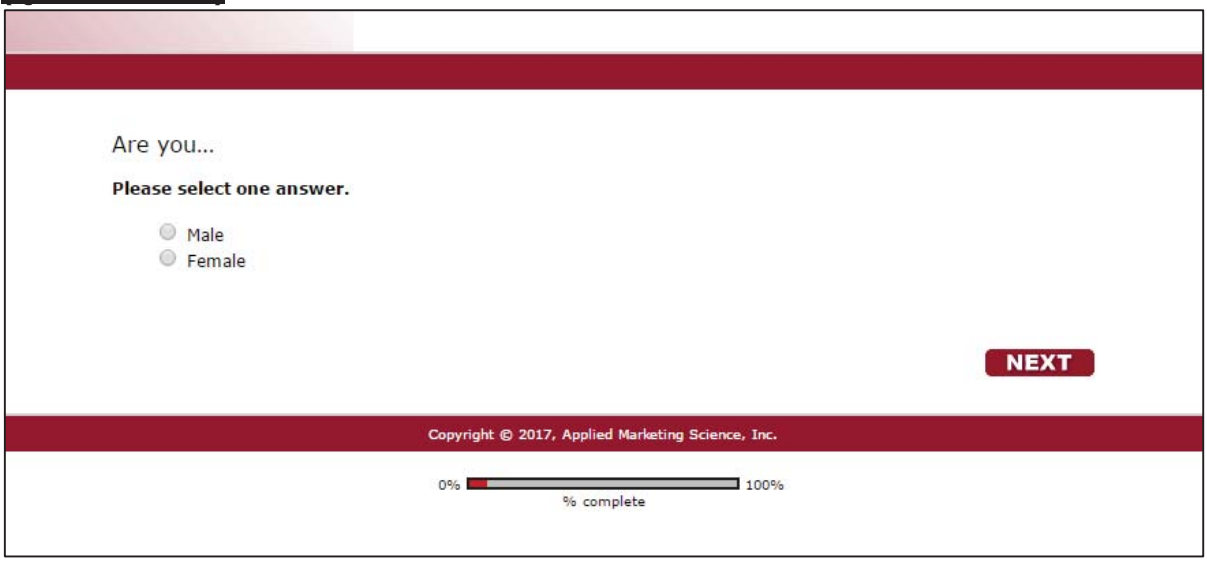
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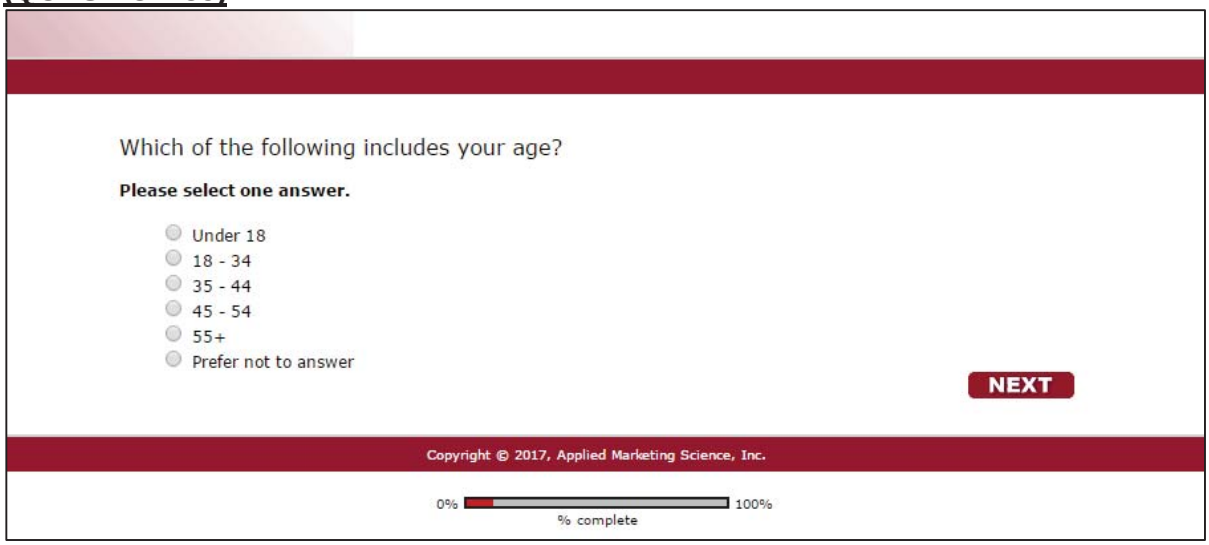
(QUESTION 25)



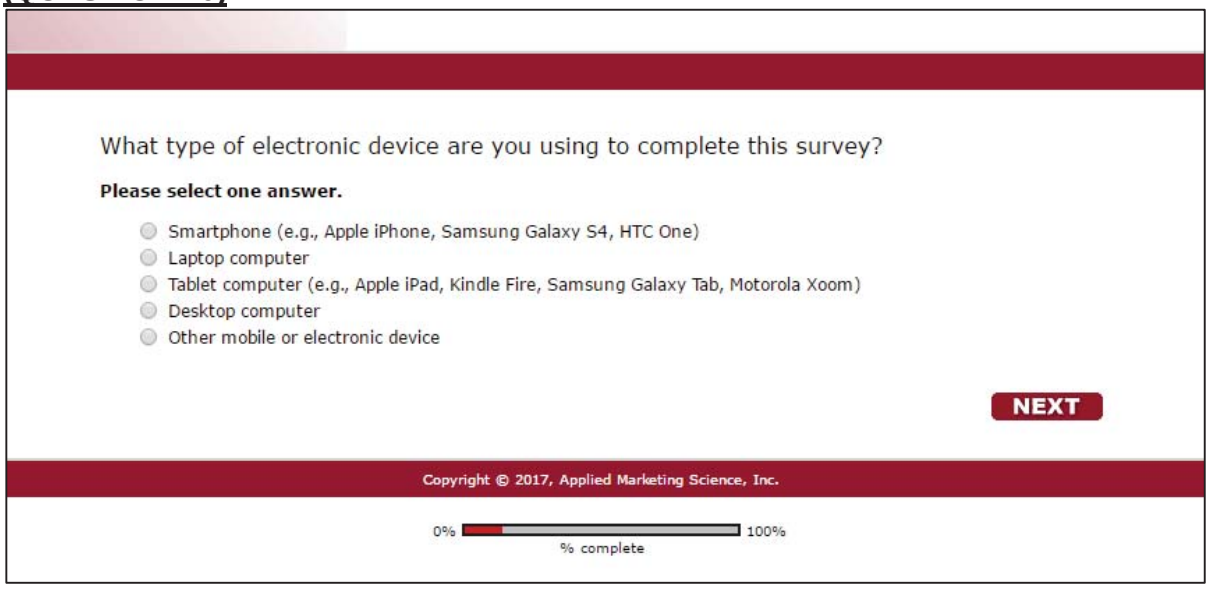
(QUESTION 30)



(QUESTION 35)



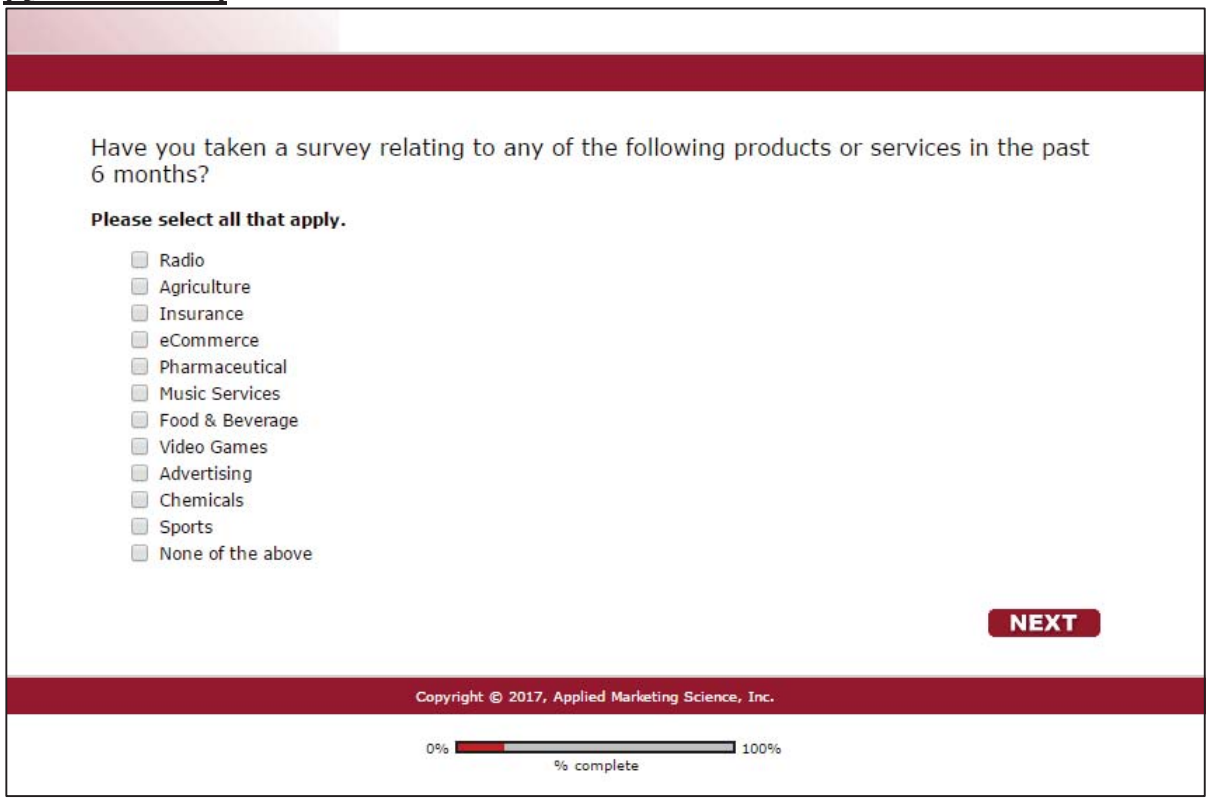
(QUESTION 40)



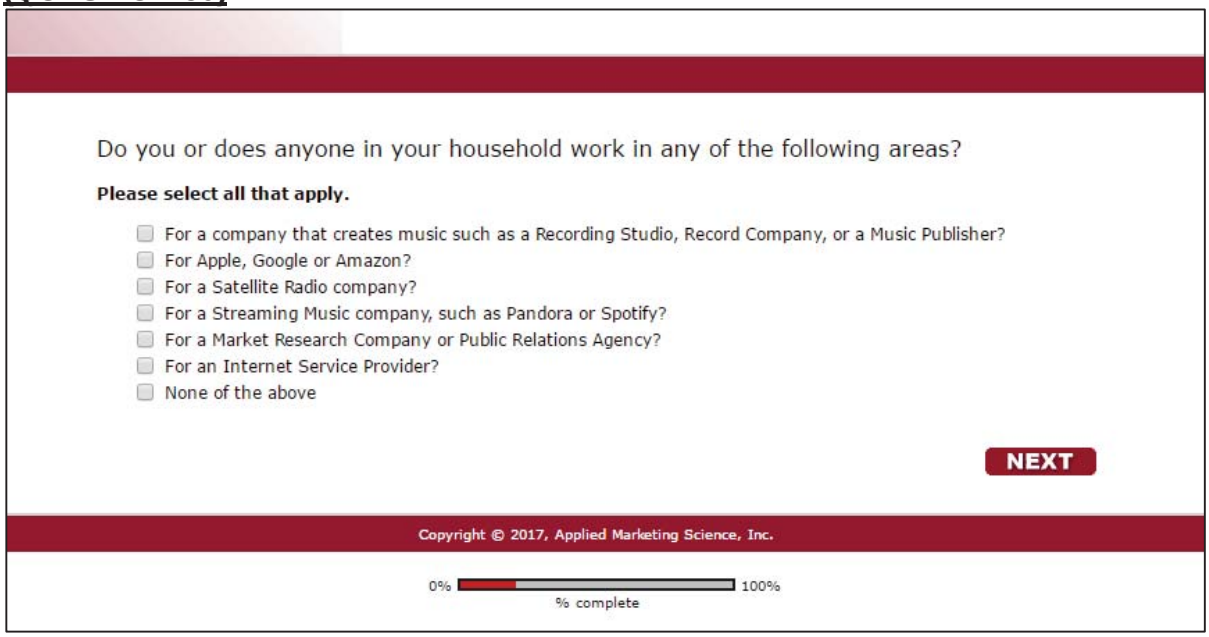
(SMARTPHONE AND OTHER MOBILE RESPONDENTS)



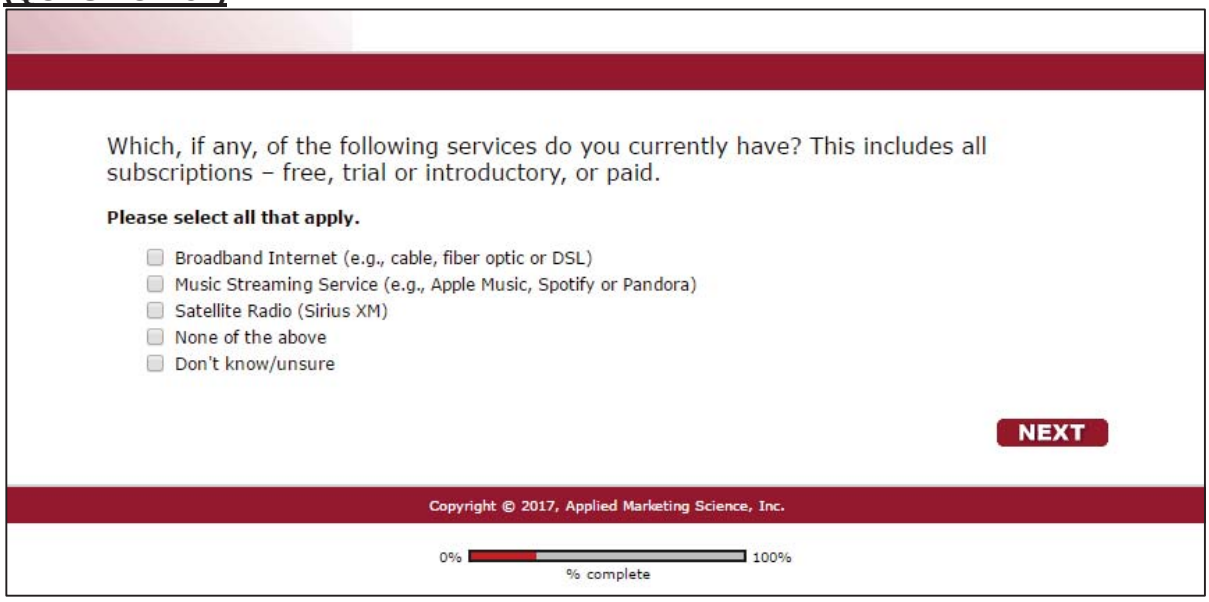
(QUESTION 49)



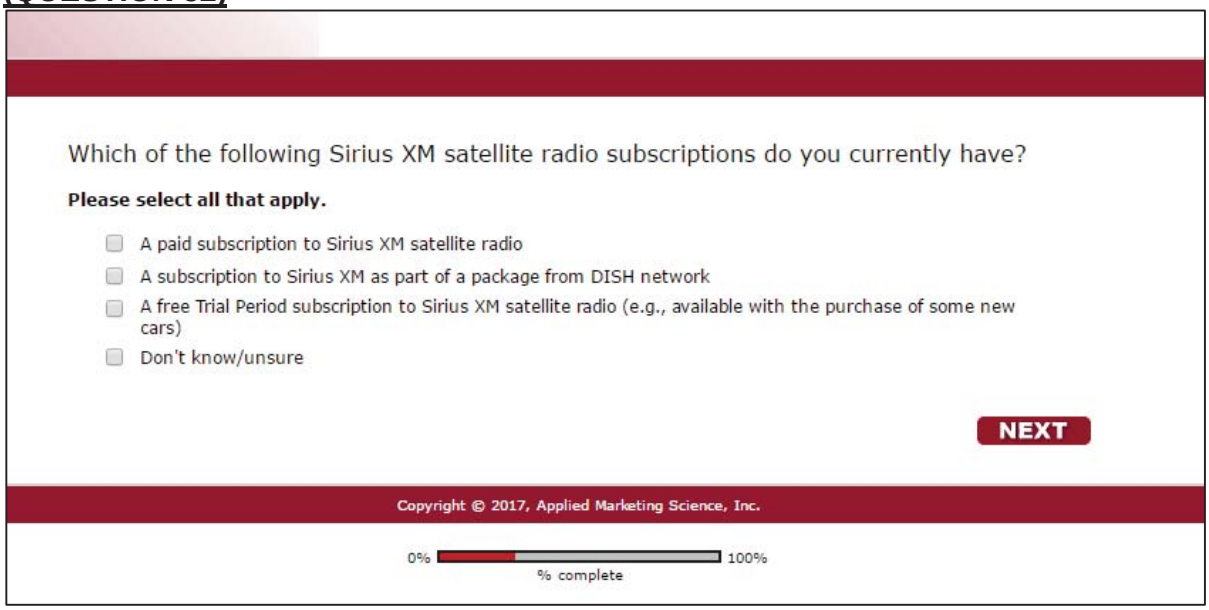
(QUESTION 50)



(QUESTION 51)



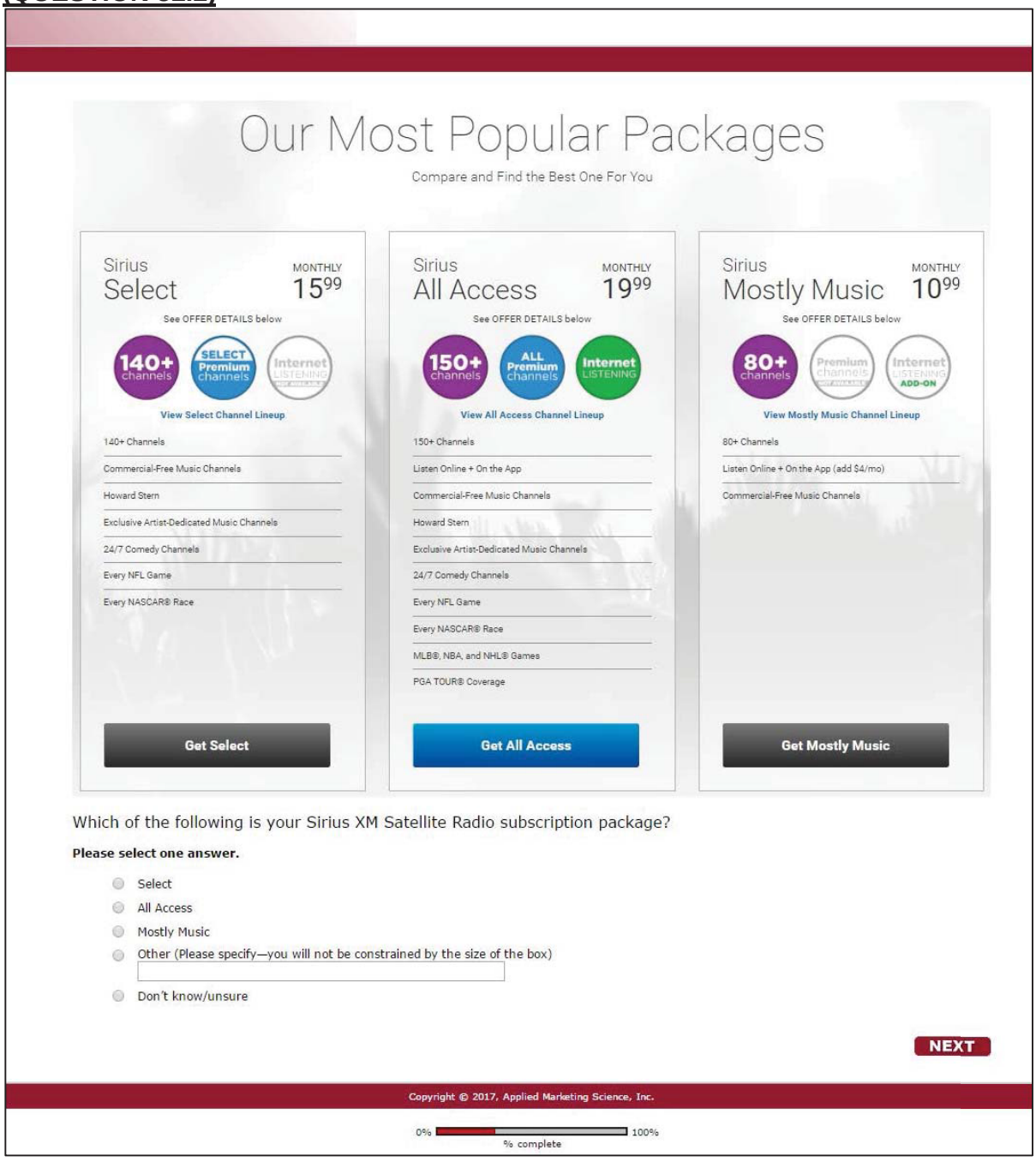
(QUESTION 52)



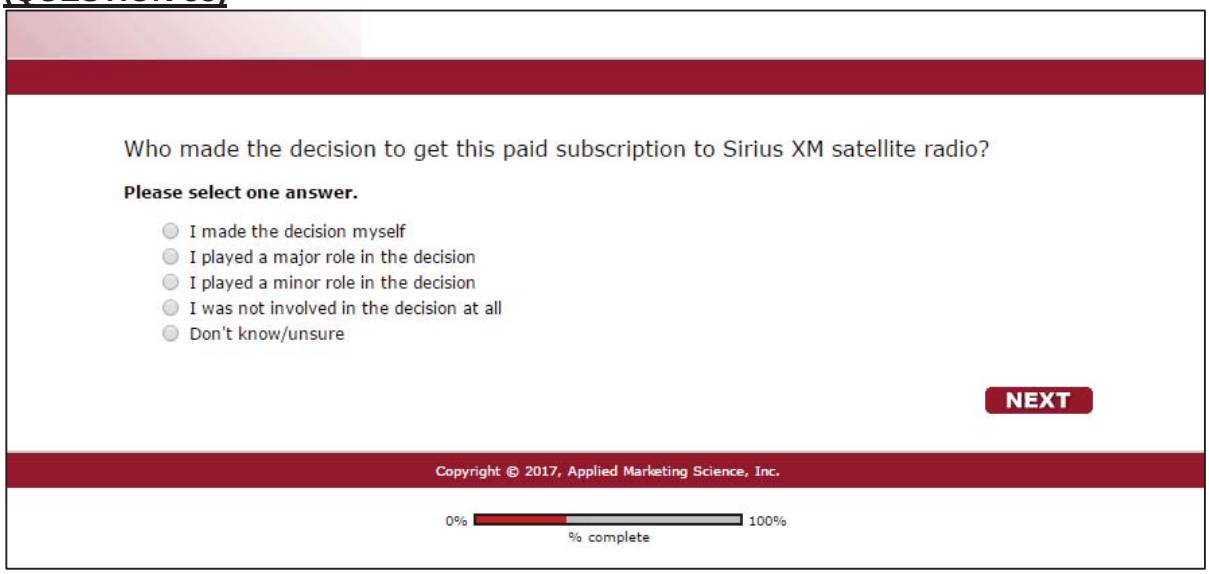
(QUESTION 52.1)



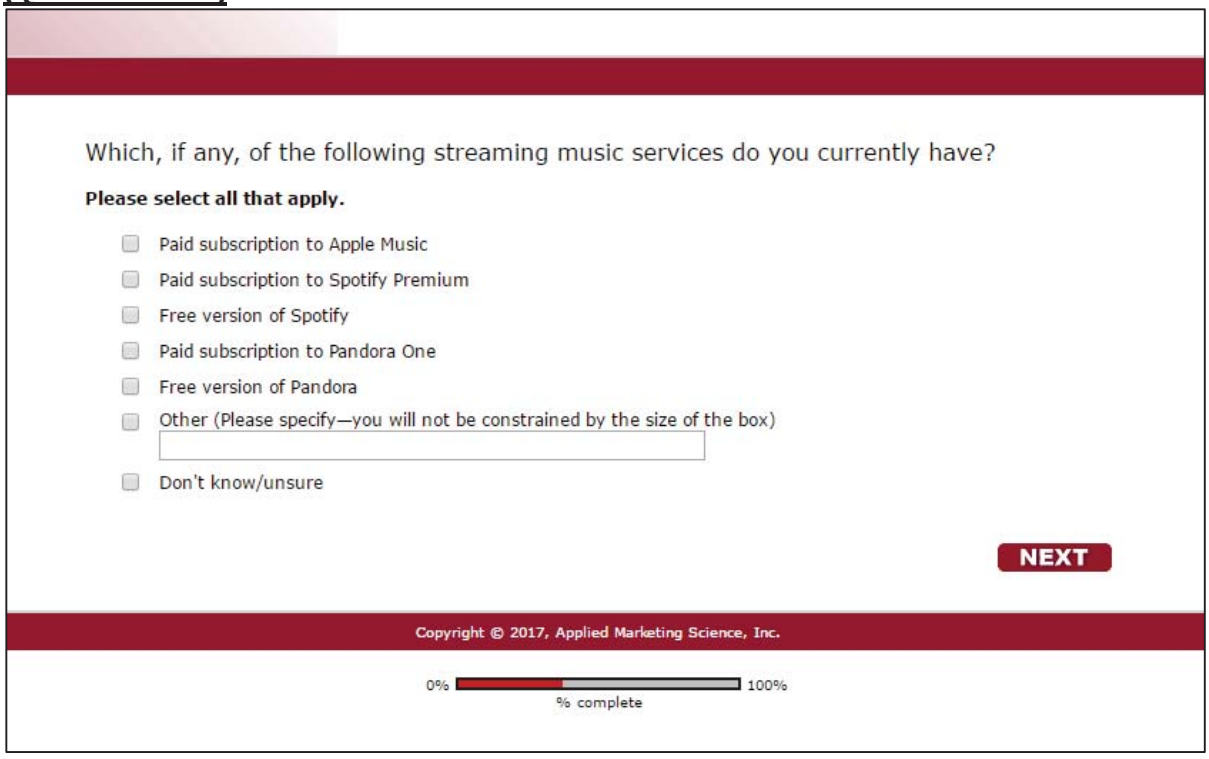
(QUESTION 52.2)



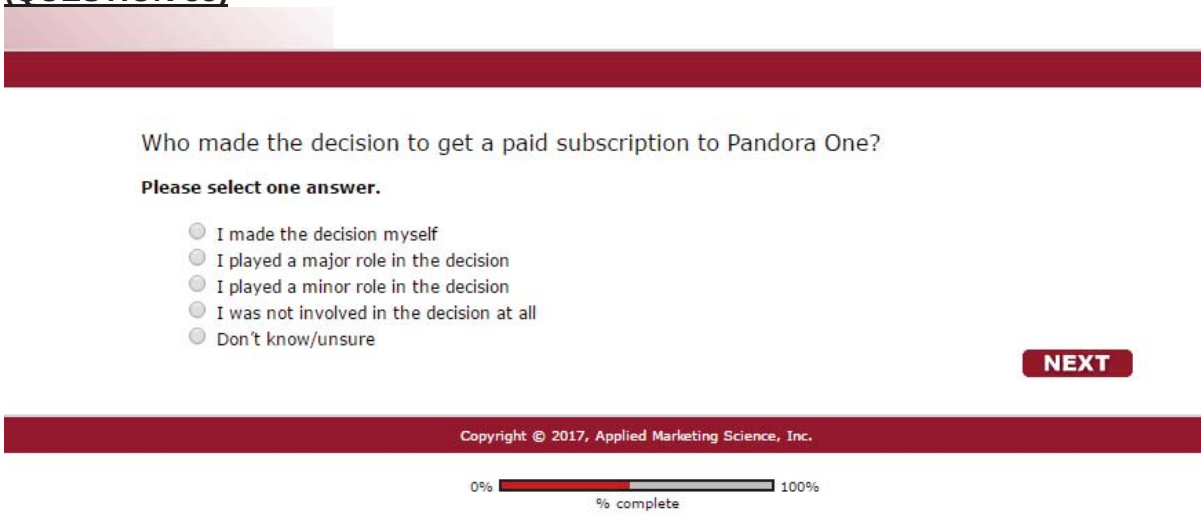
(QUESTION 53)



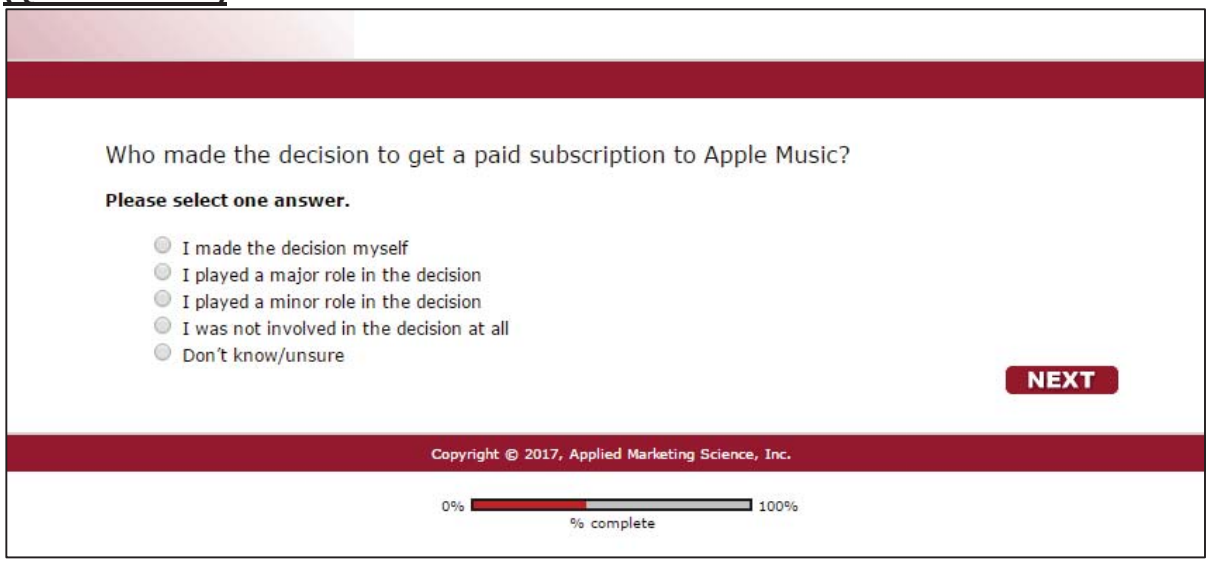
(QUESTION 54)



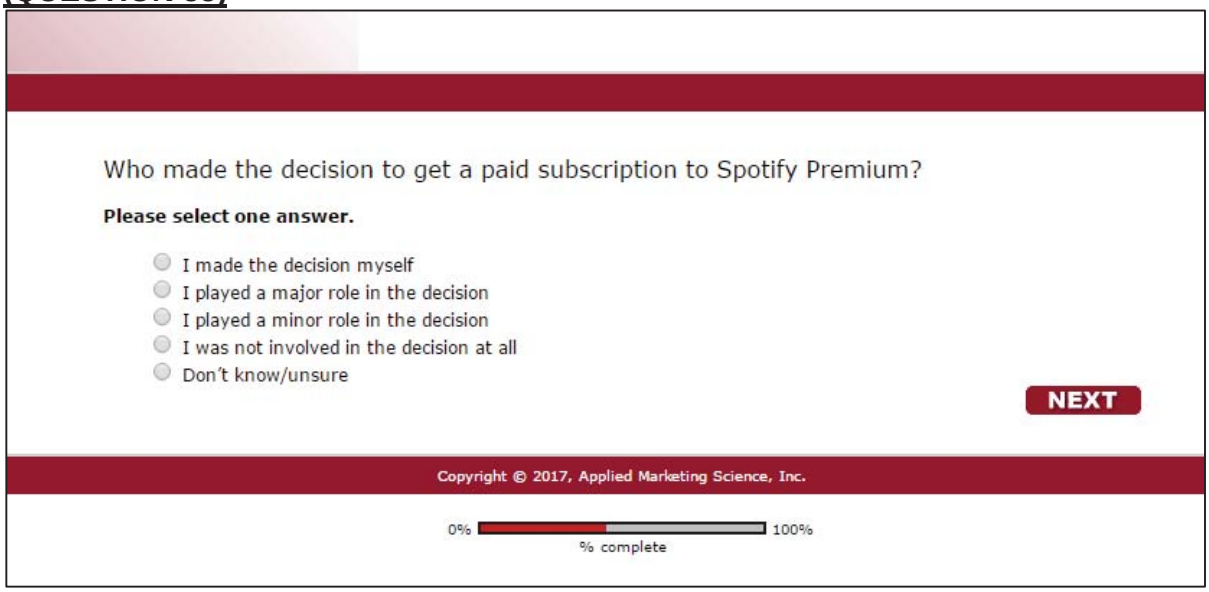
(QUESTION 55)



(QUESTION 55)

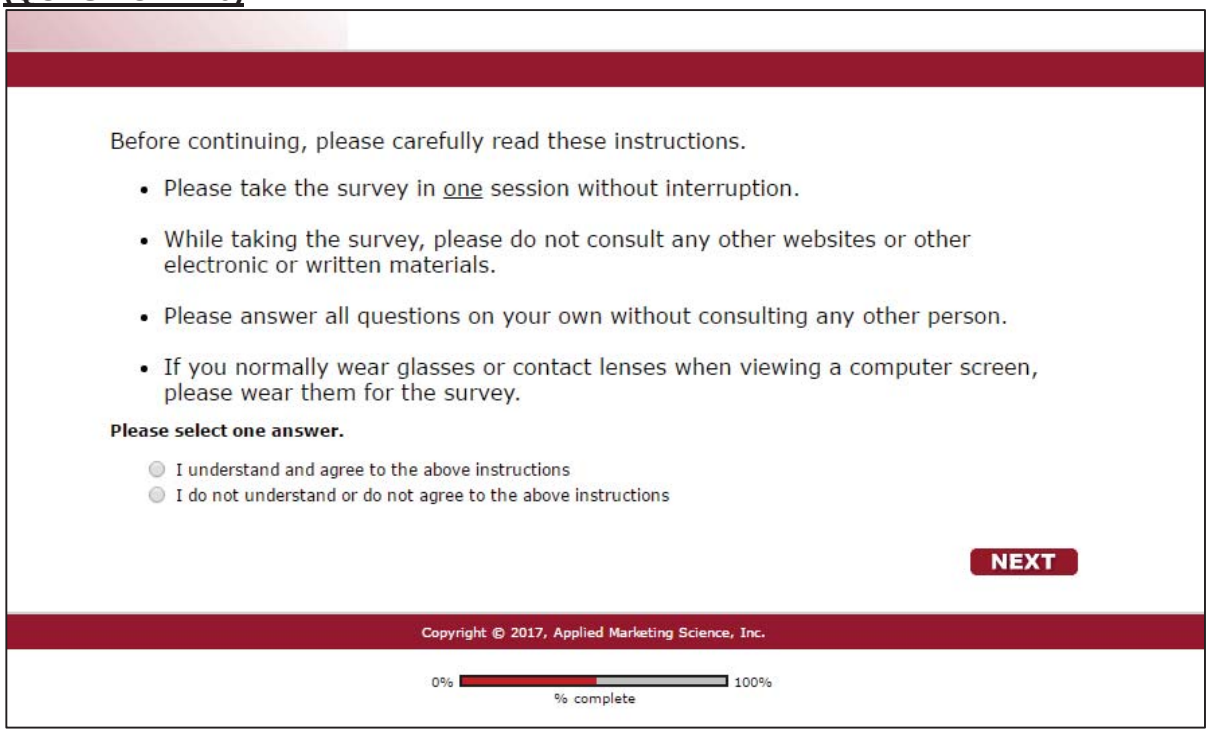


(QUESTION 55)

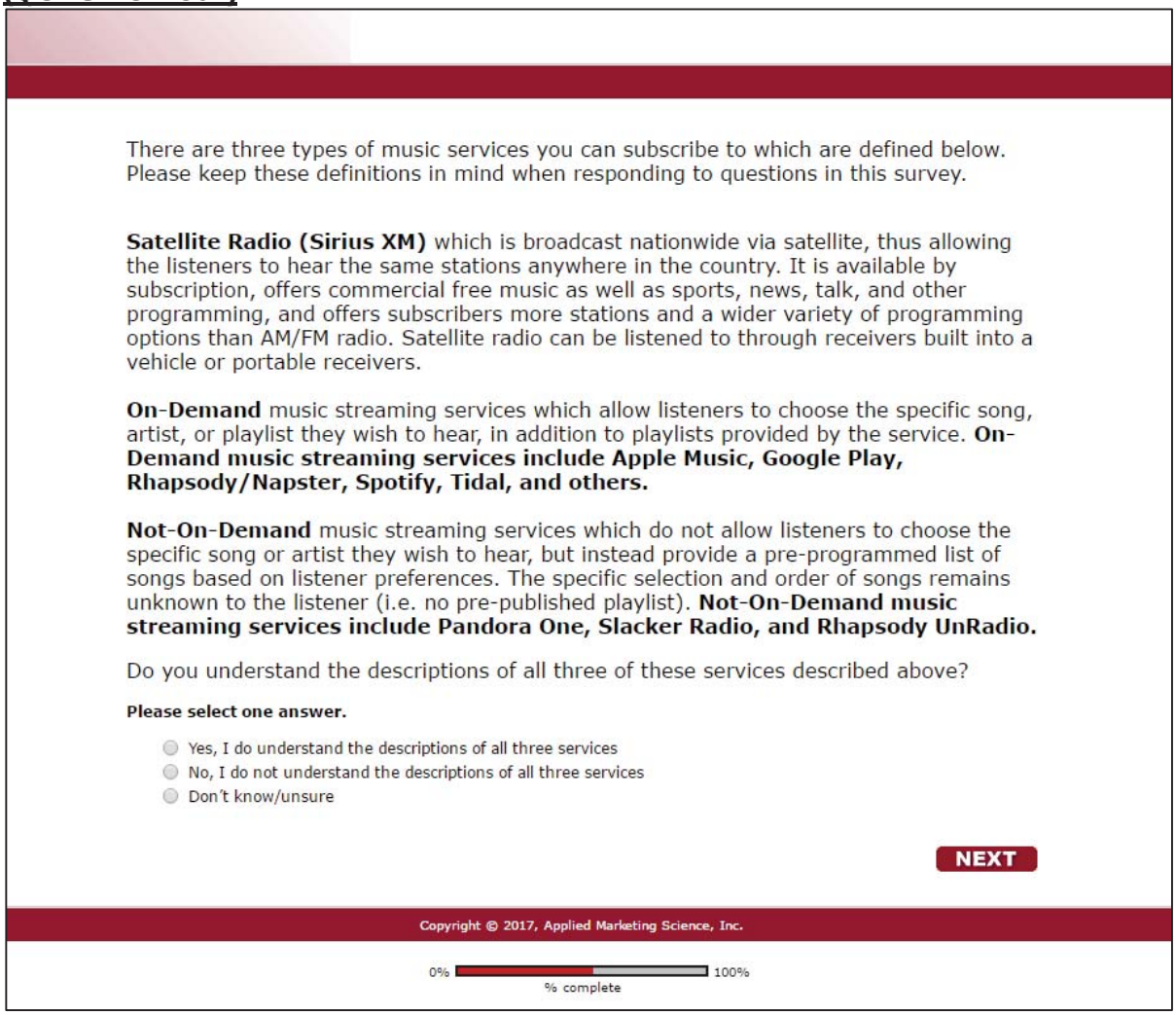


CELL 2: APPLE MUSIC

(QUESTION 140)



(QUESTION 301)



There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others.**

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.**

Do you understand the descriptions of all three of these services described above?

Please select one answer.

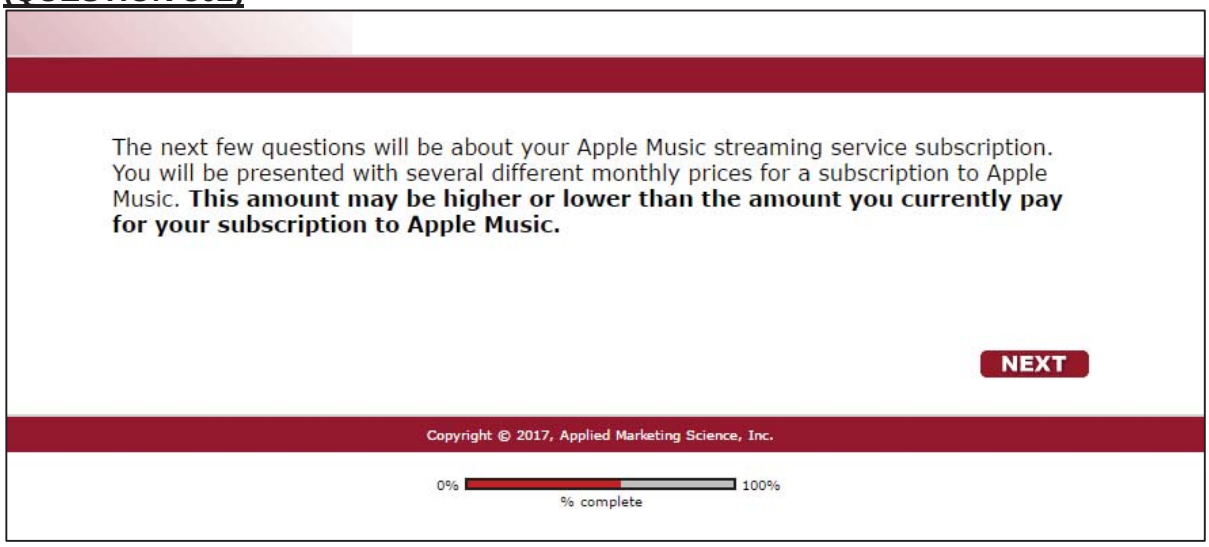
- Yes, I do understand the descriptions of all three services
- No, I do not understand the descriptions of all three services
- Don't know/unsure

NEXT

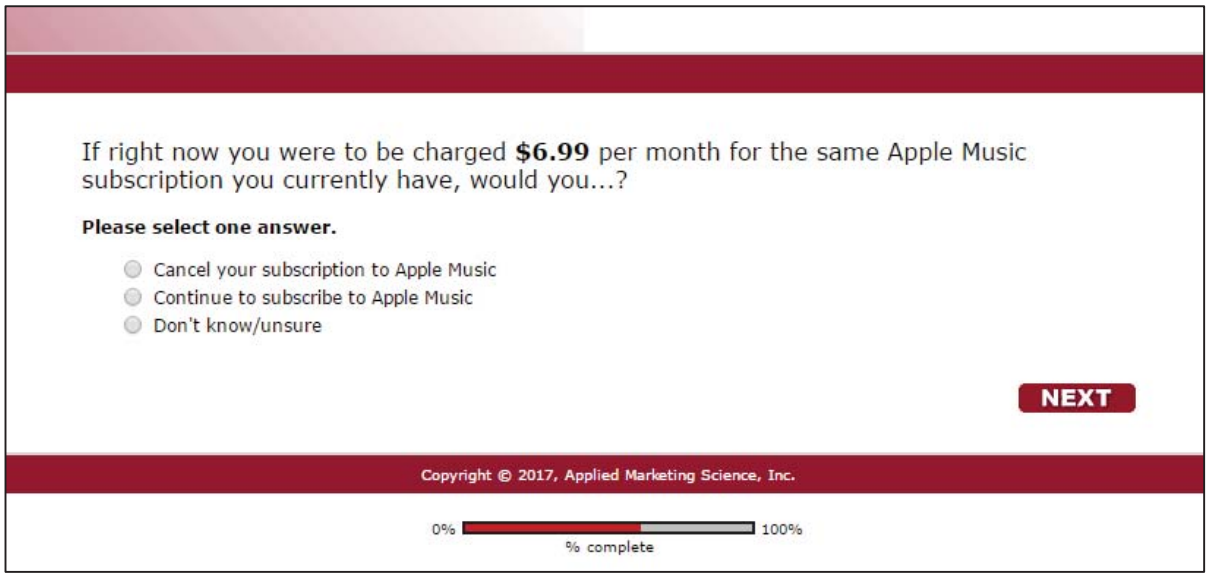
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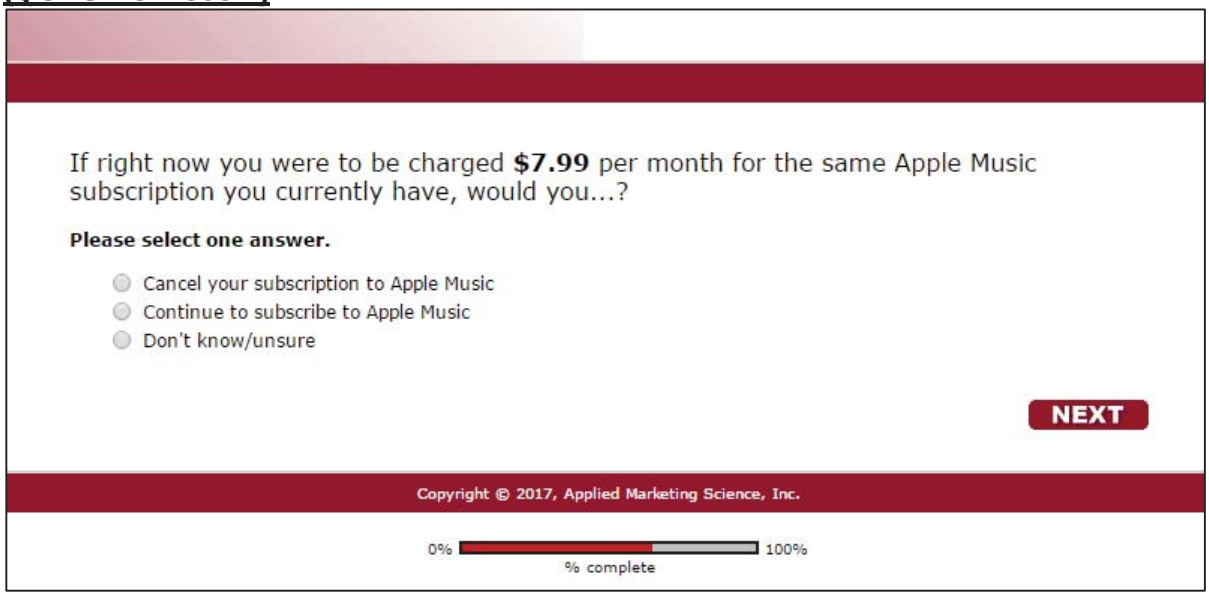
(QUESTION 302)



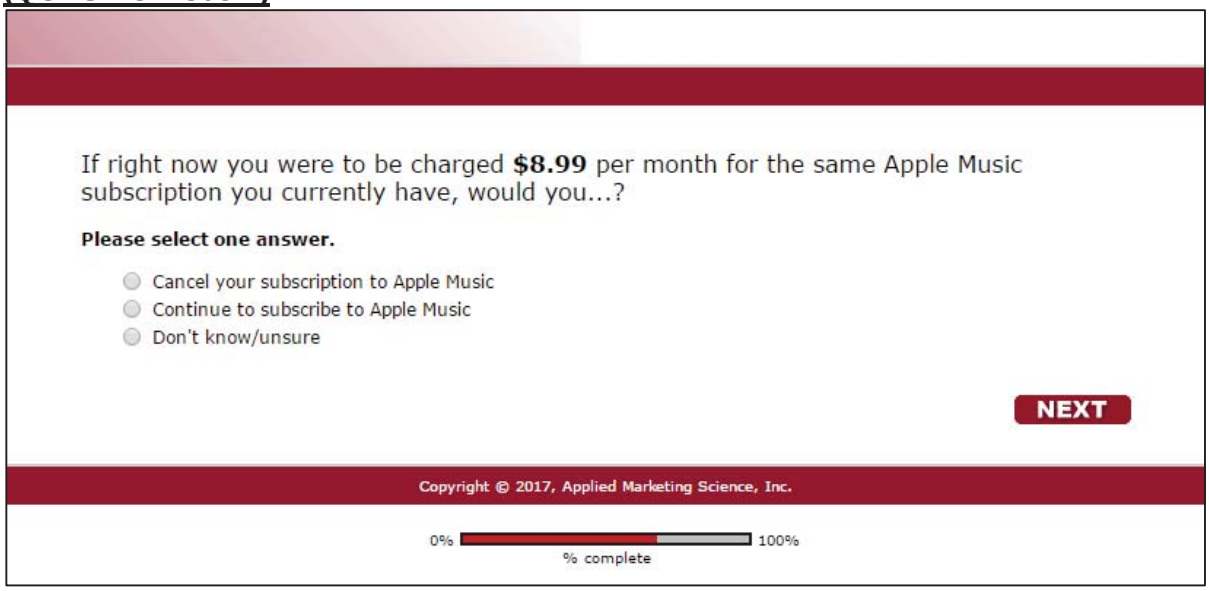
(QUESTION 303)



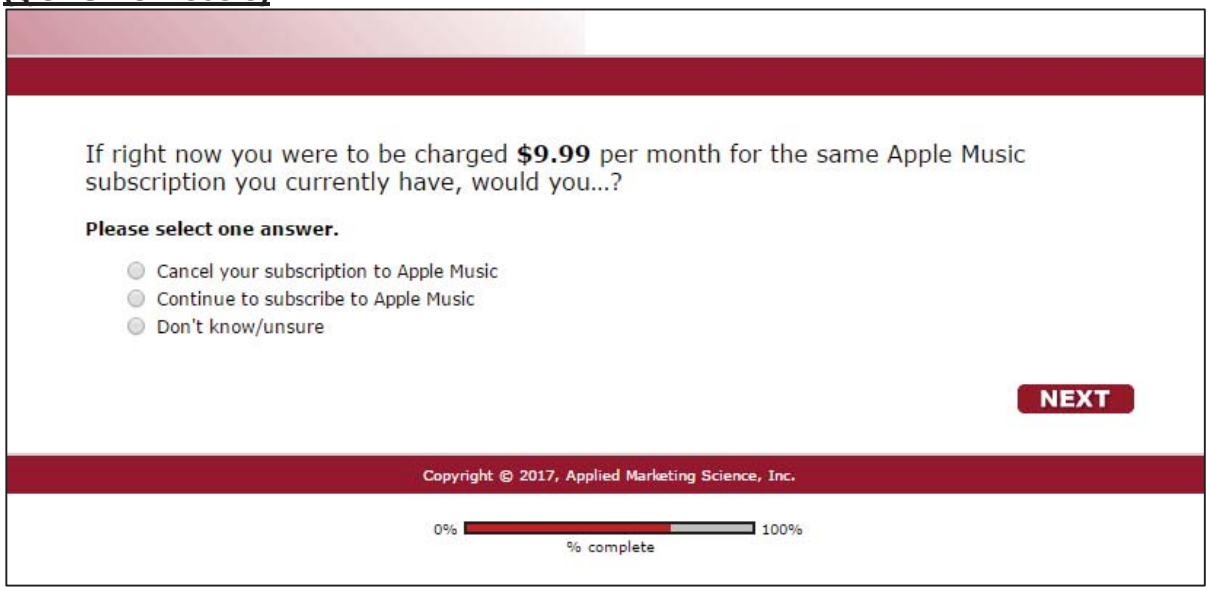
(QUESTION 303.1)



(QUESTION 303.2)



(QUESTION 303.3)



(QUESTION 303.4)



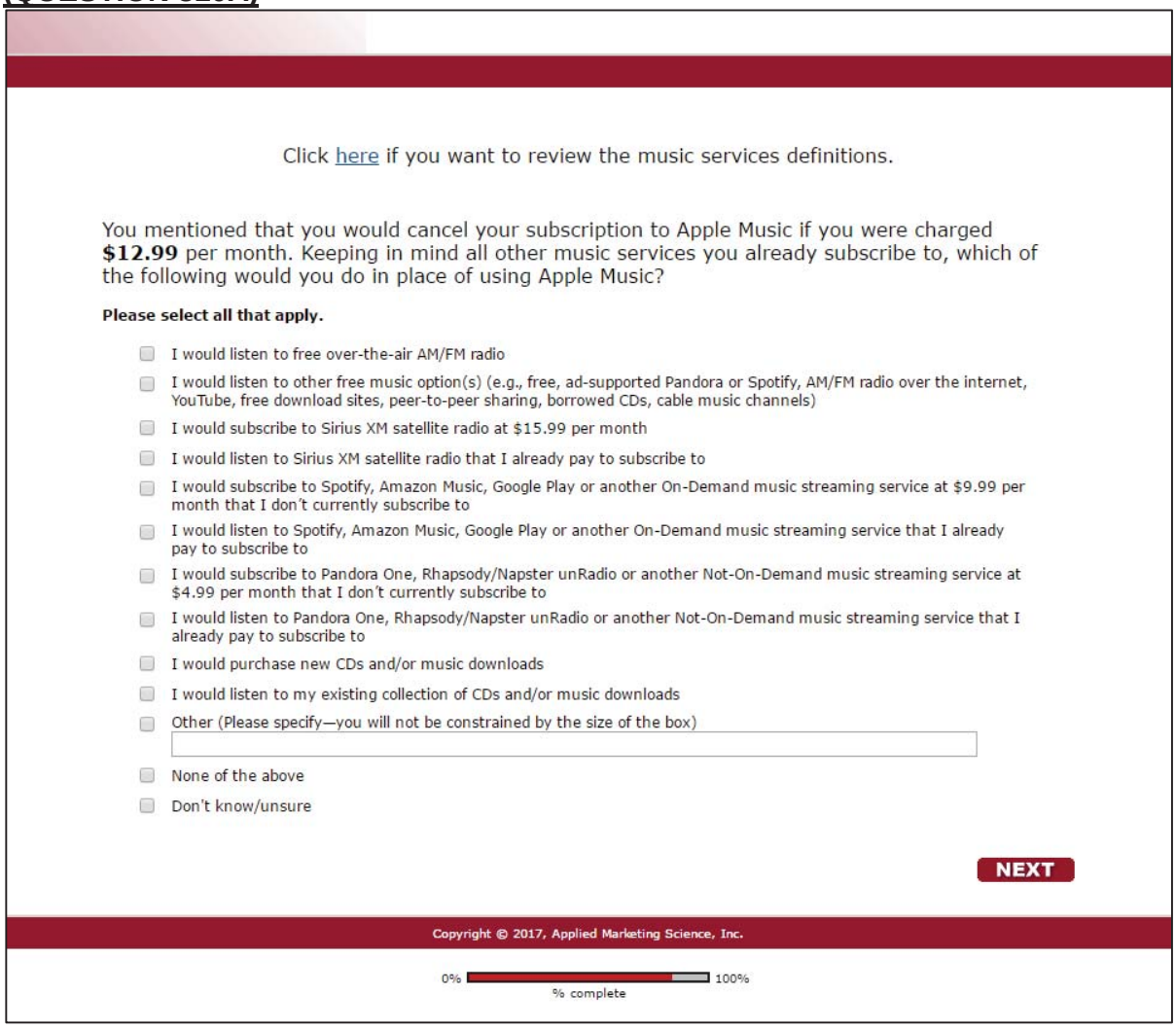
(QUESTION 303.5)



(QUESTION 303.6)



(QUESTION 310A)



Click here if you want to review the music services definitions.

You mentioned that you would cancel your subscription to Apple Music if you were charged **$12.99** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using Apple Music?

Please select all that apply.

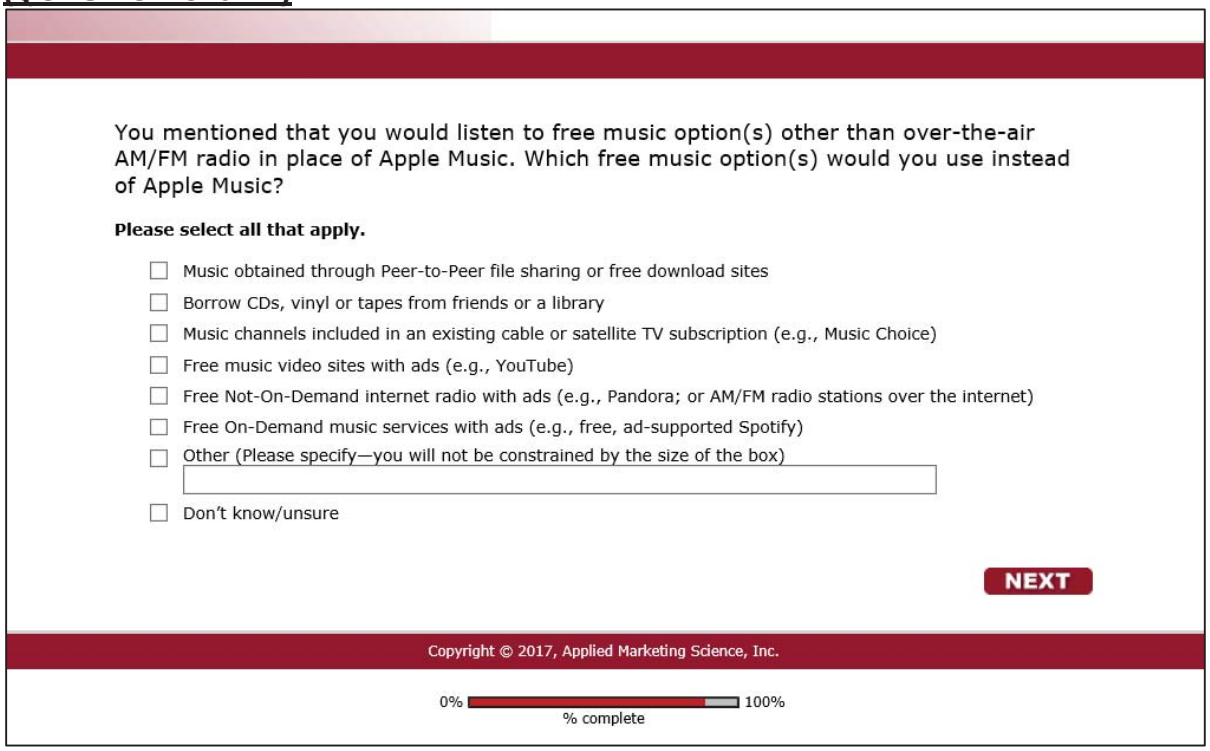
- ☐ I would listen to free over-the-air AM/FM radio
- ☐ I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels)
- ☐ I would subscribe to Sirius XM satellite radio at $15.99 per month
- ☐ I would listen to Sirius XM satellite radio that I already pay to subscribe to
- ☐ I would subscribe to Spotify, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to
- ☐ I would listen to Spotify, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to
- ☐ I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to
- ☐ I would purchase new CDs and/or music downloads
- ☐ I would listen to my existing collection of CDs and/or music downloads
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ None of the above
- ☐ Don't know/unsure

NEXT

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(QUESTION 310A.2)



You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of Apple Music. Which free music option(s) would you use instead of Apple Music?

Please select all that apply.

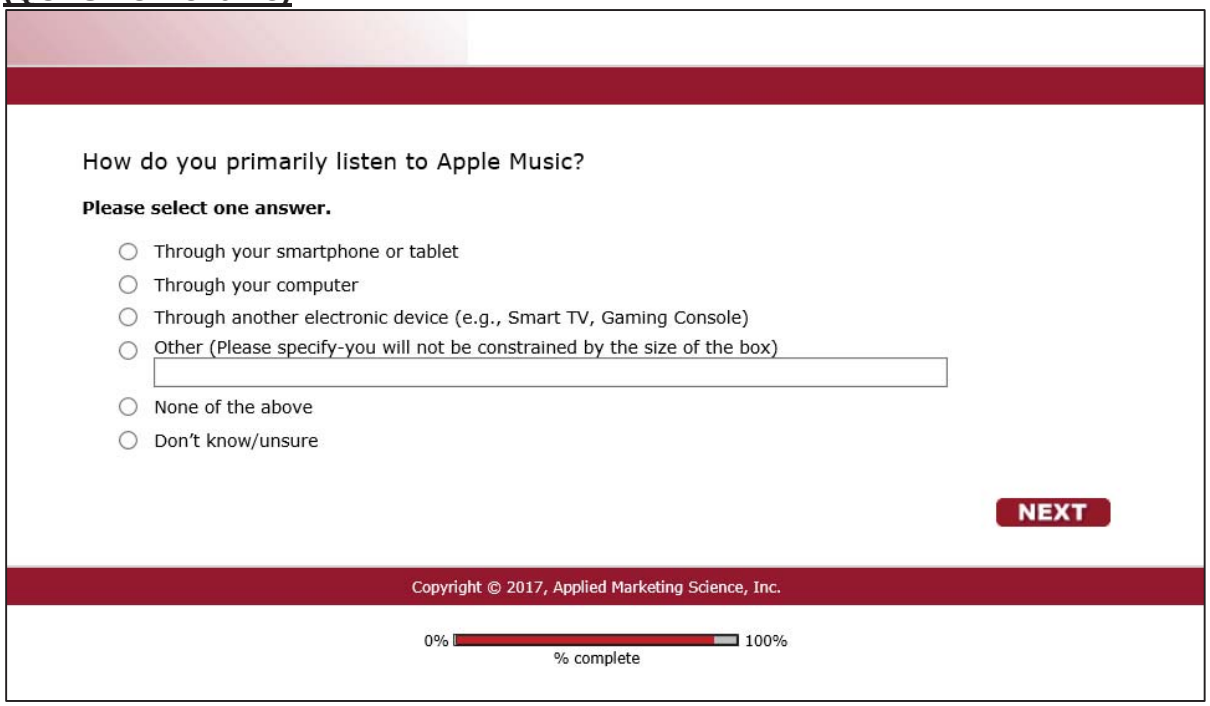
- ☐ Music obtained through Peer-to-Peer file sharing or free download sites
- ☐ Borrow CDs, vinyl or tapes from friends or a library
- ☐ Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
- ☐ Free music video sites with ads (e.g., YouTube)
- ☐ Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
- ☐ Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ Don't know/unsure

NEXT

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(QUESTION 310A.3)



How do you primarily listen to Apple Music?

Please select one answer.

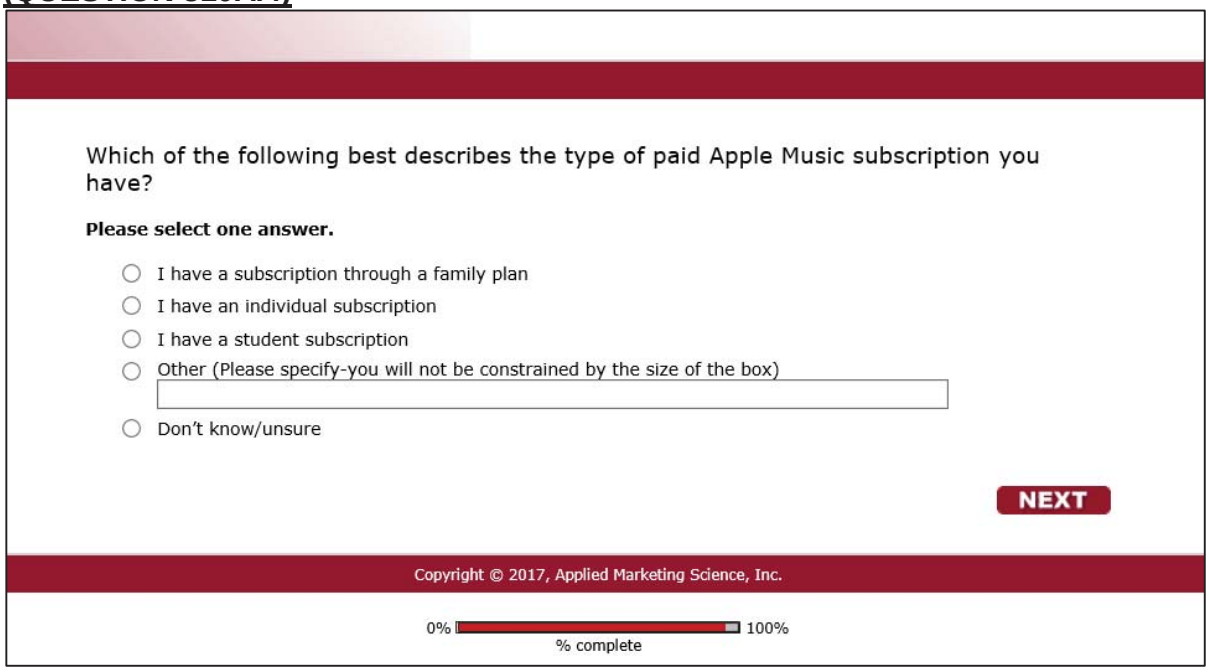
- ○ Through your smartphone or tablet
- ○ Through your computer
- ○ Through another electronic device (e.g., Smart TV, Gaming Console)
- ○ Other (Please specify-you will not be constrained by the size of the box)
- ○ None of the above
- ○ Don't know/unsure

NEXT

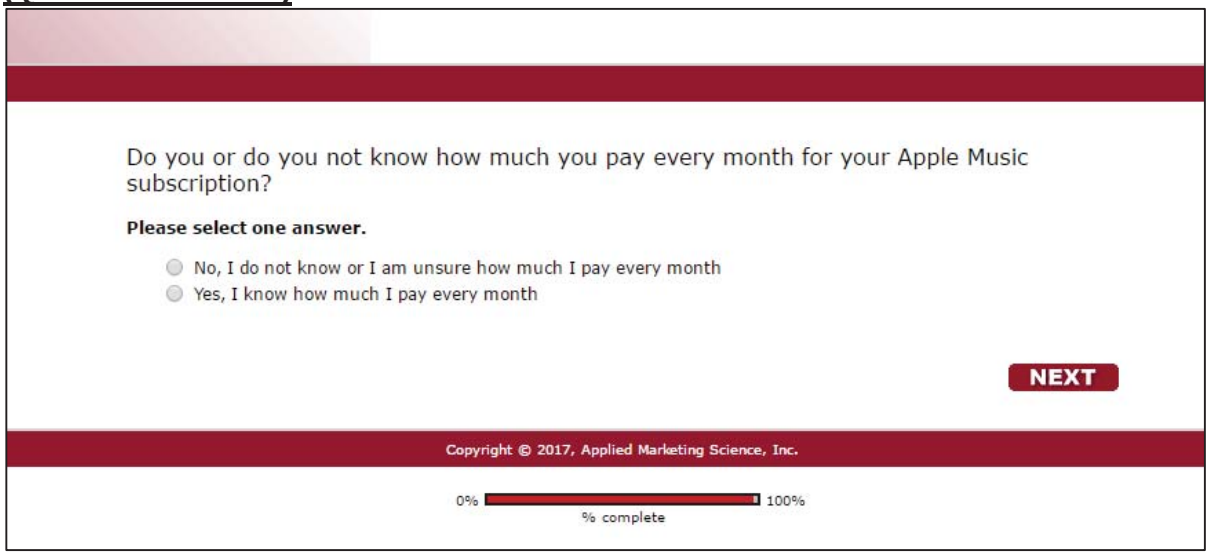
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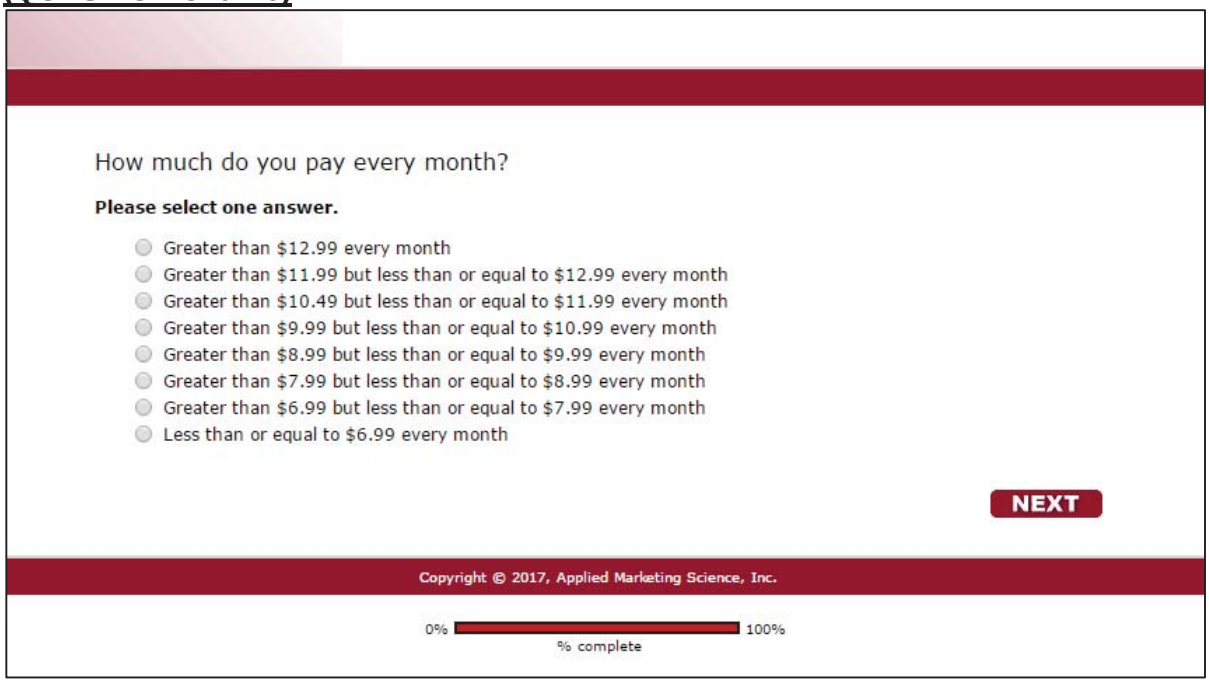
(QUESTION 310A.4)



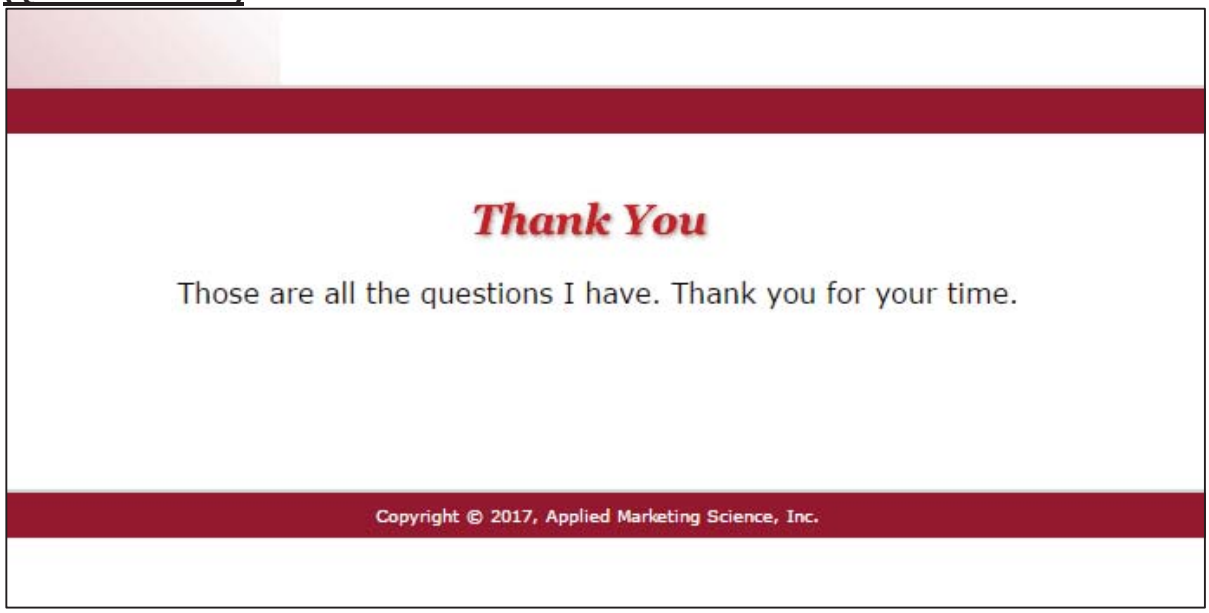
(QUESTION 310A.5)



(QUESTION 310A.6)

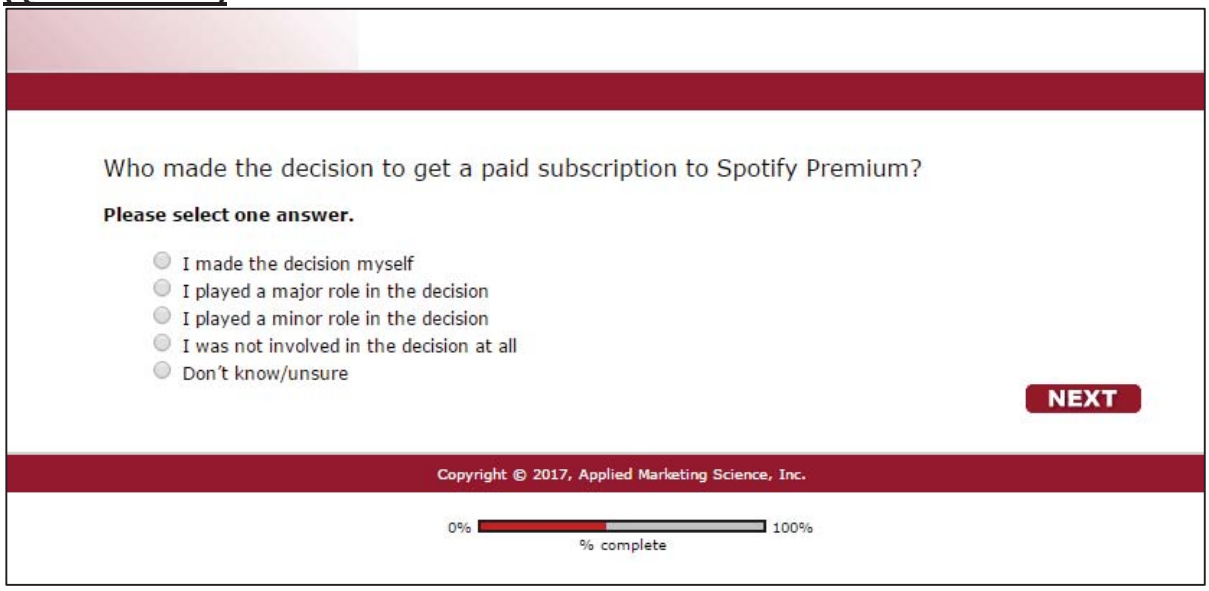


(QUESTION 320)

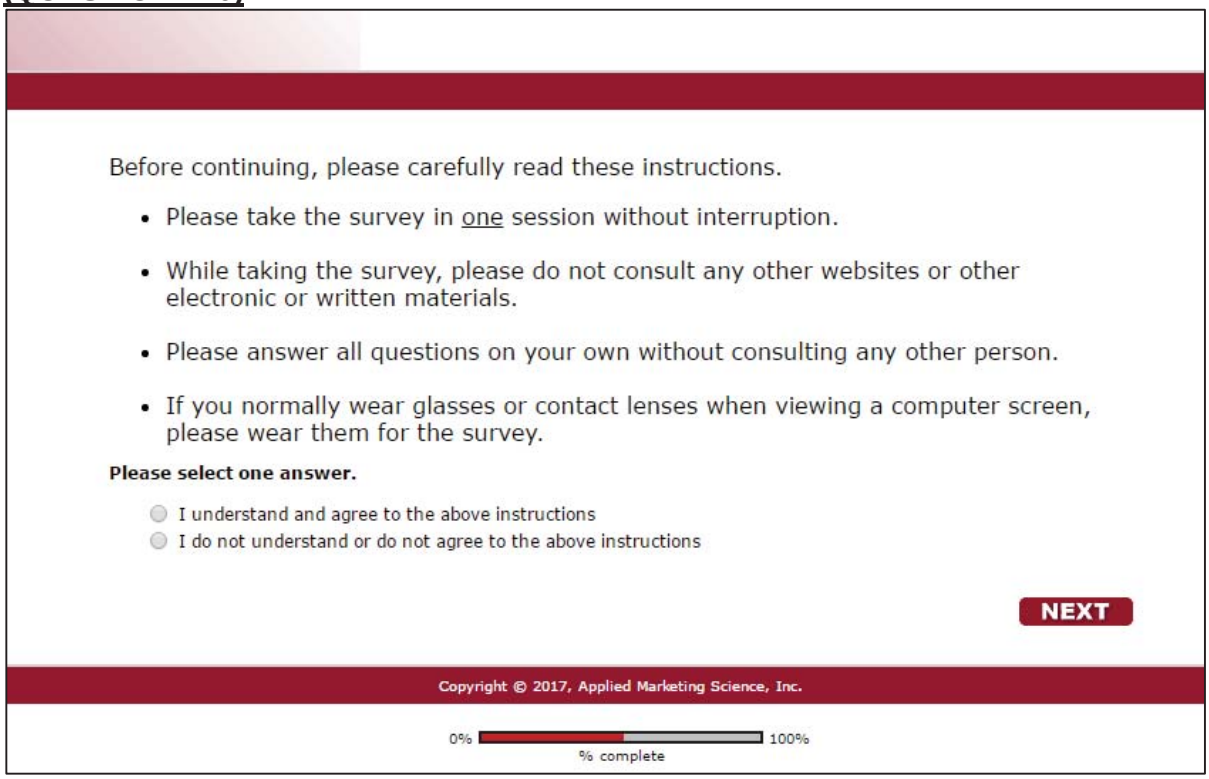


CELL 4: SPOTIFY PREMIUM

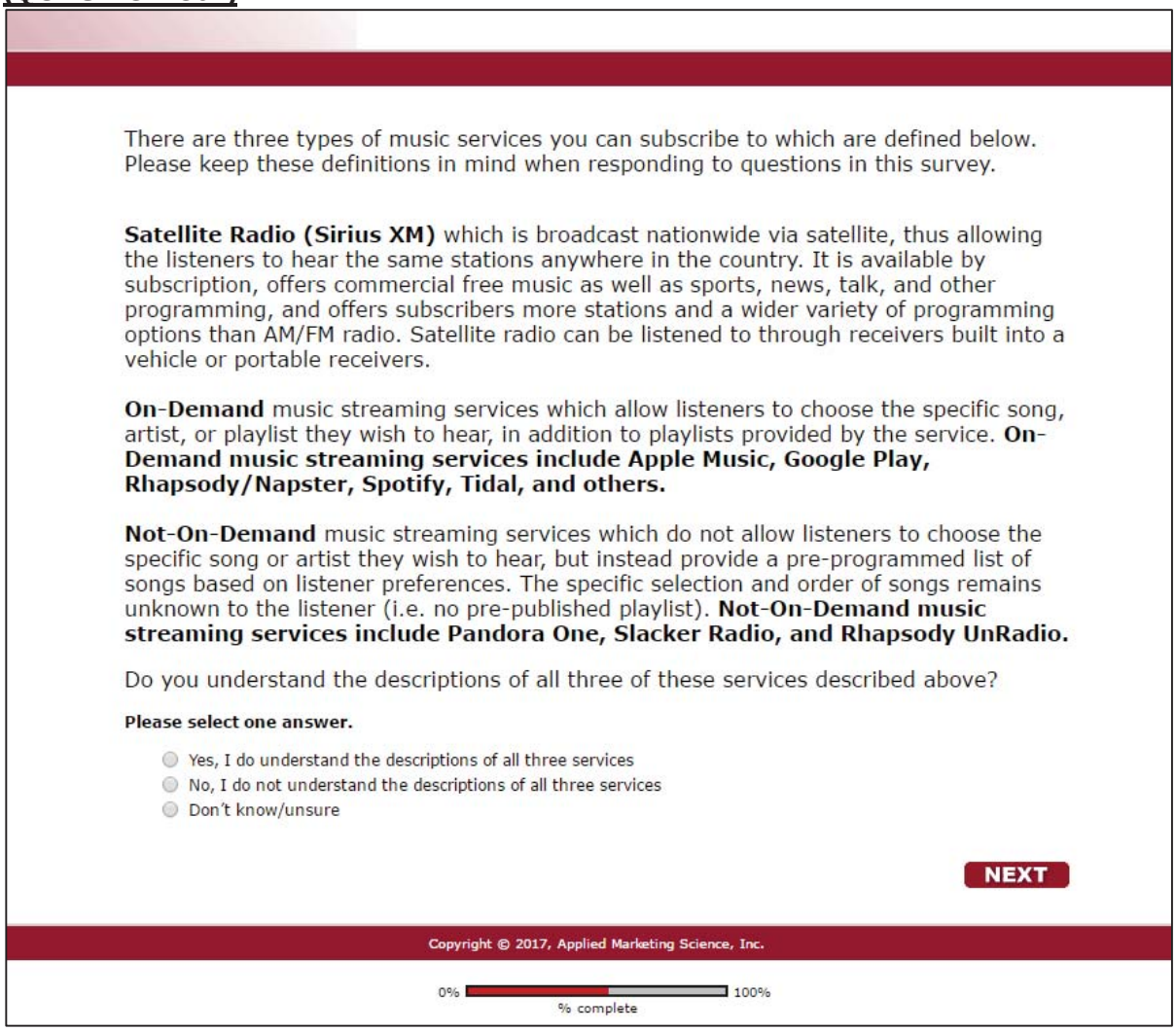
(QUESTION 55)



(QUESTION 140)



(QUESTION 301)



There are three types of music services you can subscribe to which are defined below. Please keep these definitions in mind when responding to questions in this survey.

Satellite Radio (Sirius XM) which is broadcast nationwide via satellite, thus allowing the listeners to hear the same stations anywhere in the country. It is available by subscription, offers commercial free music as well as sports, news, talk, and other programming, and offers subscribers more stations and a wider variety of programming options than AM/FM radio. Satellite radio can be listened to through receivers built into a vehicle or portable receivers.

On-Demand music streaming services which allow listeners to choose the specific song, artist, or playlist they wish to hear, in addition to playlists provided by the service. **On-Demand music streaming services include Apple Music, Google Play, Rhapsody/Napster, Spotify, Tidal, and others.**

Not-On-Demand music streaming services which do not allow listeners to choose the specific song or artist they wish to hear, but instead provide a pre-programmed list of songs based on listener preferences. The specific selection and order of songs remains unknown to the listener (i.e. no pre-published playlist). **Not-On-Demand music streaming services include Pandora One, Slacker Radio, and Rhapsody UnRadio.**

Do you understand the descriptions of all three of these services described above?

Please select one answer.

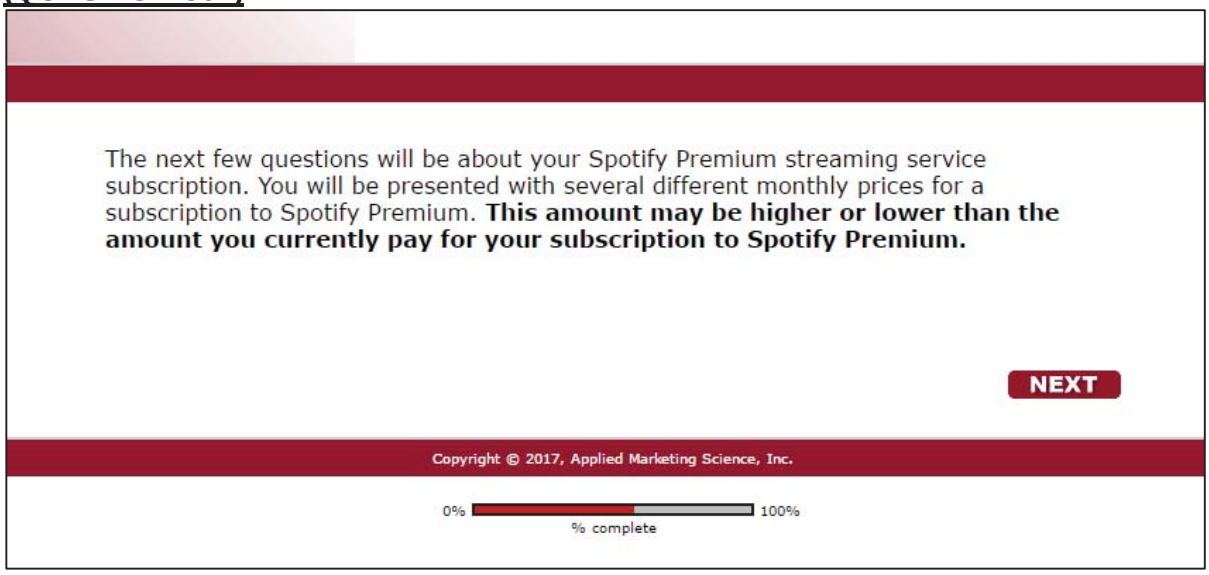
- Yes, I do understand the descriptions of all three services
- No, I do not understand the descriptions of all three services
- Don't know/unsure

NEXT

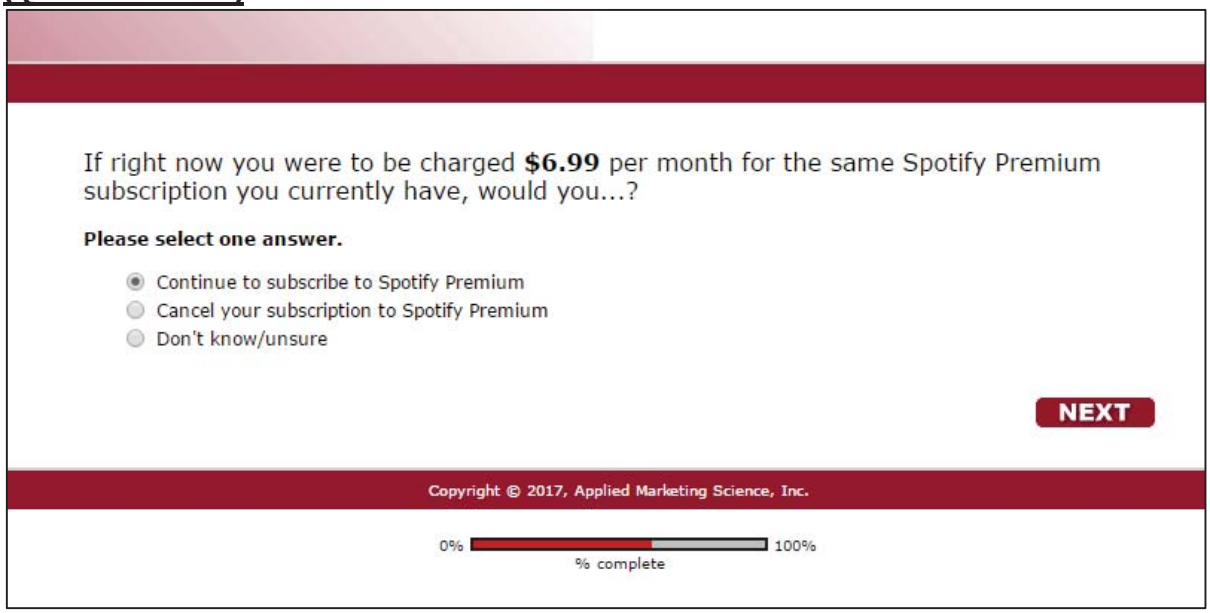
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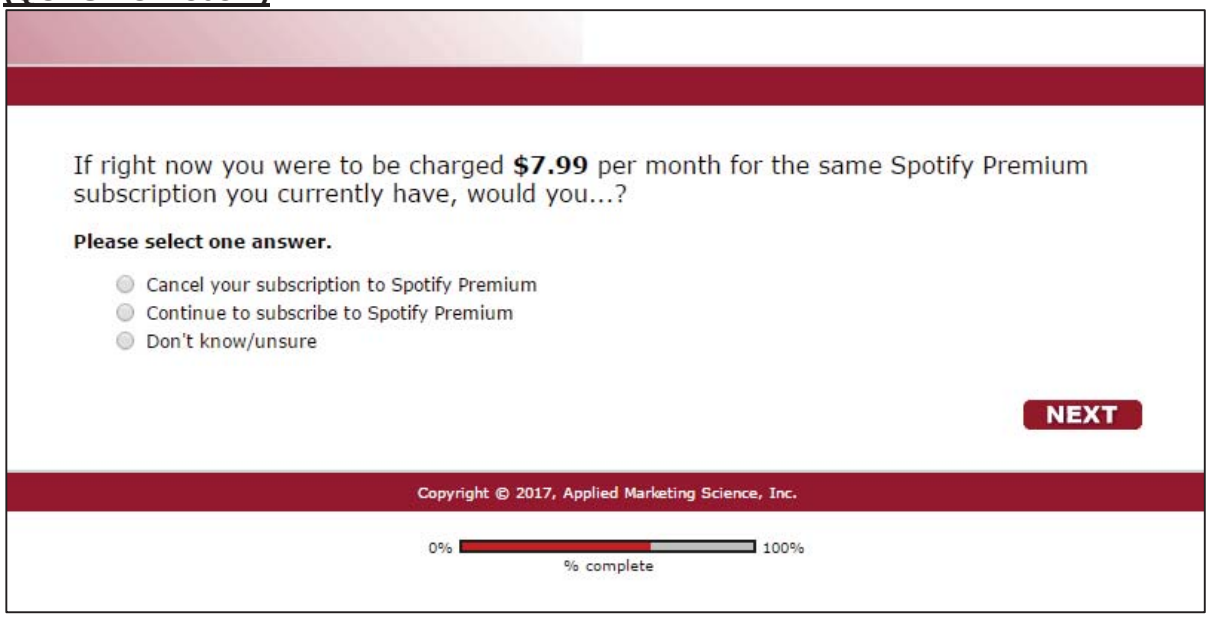
(QUESTION 302)



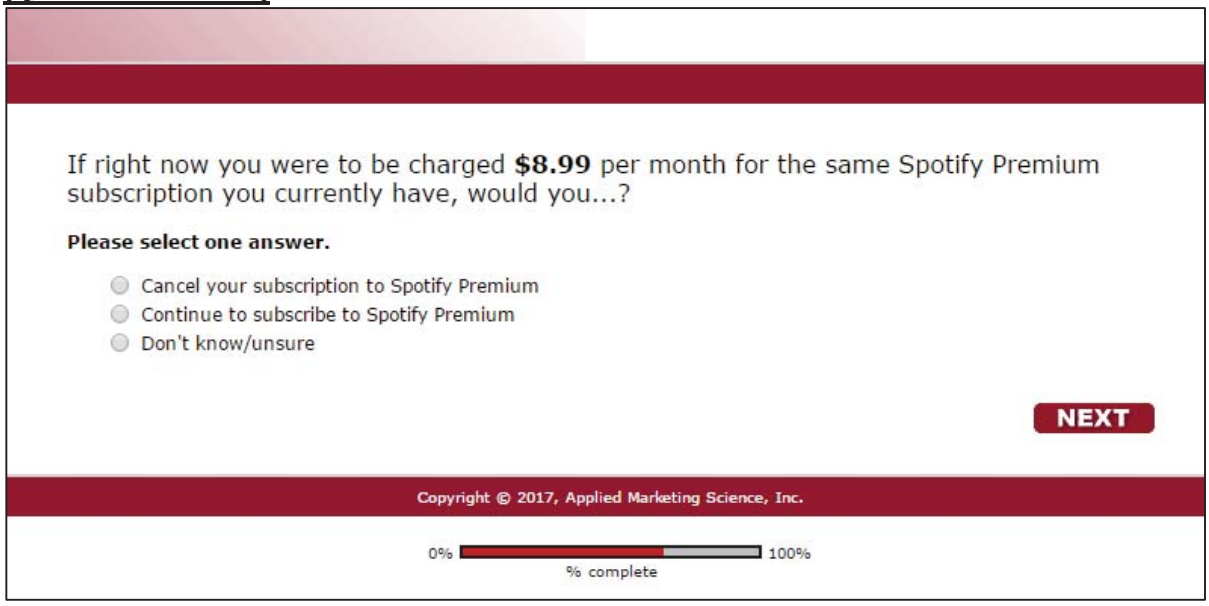
(QUESTION 303)



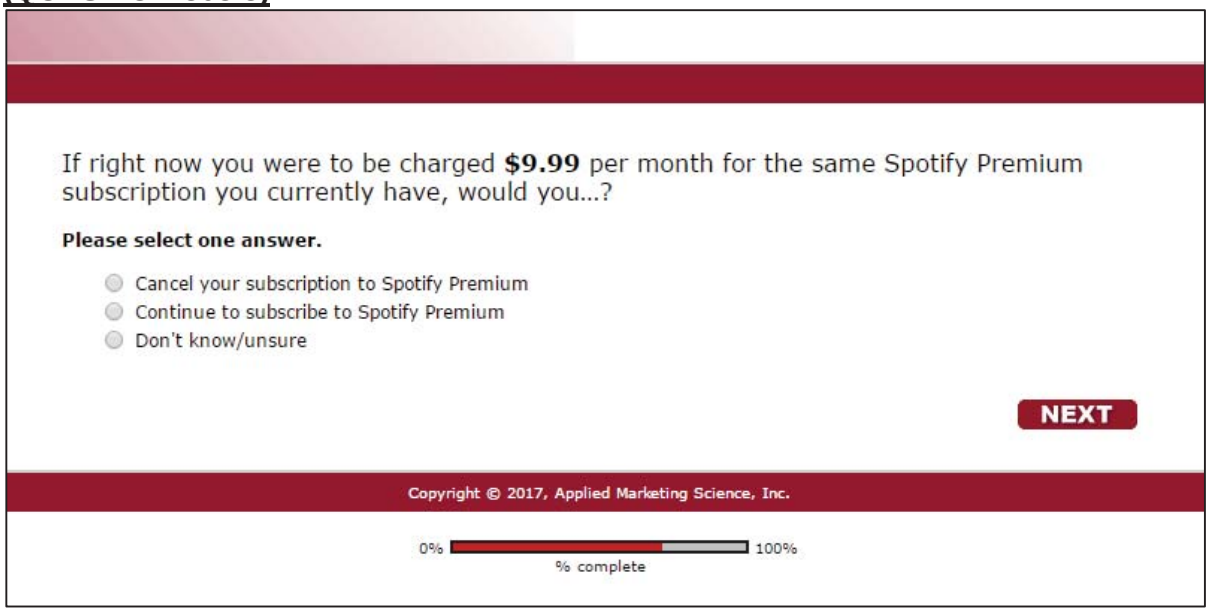
(QUESTION 303.1)



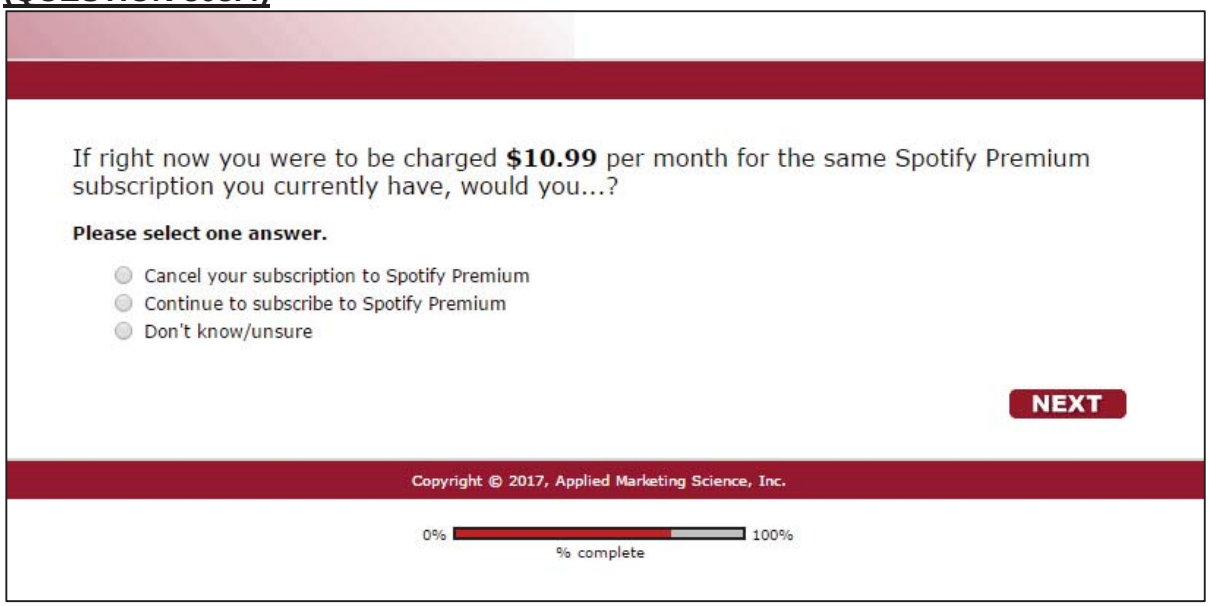
(QUESTION 303.2)



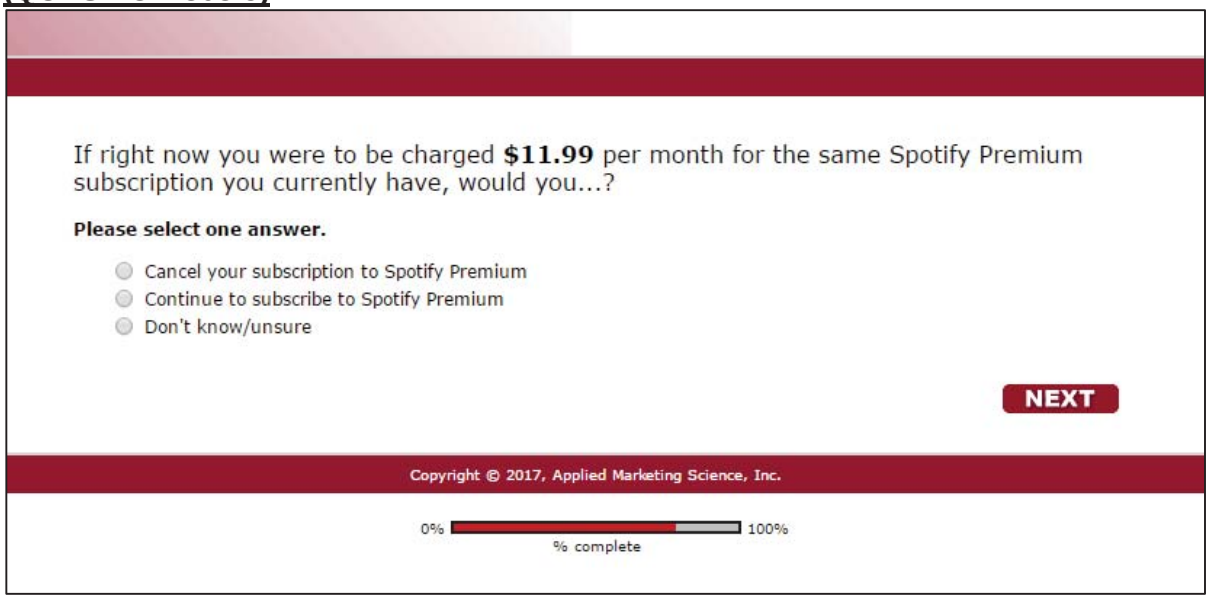
(QUESTION 303.3)



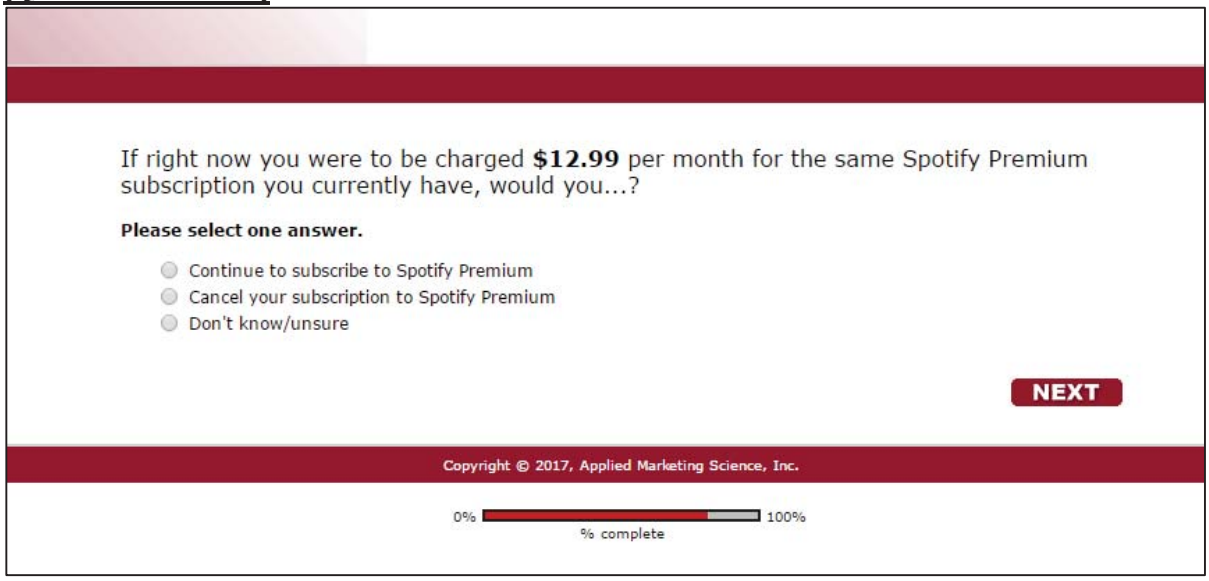
(QUESTION 303.4)



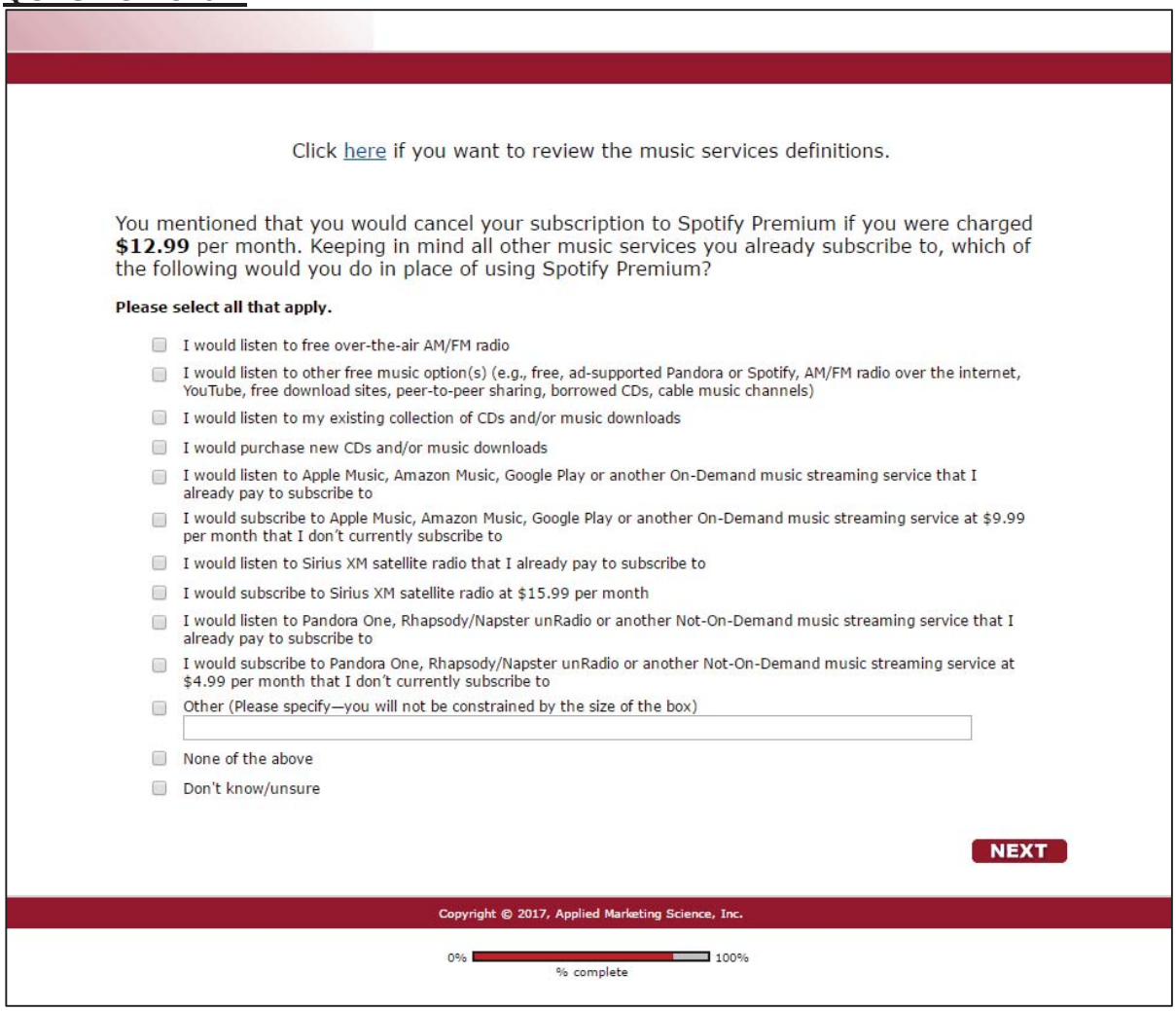
(QUESTION 303.5)



(QUESTION 303.6)



QUESTION 310.B



Click here if you want to review the music services definitions.

You mentioned that you would cancel your subscription to Spotify Premium if you were charged **$12.99** per month. Keeping in mind all other music services you already subscribe to, which of the following would you do in place of using Spotify Premium?

Please select all that apply.

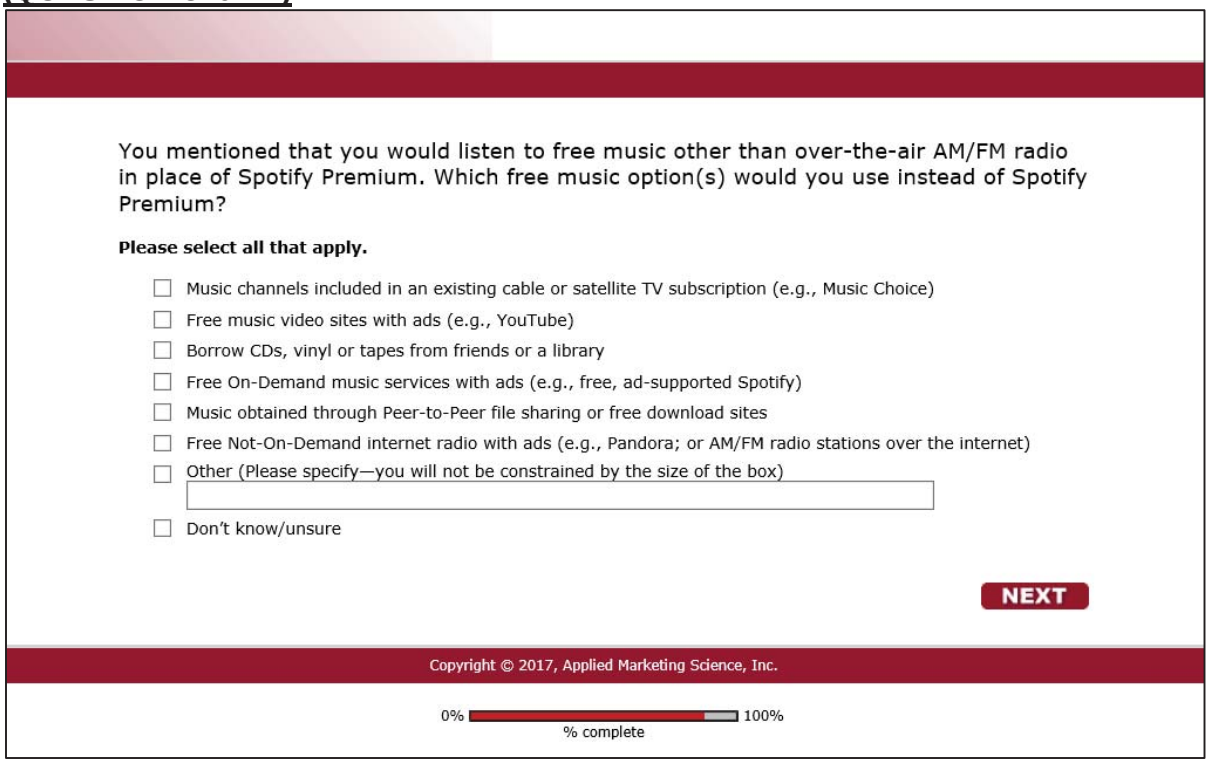
- ☐ I would listen to free over-the-air AM/FM radio
- ☐ I would listen to other free music option(s) (e.g., free, ad-supported Pandora or Spotify, AM/FM radio over the internet, YouTube, free download sites, peer-to-peer sharing, borrowed CDs, cable music channels)
- ☐ I would listen to my existing collection of CDs and/or music downloads
- ☐ I would purchase new CDs and/or music downloads
- ☐ I would listen to Apple Music, Amazon Music, Google Play or another On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Apple Music, Amazon Music, Google Play or another On-Demand music streaming service at $9.99 per month that I don't currently subscribe to
- ☐ I would listen to Sirius XM satellite radio that I already pay to subscribe to
- ☐ I would subscribe to Sirius XM satellite radio at $15.99 per month
- ☐ I would listen to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service that I already pay to subscribe to
- ☐ I would subscribe to Pandora One, Rhapsody/Napster unRadio or another Not-On-Demand music streaming service at $4.99 per month that I don't currently subscribe to
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ None of the above
- ☐ Don't know/unsure

NEXT

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(QUESTION 310B.2)



You mentioned that you would listen to free music other than over-the-air AM/FM radio in place of Spotify Premium. Which free music option(s) would you use instead of Spotify Premium?

Please select all that apply.

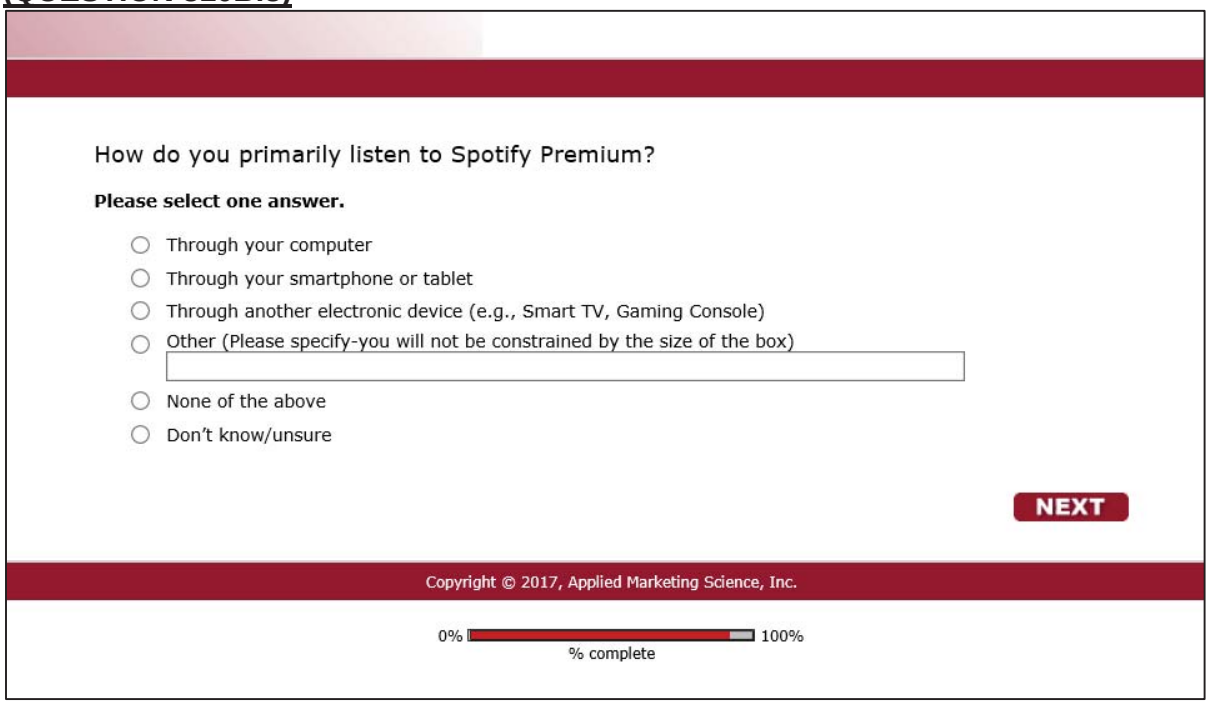
- ☐ Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
- ☐ Free music video sites with ads (e.g., YouTube)
- ☐ Borrow CDs, vinyl or tapes from friends or a library
- ☐ Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
- ☐ Music obtained through Peer-to-Peer file sharing or free download sites
- ☐ Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
- ☐ Other (Please specify—you will not be constrained by the size of the box)
- ☐ Don't know/unsure

NEXT

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(QUESTION 310B.3)



How do you primarily listen to Spotify Premium?

Please select one answer.

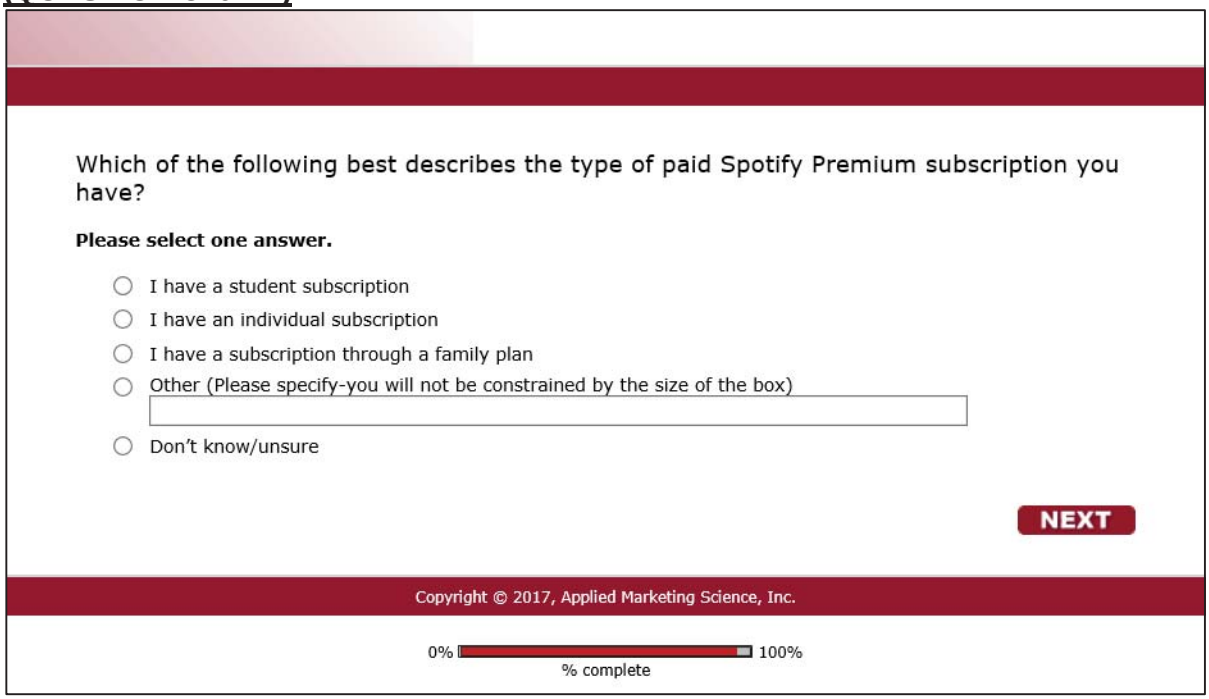
- ○ Through your computer
- ○ Through your smartphone or tablet
- ○ Through another electronic device (e.g., Smart TV, Gaming Console)
- ○ Other (Please specify-you will not be constrained by the size of the box)
- ○ None of the above
- ○ Don't know/unsure

NEXT

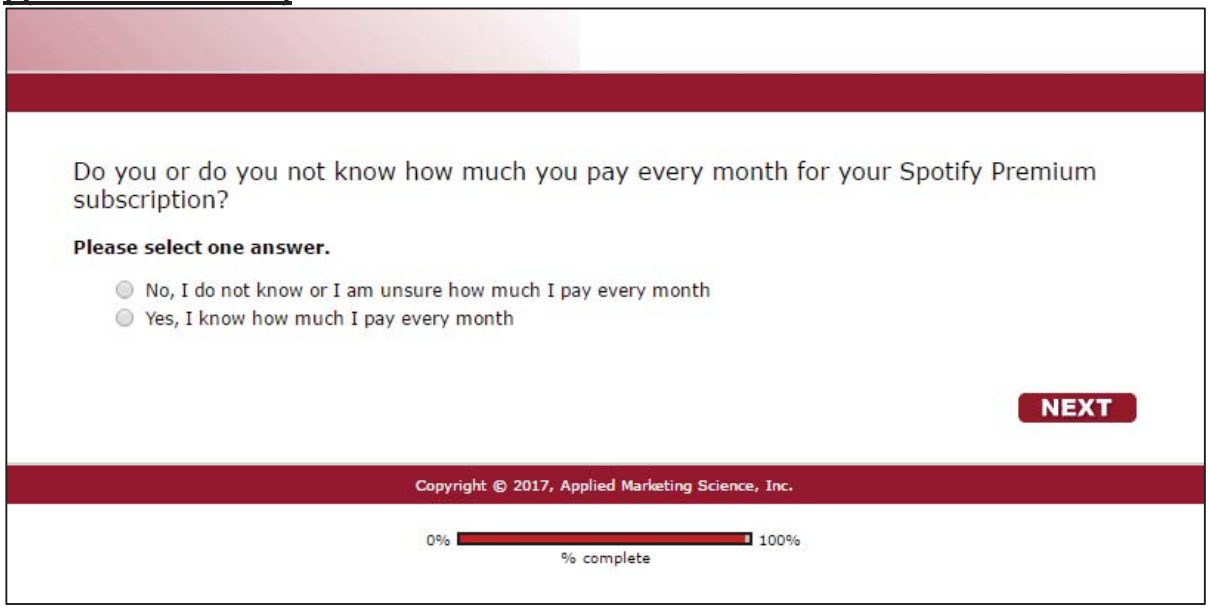
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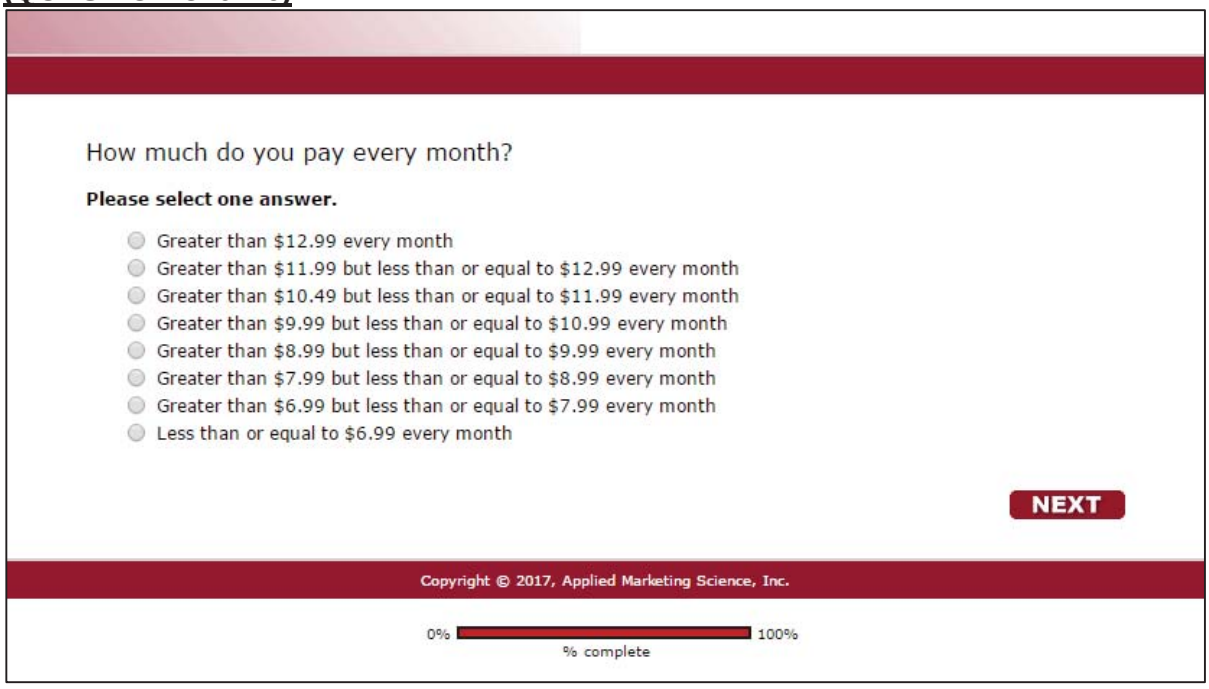
(QUESTION 310B.4)



(QUESTION 310B.5)

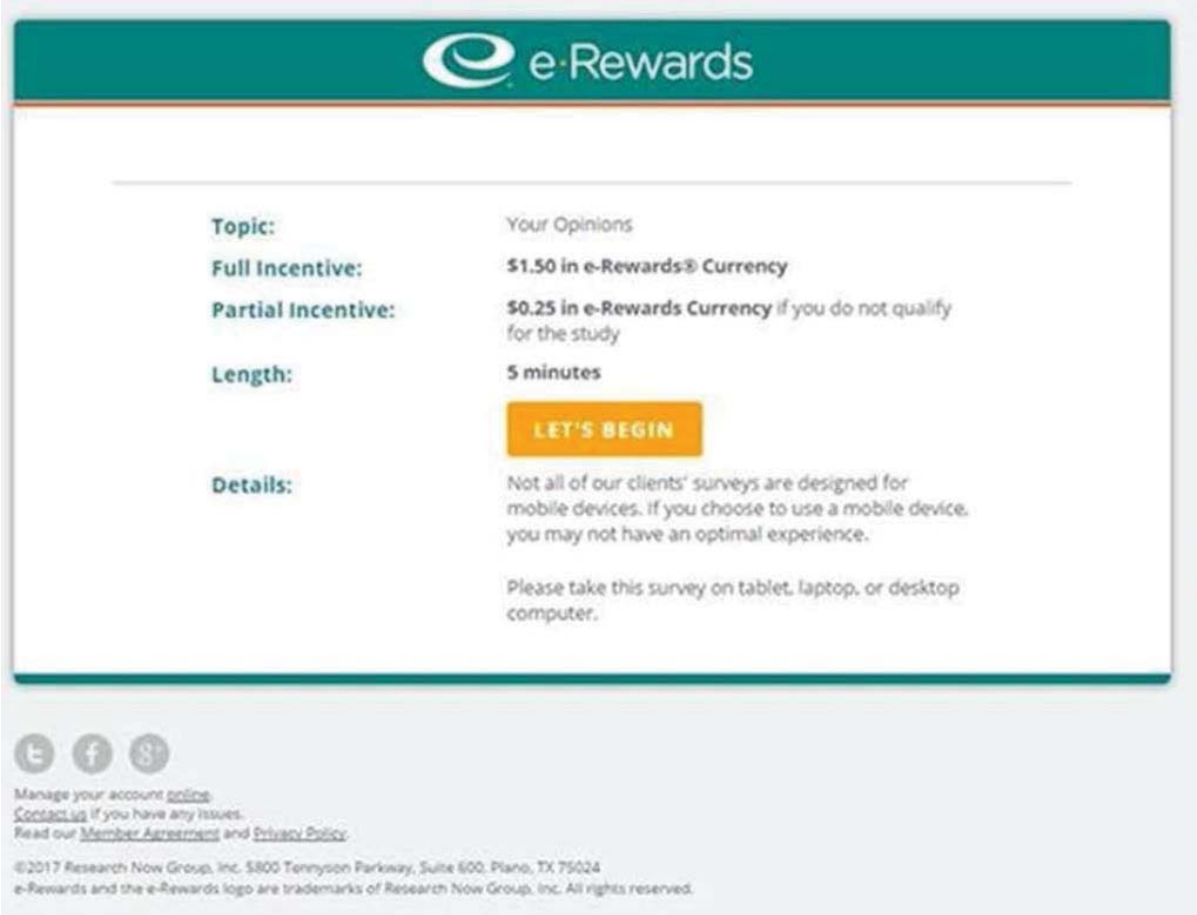


(QUESTION 310B.6)



(QUESTION 320)




e-Rewards
Topic:
Your Opinions
Full Incentive:
$1.50 in e-Rewards® Currency
Partial Incentive:
$0.25 in e-Rewards Currency if you do not qualify for the study
Length:
5 minutes
LET'S BEGIN
Details:
Not all of our clients' surveys are designed for mobile devices. If you choose to use a mobile device, you may not have an optimal experience.
Please take this survey on tablet, laptop, or desktop computer.
Manage your account online.
Contact us if you have any issues.
Read our Member Agreement and Privacy Policy.
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APPENDIX M

Screening Statistics – Modified Dhar Survey (Sirius XM)

Total Click-ins: 14931
Total Completes: 1021
Overall incidence: 6.8%

Question	Description	Total Screened Out	Percentages of total click-ins*
	Logged on, but didn't continue	8	0.1%
	Self-terminated	65	0.4%
	Terminated for over-quota	237	1.6%
Q25	State: Indicated their area was not listed	26	0.2%
Q30 and Q35	Panel Gender or Age mismatch	973	6.5%
Q35	Age: Under age 18 or indicated they would prefer not to say	231	1.5%
Q40	People who received an on-hold message for device and never returned to survey on a proper device	45	0.3%
Q49	Taken a survey on Radio or Music Services in the past 6 months	1266	8.5%
Q50	Industry Screening Question	174	1.2%
Q51	Service Subscription Question (did not have Satellite Radio Service)	8836	59.2%
Q52	Indicated that they have a subscription as part of a package from DISH network or indicated that they didn't know/were unsure	94	0.6%
Q52.2	Indicated they did not have a Select subscription package	1853	12.4%
Q53	Indicated they had a minor role or no role in the decision to get a paid subscription to Sirius XM	72	0.5%
Q201	Indicated they did not understand or were not sure if they understood the description of the 3 services	5	0.0%
Q501	Indicated they did not understand or were not sure if they understood the description of the 3 services	8	0.1%
Q500.1	Indicated they had the trial period for more than 12 months	17	0.1%
	Total Completes	1021	6.8%

*Percentage may not sum to 100% due to rounding.

Screening Statistics – Modified Dhar Survey (On-Demand)

Total Click-ins: 9084
Total Completes: 526
Overall Incidence: 5.8%

Question	Description	Total Screened Out	Percentage of total click-ins
	Logged on, but didn't continue	1	0.0%
	Self-terminated before being qualified	30	0.3%
Q25	State: Indicated their area was not listed	16	0.2%
Q30 and Q35	Panel Gender or Age mismatch	557	6.1%
Q35	Age: Under age 18 or indicated they would prefer not to say	105	1.2%
Q40	People who received an on-hold message for device and never returned to survey on a proper device	31	0.3%
Q49	Taken a survey on Radio or Music Services in the past 6 months	695	7.7%
Q50	Industry Screening Question	92	1.0%
Q51	Service Subscription Question (did not have Apple Music, Spotify, or Pandora)	4535	49.9%
Q54	Indicated they did not have a subscription to Apple or Spotify or they had both a paid subscription to Spotify Premium and a free version of Spotify	2402	26.4%
Q55	Indicated they had a minor role or no role in the decision to pay for the service	91	1.0%
Q301	Indicated they did not understand or were not sure if they understood the description of the 3 services	3	0.0%
	Total Completes	526	5.8%

Figure 1

Replication of Professor Dhar's Pricing Questions [1]

	Sirius XM Select Group [2]	
Switch Price	**Dhar Reproduction**	**Dhar Survey**
$11.49	14%	16%
$12.99	12%	8%
$14.49	11%	14%
$15.99	15%	10%
$17.49	15%	16%
$18.99	10%	5%
$20.49	7%	7%
Continue at Highest Price [3]	9%	18%
Don't Know [4]	8%	6%
Total Number of Respondents	**113**	**509**

Source: Dhar Reproduction; Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q203–Q203.6 of the Dhar Reproduction and Dhar Survey

Q203–Q203.6: "If right now you were to be charged **[INSERT PRICE]** per month for the same **[INSERT SERVICE]** you currently have, would you…?"

[2] Sirius XM Select Group includes Sirius XM users assigned to take either the Dhar Reproduction or Dhar Survey as Sirius XM Select users (cell 1).

[3] This option tallies respondents who opted to continue listening to their music subscription at the highest switch price offered in the Pricing Questions.

[4] This option tallies respondents who selected the option "Don"t know/unsure" when asked if they would switch out of their current music subscription at the highest switch price offered in the Pricing Questions.

PUBLIC VERSION

Percentage of Respondents Switching At Different Prices

Comparison Between Modified Dhar Survey and Dhar Survey [1]

	Sirius XM Select Group [2]		Sirius XM Trial Group [3]	
Switch Price	Modified Dhar Survey	Dhar Survey	Modified Dhar Survey	Dhar Survey
$11.49	21%	16%	59%	30%
$12.99	14%	8%	13%	8%
$14.49	18%	14%	14%	17%
$15.99	11%	10%	5%	8%
$17.49	16%	16%	4%	5%
$18.99	7%	5%	1%	4%
$20.49	6%	7%	1%	3%
Continue at Highest Price [4]	3%	18%	1%	21%
Don't Know[5]	4%	6%	1%	3%
Total Number of Respondents	**498**	**509**	**502**	**503**

Source: Modified Dhar Survey; Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q203–203.6 for the Sirius XM Select Group and Q503–503.6 for the Sirius XM Trial Group of the Modified Dhar Survey and Dhar Survey.

Q203–203.6: "If right now you were to be charged **[INSERT PRICE]** per month for the same **[INSERT SERVICE]** you currently have, would you…? **Please select one answer.**"

Q503–503.6: "At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of **[INSERT PRICE]** per month, would you or would you not subscribe to the service? **Please select one answer.**"

[2] Sirius XM Select Group includes Sirius XM users assigned to take either the Modified Dhar Survey or the Dhar Survey as Sirius XM Select users (cell 1).

[3] Sirius XM Trial Group includes Sirius XM users assigned to take either the Modified Dhar Survey or the Dhar Survey as Sirius XM Free Trial users (cell 7).

[4] This option tallies respondents who opted to continue listening to their music subscription at the highest switch price offered in the Pricing Questions.

[5] This option tallies respondents who selected the option "Don"t know/unsure" when asked if they would switch out of their current music subscription at the highest switch price offered in the Pricing Questions.

PUBLIC VERSION

Figure 3

Percentage of Respondents Switching At Different Prices

Comparison Between Modified Dhar Survey, Dhar Reproduction, and Dhar Survey [1]

	Sirius XM Select Group [2]		
Switch Price	**Modified Dhar Survey**	**Dhar Reproduction**	**Dhar Survey**
$11.49	21%	14%	16%
$12.99	14%	12%	8%
$14.49	18%	11%	14%
$15.99	11%	15%	10%
$17.49	16%	15%	16%
$18.99	7%	10%	5%
$20.49	6%	7%	7%
Continue at Highest Price [3]	3%	9%	18%
Don't Know [4]	4%	8%	6%
Total Number of Respondents	**498**	**113**	**509**

Source: Dhar Reproduction, Modified Dhar Survey; Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q203–203.6 of the Modified Dhar Survey, Dhar Survey, and Dhar Reproduction.

Q203–203.6: "If right now you were to be charged **[INSERT PRICE]** per month for the same **[INSERT SERVICE]** you currently have, would you…?"

[2] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey, the Dhar Survey, or the Dhar Reproduction as Sirius XM Select users (cell 1).

[3] This option tallies respondents who opted to continue listening to their music subscription at the highest switch price offered in the Pricing Questions.

[4] This option tallies respondents who selected the option "Don"t know/unsure" when asked if they would switch out of their current music subscription at the highest switch price offered in the Pricing Questions.

PUBLIC VERSION

Figure 4

Knowledge of Subscription Price [1]
Modified Dhar Survey

Payment Awareness	**Sirius XM Select Group** [2]		**Paid On-Demand Group** [3]	
I know what I currently pay	319	64%	403	81%
I don't know what I currently pay	127	26%	97	19%
Respondent has "Other" or Lifetime subscription	52	10%	-	-
Total	**498**		**500**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses to Q210.4 for the Sirius XM Select Group and Q310A.5 and Q310B.5 for the Paid On-Demand Group of the Modified Dhar Survey.

Q210.4/310A.5/310B.5: "Do you or do you not know how much you pay for **[INSERT SERVICE]**?"

[2] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[3] Paid On-Demand Group includes On-Demand users assigned to take the Modified Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Figure 5

Sirius XM Select Payment Frequencies

Modified Dhar Survey [1][2]

Payment Plan	Number of Respondents	
Monthly	83	17%
Quarterly	77	15%
Annually	252	51%
Every two years	18	4%
Every three years	16	3%
Lifetime	8	2%
Other	44	9%
Don't Know	0	0%
Total	**498**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses responses to Q210.3 of the Modified Dhar Survey.

Q210.3: "Which of the following best describes how often you pay for your Sirius XM Select subscription?"

[2] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

PUBLIC VERSION

Figure 6

Comparison of Subscription and Switch Price

Modified Dhar Survey [1]

Switch Price Comparison	Sirius XM Select Group [2]		Paid On-Demand Group [3]	
Switch Price is below price range	37	13%	37	12%
Switch Price is equal to bottom of price range	23	8%	13	4%
Switch Price is equal to top of price range	82	28%	53	17%
Switch Price is above price range	151	52%	204	66%
Total [4]	**293**		**307**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses to Q203–203.6 and Q210.5 for the Sirius XM Select Group and Q303–303.6 and Q310A.6 and Q310B.6 for the Paid On-Demand Group of the Modified Dhar Survey.

Q203–203.6: "If right now you were to be charged **[INSERT PRICE]** per month for the same Sirius XM Satellite Radio subscription you currently have, would you…? **Please select one answer.**"

Q210.5: "**[Insert payment period]** prices could vary depending upon when you signed the contract. How much do you pay every **[Insert payment period]**? **Please select one answer.**"

Q303–303.6: "If right now you were to be charged **[INSERT PRICE]** per month for the same **[INSERT SERVICE]** subscription you currently have, would you…? **Please select one answer.**"

Q310A/310B.6: "How much do you pay every month? **Please select one answer.**"

[2] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[3] Paid On-Demand Group includes On-Demand users assigned to take the Modified Dhar Survey as Apple Music (cell 2) or Spotify Premium (cell 3) users.

[4] Total for the Sirius XM Select Group includes respondents who indicated in Q203-203.6 that they would cancel their current subscription to Sirius XM Select and in Q210.4 that they knew how much they paid for their Sirius XM Select subscription. Total for the Paid On-Demand Group includes respondents who indicated during Q303-303.6 that they would cancel their current On-Demand subscription subscription and in Q310A/B.5 that they knew how much they paid for their On-Demand subscription.

PUBLIC VERSION

Figure 7

User Switching Information

Sirius XM Select Respondents with On-Demand Subscriptions [1]

Dhar Survey

User Choice	Has paid Apple Music and/or Spotify Premium [2]		Has both paid Apple Music and Spotify Premium [3]		All Sirius XM Select Respondents [4]	
Switch to On-Demand	63	62%	27	71%	110	28%
Switch to Not-On-Demand	21	21%	7	18%	54	14%
Do not switch to a paid service	14	14%	3	8%	191	49%
Don't Know	3	3%	1	3%	33	9%
Total	**101**		**38**		**388**	

Source: Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q210 for the Sirius XM Select Group of the Dhar Survey.

Q210: "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place of **Sirius XM**? This would only include a new subscription, and would not include a music service you surrently subscribe to. **Please select one answer**."

[2] This group includes respondents who indicated they owned a paid subscription to at least one of Apple Music or Spotify Premium in Dhar Survey Q54.

[3] This group includes respondents who indicated they owned a paid subscription to both Apple Music and Spotify Premium in Dhar Survey Q54.

[4] Sirius XM Select respondents are the Sirius XM users assigned to take the Dhar Survey as Sirius XM Select users (cell 1).

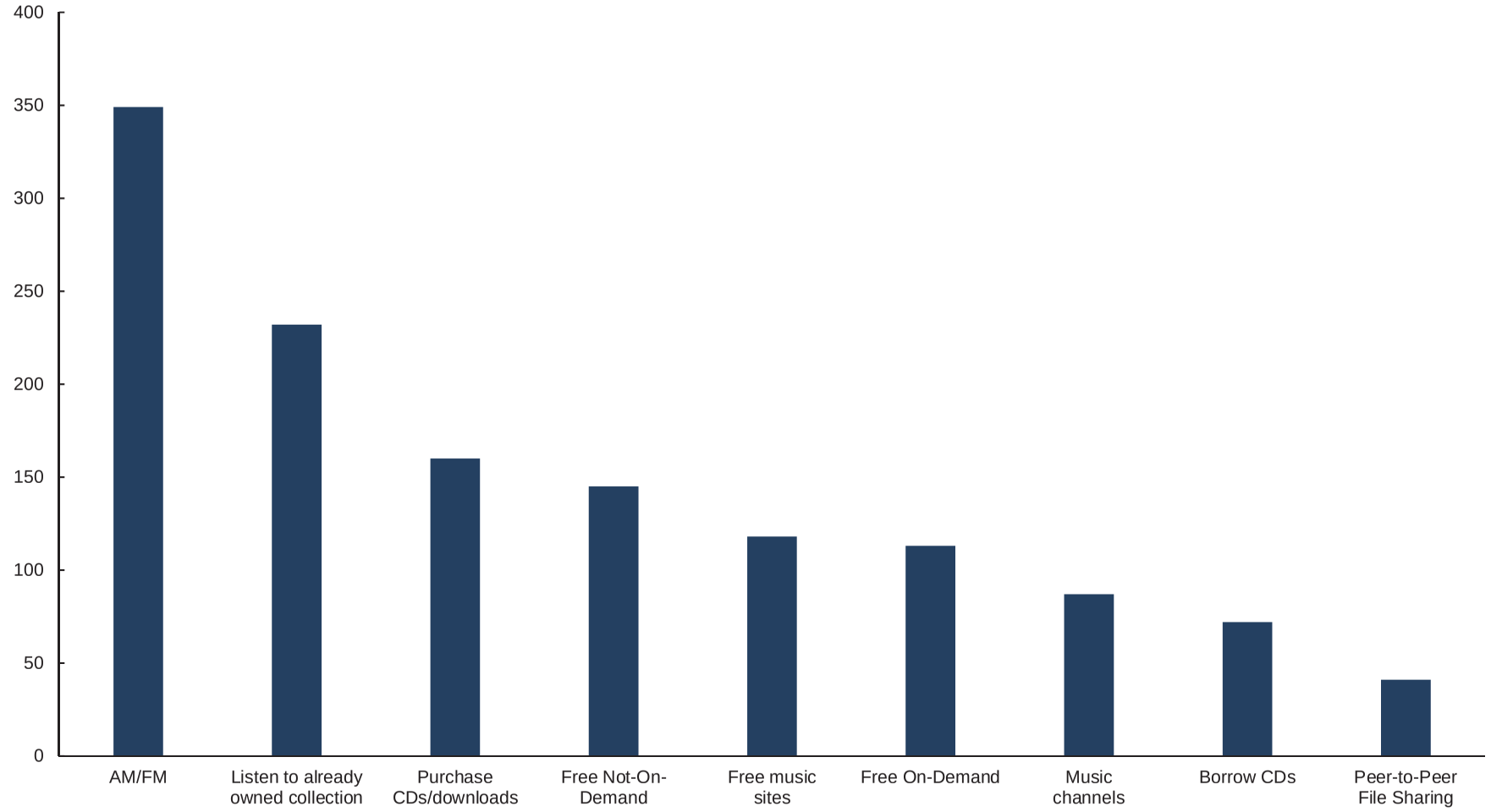
PUBLIC VERSION

Figure 8

Most Popular Music Alternatives To Paid Music Services

All Eligible Respondents

Dhar Survey



Source: Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note: This graph tallies responses to Dhar Survey Q210.1, Q210.2, Q310.1, Q310.2, Q510.1, and Q510.2. Q210.1, Q310.1, and Q510.1 ask respondents, "What, if anything, would you do instead of paying for a subscription to **[INSERT SERVICE]**?" Q210.2, Q310.2, and Q510.2.ask respondents, "How would you listen to free music instead of **[INSERT SERVICE]**?" Eligible respondents are all respondents who completed the Dhar Survey in between one and 20 minutes and answered either Q210.1, Q310.1, or Q510.1.

PUBLIC VERSION

Figure 9-A

User Switching Information [1]
Percentages Conditional on Respondent Cancelling Subscription [2]
Modified Dhar Survey

User Choice	Sirius XM Select Group [3]		Sirius XM Trial Group [4]		Paid On-Demand Group [5]	
Alternate On-Demand service (e.g. Spotify/Apple Music)	69	15%	30	6%	96	25%
Existing On-Demand service (e.g. Spotify/Apple Music)	57	12%	76	16%	82	21%
Alternate Not-On-Demand subscription (e.g. Pandora One etc.)	45	10%	35	7%	78	20%
Existing Not-On-Demand subscription (e.g. Pandora One etc.)	30	6%	35	7%	32	8%
Alternate Sirius XM Satellite radio subscription	-	-	-	-	5	1%
Existing Sirius XM Satellite radio subscription	-	-	-	-	69	18%
AM/FM radio	359	78%	401	82%	197	50%
Alernate CDs or music downloads	97	21%	96	20%	76	19%
Existing CDs or music collection	240	52%	268	55%	163	42%
Other free options (e.g. free, ad-supported Pandora and Spotify, AM/FM radio over the internet, YouTube etc.)	184	40%	236	48%	234	60%
Other	15	3%	23	5%	10	3%
None of the Above	8	2%	6	1%	5	1%
Don't Know	7	2%	6	1%	10	3%
Number of Respondents Cancelling Subscription	**463**		**489**		**391**	
Total Number of Respondents	**498**		**502**		**500**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses to Q210 for the Sirius XM Select Group, Q510 for the Sirius XM Trial Group, and Q310A and Q310B for the Paid On-Demand Group of the Modified Dhar Survey.

Q210: "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use in place of **Sirius XM**?
Please select all that apply."

Q510: "You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use instead of a paid subscription to **Sirius XM**?
Please select all that apply."

Q310A/Q310B: "You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use in place of **[INSERT SERVICE]**?
Please select all that apply."

[2] Percentages are based on the total number of respondents that completed the Modified Dhar Survey and answered Q210/510/310: 463 for Sirius XM Select Group, 489 for Sirius XM Trial Group, and 391 for Paid On-Demand Group

[3] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[4] Sirius XM Trial Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Free Trial users (cell 7).

[5] Paid On-Demand Group includes users assigned to take the Modified Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Figure 9-B

Free Music Options [1]
Percentages Conditional on Respondents Selecting to Use Free Music [2]
Modified Dhar Survey

User Choice	Sirius XM Select Group [3]		Sirius XM Trial Group [4]		Paid On-Demand Group [5]	
Free Not-On-Demand internet radio with ads (e.g. Pandora; or AM/FM radio stations over the internet)	138	75%	182	77%	163	70%
Free On-Demand music services with ads (e.g. free, ad-supported Spotify)	92	50%	111	47%	172	74%
Free music video sites with ads (e.g., YouTube)	70	38%	100	42%	136	58%
Music channels included in an existing cable or satellite TV subscription (e.g. Music Choice)	59	32%	50	21%	67	29%
Music obtained through peer-to-peer file sharing or free download sites	17	9%	33	14%	29	12%
Borrow CDs, vinyls, or tapes from friends or a library	52	28%	48	20%	43	18%
Other	13	7%	17	7%	6	3%
Don't Know	9	5%	7	3%	3	1%
Number of Respondents Answering this Question	**184**		**236**		**234**	
Total Number of Respondents	**498**		**502**		**500**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses to Q210.1 for the Sirius XM Select Group, Q510.1 for the Sirius XM Trial Group, and Q310A.2 and Q310B.2 for the Paid On-Demand Group of the Modified Dhar Survey.

Q210.1: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of **Sirius XM Satellite Radio**. Which free music option(s) would you use instead of **Sirius XM Satellite Radio**?
Please select all that apply."

Q510.1: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of a paid subscription to **Sirius XM Satellite Radio**. Which free music option(s) would you use instead of **Sirius XM Satellite Radio**?
Please select all that apply."

Q310A/B.2: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of **[INSERT SERVICE]**. Which free music option(s) would you use instead of **[INSERT SERVICE]**?
Please select all that apply."

[2] Percentages are based on the total number of respondents that completed the Modified Dhar survey and answered Q210.1/510.1/310.2: 184 for Sirius XM Select Group, 236 for Sirius XM Trial Group, and 234 for Paid On-Demand Group.

[3] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[4] Sirius XM Trial Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Free Trial users (cell 7).

[5] Paid On-Demand Group includes users assigned to take the Modified Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Figure 10-A

User Switching Information [1]

Percentages Conditional on Respondent Cancelling Subscription [2]

Dhar Survey

User Choice	Sirius XM Select Group [3]		Sirius XM Trial Group [4]		Paid On-Demand Group [5]	
Switch to On-Demand	110	28%	87	23%	-	-
Switch to Not-On-Demand	54	14%	53	14%	95	39%
Switch to Sirius XM	-	-	-	-	69	28%
No Paid Substitute Service	191	49%	204	54%	68	28%
Purchase CDs/downloads	68	18%	62	16%	30	12%
Free Music	170	44%	182	48%	54	22%
Other	15	4%	16	4%	3	1%
None of the Above	4	1%	4	1%	2	1%
Don't Know	1	0%	5	1%	0	0%
Don't Know	33	9%	35	9%	14	6%
Number of Respondents Cancelling Subscription	**388**		**379**		**246**	
Total Number of Respondents	**509**		**503**		**504**	

Source: Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q210 and Q210.1 for the Sirius XM Select Group, Q510 and Q510.1 for the Sirius XM Trial Group, and Q310 and Q310.1 for the Paid On-Demand Group of the Dhar Survey.

Q210: "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place of **Sirius XM**? This would only include a new subscription, and would not include a music service that you currently subscribe to. **Please select one answer.**"

Q210.1: "You mentioned that you would not subscr be to a paid music service in place of **Sirius XM**. What else, if anything, would you do instead of paying for a subscription to **Sirius XM**? **Please select all that apply.**"

Q510: "You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place of your trial subscription to **Sirius XM**? This would only include a new subscription, and would not include a music service that you currently subscribe to. **Please select one answer.**"

Q510.1: "You mentioned that you would not subscr be to a paid music service in place of your Trial Period subscription to **Sirius XM Satellite Radio**. What else, if anything, would you do instead of paying for a subscription to **Sirius XM Satellite Radio**? **Please select all that apply.**"

Q310: "You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per month, and you knew that **all** other On-Demand music streaming service subscriptions were also **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music service in place of **[INSERT SERVICE]**? This would only include a new subscription, and would not include a music service that you currently subscribe to. **Please select one answer.**"

Q310.1: "You mentioned that you would not subscr be to a paid music service in place of **[INSERT SERVICE]**. What else, if anything, would you do instead of paying for a subscription to **[INSERT SERVICE]**? **Please select all that apply.**"

[2] Percentages are based on the total number of respondents that completed the Dhar survey and answered Q210/510/310: 388 for the Sirius XM Select Group, 379 for the Sirius XM Trial Group, and 246 for the Paid On-Demand Group.

[3] Sirius XM Select Group includes Sirius XM users assigned to take the Dhar Survey as Sirius XM Select users (cell 1).

[4] Sirius XM Trial Group includes Sirius XM users assigned to take the Dhar Survey as Sirius XM Free Trial users (cell 7).

[5] Paid On-Demand Group includes users assigned to take the Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Free Music Options [1]
Percentages Conditional on Respondents Selecting to Use Free Music [2]
Dhar Survey

User Choice	Sirius XM Select Group [3]		Sirius XM Trial Group [4]		Paid On-Demand Group [5]	
Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)	56	33%	62	34%	27	50%
Free On-Demand music services with ads (e.g. free, ad supported Spotify)	37	22%	40	22%	36	67%
Free music video sites with ads (e.g., YouTube)	32	19%	51	28%	35	65%
Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)	37	22%	32	18%	18	33%
AM/FM radio	148	87%	163	90%	38	70%
Music obtained through Peer-to-Peer file sharing or free download sites	13	8%	16	9%	12	22%
Borrow CDs, vinyl or tapes from friends or a library	28	16%	33	18%	11	20%
Listen to music collection already owned	88	52%	110	60%	34	63%
Other	0	0%	0	0%	2	4%
Don't Know	1	1%	2	1%	1	2%
Number of Respondents Answering This Question	**170**		**182**		**54**	
Total Number of Respondents	**509**		**503**		**504**	

Source: Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q210.2 for the Sirius XM Select Group, Q510.2 for the Sirius XM Trial Group, and Q310.2 for the Paid On-Demand Group of the Dhar Survey.

Q210.2: "You said that you would listen to free music. How would you listen to free music instead of **Sirius XM Satellite Radio**?
Please select all that apply."

Q510.2: "You said that you would listen to free music. How would you listen to free music instead of paying for a subscription to **Sirius XM Satellite Radio**?
Please select all that apply."

Q310.2: "You said that you would listen to free music. How would you listen to free music instead of **[INSERT SERVICE]**?
Please select all that apply."

[2] Percentages are based on the total number of respondents that completed the Dhar survey and answered Q210.2/510.2/310.2: 170 for the Sirius XM Select Group, 182 for the Sirius XM Trial Group, and 54 for the Paid On-Demand Group.

[3] Sirius XM Select Group includes Sirius XM users assigned to take the Dhar Survey as Sirius XM Select users (cell 1).

[4] Sirius XM Trial Group includes Sirius XM users assigned to take the Dhar Survey as Sirius XM Free Trial users (cell 7).

[5] Paid On-Demand Group includes users assigned to take the Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Figure 11-A

User Switching Information [1]
Percentages Conditional on Respondent Cancelling Subscription [2]
Modified Dhar Survey: Weighted Results Comparison [3]

	Sirius XM Select Group [4]		Sirius XM Trial Group [5]		Paid On-Demand Group [6]	
User Choice	**Weighted**	**Unweighted**	**Weighted**	**Unweighted**	**Weighted**	**Unweighted**
Alternate On-Demand service (e.g. Spotify/Apple Music)	15%	15%	8%	6%	26%	25%
Existing On-Demand service (e.g. Spotify/Apple Music)	12%	12%	16%	16%	21%	21%
Alternate Not-On-Demand subscription (e.g. Pandora One etc.)	10%	10%	9%	7%	21%	20%
Existing Not-On-Demand subscription (e.g. Pandora One etc.)	7%	6%	8%	7%	8%	8%
Alternate Sirius XM Satellite radio subscription	-	-	-	-	1%	1%
Existing Sirius XM Satellite radio subscription	-	-	-	-	18%	18%
AM/FM radio	77%	78%	79%	82%	50%	50%
Alernate CDs or music downloads	21%	21%	20%	20%	19%	19%
Existing CDs or music collection	52%	52%	57%	55%	42%	42%
Other free options (e.g. free, ad-supported Pandora and Spotify, AM/FM radio over the internet, YouTube etc.)	40%	40%	50%	48%	61%	60%
Other	3%	3%	5%	5%	3%	3%
None of the Above	2%	2%	1%	1%	1%	1%
Don't Know	2%	2%	1%	1%	3%	3%
Number of Respondents Cancelling Subscription	**380**	**463**	**378**	**489**	**244**	**391**
Total Number of Respondents	**498**	**498**	**502**	**502**	**500**	**500**

Source: Modified Dhar Survey; Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q210 for the Sirius XM Paid Subscription Group, Q510 for the Sirius XM Free Trial Group, and Q310A and Q310B for the Paid On-Demand Group of the Modified Dhar Survey.

Q210: "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use in place of **Sirius XM**?
Please select all that apply."

Q510: "You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use instead of a paid subscrip ion to **Sirius XM**?
Please select all that apply."

Q310A/Q310B: "You mentioned that you would cancel your subscription to **[INSERT SERVICE]** if you were charged **[INSERT SWITCH PRICE]** per mon h. Keeping in mind all other music services you subscribe to, which of the following would you use in place of **[INSERT SERVICE]**?
Please select all that apply."

[2] Percentages for the weighted group are based on he weighted total number of respondents that completed the Modified Dhar Survey and answered Q210/510/310: 380 for the Sirius XM Select Group, 378 for the Sirius XM Trial Group, and 244 for the Paid On-Demand Group. Percentages for the unweighted group are based on the total number of respondents that completed the Modified Dhar Survey and answered Q210/510/310: 463 for the Sirius XM Select Group, 489 for the Sirius XM Trial Group, and 391 for the Paid On-Demand Group.

[3] Weighted percentages were calculated from responses such hat same percentage of weighted respondents cancelled their subscrip ion at each switch price in the Modified Dhar Survey as the percentage of respondents who cancelled their subscription in the unweighted Dhar Survey.

[4] Sirius XM Select Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[5] Sirius XM Free Trial Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Free Trial users (cell 7).

[6] Paid On-Demand Group includes users assigned to take the Modified Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Free Music Options [1]
Percentages Conditional on Respondents Selecting to Use Free Music [2]
Modified Dhar Survey: Weighted Results Comparison [3]

User Choice	Sirius XM Select Group [4]		Sirius XM Trial Group [5]		Paid On-Demand Group [6]	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**	**Weighted**	**Unweighted**
Free Not-On-Demand internet radio with ads (e.g. Pandora; or AM/FM radio stations over the internet)	75%	75%	77%	77%	69%	70%
Free On-Demand music services with ads (e.g. free, ad-supported Spotify)	50%	50%	45%	47%	75%	74%
Free music video sites with ads (e.g., YouTube)	40%	38%	41%	42%	59%	58%
Music channels included in an existing cable or satellite TV subscription (e.g. Music Choice)	32%	32%	25%	21%	29%	29%
Music obtained through peer-to-peer file sharing or free download sites	10%	9%	18%	14%	12%	12%
Borrow CDs, vinyls, or tapes from friends or a library	28%	28%	20%	20%	18%	18%
Other	7%	7%	7%	7%	3%	3%
Don't Know	5%	5%	4%	3%	1%	1%
Number of Respondents Answering This Question	**150**	**184**	**187**	**236**	**149**	**234**
Total Responses	**498**	**498**	**502**	**502**	**500**	**500**

Source: Modified Dhar Survey; Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q210.1 for the Sirius XM Paid Subscription Group, Q510.1 for the Sirius XM Free Trial Group, and Q310A.2/Q310B.2 for the Paid On-Demand Group of the Modified Dhar Survey.

Q210.1: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of Sirius XM Satellite Radio. Which free music option(s) would you use instead of Sirius XM Satellite Radio? **Please select all that apply.**"

Q510.1: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of a paid subscription to Sirius XM Satellite Radio. Which free music option(s) would you use instead of Sirius XM Satellite Radio? **Please select all that apply.**"

Q310A/B.2: "You mentioned that you would listen to free music option(s) other than over-the-air AM/FM radio in place of **[INSERT SERVICE]**. Which free music option(s) would you use instead of **[INSERT SERVICE]**? **Please select all that apply.**"

[2] Percentages for the weighted group are based on the weighted total number of respondents that completed the Modified Dhar survey and answered Q210.1/510.1/310.2: 150 for the Sirius XM Select Group, 187 for the Sirius XM Trial Group, and 149 for the Paid On-Demand Group. Percentages for the unweighted group are based on the total number of respondents that completed the Modified Dhar survey and answered Q210.1/510.1/310.2: 184 for the Sirius XM Select Group, 236 for the Sirius XM Trial Group, and 234 for the Paid On-Demand Group.

[3] Weighted percentages were calculated from responses such that same percentage of weighted respondents cancelled their subscription at each switch price in the Modified Dhar Survey as the percentage of respondents who cancelled their subscription in the unweighted Dhar Survey.

[4] Sirius XM Paid Subscription Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Select users (cell 1).

[5] Sirius XM Free Trial Group includes Sirius XM users assigned to take the Modified Dhar Survey as Sirius XM Free Trial users (cell 7).

[6] Paid On-Demand Group includes users assigned to take the Modified Dhar Survey as either Apple Music users (cell 2) or Spotify Premium users (cell 3).

PUBLIC VERSION

Figure 12

User Switching Information [1]
Sirius XM Select Respondents with On-Demand Subscriptions
Modified Dhar Survey

User Choice [2]	**Has paid Apple Music and/or Spotify Premium** [3]		**Has both paid Apple Music and Spotify Premium** [4]		**All Sirius XM Select Respondents** [5]	
Switch to Alternate On-Demand	10	20%	1	25%	69	14%
Switch to Existing On-Demand	23	46%	2	50%	57	11%
Switch to Alternate Not-On-Demand	4	8%	3	75%	45	9%
Switch to Existing Not-On-Demand	7	14%	2	50%	30	6%
None of the Above	0	0%	0	0%	8	2%
Don't Know	0	0%	0	0%	7	1%
Total	**50**		**4**		**498**	

Source: Modified Dhar Survey

Note:

[1] This table tallies responses to Q210 for the Sirius XM Select Group of the Modified Dhar Survey.
Q210: "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **[INSERT SWITCH PRICE]** per month. Keeping in mind all other music services you subscribe to, which of the following would you use in place of **Sirius XM**? **Please select all that apply.**"

[2] This table lists six of 11 possible responses options to Q210.

[3] This group includes all respondents who indicated they owned a paid subscription to at least one of Apple Music or Spotify Premium in Modified Dhar Survey Q54.

[4] This group includes all respondents who indicated they owned a paid subscription to both Apple Music and Spotify Premium in Modified Dhar Survey Q54.

[5] Sirius XM Select respondents are the Sirius XM users assigned to take the Dhar Survey as Sirius XM Select users (cell 1).

PUBLIC VERSION

Figure 13

Paid Sirius XM Package Distribution [1]
Dhar Survey

Sirius XM Package	Number of Subscribers	
Select	674	27%
All Access	1,086	43%
Mostly Music	488	19%
Other	89	4%
Don't Know	190	8%
Total	**2,527**	**100%**

Source: Written Testimony of Ravi Dhar, October 18, 2016; Backup Materials to the Dhar Report, SoundX_000154716

Note:

[1] This table tallies responses to Q52.2 of the Dhar Survey.
Q52.2: "Which of the following is your Sirius XM Satellite Radio subscription package?"

PUBLIC VERSION

Figure 14

Level of Discount Required to Continue Paid Sirius XM Subscription [1]

Boedeker Survey

Requested Discount Level in Q13 [2]	Continue to Subscribe To Sirius XM at Full Subscription Rate: Without Music Programming [3]		Without Non-Music Programming [4]	
1% - 10%	5	3%	31	6%
11% - 20%	17	9%	77	14%
21% - 30%	26	13%	113	20%
31% - 40%	19	10%	44	8%
41% - 50%	26	13%	49	9%
51% - 60%	28	14%	50	9%
61% - 70%	13	7%	22	4%
71% - 80%	9	5%	13	2%
81% - 90%	7	4%	6	1%
91% - 99%	3	2%	12	2%
None – I wouldn't need a discount to continue subscr bing	22	11%	122	22%
None – no amount of discount would convince me	15	8%	5	1%
Don't know	4	2%	13	2%
Total	**194**		**557**	

Source: Written Direct Testimony of Stefan Boedeker, Appendix F, Dated October 18, 2016

Note:

[1] This table tallies responses to Boedeker Survey Q13A and Q13B.

Q13A: "If music was not offered (i.e., you could only select a non-music package), what is the minimum level of discount (if any) that could be offered to convince you to still pay for a Sirius XM satellite radio subscription?"

Q13B: "If non-music programming was not offered (i.e., you could only have a music package), what is the minimum level of discount (if any) that could be offered to convince you to still pay for a Sirius XM satellite radio subscription?"

[2] "Requested Discount Level" lists all poss ble responses to Boedeker Survey Q13A.

Q31A: "If music [non-music programming] was not offered (i.e., you could only select a non-music [only music] package), what is the minimum level of discount (if any) that could be offered to convince you to still pay for a Sirius XM satellite radio subscription?"

[3] "Without Music Programming" includes all 194 responses to Boedeker Q13A from respondents answering "Yes" to Boedeker Survey Q12A.

Q12A: "Would you continue to subscribe to Sirius XM satellite radio at your current subscription rates if music was no longer offered (i.e., if you could only have a non-music package)?"

[4] "Without Non-Music Programming" includes all 557 responses to Boedeker Q13B from respondents answering "Yes" to Boedeker Survey Q12B.

Q12B: "Would you continue to subscribe to Sirius XM satellite radio at your current subscription rates if non-music programming was no longer offered (i.e., if you could only have a music package)?"

PUBLIC VERSION

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In re	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

WRITTEN REBUTTAL TESTIMONY OF DAVID J. FREAR
(On Behalf of Sirius XM Radio Inc.)

I. Background and Experience

1. My name is David J. Frear. I am Senior Executive Vice President and Chief Financial Officer of Sirius XM Radio Inc. ("Sirius XM"). Prior to the merger of Sirius Satellite Radio Inc. ("Sirius") and XM Satellite Radio Holdings, Inc. ("XM"), I served as Executive Vice President and Chief Financial Officer of Sirius. I hold a Master of Business Administration degree from University of Michigan Graduate School of Business Administration as well as a Bachelor of Arts degree from University of Michigan.

2. I testified on behalf of Sirius in the proceeding before the Copyright Royalty Board ("CRB") to set rates for the 2007-2012 period ("SAT I") and on behalf of Sirius XM in the proceeding to set rates for the 2013-2017 period ("SAT II").

3. I offer this rebuttal testimony to address arguments various SoundExchange witnesses, including Jonathan Bender and Jonathan Orszag, make

in their direct testimonies regarding Sirius XM's provision of trial subscriptions. Relying on certain licenses between interactive services and record labels, SoundExchange argues that Sirius XM should be limited to providing 30-day royalty-free trials.

4. For several reasons, SoundExchange's proposal that Sirius XM pay a full royalty on paid and unpaid trials should be rejected. First, since its inception Sirius XM has offered trials to "fill the funnel" for conversion to paid subscription without complaint from SoundExchange, including during the SAT I and SAT II proceedings, or from individual record labels (Sirius XM's direct licenses with record labels do not call for different royalty treatment for trials). Second, approximately [redacted] of Sirius XM trials are longer than 3 months and are paid for by auto manufacturers ("OEMs"). Sirius XM receives hundreds of millions of dollars in revenue from these OEM-paid trials and pays SoundExchange tens of millions of dollars in royalties for them. Third, Sirius XM incurs significant costs in equipping cars with radios and acquiring trialers that interactive services do not. Sirius XM pays OEMs hundreds of millions of dollars in subsidies to install satellite radios, pays OEMs hundreds of millions of dollars in revenue share payments, must maintain a system to ingest tens of millions of auto sales records from over 26,000 auto dealers and OEMs and maintain a complex relational database that matches unique vehicle identification numbers, unique radio identification numbers and vehicle owner information. Fourth, Sirius XM's relationship with its trialers is vastly different—and more indirect—than interactive services. An interactive

service trialer has proactively sought out the service being trialed—effectively pulling the service from the provider. A Sirius XM trial is ancillary to the purchase or lease of a vehicle, requiring additional time and expense to make the trialer aware of the service, induce her to use the service and convert such trialer into a paying subscriber—effectively pushing the service to the trialer.

5. In addition, I offer rebuttal testimony to address the arguments of Thomas Lys regarding the value of licensing performances of sound recordings fixed prior to February 14, 1972 ("Pre-72 Recordings"). I address Prof. Lys's incorrect assertion that certain direct licensors such as [redacted] obtained additional value that should be attributed to post-1972 sound recording performances because those direct licenses include payments for performances of Pre-72 Recordings. In fact, both prior to and since executing its license with [redacted], Sirius XM has been separately compensating record companies for its performances of Pre-72 Recordings, including a license with a headline royalty rate of [redacted] the parties to which agreed was "established by negotiations between a willing buyer and willing seller in a competitive market for Pre-1972 Sound Recordings."[1]

II. SoundExchange's Proposed Rates and Terms for Trial Subscriptions Should Be Rejected

6. SoundExchange complains that Sirius XM provides free-to-the-consumer trial subscriptions which result in payments to the record industry at

[1] The details of this license are discussed in Sec. III below.

either a discounted royalty, or no royalty at all, for the length of such trials.[2] SoundExchange argues that Sirius XM should be limited to 30-day royalty-free trials, supporting that arbitrary position based upon certain license agreements between record labels and interactive services containing such a limitation.

7. SoundExchange's rate proposal calls for computing royalty payments for trial subscriptions in two ways. Under the percentage of revenue prong, Sirius XM would, after the first month of the trial, need to impute a full monthly payment from each of its trial subscribers, regardless of the amount actually paid (*i.e.*, the revenue actually received by Sirius XM) on that subscriber's behalf by the OEM.[3] Under the per-subscriber prong, Sirius XM would need to pay a full monthly per-subscriber payment ($2.48 to $2.79) for every trial subscriber, other than those provided a 30-day unpaid trial.[4]

8. For each of the following reasons SoundExchange's proposal should be rejected.

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[2] Trials associated with the sale or lease of a new car typically range from three to twelve months. Trials associated with other transactions (e.g., sales of used cars) are typically three months or less.

[3] For example, if the OEM paid $8 for the subscriber, Sirius XM would need to gross that payment up to [redacted] Sirius XM's Gross Revenue per user (as calculated by Dr. Orszag) after making the various deductions allowed by the Gross Revenues definition. I note this provision does not yet appear in SoundExchange's proposed terms, but is discussed in Mr. Orszag's amended testimony.

[4] This is limited to 30-day trials; Sirius XM would have to pay the full per-subscriber minimum for every month – even the first – of trial subscriptions lasting longer than 30 days.

A. No Change In Business Practice by Sirius XM Warrants a Change in the Royalty Treatment of Trial Subscriptions

9. Since its launch fifteen years ago, Sirius XM (and each of its predecessor companies) has offered time-limited, free trials to new users.[5] Like most paid subscription services, Sirius XM allows new users to "try before they buy" its satellite radio service. These trials have been and continue to be a central feature in our marketing. Since the first SDARS license was agreed to in 2003, SoundExchange and the record labels have known that trials for which an OEM does not pay generate no revenue for Sirius XM and, therefore, generate no royalty payment. Since that time, the rates and terms for Sirius XM's SDARS license have twice been tried before the CRB. Despite these proceedings being hotly contested, SoundExchange never complained about Sirius XM's provision of trials to new users. SoundExchange does not identify any material change in the way Sirius XM provides trials that would now warrant changing this long-accepted practice.

10. The record industry's acceptance of this longstanding practice is further evidenced by over 500 direct licenses with record labels, none of which contain any restriction on Sirius XM's ability to offer free trials *of any length*. In fact, our free trials have never been an issue in negotiations with labels. Whatever limitations on length of trial that record labels may be able to obtain from interactive services, of far greater relevance is the abundant evidence of what the record industry's historic posture has been vis-à-vis our own service offerings.

[5] As discussed in Part B below, many of Sirius XM's free-to-the-consumer trials are paid for by the OEM.

B. Sirius XM Collects Hundreds of Millions of Dollars in Revenue – and Pays SoundExchange Millions of Dollars in Royalties – For Trial Subscriptions

11. SoundExchange's proposal overlooks the fact that Sirius XM collects revenue (from OEMs) and pays SoundExchange millions of dollars in royalties each year for its so-called "free" trial subscriptions. The revenues associated with these free trial subscriptions have grown from [redacted] in 2007 to [redacted] in 2016.[6] Almost [redacted] of Sirius XM's 2016 royalty payments to SoundExchange for SDARS—nearly [redacted]—were generated by the provision of these "free" (to the consumer) trials.[7]

12. In contrast, certain interactive services, such as Spotify, offer persistently free tiers of service, and pay royalties on those free tiers that are significantly lower than those proposed by SoundExchange here.[8] If a Spotify trialer does not convert into a paid subscriber, that user can continue to access the Spotify service's free tier, for which the record labels have agreed to accept lower royalties. Sirius XM has ***no*** persistently free tier of service so there is no under-monetized consumption on our platform.

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[6] Sirius XM does not generally offer to new trialers "free" subscriptions of longer than three months.

[7] Importantly, as explained in Appendix E to Dr. Shapiro's rebuttal testimony, these OEM payments *are already reflected* in his rate model at their actual levels. Specifically, these OEM payments have the effect of *lowering* Sirius XM's ARPU (because of the discount), thus *raising* the percentage rates Dr. Shapiro calculates in his fee proposal, which benefits SoundExchange. If SoundExchange's proposal were adopted, then Dr. Shapiro would have to adjust the effective percentage of revenue rate downward to account for the higher implied ARPU. Otherwise, Sirius XM would pay a higher percentage of revenue rate on an artificially inflated revenue base.

[8] Cowen and Company, "Spotify: A Global Streaming Leader," June 29, 2016 (the unlimited free tier of Spotify generated gross revenues of less than [redacted] per month per listener in 2015).

C. SoundExchange's Proposed 30-Day Limit on Royalty-Free Trial Subscriptions Ignores Significant Differences Between Sirius XM and Interactive Services

13. The relative costs incurred by interactive services and Sirius XM to attract new subscribers are not remotely comparable. Interactive services are accessed through computers or smartphones paid for by their subscribers. In contrast, Sirius XM has long-term agreements with every major automaker that require payments of hundreds of millions of dollars per year in subsidies and revenue share to incent the OEMs to install Sirius XM radios. In 2016 alone, Sirius XM incurred [redacted] in radio and chipset subsidies to OEMs and their suppliers to encourage the installation of Sirius XM radios in new cars. Because only about [redacted] of new car trials convert into self-paying subscribers, about [redacted] of those subsidies are necessarily spent on consumers who do not generate revenue to Sirius XM.[9] In addition to that, Sirius XM incurred [redacted] in revenue share to OEMs for successfully converted subscribers. Interactive services incur nothing equivalent to these massive OEM subsidies / payments we make to attract and grow subscribership.

14. Another point of distinction lies in the investment and time period required to identify potential subscribers and then attempt to convert them to paying subscribers. The trialer of an interactive service creates her own account and the service merely has to make sure that the email associated with the new account is not already associated with an account on a previous trial. The

[9] It is possible that subsequent purchasers and lessees of these vehicles may subscribe.

circumstances confronted by Sirius XM are dramatically different and more complex.

15. Unlike interactive services' simple email database, Sirius XM must maintain a sophisticated data-management system to (1) gather auto sales information from the OEMs and 26,000 auto dealers, (2) correlate Radio IDs,[10] VINs,[11] and consumers and (3) activate / deactivate individual radios via satellite broadcast. Sirius XM manages this enormous amount of data to track individual Radio IDs in millions of vehicles through a variety of in-house built and customized third-party software applications. Sirius XM's "Supply Chain" software, which was built in-house, is the repository for information tying Radio IDs to each vehicle's VIN. Once a new vehicle is sold or leased, the OEM—through a data exchange protocol—provides the personal information of the purchaser or lessee, which Sirius XM stores in its Subscriber Management System ("SMS"). SMS is customized third-party software that Sirius XM uses to manage the ownership data that ties back to the Radio ID—VIN data in the Supply Chain database. Recently, Sirius XM launched a new platform, the Master Data Management software, which is another customized third-party application. The Master Data Management software will become the "database of record" for the personal information of the owners and lessees of Sirius XM-enabled vehicles. More than 50 employees across at least

[10] Sirius XM maintains the ability to activate/deactivate individual radios, which it does by assigning each receiver a unique identifier called a Radio ID.

[11] OEMs assign new cars a unique vehicle identification number ("VIN"), which are communicated to Sirius XM via data exchange protocols under which the OEMs send information regarding the building of vehicles equipped with satellite radios, the shipment of those vehicles to dealerships, and the sale or lease of those vehicles to customers.

seven different business units, including Enterprise Data Management, OEM Account Management, Business Intelligence, Marketing, Remarketing, and Enterprise Data Quality, are involved in the specification, ingestion, normalization, and reconciliation of these disparate data sources.

16. Once the new owner's information is loaded into SMS, Sirius XM's marketing group begins the process of marketing the service to the new owner or lessee. Sirius XM communicates with these new trialers through direct-mail, email and telephone communications.[12] Initially, Sirius XM will email the consumer information about the trial and the service, though we only receive customer emails for about [redacted] of new car purchases.[13] As part of this initial email communication, Sirius XM asks the purchaser or lessee to opt-in to future email and only about half of our trialers opt-in, meaning we can only email market about [redacted] of all new car trialers.[14] Sirius XM also physically mails a welcome package to every new consumer trialer. This welcome package usually arrives within 14 to 20 days of the purchase or lease. Sirius XM has found that direct mailing generates the majority of conversions to subscriptions. In addition to email and physical mail, Sirius XM

[12] For ease of discussion, the present example assumes a 90 day trial. For longer trials, the basic communication stream is similar but the time between communications is longer.

[13] We receive email addresses for a slightly smaller percentage of used car purchases [redacted]

[14] Because the consumer proactively engaged with the interactive service when she set up her new account, most interactive services treat future email communications to the consumer only on an "opt-out" basis, which makes communication with the trial subscriber much easier than is the case for Sirius XM.

also phones most new trialers within the first 20 to 30 days after acquiring a new vehicle.

17. After this initial period of "awareness" marketing, which typically lasts about 45 days, Sirius XM spends the next 45 days trying to convert the trialer into becoming a self-pay subscriber. Sirius XM continues to communicate with trialers through direct mail, emails (where the trialer has opted-in) and telephone. At the end of a 90-day trial, Sirius XM deactivates the trialer's radio but does not stop conversion marketing. Sirius XM continues to market to that non-converted trialer for an additional 90 days. Across this entire 180-day period, Sirius XM sends approximately 12–15 emails, nine direct mail pieces, and makes four phone calls attempting to convert a trialer into a self-pay subscriber, representing approximately [redacted] per trialer or about [redacted] per year.[15]

18. To my knowledge, no interactive service engages in the volume of marketing to trialers undertaken by Sirius XM. Certainly, no interactive service is *calling* a trialer or non-converter trying to convert her into a subscriber.

D. Differences Between Sirius XM Trialers and Interactive Trialers Likewise Make Longer Trials Appropriate

19. There are at least three ways in which Sirius XM trialers and interactive trialers are materially different that support longer trials for Sirius XM:

[15] Even after this 180 days, Sirius XM continues to try and convert the consumer. Sirius XM has a "Gross Ad Win-Back" team that focuses on acquiring subscribers from this pool of non-converted trialers. For example, Sirius XM established its "Service Lane" program to allow auto dealer service centers to offer a two-month trial to qualifying vehicle owners; e.g., the original purchaser of the vehicle who has not been a Sirius XM subscriber in the last year. *See* http://www.siriusxmdealer.com/programs/servicelane.

(1) Sirius XM ***pushes*** its trials on consumers, whereas consumers ***pull*** their trials from interactive services, (2) interactive services have more direct digital marketing channels to their trialers than Sirius XM has to its trialers, and (3) interactive trialers have more opportunities to engage with the service than Sirius XM's trialers.

i. Push v. Pull

20. When a consumer signs up for an interactive service, the consumer is proactively searching for an interactive service and volitionally downloading the necessary software to gain access to the music on the service. For example, a consumer who wishes to obtain a free trial to Apple Music simply clicks on a button—either within the desktop iTunes application or in the Music app on her iPhone or iPad—and her free 90-day trial begins. By contrast, it seems safe to say that no consumer buys a car solely to get access to the Sirius XM service: whether a car has a Sirius XM radio is one of potentially dozens of factors a consumer weighs in making a car purchase. Unlike an interactive service, which *pulls* the trialer in, Sirius XM must identify that car purchaser, alert the purchaser of her free trial of Sirius XM's service, and attempt to convert that trialer into a self-paying subscriber.

21. Importantly, Apple requires a user to have a payment method on file prior to starting her "free" trial and automatically starts billing that user if she fails to cancel her subscription prior to the end of the trial, often referred to as a "negative option." Sirius XM, by contrast, acquires no method of payment from the

trialer, and must instead persuade the trialer to go online or call customer service and associate a payment method with her account.

ii. Direct v. Indirect Communication

22. As noted above, because the consumer proactively engaged with the interactive service when she set up her new account, most interactive services treat future email communications to the consumer only on an "opt-out" basis. This allows the interactive service to continue to email market to that trialer, which is cheaper and more efficient than physical mail and/or telemarketing. In contrast, as noted above, only about [redacted] of Sirius XM's new vehicle trialers "opt-in" to receive marketing emails, meaning Sirius XM must rely on slower and more expensive communications with [redacted] of our trial subscribers.

iii. Opportunities to Engage During Trial

23. Because the consumer has proactively sought to try an interactive service, the consumer must navigate through any online or in-app demonstrations or tips the service normally provides to new users of the service to explain its features and functions. Once a consumer has obtained a free trial to an interactive service, and engaged in the demonstration of the service, that consumer can listen to all of the music available on the service anytime and anywhere. For example, during the free trial the consumer can download as many albums and playlists as she wants and listen to them on- or offline.

24. In contrast, a listener on a free Sirius XM trial may not even know that Sirius XM is available in the car, much less how to use the service. Sirius XM

must rely upon sales people at auto dealers to alert consumers that a free trial to Sirius XM is included in her purchase or lease and give a demonstration of how to use the service. Sirius XM has a team of more than 100 people who engage with auto dealers to establish business practices which encourage sales people to make purchasers and lessees aware of the Sirius XM service.[16]

25. Even where the consumer is aware she is on a free trial to Sirius XM, that consumer listens to the service almost exclusively in her vehicle. Given the relative amount of time people spend in their vehicle, and the challenges of fully "exploring" a new audio service while driving, it simply takes more days for a consumer to fully engage with the Sirius XM service than is the case with interactive services, where the trialers are likely to engage with the service immediately and regularly in the first 30-days.

E. Alternative Proposal

26. If the Judges determine that a change to the existing regulations is appropriate, the terms of the SDARS license should allow for a royalty-free 90-day trial to new users. As described above, because Sirius XM's relationship with our trialers is less direct than between an interactive service and its trial users (our

[16] There are approximately 20,000 franchise auto dealers in the U.S. Of those, approximately 8,500 are so-called "Tier 1" dealers, referring to dealers with the highest sales volume. [redacted] Sirius XM has a team of [redacted] people assigned to these Tier 1 franchise auto dealers to ensure that in-dealership signage is properly displayed, marketing kits are placed in gloveboxes, and sales people receive proper training on how to use and explain the service to purchasers. On average, a Sirius XM representative visits each Tier 1 franchise dealer once every eight weeks—totaling more than [redacted] annual visits. In addition to the Tier 1 team, Sirius XM has another 30 people tasked with servicing the 11,500 non-Tier 1 franchise dealers.

subscribers get the trial because they bought or leased a new car, whereas the interactive users affirmatively sign up for the trial), more than one month is required to market to and successfully convert our trialers and optimize the royalty payments to SoundExchange. A trial should be defined to begin either when the trialer takes initial possession of a vehicle that has an active radio or when Sirius XM activates a radio for trial. As described in Section 8 of Prof. Shapiro's written rebuttal testimony, our proposal is also consistent with Prof. Shapiro's analysis of the likely outcome of a negotiation between Sirius XM and record labels in a workably competitive market.

III. Sirius XM's Pre-72 Lawsuits

27. In his written direct testimony, Professor Lys claims that certain of Sirius XM's direct licenses should be disregarded because they include payments for performances of Pre-72 Recordings for which labels would not otherwise be paid. Specifically, Prof. Lys claims [redacted] a leading independent music company, agreed to accept a lower royalty rate in exchange for Sirius XM's agreement to pay for performances of Pre-72 Recordings, "extra royalties that Sirius XM would otherwise not have paid."[17] Prof. Lys is incorrect.

28. Over the last four years, Sirius XM has been involved in a series of lawsuits involving Pre-72 Recordings.[18] In June 2015, before Sirius XM and

[17] Written Direct Testimony of Thomas S. Lys, ¶ 315.

[18] The first suit was filed on August 1, 2013 by Flo & Eddie, Inc. in California state court. On September 22, 2014, the Court granted Flo & Eddie's motion for summary judgment with respect to the public performance of plaintiffs Pre-1972 Recordings. On May 27, 2015, the Court granted plaintiffs motion for class certification. In September 2013, the three

[redacted] entered into a direct license in January 2016, Sirius XM had already agreed to a monetary settlement and forward-going license with the owners of approximately 85% of the Pre-72 Recordings Sirius XM performs (the "Major's Settlement").[19] At the time [redacted] entered into the direct license federal courts in New York and California had found, on summary judgment, that a right to public performance for Pre-72 Recordings existed under those states' laws and the California court had certified the class for a damages trial, of which [redacted] was the largest potential class member.

29. Subsequent to the [redacted] license, on November 13, 2016, Sirius XM entered into a class settlement for the vast majority of the remaining owners of Pre-1972 Recordings (the "Flo & Eddie Settlement").[20] This settlement is subject to approval by the United States District Court for the Central District of California. Like the Major's Settlement, this settlement will extinguish liability for past performances. The Flo & Eddie Settlement also includes a license to perform Pre-1972 Recordings through January 1, 2028 with a headline royalty rate of [redacted] Importantly, the settlement includes the following representation by the parties:

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major record labels (Sony Music Entertainment, Universal Music Group and Warner Music Group) (the "Majors"), along with ABKCO Records, filed suit against Sirius XM in Los Angeles County Superior Court. On October 14, 2014, the Court held that California recognizes a public performance right in Pre-1972 Recordings.

[19] The terms of this settlement, which extinguished liability for past performances and included a license to perform Pre-72 Recordings through December 31, 2017 are confidential and preclude introduction of its rates in this proceeding. Consistent with terms of the settlement, Sirius XM included certain financial information about the settlement in its October 22, 2015 10-Q.

[20] The Flo & Eddie Settlement covers this class action, as well as Flo & Eddie's companion cases filed in the Southern District of New York and the Southern District of Florida.

> The Parties agree that such amount represents the rate that has been established by negotiations between a ***willing buyer and willing seller*** in a ***competitive market*** for Pre-1972 Sound Recordings, and shall be precedential in all future and/or pending proceedings (including rate making proceedings and arbitrations) relating to sound recordings. (emphasis added).

As part of the Flo & Eddie Settlement, the headline royalty rate can be reduced if courts do not recognize a performance right in Pre-72 Recordings. After the execution of the Flo & Eddie Settlement the New York Court of Appeals found no such performance right under New York state law, reducing the effective royalty rate in the Flo & Eddie Settlement to [redacted]

30. As the above demonstrates, it is simply not the case that labels such as [redacted] were receiving consideration they would not otherwise have received by entering into a direct license that included Pre-1972 Recordings.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION OF DAVID J. FREAR

I, David J. Frear, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 17th day of February, 2017.



David J. Frear

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In re	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

WRITTEN REBUTTAL TESTIMONY OF THOMAS D. BARRY
(On Behalf of Sirius XM Radio Inc.)

1. My name is Thomas D. Barry. I am Senior Vice President and Controller of Sirius XM Radio Inc. ("Sirius XM"). My written direct testimony in this proceeding provides my educational and occupational background and my job responsibilities at Sirius XM.

2. In this rebuttal testimony, I respond to SoundExchange's proposals to change the governing regulations in a fashion that is designed to increase Sirius XM's royalty payments during the 2018-2022 license period by denying Sirius XM the benefit of a number of longstanding and appropriate exclusions from the "Gross Revenues" on which royalties are calculated. Chief among these is an item arising from the recent litigation between SoundExchange and Sirius XM covering the 2007-2012 license period: revenue for non-music programming "bundled" with Sirius XM packages containing licensable music. For the reasons I discuss in Section I below, the Judges should not adopt SoundExchange's unfair and disruptive "standalone sales" proposal relating to this type of programming (and to data services as well). Instead, the Judges should adopt Sirius XM's proposal, which is demonstrably more equitable

and reasonable, especially in light of the widely employed bundling strategies in the media and communications industries.

3. Apart from that disputed item, the existing definition has produced clear results that do not warrant modification, contrary to the assertions of SoundExchange witness Jonathan Bender. This is evidenced by the results of two audits of Sirius XM royalties commissioned by SoundExchange: an audit of the 2007-2009 period by PriceWaterhouseCoopers ("PwC") and an audit of the 2010-2012 period by Eisner Amper, LLP. Excluding the amounts tied to disputed legal issues and interest,[1] those audits showed differences of only about 3% of the total payments by Sirius XM during the audited periods.

4. Section II of my testimony responds to – and opposes – certain other unwarranted changes to the Gross Revenues definition proposed by SoundExchange, all aimed at depriving Sirius XM of legitimate deductions and increasing its royalty payments.

5. Section III addresses SoundExchange's attempt to disrupt our direct licensing efforts through a punitive proposal to cap the amount of our direct-license royalty adjustment.

6. Section IV responds to SoundExchange's proposed audit regulations.

7. Section V responds to SoundExchange's proposed requirement that Sirius XM report aggregate tuning hour and/or performance data from its satellite radio service.

[1] As the Judges know, the audits also flagged Sirius XM's deduction of revenues on account of performances of pre-1972 recordings, another hotly disputed legal issue where the District Court found the regulation, as written, to be ambiguous. Since 2013, those performances have been handled through a separate pre-1972 royalty adjustment rather than through an exclusion of revenue, rendering Mr. Bender's complaints on that topic irrelevant.

I. SoundExchange's Proposal to Limit the Revenue Exclusion for Data Services and Non-Music Programming to Standalone Sales Should Be Rejected and Sirius XM's Far More Equitable Proposal Adopted

A. SoundExchange's Proposal Would Create a Fee Windfall and Seriously Disrupt Sirius XM's Existing and Planned Product Offerings

8. SoundExchange proposes that the revenue exclusion for data service and non-music programming be limited to the following: "Channels, programming, products and/or other services, provided **on a standalone basis** for a separate charge where such channels use only incidental performances of sound recordings" (emphasis added).

9. The implication of this proposal, as confirmed by Mr. Bender, is that Sirius XM could exclude revenue only from transactions where a consumer purchases non-music programming separate and apart from Sirius XM's basic "Select" package, and does so without any requirement that he or she buy the Select package as well.[2] An exclusion for premium non-music programming would not be allowed, for example, when Sirius XM sells a Premier package that bundles a $15.99 Select package and a $4.00 premium non-music package, even if the charges for these two components were clearly and separately delineated to the customer, because the premium non-music package would not be considered a standalone sale. As a result, the entire $19.99 would need to be included in the royalty revenue base. This would remain the case even if Sirius XM offered the premium non-music package on a standalone basis, and therefore had independent evidence of the value of that component of the bundle. Only revenue from actual standalone sales of the non-music programming – outside of any bundle or

[2] Mr. Bender writes at page 22 of his written direct testimony that "revenue from subscription bundles is not to be allocated."

requirement to purchase another item – appear to be excludable under SoundExchange's proposal.

10. For reasons I discuss in the following paragraphs, SoundExchange's proposal should be rejected. In short, the proposal would force Sirius XM either to pay SoundExchange for programming not covered by the statutory license (at odds with the record industry's basic statutory entitlement), pay for that programming twice, or cease offering bundled packages and programming altogether. That result would be inconsistent with established practices in the entertainment industry, contrary to consumers' expectations in terms of pricing and packaging, and highly disruptive to product and packaging plans that Sirius XM has already implemented, as well as those announced or contemplated to be offered during the 2018-2022 license period.

11. To start, SoundExchange provides no testimony in support of its proposal to justify standalone sales, other than the fact that Sirius XM has been allocating and excluding revenue for certain components of its subscription bundles without a separate charge for those components.[3] But the "separate charge" requirement was already part of the regulation. Mr. Bender does not explain why standalone sales are *also* required and an appropriate allocation of revenue from bundles containing non-statutory programming is not allowed.

12. Worse, SoundExchange's proposal is highly inequitable on its face. To illustrate, if Sirius XM combined its Select package (currently retailing at $15.99) with a non-music offering that retails on its own for, say, $15.99, and offered them together for the discounted price of $25.00, SoundExchange's proposal would require Sirius XM to include the full $25 paid for the "bundle" in the Gross Revenues reported to SoundExchange, notwithstanding the fact that the equivalent standalone prices for each component would clearly establish their appropriate

[3] See page 22 of Mr. Bender's written direct testimony.

share of the bundle as being $12.50 each.[4] That highly unfair result would cause Sirius XM to pay SoundExchange and its record label members for content not covered by the statutory license, the "separate" value of which is apparent -- a result that would be at odds with the Judges' repeated statements that statutory licensees should not pay SoundExchange for non-statutory content.[5]

13. This example is not merely hypothetical. Sirius XM's business – like the rest of the entertainment industry[6] – increasingly relies on service bundles that combine various offerings into packages, and which may not be limited solely to audio entertainment. As Mr. Bender readily admits, the very purpose of SoundExchange's proposal is *to prevent Sirius XM*

[4] I address the application of SoundExchange's proposal to some of Sirius XM's actual product plans below.

[5] That highly unfair result is also at odds with the principles underlying United States Generally Accepted Accounting Principles ("GAAP"), which, in cases involving the recognition of revenue with multiple delivery elements, would allow Sirius XM to allocate $12.50 to each piece of the bundle based on reasonable evidence of their relative values, even in transactions where the two components are sold together rather than as standalones. SoundExchange's proposal would ascribe *zero* value to the non-music component of the bundle and all $25 to the Select component, even where there is reasonable evidence of the equal value of each.

[6] Nearly every major business with which consumers interact in the United States employs tiered pricing and bundling in some way, from McDonald's bundling of a Value Meal or Happy Meal, to Microsoft's bundling of Microsoft Office, to the insurance industry bundling automobile, home and umbrella plans. Tiered and bundled pricing and packaging is unquestionably a long-term, standard practice in the entertainment industry, well beyond the satellite radio business. Today, for example, DISH Network Corp., the satellite-to-home paid TV service, offers subscribers many bundled packages at widely varying price points, including DISH Top 250, a package of 200 channels plus 17 movie channels, with Turner Classic Movies, The Movie Channel, Starz Encore, Disney XD, Bravo, A&E, Sundance, ESPN, local channels and regional sports channels. Some of these components are sold separately, but most are not. Similarly, Verizon Fios offers a variety of packages at several price points, including its "triple play offering" of HD television programming, Internet service, and phone service. Amazon offers consumers "Amazon Prime," a bundle that offers free shipping, exclusive access to movies and TV shows, ad-free music, unlimited photo storage, and access to Kindle books for a single price. Amazon Prime includes tiers as well within the bundle: an $8.99 tier for prime video, and a $10.99 tier to add free two-day shipping (same day in some areas) as well as unlimited music streaming, reading, and photo storage.

from selling a discounted bundle without paying SX for the entire bundle, an outcome that would apply even where the standalone prices for the components in the bundle provide more than ample evidence of their value. A number of simple packaging examples illustrate the problems presented by SoundExchange's proposal with respect to Sirius XM.

14. Sirius XM currently offers an All Access package (the "Current All Access Package") for $19.99 that consists of three components:

- the Select package, which retails for $15.99;
- a package of premium non-music channels consisting of (in the case of the XM system) NFL Radio, NFL play-by-play, NASCAR Radio, Howard 100 and Howard 101 and (in the case of the Sirius system) Fantasy Sports Talk, MLB Radio, NBA Radio, Golf, and Opie Radio (none of which make more than incidental use of sound recordings); and
- Sirius XM Internet Radio ("SIR"), an internet radio service where the performances of sound recordings are separately licensed under the webcasting statutory license, and which is offered on a standalone basis for $15.99 per month.[7]

15. Sirius XM prices its Select package at $15.99, regardless of whether the programming is delivered via the Internet or through its satellite radio system, and sells that package to millions of subscribers. However one might divide the $4.00 difference between the Select and All Access prices as between the premium non-music portion and internet access, what is clear is that ***none*** of the $4.00 difference is attributable to the value of performances of sound recordings in the Select package. To force Sirius XM to pay royalties on the entire $19.99

[7] SIR is also available to subscribers of our Select package for an additional charge of $4.00.

would, purely and simply, create a windfall to SoundExchange—including receiving a double payment in the form of a percentage of revenue royalty ***and*** a per-performance royalty for the separately licensed performances of sound recordings delivered via Sirius XM Internet Radio. SoundExchange is entitled to payment of one royalty per performance, not two. Further, it is not entitled to *any* royalty with respect to non-music programming that is a part of the additional price consumers are asked to pay to receive the Current All Access Package.

16. Sirius XM operates a growing and diverse business which is not limited to audio entertainment. [redacted]

17. Under SoundExchange's "standalone sales" proposal, it appears that Sirius XM would be forbidden from allocating the revenue from the Current All Access Package and the Future All Access Package to their constituent components and excluding the revenue for those components not covered by the SDARS statutory license – even in the starkest case where those components have clear standalone prices. SoundExchange and its members should not be entitled to profit from such content nor should Sirius XM and its stockholders be required to pay twice for it.

18. The problems inherent in SoundExchange's proposal are not limited to the current and Future All Access Packages. Sirius XM has publicly announced and features in its annual Report on Form 10-K filed with the Securities and Exchange Commission on February 2, 2017, that it is well along towards developing a product called "360L" that will combine wireless Internet capabilities and Sirius XM's satellite service in a single, cohesive in-vehicle entertainment offering. [redacted]

19. There is no reason that Sirius XM should be forced to include in its "Gross Revenues" reportable to SoundExchange the entire revenue from a bundle [redacted] where the value of the standard music/non-music package is clearly known and included in the payment to SoundExchange.

B. Sirius XM's Proposal for Addressing Bundled Programming is Fair, Equitable and Transparent

20. To avoid such inequitable results, Sirius XM proposes instead the following exclusion:

> (vi) Licensee revenues for the provision of . . .
>
> (B) Channels, programming, products and/or other services, other than as included in Licensee's standard music/non-music package, where such channels use only incidental performances of sound recordings; in cases in which Licensee offers such channels, programming, products and other service in a bundle or package with its standard music/non-music package, the exclusion shall be an amount equal to the difference between: (a) the stated sale price of the bundle, minus (b) the stated sale price of the bundle multiplied by a fraction, the numerator of which is the publicly stated retail price of the standard music/non-music package when sold on a standalone and undiscounted basis, and the denominator of which is the publicly stated retail price of the bundle when sold on a standalone and undiscounted basis.[8]

21. This proposal is far more equitable and reasonable than SoundExchange's for several reasons. First, it relies on observable standalone retail prices, is easily implemented, and therefore would prevent any possible gamesmanship that SoundExchange (falsely) claims Sirius XM would engage in. If the standalone retail prices dictate that 4/5ths of the value of an All

[8] We propose a similar amendment to the Data Services exclusion, where SoundExchange has proposed a similar "standalone sales" limitation. While the discussion in the text focuses on non-music programming, it applies to data services bundled with other Sirius XM programming as well. I note that we also propose changing "Revenues recognized by Licensee for the provision of" to the simpler "Licensee revenues for the provision of" to avoid any further accusations from SoundExchange (albeit rejected by the Judges in the recent litigation regarding the SDARS I period) that Sirius XM did not and could not "recognize" revenue for portions of a bundle.

Access bundle should be allocated to the royalty-bearing Select package (using our current $15.99/$19.99 pricing as an example), Sirius XM cannot arbitrarily allocate just $2 to the royalty-bearing portion of that bundle and allocate $18 to the non-music portion: a full $15.99 would go into the revenue base. Nor could Sirius XM alter the allocation if the bundle were sold at the discounted price of, say, $15: $12 (4/5ths of the sale price) would need to be included in Gross Revenues.

22. Second, our proposal achieves two clear goals of CRB proceedings: (i) avoiding a situation where Sirius XM must pay statutory royalties for non-statutory content; and (ii) as dictated by 801(b)(1)(D), avoiding the highly disruptive effect of preventing Sirius XM from making bundled sales (or doing so at the cost of paying royalties on the non-statutory components of the bundles).

23. Third, it reduces ambiguity and areas of potential dispute without sacrificing Sirius XM's business flexibility. The regulations promulgated by the Judges in connection with this proceeding should be narrowly tailored, clear and straightforward. Ambiguities as to how to apply the regulations serve neither the interests of the music industry nor the interests of users of statutorily licensed sound recordings, and will serve only to spawn further, costly disputes of interpretation to no one's ultimate benefit.[9] The regulations should also reflect the market for the

[9] As recently suggested by the Judges in one such dispute, the most economically appropriate method to apportion the price of any bundle may be to allocate the revenue for the bundle *pro rata* among its components based on evidence of the relative value of each of the components of the package (i.e., as opposed to the difference between the Select price and the bundle price). This allocation would be consistent with the principles and accounting literature underlying GAAP, which in certain cases allows the allocation of revenue from multiple element arrangements for recognition purposes as long as there is reasonable evidence (including, but not limited to, standalone sales) of the value of the elements. Sirius XM has <u>not</u> proposed that approach here, for very practical reasons. Our experience with SoundExchange audits suggests that such an approach could very well lead to endless disputes over the sufficiency of the evidence used to support the allocation of the bundle, whereas the standard retail prices for the

wide range of products and services that Sirius XM offers, and more importantly, is likely to offer, during the license period. It would be imprudent to ignore that Sirius XM offers a wide range of products and services that are sold in a bundle with a range of functionalities, only a small portion of which rely on copyrighted sound recordings that are subject to this proceeding.

24. For similar reasons, Sirius XM's proposal eliminates the current "separate charge" requirement. This is intentional. If an allocation for the Select package is included in the Gross Revenues based on the stated retail prices of that package, and the remainder excluded, then there is no need to layer on a further requirement that the components of the bundle be separately charged as well. This makes business sense for Sirius XM – a single discounted package price is more effective from a marketing standpoint than a package chopped up into separately-priced pieces – and will avoid disputes over what constitutes a "separate charge."

II. SoundExchange's Other Proposed Changes to the Gross Revenues Definition Should Be Rejected

25. SoundExchange proposes the following additional changes to the Gross Revenues Definition at 382.11 (proposed new language is underlined):

> **…** (3) To the extent otherwise included by paragraph (1) or (2), Gross Revenues shall exclude:
>
> (i) Monies or other consideration attributable to the sale and/or license of equipment and/or other technology, including but not limited to bandwidth, sales of devices that receive the Licensee's SDARS and any ~~taxes,~~ shipping and handling fees therefor;
>
> (ii) Royalties paid to Licensee for intellectual property rights;
>
> (iii) Monies or other consideration received by Licensee from the sale of phonorecords and digital phonorecord deliveries;
>
> (iv) Sales and use taxes~~,~~;

Select and bundled packages will be readily observable and objective. And what we are proposing ensures that the Select portion of the bundle will always be allocated its full share of revenue based on its non-discounted retail price.

> (v) ~~shipping and handling, c~~Credit card, invoice, ~~fulfillment service~~ activation, swap and early termination fees charged to subscribers and reasonably related to the Licensee's expenses to which they pertain;
>
> (vi) Bad debt expense, and . . .

There are several problems with these changes.

26. First, SoundExchange's proposals would not allow an exclusion unless the money could be included in the revenue base as either (1) U.S. subscription revenue for Sirius XM's satellite radio service or (2) advertising revenue. This could forbid legitimate deductions that are either not subscription or advertising revenue, or that are not, for accounting reasons, categorized as revenue at all. Equipment revenue, royalties paid for intellectual property rights, and phonorecord sales, for example, are not subscription or advertising revenue. Bad debt and Credit Card expense (an exclusion which SoundExchange would allow) are not booked as revenue at all. And the vast bulk of the sales and use taxes Sirius XM collects and pays through to local taxing authorities [redacted]

27. Mr. Bender's testimony suggests that SoundExchange's proposal is intended to prevent something else: Sirius XM reducing its reportable Gross Revenues for SDARS on account of refunds or other downward adjustments to categories of revenue that aren't included in Gross Revenues in the first place (for example, bad debt or on webcasting subscriptions). Sirius XM does not disagree with that principle, [redacted] But that goes to show that such issues can be (and are) properly handled in an audit, not through an overbroad edit to the Gross Revenues definition that would rule out a wider array of legitimate exclusions.

28. Second, SoundExchange's new proposed requirement that fees be "charged to subscribers" in order to be excluded would forbid Sirius XM from taking exclusions that SoundExchange includes in the regulation – and exclusions that the Judges have repeatedly

upheld – and thus require Sirius XM to count as revenue sums that *it never collects*. The most significant item here is credit card processing fees paid to Visa, MasterCard, American Express, and associated entities for processing subscriber payments made by credit card. [redacted] The fact that the customer is not explicitly billed the $2 credit card processing fee (it is instead subsumed in the $100 charge) should not cause Sirius XM to have to report the full $100 to SoundExchange.

29. Third, SoundExchange's new proposed requirement that excludable revenue be "reasonably related to the Licensee's expenses to which they pertain" is a vague requirement that will create more disputes than it prevents. While certain billed revenues tie explicitly to clearly identifiable and separate expense accounts – invoice fees, for example, reflect amounts charged by a vendor for processing, printing, and mailing paper invoices – others are less explicit (although by no means less justified). [redacted] Sirius XM should not be forced to include those unrelated fees on the argument that they don't "reasonably relate" to a particular expense account.

30. Fourth, and relatedly, SoundExchange's proposal omits late fees as an excludable charge. Those fees are charged [redacted] and therefore should not be included. Despite this, [redacted] Accordingly, our proposed terms add late fees as an excludable item.

31. In sum, the Gross Revenues definition was thoughtfully constructed 10 years ago by the CRB and has, as noted above, proven to be largely clear and unambiguous through two audits conducted by SoundExchange covering the 2007 to 2012 period. SoundExchange's proposed revisions to the definition are nothing more than an attempt to obtain a rate increase in another form.

III. SoundExchange's Proposed Change to the Direct License Share Should Be Rejected

32. SoundExchange also proposes yet another de facto rate increase through a change to the Direct License Share at 37 C.F.R. § 382.12(d). Even though the share will continue to be calculated based on the performances of directly licensed tracks on Sirius XM's webcasting reference channels – a metric that SoundExchange itself advocated for in *SDARS II* – SoundExchange now proposes that if the percentage of directly licensed *plays* on Sirius XM's satellite radio service (which we refer to as the "Playlist Share") is *less* than the Direct License Share of internet reference channel performances, then that lower Playlist Share shall be used instead to calculate the direct-license adjustment to Sirius XM's royalty payments to SoundExchange. For example, if the Direct License Share as written (based on internet performances) is 6.4%, but the Playlist Share constitutes only 5.9% of the total plays on the satellite channels, then Sirius XM would get only a 5.9% reduction in its royalty payment. This

inequitable "lesser of" proposal is a transparent effort to make our direct licensing efforts uneconomical and should be rejected.

33. The genesis for the proposed change – described at length in the written direct testimony of George White – is that SoundExchange continues to distribute Sirius XM royalties to its members based on satellite plays, creating a mismatch if the directly licensed tracks are played on channels that, on average, have lower listenership on the internet than the other internet channels.[10] SoundExchange claims that if the Direct License Share (based on internet performances) is higher than the Playlist Share, those labels who continue to be paid via SoundExchange will receive lower payments than they would absent direct licensing.

34. To start, SoundExchange's complaint is purely hypothetical: as Mr. White explained, [redacted]

35. Even if the Direct License Share were higher than the Playlist Share, it would not create the inequity SoundExchange claims. If 10% of Sirius XM's performances are directly licensed, and it pays SoundExchange 90% of what it otherwise would pay, there is nothing inequitable about the non-direct-licensors splitting up the 90%. That amount reflects their share of performances on the internet reference channels, the measure the Judges have decided – at SoundExchange's prodding – is the best measure of the relative value of sound recordings used

[10] To give another example, if the Bluegrass channel has half the internet listenership of the Highway, a directly licensed track played on the Bluegrass channel will generate half the internet performances of the track played on the Highway, even though their share of plays on the satellite service will be identical.

by Sirius XM. That the non-directly-licensing labels' share of *spins* might be 92% is irrelevant, regardless of whether SoundExchange chooses to pay out on that basis.

36. SoundExchange's proposal would take a knife to the heart of Sirius XM's direct licensing effort. Sticking with the prior example, if Sirius XM is paying direct licensors for 10% of its performances,[11] but can only reduce its SoundExchange payments by 8%, it could end up paying more to the direct licensors than it saves in SoundExchange payments – and would be paying twice for the performance share (the 2%) it is unable to carve out from its SoundExchange payments.

37. In the end, Sirius XM agrees that the mismatch is problematic. As Mr. White explains, it prevents us from considering direct licenses with labels who "under-index" on the internet channels. But the fix for that is not a punitive "lesser of" approach that would maintain the discrepancy; it is, rather, ***to have the Direct License Share be calculated on the same basis as SoundExchange distributes Sirius XM royalties***. That is precisely why Sirius XM proposed the Direct License Share be based on satellite plays rather than internet reference channel performances.

IV. SoundExchange's Proposed Changes to the Audit Regulations Should Be Rejected

38. SoundExchange has proposed that the audit provisions from the recently adopted webcasting regulations be adopted for the SDARS regulations, with the additional change that Sirius XM must pay the costs of any audit that reveals an underpayment of 5% or more (versus the 10% found in the webcasting regulations and the current SDARS regulations). The testimony of Mr. Bender also discusses the recent royalty examination of Sirius XM at length,

[11] To be consistent with the Direct License Share ordered by the Judges, Sirius XM pays its direct licensors based on their share of internet reference channel plays.

suggesting Sirius XM exploited loopholes and deliberately underpaid SoundExchange. Sirius XM objects to four aspects of this proposal:

39. *Overpayments*. Just as Sirius XM should be required to make any underpayment revealed in an audit, basic fairness requires that an independent auditor (as the regulations require) should identify, and SoundExchange should issue a credit for, any overpayment revealed in an audit. The concern SoundExchange raised in the *Web IV* proceeding – that crediting an overpayment would require it to claw back funds already distributed to record companies and artists – does not apply here. Overpayments in the webcasting setting, where licensees pay on a per-performance basis, are necessarily tied to over-counting performances of certain tracks; correcting such performance counts could therefore entail a clawback of royalties already distributed for those performances. Because Sirius XM pays royalties on a percentage of its revenue, correcting an overpayment will not be tied to any particular performances, or require SoundExchange to claw back any previous distributions to copyright owners made on account of Sirius XM. Sirius XM would simply be able to reduce its payment in the next reporting period by the amount of the credit, no different than any other deduction from revenue allowed during the period.[12]

40. *Interest Charge*. SoundExchange's proposed terms would apply the 1.5% per month penalty for late payments and statements of account. As I pointed out in my direct testimony, the logic of this penalty – intended to provide an incentive to a licensee to make timely payments in the first place – does not apply to good-faith inaccuracies in a timely-made payment. Worse, it is tremendously unfair and inappropriate for an audit that may be completed

[12] My written direct testimony indicated that the *Web IV* determination added the underpayment/overpayment requirement to the governing regulations. While the Judges' *initial* determination did so, the final published regulation (titled "overpayment or underpayment of royalties") provides for the crediting of an overpayment only where the parties agree to do so.

several years after the reporting period, and where the parties may have good-faith disputes over ambiguous terms in a complicated revenue definition. The 1.5% rate is so far in excess of any alternative investments that it actually incentivizes SoundExchange to delay audits and their resolution. There is no justification for interest charges that outstrip the principal owed, as was the case in SoundExchange's recent audit of Sirius XM. The audit provisions in Sirius XM's direct licenses have no interest component on underpayment at all. Nor do most of Sirius XM's agreements with the OEMs, despite containing "rev-shares" comparable to the statutory license. Accordingly, Sirius XM's proposed terms include the more sensible and equitable standard interest rate applied to federal court judgments. SoundExchange provides no arguments in support of the 1.5% in its direct case; it simply replicates the regulation adopted in *Web IV*.[13]

41. *Dispute Resolution.* A related concern with the interest charge is the seemingly endless delay in finalizing audits. As the Judges noted in *Web IV* (and I echoed in my written direct testimony), audit results should not be automatically binding – the parties must have some ability to dispute the findings, particularly where it appears that the auditors are simply taking directions from SoundExchange as to what deductions are or are not allowed under the regulations. But by the same token, audits must eventually be settled and our books for past years closed. Our SoundExchange audit for 2007-2009 is still unresolved, ten years after the start of the audited period, and five years since the draft audit report was provided in February 2012. We therefore propose a requirement, based on the similar audit provisions in our direct licenses, that renders the disputed amounts Sirius XM paid during any audited period final on the date two years after an audit report is delivered, absent a legal action being filed before that time

[13] The *Web IV* determination provides no explanation for the adoption of the 1.5% rate, which did not exist in the prior webcasting regulations. I have been informed that the appropriateness of that rate level was not briefed by any of the participants.

by SoundExchange (in the case of an underpayment) or Sirius XM (in the case of an overpayment).

42. *Fee Shifting*. SoundExchange has provided no justification for the change other than the fact that, because Sirius XM is large, even a 5% underpayment "dwarfs" the cost of the audit. But that's a non sequitur. The level of underpayment that triggers the fee shift is not based on how much the audit costs (which, given our size, is actually less than half of one percent of our payments to SoundExchange), but on deciding at what percentage an underpayment becomes unreasonable enough to penalize the licensee. SoundExchange has provided no evidence to support that level being 5% as opposed to the 10% currently in the regulations and our direct licenses.

V. SoundExchange's Proposals Regarding the Use of ATH and Performance Reporting Should Be Rejected

43. SoundExchange proposes new regulations that require Sirius XM, if "capable of obtaining reasonably reliable data," to report Aggregate Tuning Hours or Performances on its satellite radio service, and further require SoundExchange to distribute royalties based on such data and Sirius XM to calculate its Direct License Share and Pre-72 Recording Share based on such data. This should be rejected. While Sirius XM's 360L technology will begin to be offered during the forthcoming license period, [redacted] Sirius XM does not disagree with the spirit of SoundExchange's proposal, but the regulations should not build in a contingency that may or may not occur, or a concept such as "capable of obtaining reasonably reliable data," which is sure to create disputes.

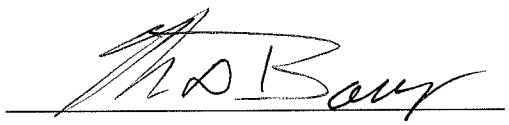
Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
THE LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of	)	
DETERMINATION OF ROYALTY RATES AND TERMS FOR TRANSMISSION OF SOUND RECORDINGS BY SATELLITE RADIO AND "PREEXISTING" SUBSCRIPTION SERVICES (SDARS III)	)	**Docket No. 16-CRB-0001-SR/PSSR (2018-2022)**

DECLARATION OF THOMAS D. BARRY

I, Thomas D. Barry, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned proceeding are true and correct to the best of my knowledge, information, and belief.

Executed this 17th day of February, 2017.



Thomas D. Barry

PUBLIC VERSION

SXM Reb. Ex. 1

RESTRICTED DOCUMENT

Subject to Protective Order in Docket No. 16-CRB-0001 SR/PSSR (2018-2022) (SDARS III)

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SXM Reb. Ex. 2

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Before the
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In the Matter of	)	
ADJUSTMENT OF RATES AND TERMS FOR PREEXISTING SUBSCRIPTION SERVICES AND SATELLITE DIGITAL AUDIO RADIO SERVICES	)	Docket No. 2006-1 CRB DSTRA

WRITTEN REBUTTAL TESTIMONY OF

JOHN R. HAUSER

Kirin Professor of Marketing and Head of the Management Science Area
MIT Sloan School of Management, Massachusetts Institute of Technology

July 2007

TABLE OF CONTENTS

I. Introduction 1

II. Assignment 3

III. Summary of Opinions 4

IV. Two Key Conceptual Flaws in the Wind Survey 8

V. Further Critique of the Wind Survey 16

VI. Two Surveys Correct Some of the Flaws in the Wind Survey 24

VII. Qualitative Research to Identify the Voice of the Customer 26

VIII. Questionnaire Development 28

IX. Identifying the Samples 30

X. Validations 34

XI. Mall-Intercept and Internet Questionnaires 35

XII. Willingness to Pay for Music 37

XIII. The Importance of Music 40

XIV. Relative Importance of Sound Recording Rights, 1972 and Later, as a Percentage of the Importances of Music Programming Features 41

XV. Use by the Pelcovits Report of Data from the Wind Survey and Opinions Expressed in the Wind Report 42

XVI. Use by the Ordover Report of Data from the Wind Survey and Opinions Expressed in the Wind Report 44

XVII. Results of Correcting Data from the Wind Survey and Opinions from the Wind Report Used in the Ordover and Pelcovits Reports 46

Exhibits:

A – Curriculum Vitae
B – Testimony in Last Four Years
C – Materials Reviewed
D - List of Customer Needs from Exploratory Research
E - Mall-Intercept Questionnaires: Word versions and CAI Screen Shots
F – Mall-Intercept Screening Statistics and Sample Deposition
G - Internet Survey Questionnaire and Screen Shots
H - Internet Survey Invitation to Respondents
I - Internet Survey Screening Statistics Sample and Disposition
J - Willingness to Pay for Satellite Radio
K - Value of Satellite Radio Features
L - Anchored Importances as Measured in the Mall-Intercept Survey
M - Importance of Music Programming Features (From Internet Survey)
N - Willingness to Pay Using Pelcovits Cut-off
O - Value of Sound Recording Rights Disaggregated by Time Period

Appendices:

1 –	Calculations Reweighted for Demographics of XM and Sirius Subscribers
2 –	Validation Protocol
3 –	Exhibits with Confidence Intervals for Estimates Used in this Report

I. Introduction

1. My name is Dr. John R. Hauser. I am the Kirin Professor of Marketing and Head of the Management Science Area at the MIT Sloan School of Management at the Massachusetts Institute of Technology ("MIT"). The Management Science Area at the MIT Sloan School of Management includes the Marketing Group, the Statistics Group, and other groups. I have served MIT in a number of capacities including Head of the Marketing Group, Director of the Center for Innovation in Product Development, and Director of the International Center for Research on the Management of Technology. The principal focus of my research and teaching at MIT has been in the areas of marketing management, new product and service development, customer satisfaction, marketing research, and competitive marketing strategy.

2. I am the author of over seventy articles and papers, as well as the textbooks *Design and Marketing of New Products* and *Essentials of New Product Management*. In addition, I served as editor-in-chief of *Marketing Science* and have held senior editorial positions with *Management Science*, the *Journal of Product Innovation Management*, and the *Journal of Marketing Research*. I have also received numerous awards for excellence in research and teaching in marketing and marketing research, and was recognized by the American Marketing Association with the Converse Award for "outstanding contributions to the development of the science of marketing."[1] I received the Parlin Award, "the oldest and most distinguished award in the [marketing research] field [that recognizes] distinguished academics and practitioners who have demonstrated outstanding leadership and sustained influence on the evolving profession of marketing research."[2] I have done research on and have provided consulting advice about market research and new product development for over thirty years. My textbooks on new product development have also been influential and have been used at many universities.

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[1] See http://web.mit.edu/newsoffice/1996/converse-0403.html.
[2] See http://www.marketingpower.com/content1097.php.

I am a trustee of the Marketing Science Institute. My Curriculum Vitae is attached as Exhibit A.

3. One article, for which I have received awards, is particularly relevant to this case. I have been informed that this article on the "Voice of the Customer" was identified by the INFORMS Society of Marketing Science as one "of the top 20 marketing science articles in the past 25 years."[3] This article, among other things, establishes a scientific basis for identifying those aspects of a product or service that customers or potential customers use when making a decision to purchase or use that product or service. When published, this article was awarded prizes for the best article published in marketing science (1993) and the best article based on a dissertation (awarded 1995). It has influenced the scientific literature on qualitative interviewing, having been cited at least 178 times by peer-reviewed articles (based on ISI's Web of Science) and at least 352 times on Google Scholar.[4]

4. I have served as an expert witness in connection with a range of disputes. Most of this expert testimony has involved surveys and other market research to measure customers' attitudes, beliefs, and intentions. I have been called upon to project what customers would have done in different market scenarios, to measure the importance of product features, to measure the impact of rumors, to evaluate marketing research with respect to advertising claims, and to investigate the potential for customer confusion. I have also consulted to dozens of major corporations, including General Motors, Fidelity Investments, American Airlines, Proctor & Gamble, and IBM. A list of cases in which I have testified within the last four years at deposition or trial is attached as Exhibit B.

5. The subject area headings in this report are intended to assist the reader and no inference should be drawn from the use or omission of any wording or description in these headings.

6. Part of the work for this investigation was performed under my direction by Applied Marketing Science, Inc. ("AMS").[5] Since 1989, AMS has conducted market

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[3] Griffin, Abbie and John R. Hauser (1993), "The Voice of the Customer," Marketing Science, vol. 12, No. 1, (Winter), 1-27.

[4] Data as of June 23, 2007.

[5] See http://www.ams-inc.com.

research and surveys designed to gauge consumers' wants and needs for new products in dozens of industries. I am a Senior Consultant for and Co-Founder of AMS.

7. My rate of compensation for this assignment is $650 per hour. My compensation is not contingent upon the outcome of this dispute.

II. Assignment

8. I have been asked by counsel for XM Satellite Radio Inc. ("XM") and Sirius Satellite Radio Inc. ("Sirius") to review and respond to the original and amended Expert Testimony of Yoram (Jerry) Wind (hereafter the "Wind Report") written on behalf of SoundExchange, Inc. (hereafter SoundExchange). In addition, I reviewed the use of the opinions in the Wind Report by two economists who have provided opinions in this case. Those reports are the Expert Testimony of Janusz Ordover (hereafter the "Ordover Report") and the original and amended Expert Testimony of Michael Pelcovits (hereafter the "Pelcovits Report").

9. My work is ongoing; I may update and revise my results and conclusions as I review additional data and information. I reviewed the Wind Report, the Pelcovits Report, and the Ordover Report. In addition, I reviewed the survey described in the Wind Report as well as data files summarizing the results of the survey. I reviewed the deposition transcript and trial transcript of Dr. Jerry Wind. I also reviewed the web pages of XM and Sirius and two Harvard Business Review cases on XM Satellite Radio.[6] I have subscribed to XM and have experienced it first hand. By professional experience I have reviewed numerous articles and textbooks on survey research and on conjoint analysis. I have cited some of these articles in the footnotes to this report. A complete list of materials I have considered to date in connection with this assignment is included as Exhibit C. To the extent that I review additional information after this report is filed, I will supplement this list.

[6] XM Satellite Radio (A & B) Harvard Business Review Case 9-504-009. I have also reviewed the Instructor's notes to that case and have taught this case in a basic marketing management course at MIT.

10. In addition to my review and response to the Wind, Pelcovits, and Ordover Reports, I also designed and executed two surveys among subscribers and potential subscribers of satellite radio. These surveys are based on scientific principles and were executed according to those principles. My surveys correct some of the methodological flaws in the survey described in the Wind Report (hereafter the "Wind Survey") and provide more accurate measures of the value that subscribers and potential subscribers of satellite radio place on the various features of satellite radio.

III. Summary of Opinions

11. The willingness to pay ("WTP") question (Question 9) and analyses in the Wind Survey and Wind Report are biased by the method in which the feature in question is always removed first from satellite radio service. This biased method strongly favors SoundExchange, and the results for each feature cannot be used on a standalone basis because they insufficiently account for the value provided by other features. Based on this biased method, the Wind Report estimates that respondents are willing to pay $6.80 for music. When these questions are re-asked cumulatively – the more appropriate method, as I explain below – in an order that favors XM and Sirius, results show that respondents would be willing to pay only $0.92 for music. If the questions are asked cumulatively, in an unbiased, random order, respondents are willing to pay $2.93 for music in general, a number that is reduced to $1.78 when music is limited to music of the 70's, 80's, 90's and today.[7]

12. The features that the Wind Survey uses in its willingness-to-pay and constant-sum questions were obtained from counsel for SoundExchange and were not modified by Dr. Wind. It is scientifically more appropriate to select features based on the "voice of the customer." Based on this limited set of features and an analysis that favors SoundExchange, the Wind Report estimates that 74% of the respondents allocate the most points to music. When importances are measured for features

[7] I am informed that the sound recording rights at issue in this case are for sound recordings created from February 15th, 1972 onward. They do not cover sound recordings prior to 1972 or live performances.

identified based on the voice of the customer and ties are broken fairly, as done in my surveys, substantially fewer respondents, 5.4%, allocate the most points to music of the 70's, 80's, 90's, and today.

13. There are other biases or threats to reliability in the Wind Survey and the Wind Report. These biases and threats to reliability exacerbate the fundamental biases discussed in Paragraphs 21 - 38. Among these biases and threats to reliability are the following:

- The willingness-to-pay question, Question 9, is leading, biased upward and confusing (see paragraphs 40 - 44 of this report).
- The value of music is inflated substantially in the conjoint analysis (paragraphs 45 - 48).
- The respondents' answers to the Wind Survey's most open-ended question (Question 1, as shown in Figure 11 of the Wind Report), contradict the Wind Report's conclusion (paragraphs 49-50).
- Many conclusions in the Wind Report are based on figures that improperly conflate the responses to questions addressing primarily programming features (Questions 2 and 3 of the Wind Survey) with the responses to less restrictive questions (Questions 1 and 11 of the Wind Survey) (paragraph 51).
- The Wind Report's use of a single coder does not allow us to assess the reliability of the content (open ended responses) analysis in the Wind Report. The use of independent, multiple coders would have allowed for the objectivity and would have allowed the quality of work of each coder to be assessed (paragraph 52).

14. I designed and executed two surveys to examine the impact of some of the critical flaws in the Wind Survey. These surveys are based on scientific principles and were executed according to those principles.

15. The first survey I conducted replicates the mall-intercept methodology used by the Wind Survey and provides more-accurate estimates of willingness to pay (WTP) for the sound recording rights at issue in this case. This survey also measures the importance of a more-representative set of features of satellite radio services. The second survey is an Internet Survey, a commonly accepted and scien-

tifically valid methodology. The second survey uses constant-sum methods to measure the relative importance of various features of music programming.

16. I found, based on the willingness-to-pay questions in the mall survey I conducted, that the consumers' willingness to pay for music programming is $2.93. This is a more reasonable estimate than the Wind Report's value of $6.80.[8] It is more reasonable because the Wind Report's value is based on a biased methodology that grossly inflates its estimate of the value of music programming.[9] We can further parse consumers' willingness to pay for music programming to focus on music from the 70's, 80's, 90's, and today. I parse consumers' willingness to pay with the importance ratings for various types of music programming in the Internet survey I conducted. Based on this parsing, the value of music programming from the 70's, 80's, 90's and today is $1.78.

17. As part of the Howard Stern analysis, the Pelcovits Report relies on data from Question 9 of the Wind Survey that are flawed and misleading. Rather than the 43% cancellations if music were unavailable on satellite radio that the Pelcovits Report draws from the flawed data of the Wind Survey, my mall-intercept survey reveals that only 12.2% of the respondents would cancel their service. The Pelcovits Report further assumes that Sirius (and by implication, XM), would not find it viable to provide service to all customers who the Wind Survey identifies as willing to pay less than $12.95 if music were not available.[10] The Wind Survey attributes an average willingness to pay of $7.27 to customers who would pay less than $12.95 and the Pelcovits Report assumes that Sirius (and by implication, XM) would not find it profitable to provide service at $7.27.[11] This is an incorrect assumption arising from the Pelcovits Report mistakenly attributing the average willingness to pay of $7.27 to all of these customers, when in fact their will-

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[8] This WTP value is derived from Figure 8, on page 24 of the Wind Report. It is equal to $12.95 - $6.15, the latter being the price on average that respondents are said to be willing to pay for a satellite radio service without music. The Wind Report concludes, the balance of the purchase price of $12.95 must be equal to the value of music programming.

[9] This is discussed in further detail in paragraphs 23 – 29 of this report.

[10] Pelcovits Report, Footnote 14 on pages 13-14.

[11] The Pelcovits Report uses data attributed to Sirius' customers. The Wind Report provides an estimate of $7.18 as the average willingness to pay for satellite radio customers who would pay less than $12.95. Wind Report, page 24, Figure 8.

ingness to pay can fall anywhere in the range from $0.01 to $12.94. With this flaw in mind, we can nevertheless use data from the willingness-to-pay question in the mall-intercept survey I conducted to show that 12.2% of respondents would cancel and an additional 9.6% of respondents would pay less than $7.27 for their service.[12] Thus, when these flaws in the Wind Report are corrected, the estimate of the percent of subscriber revenue lost if music were not available that the Pelcovits Report derives from the Wind Survey would be 21.8% -- much smaller than the 56% in the Wind Report. Indeed, even 21.8% overstates the "value" as applicable to this case because it includes the value of music recorded prior to 1972 and live music. A more accurate, but still conservative, estimate would reduce the 21.8% value by another 39.2%, to account for the importance of music from the 70s, 80s, 90s and today. The Pelcovits Report also uses the Wind Survey's flawed data as part of its "Shapley value" model. The Pelcovits Report's analyses are flawed because the inputs to the calculations are fundamentally flawed due to the fact that the Wind Report does not determine the appropriate incremental value for music and ignores other aspects of XM's and Sirius' services that add significant value.

18. While I do not opine on the methodology, relevance or appropriateness of analyses in the Pelcovits Report, the effect of using the Wind Survey's flawed data on that analysis is dramatic. To illustrate this, when the inputs from the Wind Report into the Pelcovits Report's Howard-Stern analysis are adjusted based on the results from my Internet and mall intercept surveys, the Pelcovits Report's own analyses conclude that the percent of satellite radio service revenues attributable to the sound recording rights at issue in this case are 2.8% or less.[13,14]

19. The Ordover Report similarly refers to and relies on data from the Wind Report that are flawed and misleading, including the results from the Wind Report's constant sum question. When the Wind Report's constant-sum question is re-asked

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[12] I summarize the results using the $7.27 cut-off that is used by the Pelcovits Report (Footnote 14, pages 13-14). Data are also available to calculate results for other cut-off levels such as the $7.18 average in the Wind Report, Fig. 8, p. 24, or for any other cut-off that might be proposed. I am not opining that $7.27 is the appropriate cut-off.

[13] The Pelcovits Report refers to satellite radio service as SDARS for "satellite digital audio radio services."

[14] See calculations in Paragraph 118.

using a more-complete set of features and breaking ties fairly, substantially fewer respondents assign the most points to music of the 70's, 80's, 90's, and today: 5.4% versus the 74% that the Ordover Report quotes. The more general feature, "I can listen to music" is ranked first by 10.7% of the respondents. Further, as noted above, my survey reveals that the percent of respondents who would cancel if satellite radio lacked any music programming is 12.2%, much lower than the 43% that the Ordover Report relies upon. The Ordover Report quotes the Pelcovits Report to estimate that "music accounts for approximately 55% of the value of all programming content distributed by the SDARS."[15] This 55% was an approximation of the 56% from the Pelcovits Report which was in turn based on data from the Wind Report.[16] Among other flaws, the 56% is based on a flawed questioning approach (Wind Survey Question 9), hence, this 55% itself is flawed.

20. Thus, the calculations outlined in the Ordover Report, like those in the Pelcovits Report, are based on flawed data and, hence, are themselves flawed.[17] While I express no opinion on the methodology, relevance, or appropriateness of Dr. Ordover's report generally, were Dr. Ordover to redo those calculations using data from my mall-intercept and Internet surveys – data that are more-accurate than the data from the Wind Survey – the Ordover Report would estimate royalties that are substantially less than those estimated based on the flawed data from the Wind Report.

IV. Two Key Conceptual Flaws in the Wind Survey

21. There are many flaws in the Wind Survey. These flaws increased erroneously the value that the Wind Report estimates for music programming. Indeed, when these flaws are corrected (and the remaining aspects of the methodology in the Wind Report are kept intact), the estimated value of music programming is substantially lower. I address in this section two key conceptual flaws in the Wind Survey.

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[15] Ordover Report, p. 41.
[16] Ibid., and pages 12-13, and Footnote 14, pages 13-14, of the Pelcovits Report.
[17] For Ordover's calculations, see pp. 41, 46 and 51 of the Ordover Report.

22. The first conceptual flaw is the biased method by which features of satellite radio service are removed in the willingness-to-pay question, Question 9, of the Wind Survey. The Ordover and Pelcovits Reports rely on this question and this question alone for quantitative inputs to their royalty estimations.[18] I call this the "tires-on-the-car" criticism. The only method that was used in the Wind Survey and the Wind Report was the method that is most favorable to SoundExchange. By choosing this most-favorable method, the measured willingness to pay for music is inflated. The second conceptual flaw is the biased manner in which the features of satellite radio service were defined for those methods in which points or importance were allocated. I call this the "voice-of-counsel" flaw. By choosing a limited number of service features and by defining music in a manner most favorable to SoundExchange, the relative share or importance of music is inflated. It is more appropriate to base the set of features on interviews with customers – the voice of the customer.

23. "Tires-on-the-car" flaw. As in many scientific arguments, we begin with a thought experiment.[19] Imagine that we are purchasing a new automobile, such as a Chrysler 300C. We might be willing to pay $40,000 for a suitably equipped 300C. Now suppose that we are told that the automobile will come with wheel rims, but no tires. Furthermore, we assume in this thought experiment that there is no alternative market in which we can purchase tires for our new automobile. Our assumption implies that if the automobile does not come with tires, we would have to drive the automobile on its wheel rims. If this were the case, it is unlikely, in this "but for" world, that we would pay $40,000 for the Chrysler 300C. If asked in a survey we might be willing to pay, say $1,000, which might

[18] Other data in the Wind Report are quoted in the Pelcovits and Ordover Reports. I comment in this report on the accuracy and appropriateness of those data as well.

[19] This is often called a "Gedankenexperiment" (from the German). For example, many of Einstein's arguments for relativity are based on Gedankenexperiments. A thought (Gedanken) experiment is an important tool to check the implications of a theory. In this case, we use the thought experiment to demonstrate that the procedure in the Wind Report leads to illogical conclusions. From Wikipedia (visited June 24, 2007), "Thought experiments have been used in a variety of fields, including philosophy, law, physics, and mathematics. In philosophy, they have been used at least since Greek antiquity, some pre-dating Socrates. In law, they were well-known to Roman lawyers quoted in the Digest. In physics and other sciences, notable thought experiments date from the 19th, and especially the 20th Century, but examples can be found at least as early as Galileo." http://en.wikipedia.org/wiki/Thought_experiment.

be the salvage value of the automobile. This hypothetical line of questioning parallels the willingness-to-pay questions in the Wind Survey. If we compare the initial willingness to pay for a Chrysler 300C ($40,000) to the no-tire willingness to pay ($1,000), then, using the Wind Report's logic, we compute a value of $39,000 for the incremental revenue due tires.

24. Fortunately we do not live in a world where automobiles are sold without tires and, even if an automobile were sold without tires, there is a competitive secondary market in tires. A typical value of four tires for a Chrysler 300C is $564.[20] Thus, the value to the customer of four tires is substantially less than the $39,000 that we obtain following the logic in the Wind Report.

25. Now imagine that we asked the same question, but following other *cumulative* "value" questions. Suppose we first took away premium features (better engine, better interior, better sound system, etc.), then we reduced the car from a Chrysler 300C to a lesser-valued model, then we removed other features, continuing until we had an automobile valued at $14,000. If we now ask the no-tire question for this automobile, we still get an answer of $1,000 (assuming the same salvage value), but our computed value for incremental revenue is now $13,000. We have reduced the measured value of willingness to pay for tires to 1/3rd of its original value just by the order in which we asked the cumulative willingness-to-pay questions. Clearly, the order in which features are removed in the series of cumulative willingness-to-pay questions has a critical impact on the measured willingness to pay for tires.

26. The willingness-to-pay question in the Wind Survey is a "tires-on-the-car" question. For the moment ignore the other flaws in the Wind Survey. In the question that measures willingness to pay, respondents are asked how much they would be willing to pay for satellite radio if music programming were not available.[21] The

[20] www.tirerack.com. Tire observed on July 11, 2007 was a Bridgestone Turanza Serenity 225/60HR18.
[21] An Appendix to the Wind Report provides a text document. In this document, the word "not" is omitted. If this were the case in the computer-aided survey, this is another flaw.

Wind Survey upwardly biases the question by deleting music alone, and leaving all other features intact. The value of the other features is underemphasized.[22]

27. The order in which features in the Wind Survey are removed is also important. To demonstrate why, we consider a second thought experiment. Suppose we obtain a set of features that consumers consider important for satellite radio. These features might be national reception, commercial-free, and sound quality, as well as various forms of programming. Now suppose we remove national reception, commercial-free, sound quality, and any programming not available elsewhere. Such a service might be reasonably close to that obtainable for free on FM or AM radio. The respondent might be willing to pay very little for such a service because the respondent can obtain essentially the same service for free by using existing FM and AM radio.[23] For the sake of argument, assume that the respondent would pay $1 per month for a satellite radio service in which national reception, commercial-free, sound quality, and unique non-music programming were removed. If we now remove music programming, the respondent might be willing to pay $0.35 per month for such a service. Performing exactly the same calculations as in the Wind Report, we now obtain the value of music to be $0.65, less than 1/10th the value obtained by the Wind Report.[24]

28. The calculations in the Wind Report, based on a scenario in which music programming is removed and all other features are left intact, are one extreme – the extreme that most favors SoundExchange. Another extreme would be to first remove all of the premium features, such as national coverage, commercial-free, sound quality, and unique programming to make XM and Sirius essentially equal to FM and AM radio, removing music last and measuring its importance in that context. This scenario gives a small value for music and is no less legitimate than

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[22] The Wind Survey also deletes other types of programming, but each time a question is asked only one type of programming is deleted. Although there is a randomization in the order in which these single-deletion scenarios are presented, the Wind Survey never asks a question in which music is deleted after another type of programming has already been deleted (in a cumulative manner). Furthermore, the deletions in the Wind Survey are limited to types of programming. The Wind Survey never deletes any other features of satellite radio programming even though consumers consider these features to be important.

[23] Assuming they already own an FM or AM receiver.

[24] These values are for illustrative purposes only. I later provide values from a survey of XM and Sirius subscribers and considerers.

the approach in the Wind Report. This calculation favors XM and Sirius. We have seen in the "tires-on-the-car" thought experiment above that it is important to remove features cumulatively to value properly different features. While there is no good theory to determine the proper order in which features are cumulatively to be removed, one reasonable strategy would be to remove features in a random order and then average over all possible values. This is a conservative estimate because, for brevity and to avoid respondent wear-out, we do not include all of the features of XM and Sirius radio in the mall-intercept survey. An estimate obtained in this manner will still estimate a higher-than-actual willingness to pay for music programming.

29. I describe in a later section, a survey that replicates most aspects of the Wind Survey, e.g., mall intercept, computer-aided questions, etc. However, I ask willingness-to-pay questions in which features are cumulatively removed in a random order.[25] From this survey I obtain an estimate of $2.93 (relative to a $12.95 per month subscription price) as the value of music for XM and Sirius service ($3.37 unweighted).[26] This is a conservative estimate as described above and because it does not distinguish sound recordings from 1972 and later versus sound recordings from before 1972.[27] As a second survey demonstrates, if we focus only on music of the 70's, 80's, 90's and today, customers would be willing to pay $1.78 ($2.05 unweighted).[28]

30. "Voice-of-counsel" flaw. The Wind Report uses many methods, such as constant-sum analysis and conjoint analysis, to analyze the data obtained from the Wind Survey. Both constant-sum analysis and conjoint analysis have a long his-

[25] Following good survey practice and correcting another flaw in the Wind Survey, respondents are first asked how often they pay for satellite radio. Some respondents pay by the month, but others have yearly or even lifetime subscriptions. These are converted to monthly subscription rates for this calculation.

[26] The "weighted" value is obtained by weighting the data from my mall-intercept survey to account correctly for the presence of a filter question, question 9(a), in the Wind Survey. This filter question was intentionally absent in the mall-intercept survey I conducted. See paragraph 97 for more-detailed explanation. Because I use data from the Wind Survey for calculating the weighted value, I also provide unweighted values (based on the raw data) for completeness.

[27] I am informed that sound recordings of interest in this case were recorded on or after February 15, 1972. Furthermore, valuing "sound recordings" per se does not account for live performances.

[28] This, too, is conservative because it does not account for live performances. Although I included live performances in my Internet Survey, some of these live performances include music of the 70's, 80's, 90's, and today, thus, to be conservative, I do not further subtract the measured value of live performances.

tory in marketing research, are used routinely by corporations and other entities to make important decisions, and have proven accurate as analysis methods. However, the results of these types of analysis are only as accurate as the inputs to these analyses. If the inputs are biased or incomplete, the results will be biased, incomplete, and misleading.

31. Calculations of relative importances from either constant-sum analysis or conjoint analysis are sensitive to the features that are used as items in these analyses.[29] I illustrate these effects with a thought experiment and then critique the selection of features in the Wind Survey. I later describe the results of surveys in which the features are chosen in a more representative and scientifically valid manner.

32. As a thought experiment, consider again a purchase of a Chrysler 300C. There are many features that might be relevant to this decision such as the styling of the car, speed and acceleration provided by the engine, the ride and handling provided by the suspension of the car, the quality of the interior including seats and dashboard, the roominess of the front and rear seats, the cargo capacity of the trunk, the fuel type and mileage, and so on for a large number of features. Suppose we select only three features: the tires, the cup holders, and the floor mats. If we ask a respondent to allocate 100 points among these three features, it is reasonable that the tires might receive the most points. Similarly, when the Wind Report states that respondents allocate the most points to music, this result is highly dependent upon the features that are used in the constant-sum question.[30] On the other hand, if we were to provide the respondent with a list of all of the features that affect his or her decision to purchase a particular automobile, this list could be quite lengthy. If tires were included in such a more-appropriate list, it is unlikely that tires would receive the most points.[31] This example is chosen to be extreme. However, it illustrates how summary statements, such as "percent of points allocated to a feature" and "more points allocated than any other feature,"

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[29] Features, as used in this report, are also known as "customer needs."

[30] For example, see Wind Report, page 37.

[31] There is a technical issue in that tires affect the ride and handling, the safety, and the fuel mileage of an automobile. In an actual analysis we would be careful about defining features with respect to consumer needs.

are highly dependent upon the list of features that are used in the constant-sum analysis. Conjoint analysis is subject to the same criticism.

33. The selection of features for the constant-sum analyses in the Wind Report can and do have a major effect. For example, both the Ordover Report and the Wind Report cite a statistic that 74% of the respondents placed the most points on music.[32] I demonstrate later in this report that, if we include features of satellite radio service that consumers consider important and if we redefine music to that of the 70's, 80's, 90's, and today, substantially fewer respondents, 5.4%, allocate the most points to music.[33] In a second survey, the Internet Survey, we ask respondents to allocate points to aspects of music programming. In that survey only 16% allocate the most points to music of the 70's, 80's, 90's, and today as the most important feature of music programming.

34. There are many ways in which one might select the features to use in constant-sum analyses and conjoint analyses. The most appropriate method is to undertake qualitative research with subscribers (and considerers) of satellite radio service so that we might use the features that customers themselves use in making decisions about subscribing to satellite radio service. This method is called the voice of the customer. It is used widely by corporations and other entities. For example, AMS alone has used voice-of-the-customer methods for 18 years to provide advice to over 130 clients including many Fortune 500 and Fortune 100 firms. Major decisions have been based on these analyses. I describe later in this report revised surveys in which constant-sum, willingness-to-pay, and anchored-importance analyses use features chosen based on the voice of the customer. The results are substantially different from those obtained in the Wind Report – even though, in one of the surveys, much of the methodology of the Wind Survey was repeated without change.

35. In contrast to a careful, scientific study of the voice of the customer, Dr. Wind's deposition suggests that counsel for SoundExchange was the only source in the selection of the features for both the constant-sum analyses and the conjoint

[32] Wind Report, page 37. Ordover Report page 23.
[33] Detailed calculations and interpretations are provided in Section XIII.

analyses. We do not expect counsel for SoundExchange to be unbiased, hence, by implication, neither the constant-sum analyses nor the conjoint analyses is unbiased. Dr. Wind himself admits that counsel for SoundExchange is not neutral in this case.[34]

36. In Dr. Wind's deposition,[35] Dr. Wind states that the features and levels in his conjoint analysis, as well as the programming categories[36] and non-programming features[37] came from discussions with SoundExchange's lawyers. The following quotes from Dr. Wind's deposition are illustrative.

> **Q. Did anyone else have any end put [sic] into the design of your survey?**
> **A.** No, but I had, obviously, discussions with data development, in terms of the methodology to be used. For example, the using of computer assistance interviewing.
> **Q. Right.**
> A. And I had discussions with the lawyers in the case as concerning the factors, and especially the levels for the conjoint analysis.
> ...
>
> **Q. Do you have any knowledge of -- well, let me ask you this. Are you a user of satellite radio?**
> A. Use it occasionally when I rent a car and it's in the car.
> **Q. Otherwise you don't own any satellite radio product?**
> A. No.
> **Q. And have you done any, other than talking to counsel, have you done any research into satellite radio, either the industry or the nature of the product?**
> A. No. Basically I relied on them in terms of the information that led to the selection of the factors and levels.[38]
>
> ...
>
> **Q. How did you pick these 20 non-programming features that you asked about?**
> A. It was basically as part of a discussion with the lawyers in terms of what else are the non-programming features of satellite radio, and discussion came out to basically the number of minutes of commercials from music, geographical coverage and price.

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[34] **"Q. Well, you understand that they are not neutral in this case, right?** A. Yes, but they basically understand the category and expectation and discussion on design, that they would represent the facts as opposed to bias facts." (Wind Deposition, page 164).
[35] On a sequences on page 17-19, pp. 86-88 and on pp. 163-165.
[36] Questions 4, 5, 8 and 9 of both the "subscribers" and "considering subscribing" main questionnaires
[37] Questions 6a, 6b, 6c and 7 of both the "subscribers" and "considering subscribing" main questionnaires
[38] Deposition of Yoram Wind, Ph.D., New York, New York, 16 Friday, April 27, 2007, pp. 17-19.

Q. So in selecting these non-programming features, did you talk to anybody other than SoundExchange's lawyers?
A. No. They were basically my surrogates experts, substantive experts to the category, the same way in consulting project you will work with the people in the company as your substantive experts.

37. The quotes in the previous paragraph show that counsel for SoundExchange had a major role in selecting features. There is further indication in Dr. Wind's deposition that counsel for SoundExchange participated in reducing the number of programming categories in the Wind Survey.[39] Reducing the number of features made music appear to be relatively more important. Counsel for SoundExchange appears to be the only source of input for the features in the Wind Survey. Dr. Wind was not able to substantively add to the selection of features. He stated in his deposition that he is not a satellite radio user, except in rental cars, and performed no independent research to understand the services.[40]

38. To summarize this section, there are at least two major flaws in the Wind Survey each of which substantially inflates the measured value of music. In Question 9 of the Wind Survey, estimates of willingness to pay are inflated when the Wind Survey uses only the approach that is most favorable to SoundExchange. Estimates of relative value (constant-sum and conjoint-analysis questions) are inflated because the Wind Survey uses only those features provided by counsel for SoundExchange (rather than the voice of the customer). Both the Pelcovits Report and the Ordover Report rely explicitly on the inflated estimates of willingness to pay in the Wind Report, thus, by implication, the conclusions in the Pelcovits and Ordover Reports are themselves flawed.

V. Further Critique of the Wind Survey

39. In the previous section I focused on two major conceptual flaws in the Wind Survey. In this section, I critique other aspects of the Wind Survey that either inflate the measured value of music or call into question the reliability of the Wind Survey.

[39] Wind Deposition, pages 87-88.
[40] Wind Deposition, pages 18-19

40. Biases in the willingness-to-pay question (Question 9). Willingness to pay (WTP) is defined as the largest amount that a consumer will pay for a product or service. WTP can be larger than the current market price.[41] For example, a consumer might be able to purchase a gallon of gasoline for $2.99 at current market prices, but would be willing to pay as much as $4.00 before reducing his or her purchase of gasoline. In this case the WTP for gasoline would be $4.00 per gallon. The amount by which WTP exceeds market price is called consumer surplus. In most competitive markets we expect positive consumer surplus for at least some consumers.

41. The Wind Report (page 19) acknowledges that some respondents provided a WTP higher than the market price ($12.95 in the Wind Report) to questions in the pre-test survey. Based on the definition of WTP, these are reasonable responses. However, while accepting other pretest answers,[42] the Wind Report "excluded these respondents from the final survey."[43] The Wind Survey was then revised so that any answer greater than $12.95 was discouraged.[44] Specifically, Question 9 in the Wind Survey was designed to discourage any answer that would indicate a willingness to pay greater than $12.95.[45] Not allowing (or discouraging) the possibility of consumer surplus biases answers in Question 9 of the Wind Survey in a manner that favors SoundExchange. This is best illustrated with another thought experiment. Suppose that a respondent is willing to pay $19.95 for satellite radio service even though the market price is currently $12.95. This would reflect a consumer surplus of $7.00 per month – a value of consumer surplus that is not un-

[41] In the widely used Harvard Business School case on XM Satellite Radio, there is evidence that the measured WTP for XM's service was higher than that which was announced publicly for the launch of Sirius Satellite Radio. This case is listed as "Most Popular" on the Harvard Business School Publishing website, http://harvardbusinessonline.hbsp.harvard.edu/. Visited June 24, 2007.

[42] "Except as noted below, the respondents had no difficulty completing the tasks, and therefore the answers were included in the final results." Wind Report, page 19.

[43] Wind Report, page 19.

[44] Wind Report, page 19.

[45] A willingness to pay of $12.95 is not accepted in Question 9b of the Wind Survey. If a respondent answers more than $12.95, the respondent is directed to Question 9c which forces the respondent to confirm this answer. A question such as 9c is a demand artifact that discourages an answer above $12.95. An answer above $12.95 is recorded only if the respondent persists with a "YES" answer. If, in Question 9c, respondents answer "NO" indicating that the asking of Question 9c changed their initial answer, respondents are asked Question 9d. Question 9d asks willingness to pay, but specifically directs that "*NOTE: ANSWER MUST BE LESS THAN $12.95.*" Any answer with positive consumer surplus was discouraged by the structure of Question 9 in the Wind Survey.

reasonable given the answers I obtained in my mall-intercept survey.[46] Such a respondent might still be willing to pay $12.95 per month in the absence of music. Thus, it is not unreasonable that the respondent would be willing to pay just as much in the absence of music as in a service with music. This is the case because some of the drop in WTP due to the absence of music would be absorbed by the consumer surplus that the respondent is receiving from satellite radio. Such respondents would have a higher true WTP for satellite radio in the absence of music than would be measured by the Wind Survey. This bias causes the Wind Report to inflate its calculated value for music programming. Omitting the pretest respondents with positive consumer surplus from the analysis and discouraging subsequent respondents from reporting positive consumer surplus upwardly biases the Wind Report's estimate of the value of sound recordings.

42. The Wind Report is inconsistent in the way in which it treats $12.95 as the maximum WTP. For example, despite excluding respondents in the WTP question who provided a WTP of more than $12.95, the Wind Report allows for a price of $14.95 in the conjoint analysis. Because these scales are not consistent, the estimates from the WTP question and the conjoint analysis cannot confirm each other, nor can they converge on a final estimate.

43. The WTP question, Question 9 in the main questionnaire of the Wind Survey, is further biased toward lower values in many ways.

    i. Respondents are immediately reminded that the market price is $12.95. They are never told that it is possible that they might have consumer surplus. As a result their WTP for services without music is anchored on the $12.95 rather than their true WTP.

    ii. If respondents were anchored at their true WTP for satellite radio, which might be more than $12.95, they might have provided a higher WTP for a service without music.

    iii. In a one-sided question respondents are asked: "Furthermore, if you think that not having this programming type would lead you to cancel your subscription please say so." Dr. Wind concedes in his testimony

[46] Calculated as the WTP of $19.95 minus the market price of $12.95.

that it is possible that this is a leading question.[47] It is indeed a leading question. While it is reasonable to remind respondents that cancellation is possible, this question presents only one possibility – cancellation. A two-sided question would either present both possibilities – cancellation and continuation, or would measure cancellation in another unbiased manner. This is not a trivial distinction. As Stanley L. Payne indicates in his classic text on "The Art of Asking Questions," a one-sided question can increase responses in the direction of the bias by as much as 80%.[48]

44. Question 9 in the Wind Survey also leads to potential confusion because it does not take into account the complexities in the pricing of satellite radio subscriptions. It is possible that subscribers currently pay more than $12.95 for a subscription. For example, if a subscriber pays for service for an additional receiver, then the subscriber would pay an additional $6.99 per month. The Wind Survey does not clarify that respondents should focus only on their main subscription. Thus, some respondents could be confused by the $12.95 base price and thus provide answers that cannot be interpreted reliably. Furthermore, the net price to a subscriber is less than the nominal subscription fee because part of the subscription fee subsidizes the cost of the receivers (hardware).[49] It is possible that some respondents were aware of this net price affect and, as a result, gave a lower WTP for satellite radio without music. We do not have transcripts of the pretest interviews for the Wind Survey, and there is no evidence that Dr. Wind checked for

[47] Wind Testimony June 14, 2007, p. 280.

[48] Payne cites an example where simply stating clearly both sides of a question changed the response dramatically. When only one side of the issue was stated, 63% of the respondents in a national poll agreed with a statement that companies could avoid layoffs. When both sides of the issue were stated, this number dropped to 35%. Stanley L. Payne, *The Art of Asking Questions*, (Princeton NJ: Princeton University Press), 1951, 7-8. The two questions were, "Do you think most manufacturing companies that lay off workers during slack periods could arrange things to avoid layoffs and give steady work right through the year?", versus "Do you think most manufacturing companies that lay off workers during slack periods could avoid layoffs and provide steady work right through the year, or do you think layoffs are unavoidable?"

[49] The Harvard Business Review case provides many examples and discussions of how XM subsidizes equipment. From the case, it is relatively easy to demonstrate that the net price per month to subscribers is less than the nominal price per month. Subsidization of hardware to sell service is common in the cellular telephone industry and many consumers are likely to be aware that they (often) must sign up for cellular telephone service plans in order to obtain a reduced price on the telephone itself.

these biases, therefore we cannot determine whether or not these potential biases were present.

45. Inflation in the importance of music in the conjoint analysis. In the previous section I showed that the value of music is upwardly biased because the features used in the conjoint analysis are incomplete and based on the voice of counsel. There are two additional flaws in the Wind Report that inflate the implied value of music.

46. First, the Wind Report defines the importance of a feature as the "partworth" of the highest level minus the "partworth" of the lowest level. This is a common definition of importance as differences in partworths measure the value to a respondent in going from a low level of a feature to a higher level of a feature. However, the high level of the music feature in the Wind Survey is defined as: "Substantially more channels and more variety of music than currently offered."[50] Thus, the relative importance of music based on conjoint analysis, as stated in the Wind Report, is not the importance of music as provided by XM and Sirius, but rather the importance of providing substantially more channels and more variety than currently offered. Furthermore, as shown by my voice-of-the-customer research, there are many features that consumers value about music programming on satellite radio than simply the number of channels and the variety of sound recordings. So, even if the relative importance in the Wind Survey were calculated using levels for each feature that matched satellite radio, the set of features in the Wind Survey's conjoint analysis is incomplete. The relative importance of music, based on the Wind Survey's conjoint analysis, is thus inflated and could not properly capture the true value of satellite radio's music programming.

47. Second, the music feature in the conjoint analysis in the Wind Report conflates both sound recordings that are at issue in the case (1972 and later), with sound recordings that are not at issue in this case (earlier than 1972). The Internet survey that I describe in this report demonstrates that this alone would inflate the conjoint-analysis-importance of music. On average, music of the 70's, 80's, 90's, and today is given 15.8 points out of 100 when respondents are asked to value dif-

[50] Wind Report, Figure 4, page 15.

ferent aspects of music programming. Music of the 40's, 50's, 60's, and earlier is given 10.2 points. Thus, the value of music programming the music at issue in this case relative to all music ranges from 15.8% to 60.8%, the latter being the ratio of music at issue in this case to music of all time periods.[51]

48. We can observe some of the inflation in the conjoint analysis by calculating an average WTP from the conjoint analysis. In conjoint analysis, respondents' trade-offs are used to estimate a "partworth" for each level of each feature. Value to the customer, sometimes called "utility," in conjoint analysis is the sum of the partworths.[52] The whole (utility, here), in other words, may be described as the sum of its parts. As noted above, the importance of a feature is often calculated as the difference between the partworths of its most preferred and least preferred levels. Relative importance is often calculated as the importance of a feature divided by the sum of these differences (importances) across all features. The differences in partworths are called importances because they enable us to compare the relative value to consumers of extreme changes in features. If, for example, one feature is only half as important as another, changing from the worst to the best level of the less important feature adds only half of the value of changing from the worst to the best level in the more important feature. In Figure 24 of the Wind Report we read that the calculated relative importance of music is 30% and the importance of price is 15%.[53] The difference between the lowest and highest prices shown to respondents in the conjoint analysis is $6 ($14.95 - $8.95). We can use these figures to calculate a WTP value for music programming. Because, according to the Wind Report, music programming is twice as important as price (30% compared to 15%), the value of changing from the least preferred level of music to the most preferred level would be worth twice as much to consumers as the change in price from $14.95 to $8.95. In the conjoint stimuli of Wind's Survey, the change in price was $6. This implies that the value of music is $6 x 2 = $12 out of $12.95,

[51] Computed as 15.8/(15.8+10.2). This is a conservative estimate, as it is also possible to include in the denominator the some or all of the average importance for "I can hear live studio performances and concerts" in the calculation, since live performances are also not at issue in this case. This calculation would be 15.8/(15.8+10.2+6.6) = 48.5%.

[52] Occasionally, conjoint analysis will allow for interaction terms. The conjoint analysis in the Wind Report seems to be a "main-effect" model, hence this calculation is appropriate.

[53] Wind Report, Figure 24, page 42.

which is an unrealistically high estimate.[54] It is even more unrealistic when we use the conjoint analysis to compute the value of XM and Sirius service to these customers. Recall that the average relative importance of price in Wind's report is 15%. Thus, excluding price, the average relative importance of the other features is 85%. Using the mechanical computation of WTP for this high-service profile, other features are worth 5.67 times as much as the $6 change in price. Thus the total willingness to pay for the high level of service would be approximately 5.67 x $6, or $34, which is an unrealistically high willingness to pay for the average respondent.[55] This calculation would be even higher if the conjoint analysis were based on a more-complete set of features. I provide these computations to indicate some of the inflation in the conjoint analyses that results from the biased selection of which features to include. I do not opine that these are accurate calculations of WTP.

49. The Wind Report's analysis of the open-ended questions (Q1-3, 11) does not demonstrate that music predominates. The Wind Survey begins with a series of open-ended questions. Such questions are a valid means to encourage the respondent to start thinking about the category and to recall their state of mind when they made decisions about satellite radio. Although such questions probe top-of-mind awareness of features, such top-of-mind awareness does not indicate importance. For example, scientific evidence suggests that "important needs are no more likely to be mentioned by a customer than needs in general."[56] Nonetheless, the Wind Report uses these open-ended answers to motivate the biased estimates obtained from the willingness-to-pay and constant-sum questions. Closer inspec-

[54] Calculated as (30%/15%) x ($6). This is only an approximation. WTP is a non-linear function of the partworths and, possibly of the levels of price in the conjoint analysis. A more accurate calculation would be to calculate WTP for each respondent and then average. Here we simply use the overall average importances in a single calculation. This calculation is inflated for the numerous reasons that I cite elsewhere in my report.

[55] Calculated as (85%/15%) x ($6). The same caveats apply as in the previous footnote. We might expect some respondents to have a willingness to pay as high as $34. If the average willingness to pay for satellite radio service were $34, then it is likely that the willingness to pay for satellite radio service without music might be above $12.95 for many respondents. See discussion in paragraph 41.

[56] Griffin, Abbie and John R. Hauser (1993), "The Voice of the Customer," *Marketing Science*, vol. 12, No. 1, (Winter), page 19.

tion of the figures in the Wind Report suggests that the impact of music is overstated relative to the data.

50. The Wind Report states that "respondents cited music more than any other programming type or price, coverage, or commercial-free . . . ."[57] However, examining Figure 11, which is a summary of the answers to Question 1 of the Wind Survey, we see that music programming (no mention of commercial-free) is mentioned by only 17% of the respondents. On the other hand, commercials are mentioned by 20% of the respondents (commercial-free by 18%). Figure 11 directly contradicts the summary in the Wind Report.

51. The summary of the open-ended questions in Figure 9 is misleading. Figure 9 of the Wind Report shows the combined results of Questions 1 to 3 and Q11. Open-ended Questions 2 and 3 focus solely on programming. Unlike Question 1, which is the most open-ended question, Questions 2 and 3 focus on programming features. Nonetheless, Figure 9 conflates the answers from Questions 2 and 3 with those of Questions 1 and 11.[58] Music is a reasonable response to all four questions, but commercial-free is more explicitly a response to two of the four questions.[59] Nonetheless, the Wind Report opines based on Figure 9 that "These results show the clear dominance of music in the minds of subscribers when it comes to reasons to subscribe to satellite radio."[60] We see similar biases in the interpretations of Figures 12 and 14.

52. The use of a single coder in the content analysis of the open-ended questions. Content analysis of open-ended questions requires judgments. The academic literature has developed a series of methods to assess the reliability of judges (here, coders) that are used in content analyses such as the netting of open-ended responses like Wind's Q1-Q3 and Q11.[61] These methods are common in the scien-

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[57] Wind Report, page 2.

[58] Question 11 is asked at the end of the Wind Survey and is a general question. However, because the bulk of the survey focuses on programming, it is likely that respondents were primed to answer about programming in Question 11.

[59] And, as indicated in the previous footnote, the focus of the survey biases against a non-programming response in Question 11.

[60] Wind Report, page 24.

[61] For example, Wright, Peter L. (1973), "The Cognitive Processes Mediating Acceptance of Advertising," *Journal of Marketing Research*, 10, (February), 53-62. 175 citations from ISI's Web of Science as of June 24, 2007. Garrett, Dennis E. and Marie Adele Hughes (1990), "Intercoder Reliability Estimation Ap-

tific literature and they are often used to assess the reliability of coders in litigation contexts. The Wind Report uses a single coder. With only a single coder we cannot assess the reliability of the coding of responses and, by implication, cannot assess the reliability of opinions based on the qualitative questions that were so coded. Indeed, Dr. Wind's testimony suggests that between 21 and 31 coding errors were made.[62]

53. To summarize this section, there are many additional flaws in the Wind Survey and the Wind Report that exacerbate the fundamental biases introduced by the two critical flaws cited in Section VI. The willingness-to-pay question, Question 9 of the Wind Survey, is biased upward and confusing. The value of music is inflated substantially in the conjoint analysis. Figure 11 contradicts conclusions, based on the open-ended questions, that music predominates. Conclusions are based on figures that conflate questions that encourage non-programming features, with questions that are limited to programming features. And, the use of a single coder does not allow us to assess the reliability of the content analysis.

VI. Two Surveys Correct Some of the Flaws in the Wind Survey

54. I designed and executed two surveys to examine the impact of some of the critical flaws in the Wind Survey. The first survey, a mall-intercept survey, corrects some of the flaws in the willingness-to-pay question and provides an alternative measure of feature importances. The second survey, an Internet survey, uses a constant-sum methodology to parse the value of music programming.

55. The results of the two surveys demonstrate that the value of music is substantially less than that obtained by the Wind Survey and, hence, substantially less than that used in the Pelcovits and Ordover Reports.

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proaches in Marketing: A Gereralizability Theory Framework for Quantitative Data," *Journal of Marketing Research*, 27, (May), 185-195. 43 citations from ISI's Web of Science as of June 24, 2007. Perreault, Jr., William and Laurence E. Leigh (1989), "Reliability of Nominal Data Based on Qualitative Judgments," *Journal of Marketing Research*, 26, (May), 135-148. 187 citations in ISI's Web of Science as of June 24, 2007. Rust, Roland T. and Bruce Cooil (1994), "Reliability Measures for Qualitative Data: Theory and Implications," Journal of Marketing Research, Vol. XXXI (February), pp. 1-14 75 citations in ISI's Web of Science as of June 24, 2007. Nunnally, Jum. C and Ira H. Bernstein (1994), Psychometric Theory (Third Edition), McGraw-Hill, Inc., New York, New York, pp. 232-234.

[62] Wind Testimony June 18, 2007, p. 72.

56. Both surveys are based on the voice of the customer and, hence, correct the voice-of-counsel flaw in the Wind Survey. Using experienced qualitative interviewers to talk directly to subscribers and potential subscribers of satellite radio, I identified a list of features that is more-representative of those features that subscribers and potential subscribers use in their decisions about satellite radio.

57. The first survey replicates the mall-intercept and computer-aided interviewing methodology used by the Wind Survey.

58. The willingness-to-pay questions in the first survey correct the "tires-on-the-car" flaw in the Wind Survey. Using a methodology similar to that used by the Wind Survey, I asked respondents for their willingness to pay for alternative satellite radio services. However, unlike the Wind Survey, this mall-intercept survey used a more-representative set of features and removed these features in a random order.

59. Using proven scientific methods, respondents in the first survey were also asked to express their importance judgments for a more-representative set of features. As is appropriate for the number of features identified by the voice of the customer, I used anchored scales which are easier for the respondent to answer. Scientific research has demonstrated that such anchored scales are equally as accurate as constant-sum questions in terms of predicting behavior based on the measured importances of features.[63]

60. The second survey uses a different modality to test the robustness of the findings. The modality is an Internet survey based on a representative set of subscribers and potential subscribers. Internet surveys are an increasingly common form of market research. Almost 70% of the U.S. population[64] and over 77% of the adult population has access to the Internet.[65] Internet panels (lists of Internet users who have agreed to participate in surveys) are now large enough to represent the population and are considered sufficiently representative for good research. "Even

[63] For example, see Griffin, Abbie and John R. Hauser (1993), "The Voice of the Customer," *Marketing Science*, vol. 12, No. 1, (Winter), page 18, Table 2. AMS has extensive experience with anchored questions. Major corporations routinely based decisions on the results of these questions.
[64] http://www.internetworldstats.com/stats2.htm, November 17, 2006.
[65] Quirk's Marketing Research Review, July/August 2006, p. 10.

older, low-income consumers can be well-represented within online panels."[66] The largest corporations use these surveys to support multi-million dollar marketing decisions.[67] Increasingly, courts are accepting the results of Internet surveys in a wide range of cases.[68] Accuracy of data entry is an additional advantage of Internet surveys, and the format of the survey in this situation made an Internet survey particularly appropriate.[69] Using a smaller set of features, I asked respondents to allocate a constant-sum of 100 points to features of music programming.

61. Before describing the detailed results of the two surveys, I review the methodologies used in the two surveys.

VII. Qualitative Research to Identify the Voice of the Customer

62. In 1993 Prof. Abbie Griffin and I published an article in *Marketing Science* on the "Voice of the Customer." At the time of its publication this article received an award for the best article in the marketing sciences and an award for the best article based on a dissertation. This article is highly cited and was recently named as one of the top marketing science articles in the last 25 years.[70] This article develops and tests methods to identify "customer needs" for the use in methods such as constant-sum importances, anchored importances, or conjoint analysis. Voice-of-the-customer methods are used widely. AMS has actively applied voice of-the-customer methods for the past 18 years. They employ experienced interviewers who routinely interview customers to identify customer needs. In the context of this report, I have been using the word, "features," to describe customer needs.

63. I instructed AMS to use in-depth, experiential interviews. Experiential interviews are one-on-one discussions between a trained interviewer and a customer (sub-

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[66] Quirk's Marketing Research Review, July/August 2006, p. 62.

[67] According to an annual study (reported in January, 2006) conducted by Inside Research®, 31% of survey research was conducted online in 2005.

[68] Robert H. Thornburg, *Trademark Surveys: Development of Computer-Based Survey Methods,* 4 J. Marshall Rev. Intell. Prop. L. 91 (2005)

[69] In my experience one obtains the same survey results (up to normal sampling variation) from Internet and from central facility respondents. For this assignment, I followed protocols designed to select a representative sample and to maximize the response rates to the surveys. It is my opinion that these protocols are sufficient to assure that the respondents are representative of the sampled population.

[70] See details in Paragraph 3.

scriber or potential subscriber) in which the interviewer encourages the respondent to talk about the respondent's experiences in choosing and using satellite radio. The interviewer listens carefully to the words and phrases used by the respondent while probing to understand more about the respondent's decision processes.[71]

64. At my direction, AMS conducted a total of 41 experiential interviews between February 12th and February 21st, 2007 in Boston and Cincinnati.[72] Forty-one interviews are more than sufficient to identify customer needs.[73] Based on these interviews, AMS provided me with a summary of the words and phrases that subscribers and potential subscribers use in evaluating satellite radio. These "features" formed the basis of the anchored importance questions that I used in the first survey. See Exhibit D. The headings were provided by the interviewers to organize the features.

65. I used a subset of these features in the willingness-to-pay questions in the mall-intercept survey and in the constant-sum questions in the Internet survey. In both cases a subset was necessary to avoid respondent wear-out due to a larger number of features. As a result, both the willingness-to-pay questions and the constant-sum questions are conservative in the sense that they over-estimate the value of music to XM and Sirius. That is, if additional features were included, those additional features might be judged to be important by some respondents and, thus, lower the percentages of respondents who consider music important. I selected a

[71] AMS calls their voice of the customer analysis "Vocalyst." In many cases there is a second phase of the Vocalyst process in which customers sort features (customer needs) so that product developers can better understand the structure of the customer needs. This second phase enables researchers to study the interdependence among features and, if necessary, develop scales that explore independent "factors," which are combinations of features. For the purposes of this report I wanted to measure importances directly with respect to the features customers identify rather than combinations of features. As a result, the features in my mall-intercept survey are not necessarily independent. The result is that we should be extremely cautious of any operation that attempts to add together importances to obtain the importance of a combined set of features. In some cases, Vocalyst interviews are transcribed so that multiple analysts can evaluate them. When interviews are transcribed, they are transcribed so that no customer needs are missed. To the extent that any customer needs were missed by not using multiple analysts, my analysis of the anchored-importance and constant-sum questions are conservative in the sense that they over-estimate the importance ratings for music (anchored scales and constant-sum scales) or the value of music (constant-sum scales).

[72] Twenty-one (21) in-person one-on-one interviews were conducted in Boston. Twenty (20) one-on-one interviews were conducted in Cincinnati, thirteen (13) of which were in person, and seven (7) of which were conducted by telephone.

[73] See Griffin and Hauser (1993), op. cit.

specific set of features for each question based on my experience with voice-of-the-customer methods. I endeavored to select the features that were discussed often by customers in our exploratory research. The features attempt to cover most of the customer needs expressed by customers. I included features regarding music of the 70s, 80s, 90s, and today, and music of the 40s, 50s, 60s because they were necessary to parse out the particular sound recording rights germane to this case. These features are not independent of the more-general music feature, hence, in this report, I do not treat these features as independent. Customers had mentioned music from different eras during our exploratory research.

VIII. Questionnaire Development

66. The voice-of-the-customer interviews enabled me to identify the appropriate features for satellite radio, using the words and phrases that consumers use to describe these features.

67. Based on the set of features and on the words and phrases used by customers in the qualitative interviews, I reworded key questions from Wind Survey to incorporate this representative set of features and to correct other identified flaws. The flow of the questionnaire is described Paragraphs 85-89, including decisions that I made in rewording. This questionnaire was programmed into a computer-based software system designed for administering and analyzing such questionnaires.[74] Examples of the final mall-intercept questionnaire that respondents were asked to complete is provided in Exhibit E. Recall that respondents answered these questions via the mall interview facilities' computers, with assistance or supervision from the interviewers (respondents could type at the computer themselves or have the interviewer enter answers for them). Exhibit E contains a text description of questionnaire as well as example reproductions of the computer screens. As in

[74] The questionnaire was programmed by Bernett Market Research (hereafter Bernett), in Confirmit. Bernett is an experienced market research firm, founded in 1972, which has conducted a large number of surveys on the Internet, in malls and via telephone. Confirmit is a well-known and widely-used software system for these types of applications. I have used Bernett in the past and am confident in their abilities to provide this function. AMS uses Bernett extensively in their day-to-day activities. The skip patterns were checked by AMS.

the Wind Survey, there are various skip patterns and randomizations; these can be reproduced from the text description.

68. The mall-intercept questionnaire was pre-tested with sixteen (16) respondents on May 16th through May 21st, 2005 to ensure that respondents understood the descriptions, instructions, and questions and that their answers adequately represented their beliefs. Minor changes in the wording and formatting of the questions were made as a result of the pretest to assure that respondents understood the questions and that the interview flowed smoothly. Respondents were debriefed to ensure that the questionnaire maintained a "double-blind" protocol. In a double-blind protocol, neither the interviewer nor the respondent is given either explicit or implicit cues from which to guess the purpose of the study. Following standard procedures, but unlike the Wind Survey, no pretest responses were included in the final sample.

69. In correcting the willingness-to-pay and importance questions, the mall-intercept survey asks respondents about a representative set of features of satellite radio. I wanted to avoid any implicit communication to interviewees that I was interested in the value of music.[75] Therefore, I did not, as part of that survey ask respondents about the components of music programming in the mall-intercept survey. Instead, I used a second survey to investigate the relative value of various components of music programming.

70. I developed the questions for the Internet survey based on the words and phrases identified in the qualitative interviewing. The components of music programming are those that subscribers and potential subscribers used in the voice-of-the-customer experiential interviews. The Internet survey was programmed by AMS. All skip patterns and randomizations were checked for accuracy. The Internet Survey asks constant-sum questions for those features that relate to music programming.

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[75] Although the respondents see the survey once in a mall-intercept format, the interviewers see the survey many times. If the interviewers know, at the end of the interviewing some respondents, that there is a focus on programming, or music programming, then it is possible for the interviewers, by body language or other means, to communicate this focus to subsequent respondents. I note that the Wind Survey takes no precautions to avoid this type of "demand artifact." Because I have not been provided with any transcripts of the Wind Survey's pretest interviews, I cannot determine whether Dr. Wind tested for demand artifacts.

71. There was a pretest and a soft launch of the Internet survey. A total of ten (10) respondents completed the survey on June 6-7, 2007 to ensure that respondents understood the descriptions, instructions, and questions and that their answers adequately represented their beliefs. Minor changes in wording and formatting were made to ensure that the respondents understood the questions and that the interview flowed smoothly. Pretest respondents were debriefed to ensure that the protocol was double-blind. Following standard scientific procedures, but unlike the Wind survey, no pretest responses were included in the final sample.

72. On June 11-12, 2007 there was a soft-launch of the Internet survey to ensure that all programmed systems were working properly and that the data were being recorded. There were forty (40) respondents in the soft launch. There were no problems identified, so the survey was launched to a full set of respondents on June 19-July 2, 2007. I compared the results between the soft-launch respondents and the remaining respondents. Comparing the mean scores for the importance question, there were no significant differences at the 95% confidence level using tests that account for the simultaneous testing of multiple questions.[76] Based on these tests, I included the soft launch respondents in the analysis, so that the Internet survey has a total of 279 valid respondents.

IX. Identifying the Samples

73. For the mall-intercept survey I used the same sampling methodology employed by the Wind Survey. The universe for this survey was adults, 18 years of age or older, who currently subscribe to either the XM or Sirius satellite radio service, or who are considering subscribing in the next 30 days. Only respondents who indicated that they make or take part in making the decision to subscribe to satellite

[76] Using the appropriate multiple *t*-test for eight tests of mean differences, the critical *t*-value is 2.74, which was higher in magnitude than any of the individual *t*-test values for the eight differences in mean importances. The concept of multiple-test corrections is the following. Suppose we want to test differences for twenty scales at the 0.05 level. The 0.05 level corresponds to a $1/20^{th}$ chance that something is significant by chance. Intuitively, if we test twenty scales at the $1/20^{th}$ level we expect approximately one scale to be identified as *significant* by chance. The actual calculations are more complex and can be done for any number of scales. The calculations are based on the probabilities involved when eight tests are being done simultaneously. The calculations account for multiple, simultaneous tests by calculating the appropriate critical value of the *t*-statistic to be used with such multiple, simultaneous tests.

radio for their household were included in the universe. And only subscribers to a satellite radio service (as opposed to XM and Sirius's services over satellite television or the Internet) were included. I chose markets to mirror the Wind Survey. The same 24 markets (six from each of the four census areas) were selected.[77,78] Those markets are listed in Figure 1.

Figure 1. Survey Locations.

EAST	CENTRAL	SOUTH	WEST
Attleboro, MA*	Eau Claire, WI	Houston, TX	Seattle, WA
Rochester, NY*	Indianapolis, IN	Raleigh, NC	Los Angeles, CA
Taunton, MA*	Chicago, IL	Atlanta, GA	San Francisco, CA
Yorktown Heights, NY	Des Moines, IA*	Memphis, TN	Denver, CO
Philadelphia, PA	Detroit, MI	Tallahassee, FL	Portland, OR
Baltimore, MD[79]	Minneapolis, MN	Tulsa, OK	Las Vegas, NV

74. In each of these markets, a mall with an interviewing facility was selected randomly. Following the methodology in the Wind Survey, potential survey respondents were selected as randomly as feasible from all parts of the mall where the field site's survey people were allowed to recruit.[80] Some of the interviews were conducted on weekends and in the evenings to ensure the inclusion of working respondents.

75. Following the methodology in the Wind Survey, mall-intercept respondents were pre-screened on age and gender, which was intended to give a sample representative of the U.S. population as a whole.[81,82]

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[77] The Wind Report states that these markets were selected randomly, in accordance with standard survey practice.

[78] Four sites had to be replaced due to excessive amounts of invalid interviews. Each site was replaced with a site in the same census region. Attleboro, MA replaced Springfield, MA; Rochester NY replaced White Plains, NY; Taunton, MA replaced Waterbury CT; Des Moines, IA replaced St. Louis, MI. The decision to replace interviewing cites was done before I examined the results of the survey (other than the validity checks).

[79] Wind included Baltimore as part of the northeast region. However, according to the U.S. Census Bureau (www.census.gov), the state of Maryland (and therefore Baltimore) is in the southern region.

[80] I am informed that most malls have strict regulations on where survey research facility staff may recruit shoppers for interviews. This contrasts with the statement in the Wind Report that interviewers recruited respondents from all parts of the mall (Wind Report, p. 8).

[81] The Wind Report does not vary quotas within census regions to match those in the population. For example, Tulsa, Oklahoma with a population of 382,457 has virtually the same quota as Los Angeles with a population of 3,844,829. As a result, the percent of respondents in the four census regions are 25%, 25%,

76. The pool of mall-intercept respondents was further screened to meet the universe definition, including whether they subscribe or intend to subscribe to XM or Sirius, and to satisfy the standard security requirements.[83] A copy of the screening questionnaire is attached as part of Exhibit F.

77. Responses to the mall-intercept survey were obtained from 337 respondents of whom 230 currently subscribe to a satellite radio service and of whom 107 are considering subscribing to a satellite radio service within the next 30 days (the "considering subscribers").[84,85] The mall-intercept sample disposition is provided in Exhibit F. There were 8,852 potential respondents contacted. Of that number, 529 respondents qualified by meeting the universe definition and the screening requirements and were not "over quota." Of the 529 who qualified and met quotas, 364 agreed to and completed the survey. Of those, 337 remained after we eliminated invalid respondents. Overall, the survey had a response rate of 68.2%, which is extremely high.[86]

78. Exhibit G provides a copy of the questions and screen shots from the Internet survey; Exhibit H provides the Invitations to Respondents; and Exhibit I provides the sample disposition and screening statistics for the Internet survey.

25%, and 25% for Northeast, Midwest, South, and West, respectively. This does not match the census population of 18.7%, 22.5%, 35.9%, and 22.9%. Without re-weighting, the Wind Survey is representative rather than random. The effect of these quotas on the results is likely small relative to the other biases in the Wind Survey. Thus, to avoid ambiguities in any comparison, I replicated the quotas in the Wind Survey.

[82] The gender and age demographics of satellite radio subscribers resulting from the Wind Survey's prescreening method do not match those of satellite radio subscribers in other market research. In Appendix 1 I reweight the data of the mall-intercept and Internet surveys to match the gender and age demographics of actual satellite radio subscribers obtained from market research conducted by XM and Sirius. Based on comparing the reweighted data to the raw data, I identified no differences in the numbers in this report that were significant at the 95% confidence level.

[83] Security requirements included termination of respondents if they were personally known to the interviewer, or they were employed in a market research firm, an ad agency, the entertainment industry, or a satellite radio provider, or had taken part in any market research survey in the past three months.

[84] The subscription must have been a paid or trial subscription obtained directly from XM or Sirius for the respondent to be eligible for the survey. I made the further distinction that respondents who obtained paid access solely via the Internet from XM or Sirius were excluded from the survey. I am informed that the music royalties in question in this case do not apply to Internet broadcasts.

[85] I replicated the quota system used in the Wind Survey. This quota system of "maxima" does not guarantee a target proportion when the maxima are not reached. To retain comparability to the Wind Survey in my analyses, I used the Wind Report's proportions of 75% subscribers and 25% considerers.

[86] As described in an earlier footnote, four sites were ruled to have produced unacceptably low-quality results prior to examining or analyzing the WTP or importance results for those sites. These four sites were replaced and their screening statistics do not appear in Exhibit F. We replaced an additional 12 respondents, prior to looking at their data, based on the recommendation of the field sites.

79. For this survey, potential respondents were selected at random from Survey Sampling Inc.'s ("SSI") database and sent an invitation (Exhibit H) to go to a special website to complete the survey. Each invitation included a URL with an embedded password that was then matched against a list of valid passwords and against the list of passwords that had already been used. (The former assures that only valid respondents complete the questionnaire. The latter assures that each respondent completes the questionnaire at most once.) Respondents received an initial e-mail invitation and two e-mail reminders. SSI motivates respondents to participate in these surveys by giving them chances to receive prizes in monthly drawings.

80. Following the methodology in the Wind Survey, Internet survey respondents were pre-screened on age, gender and region, which was intended to give a sample representative of the U.S. population as a whole.[87]

81. The pool of Internet survey respondents was further screened to meet the universe definition, including whether they subscribe or intend to subscribe to XM or Sirius, and to satisfy the standard security requirements.[88] A copy of the screening questionnaire is attached as part of Exhibit G.

82. Responses to the Internet survey were obtained from 279 respondents of whom 219 currently subscribe to a satellite radio service and of whom 60 are considering subscribing to a satellite radio service within the next 30 days (the "considering subscribers").[89] Unlike the Wind and mall-intercept surveys, I placed no "over quota" maxima constraint on subscribers and considerers. However, in my analysis, for ease of comparison to the Wind Report, I retained the weighting in the Wind Report of 75% subscribers and 25% considerers. The Internet Survey sample disposition is provided in Exhibit I. There were 100,454 potential respondents contacted. Of that number, 18,793 respondents responded to the invitation and did not exit before qualifying questions could be asked. After eliminating

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[87] The Wind Report does not vary quotas within census regions to match those in the population.

[88] Security requirements included termination of respondents if they were personally known to the interviewer, or they were employed in a market research firm, an ad agency, the entertainment industry, or a satellite radio provider, or had taken part in any market research survey in the past three months.

[89] The subscription must have been a paid or trial subscription obtained directly from XM or Sirius for the respondent to be eligible for the survey. I made the further distinction that respondents who obtained paid access solely via the Internet from XM or Sirius were excluded from the survey. I am informed that the music royalties in question in this case do not apply to Internet broadcasts.

unqualified respondents and respondents who were over quota, 319 completed the survey, and 279 remained after we eliminated invalid respondents. Overall, the survey had a response rate of 18.7 percent, which is high for an Internet survey.

X. Validations

83. Mall-intercept survey. At my direction, Bernett conducted the validation of the mall survey interviews. Respondents were contacted after the survey by telephone and asked questions to confirm that they had indeed taken the survey, that they were qualified to take the survey, their age, and that they had received the proper incentive.[90] A detailed description of this process can be found in Appendix 2. We were able to reach and validate 51% of the respondents. Based on our efforts, 4.7% of the respondents failed validation and were removed from the analysis.[91]

84. Internet survey. The validation process is different for an Internet survey, because only the Internet panel provider is allowed to contact the respondents. To provide an unbiased validation, I had a file containing the Internet panel provider's demographic data appended to the Internet survey data file. At my direction, AMS personnel compared the age and gender data reported by respondents in the survey to the data from the panel provider. Respondents with different gender in the two data sources were eliminated, as were those reporting themselves to be in a differ-

[90]On the issue of incentives, I agree with the Wind Report (page 8) that "Such incentive payments are common for mall-intercept surveys and, given the double-blind nature of the survey, have no impact on the results of the survey."

[91]16 respondents failed validation and were not included in the final analysis. One of them was one of the 12 respondents who was replaced at the recommendation of the field sites (see footnote 86). The 51% percentage reflects the percent of respondents who were reached and validated during the validation process. Of the remaining 49%, we were unable to reach 37.2% within 16 attempts, 1.5% or respondents refused validation, 3.6% had a wrong number, 2.1% had disconnected phone lines,. The remaining 4.7% are the 16 respondents who failed validation, i.e., they were contacted and they did not satisfactorily answer the validation survey.

ent age group than in the panel data.[92] For the Internet survey we were able to validate 87% of the respondents (see Exhibit I).

XI. Mall-Intercept and Internet Questionnaires

85. Mall-intercept questionnaire. After initial screening, Questions 1 and 2 ask how long respondents have been a satellite radio subscriber, how many satellite receivers they own, what type of satellite receiver they own, and where they listen to satellite radio. Satellite radio subscribers might not be homogeneous in the importance they place on music or in their willingness to pay for music. These questions enable me to test for homogeneity or heterogeneity. Although there were a few differences, for example, the mean importance for "provides excellent sound quality (better than either AM or FM radio)" is 82.5 for subscribers to XM-only and 67.9 for Sirius-only users on a 100 point scale, $t = 2.79$, significant at the 0.01 level), I did not identify any heterogeneity that materially affected my opinions about the willingness to pay for music or the importance of music.

86. Questions 3, 4, and 5 ask how respondents pay for satellite radio so that the willingness-to-pay questions can be asked in the format with which respondents are familiar.

87. Question 6 asks for the respondent's "reservation price," that is, the most they would be willing to pay for a satellite radio subscription. This is a question that was skipped in the Wind Survey. This question corrects that omission.

88. Question 7 replicates the willingness-to-pay question from the Wind Survey while correcting many of its flaws. A more-representative set of satellite radio features are used, these are deleted from the service in a random order, and the respondent is not biased to answer that they would cancel the service if a feature were removed.[93]

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[92] Forty respondents out of 319 were eliminated from the study, prior to examining their responses vs. the rest of the sample. Panel data on age was given in the form of year of birth, so it is unlikely that respondents could simply have obsolete age data from that source.

[93] To avoid unnecessary complexity in the mall-intercept WTP question, the filter question used by the Wind Survey (Question 9(a) was not replicated. This question reads: "As you know, the single subscription price per month for satellite radio is $12.95. Let's assume that some of the current programming types

89. Question 8 measures the importance that respondents place on various features of satellite radio. The features are based on the voice of the customer and are representative of the features respondents use to evaluate satellite radio. Rather than a constant-sum format, I chose an anchored format. In an anchored format, respondents allocate 100 points to the most important feature or features. They then allocate between 0 and 100 points to all other features. When the number of features is small, anchored formats and constant-sum formats provide equally accurate predictions.[94] However, when there are more features respondents often find anchored formats easier to understand and more natural than constant-sum formats. In this case, the voice-of-the-customer methods identified forty-seven (47) features, which were summarized as twenty-nine (29) features in the mall-intercept survey. Twenty-nine features are too many for constant-sum scales. No attempt was made to assure that the twenty-nine features were independent. Indeed we can expect some overlap as is the case in any realistic description of customer needs.

90. For brevity, I focused on those aspects of the Wind Survey that were used by the Pelcovits and Ordover Reports. This focus should not be interpreted as an endorsement of the other questions in the Wind Survey. In previous paragraphs I provided a critique of many of those questions.

91. Internet survey questionnaire. Screening Question 1 is a security question. Screening Questions 2 ask for the respondent's age, state of residence, and gender. These questions are used as quotas in a stratified sampling methodology to obtain an efficient and representative sample. Screening Questions 3, 4, 5, and 6 qualify the respondent as either a satellite radio subscriber or as a considerer.

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were not available. Assuming that all other programming and non-programming features of the service, remain the same (sic.). If (*INSERT PROGRAMMING TYPE*) were not available, would it affect the amount you would be willing to pay for satellite radio?" Skipping the filter question means that fewer respondents were measured as "no change" and, hence, the WTP in my mall-intercept survey is raised as a result of this omission. This favors SoundExchange. The true WTP for music is less than that measured by my mall-intercept survey. I provide an estimate of this true WTP by reweighting the data to reflect the filter question used in the Wind Survey.

[94] Griffin and Hauser (1993), op.cit., page 18, Table 2. Anchored and constant-sum scales are compared on their ability to predict consumer interest and consumer preference for new product concepts. The predictive ability of the two scales was identical.

92. Internet Questions 1 and 2 ask how long respondents have been subscribers (if they are subscribers), how many receivers they own, what types of receivers they own, and where they listen to satellite radio.

93. Internet Question 3 is asked only of considerers. Internet Question 3 provides the considerer respondents with information on XM, Sirius, or both, depending on their interest. This information replicates what considerers would receive from sources such as the XM and Sirius websites. This methodology is known as "information acceleration" and is an accepted methodology in marketing.[95]

94. Internet Question 4 focuses on music programming and asks respondents to allocate 100 points among eight (8) music programming features. In this question there are sufficiently few features that respondents can answer constant-sum questions about the features. (This was confirmed in the pretests.) The eight features are based on the voice-of-the-customer experiential interviews.

XII. Willingness to Pay for Music

95. The mall-intercept survey provides better data than that provided by the Wind Survey with which to calculate the willingness of subscribers and considerers of satellite radio to pay for music. These calculations are based on a question that is similar to the question used in the Wind Survey with two changes. The biases of the Wind Survey are reduced and the "tires-on-the-car" flaw is corrected.

96. These calculations are conservative for three reasons. First, to avoid an excessively lengthy question sequence, some of the features of satellite radio are not used in the question sequence. Second, as in the Wind Survey, willingness-to-pay is measured for music. Music prior to 1972 is also important to consumers. Music is not limited to music of the 70's, 80's, 90's, and today as demonstrated by

[95] Urban, Glen L., John R. Hauser, William J. Qualls, Bruce D. Weinberg, Jonathan D. Bohlmann and Roberta A. Chicos (1997), "Validation and Lessons from the Field: Applications of Information Acceleration," *Journal of Marketing Research*, 34, 1, (February), 143-153. Urban, Glen L., Bruce Weinberg and John R. Hauser (1996), "Premarket Forecasting of Really-New Products," *Journal of Marketing*, 60,1, (January), 47-60. The latter paper received the 1996 MSI Award for the most significant contribution to the advancement of the practice of marketing. The former article has been cited 28 times as indicated by ISI's Web of Science and was cited 43 times in Google Scholar. The latter article has 54 citations on ISI's Web of Science and 91 citations on Google Scholar. Data as of June 23, 2007.

both the mall-intercept and Internet surveys. The willingness to pay for the sound recording rights at issue in this case is less than that measured for music recordings, per se. For example, if we were to use the Internet survey constant-sum questions to split the willingness to pay between pre-1972 music (not at issue in this case) and post-1972 music (which is at issue in this case), the true willingness to pay would be estimated as approximately 60.8% of that measured in the mall-intercept survey.[96] Even this is conservative. There are other features of music programming, other than the sound recording rights, that are important to subscribers and considerers of satellite radio. When these are properly accounted for in the analysis, the willingness to pay for post-1972 music is only 15.8% of that measured in the mall-intercept survey.

97. Third, the Wind Survey used a filter question. The Wind Survey found that 141 out of 400 respondents (35.3%) were identified as "no change" by the filter question.[97] In the mall-intercept survey I chose to ask a series of questions that included WTP for satellite radio service without music, but also included WTP for satellite radio service without other features. This format made it awkward to ask a filter question for every sequential WTP. Thus, rather than replicate the Wind Survey's filter question, I chose to use the results of the Wind Survey's filter question and apply those results to the data I obtained from a more-appropriate WTP question. In subsequent paragraphs I report data weighted to reflect the Wind Survey's filter question. For completeness, I also report the unweighted data, that is, data that are not weighted to reflect the Wind Survey's filter question.

98. In the willingness-to-pay question, respondents were asked to provide WTP judgments for satellite radio services in which seven features were deleted sequentially. Of the 337 respondents, 33 respondents answered questions in which music was deleted first.[98] Because I did not use a filter question in the mall-

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[96] Constant-sum importance of music from the 70's, 80's, 90's, and today is 15.8; constant-sum importance of music from the 40's, 50's, 60's, and earlier is 10.2. A more conservative calculation would include constant-sum importance of live studio performances and live concerts, which is 6.1.

[97] Wind Report, Figure 8, page 24.

[98] The order in which respondent were asked to evaluate satellite radio without music programming was not significantly different from random (χ^2= 2. 23, p=0.897, 6 d.f.). When the ordering of respondents is re-

intercept survey, only 3 out of 33 respondents (9.1%) were measured as "no change" in the second portion of the WTP question. If we believe that the filter question was accurate, then we can reweight the data in the mall-intercept survey to reflect the skipped filter question. Although this is, in my opinion, the more-accurate estimate, this adjustment will sometimes lower the WTP (and, hence, favor XM and Sirius). To be complete, I report the data both ways – weighted and unweighted, in the detailed sections of this report. Occasionally in the report, for ease of exposition, I sometimes report only the weighted values. I believe the weighted values to be more accurate estimates.[99]

99. In an attempt to balance ease of exposition with completeness, I have divided Exhibits J and K into Exhibits J-1 and J-2 and Exhibits K-1 and K-2. Exhibits J-1 and K-1 summarize the results of the willingness-to-pay (WTP) question when the data are unweighted, that is, they do not reflect the lack of a filter question. Exhibits J-2 and K-2 summarize the results of the WTP question when the data are reweighted to reflect the lack of a filter question. The first set of exhibits J-1 and J-2 give the value of satellite radio when a feature is removed. The second set of exhibits K-1 and K-2 subtracts this value from $12.95 to impute a value of the feature. When music is removed first, as in the Wind Survey, the WTP for music is $6.48 ($9.21 unweighted) . When music is removed last, a procedure that is no less appropriate than that in the Wind Survey, the WTP for music is $0.92 ($0.92 unweighted). When we average over all possible orders, the WTP for music is $2.93 ($3.37 unweighted). For further ease of exposition, Exhibits J and K, as well as subsequent exhibits do not display the confidence intervals for these estimates. Instead, I have provided all relevant confidence intervals in Appendix 3.

100. Based on Exhibits J-2 and J-2 and on the fact that music at issue in this case makes up a 60.8% portion of "music," I opine that a conservative (favorable to

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weighted to reflect a purely random ordering, the resulting WTP for satellite radio without music programming is not significantly different from that obtained by the overall sample (t= -0.727, p=.468).

[99] This is for simplicity of exposition only in the body of the report. Exhibits that are part of this report, provide the unweighted estimates.

SoundExchange) estimate of the WTP for music is approximately $1.78 ($2.05 unweighted).[100]

XIII. The Importance of Music

101. The mall-intercept survey also gathered data on the measured importance of the features of satellite radio service. These data were gathered with anchored importance scales, which scientific experiments have demonstrated are equally as accurate as constant-sum scales in terms of measuring importance and predicting consumer preference. Unlike the features in the Wind Survey, which were based on the voice of SoundExchange's counsel, the features in the mall-intercept survey are based on the voice of the customer.

102. Exhibit L summarizes the anchored-importance data.[101] The first column describes the feature. The second column is the average anchored score. The third column indicates the percent of respondents who allocated the most points to that feature.[102] These features were presented to respondents in a random order, thus, for ease of display, I have presented the features in order of average anchored importance.

103. The feature that has the highest average anchored importance score is "I can listen to music," but that feature is ranked first by only 10.7% of the respondents. This is substantially less than the 74% estimate from the Wind Report that is quoted by the Ordover Report. However, "I can listen to music" includes sound recordings that are at issue in this case, sound recordings that are not at issue in this case, and live performances. If we examine the average importance of "I can listen to music from the 70's, 80's, 90's and today," we see that its average importance is less than features such as (paraphrasing) "music channels without commercials,"

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[100] See Exhibit O as well. Another estimate might be made by using the fact that music of the 70's, 80's, 90's, and today makes up only 15.8% of the constant-sum importance of music programming. Using this fact provides a WTP estimate that is more-favorable to XM and Sirius of $0.46 ($0.53 unweighted).

[101] See Appendix 3 for confidence intervals for the importances in Exhibit L.

[102] If a respondent allocated the maximum points to more than one feature, then this percentage reflects that allocation. In an anchored scale, the respondent is instructed to allocate 100 points to the most important feature. Suppose that the respondent allocates 100 points to two features. Then, in computing percentages for each feature that respondent is split between the two features.

"finding what I want to listen to (and when)," "excellent sound quality" and "listening wherever I go." Sound recordings at issue in this case are ranked first by only 5.4% of respondents. Thus, using features based on the voice of the customer (and doing fair calculations) rather than the voice of counsel, changes the percentage from 74% to 5.4% – a dramatic effect.

XIV. Relative Importance of Sound Recording Rights, 1972 and Later, as a Percentage of the Importances of Music Programming Features[103]

104. The Internet Survey focuses on music programming features. Respondents are asked to allocate 100 points among the eight music programming features that were identified based on the voice of the customer. Only one of these eight features, "I can hear music from the 70's, 80's, 90's, and today," is based on the sound recording rights that are at issue in this case.

105. Exhibit M summarizes the results of the constant-sum allocation in the Internet Survey.[104] The first column is a description of the feature. The second set of columns is the average percentage allocation to that feature.[105] The third set of columns indicates the percent of respondents who allocated the most points to that feature.[106] The feature of music programming that has the largest overall average importance (24.1 out of 100) is "Most channels are commercial free." This feature is also ranked first by the most respondents (34.9%). This is a distinguishing feature of satellite radio and, hence, it is not surprising that respondents view this feature as most important. The feature, "I can hear music from the 70's, 80's, 90's and today," was the second-most important feature, with an average score of 15.8, only 2/3^{rds} of the feature, "Most channels are commercial free." The sum of the mean scores across features adds to 100. Following the Wind Report we can interpret these average scores as percent importances for various aspects of music

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[104] Confidence intervals for the relative importances of music programming features are provided in Appendix 3.
[105] Because each respondent allocates the same number of points, we can take the averages in either order.
[106] Ties are broken as in Exhibit K.

programming. By this measure, as used in the Wind Report, the sound recording rights at issue in this case (music recorded from 1972 onward) are worth only about 15.8% of the total value of music programming on satellite radio.

106. We can also use the data in Exhibit M to further clarify the WTP as measured for satellite radio in the absence of music. In a measure favorable to SoundExchange, we could parse the WTP by looking only at the comparative importances of "music from the 70's, 80's, 90's, and today" versus "music from the 40's, 50's, 60's, and earlier." In a measure that takes into account more of the features that consumers found to be important, we can parse this WTP by the relative importance of "music of the 70's, 80's, 90's, and today" versus all other features included in the Internet survey. The former gives a parsing weight of 60.8% for the importance of music from the 70s, 80s, 90s and today in the WTP; the latter, more thorough parsing gives a weight of 15.8% for music from the 70s, 80s, 90s and today.

107. From Paragraph 99 we measured the WTP for music to be $2.93 ($3.37 unweighted). Using the results from the Internet survey favorable to SoundExchange (60.8%) we parse this value to $1.78 ($2.05 unweighted for the filter question). Using the more thorough weight (15.8%), which is favorable to XM and Sirius, we parse this value to $0.46 ($0.53 unweighted).

XV. Use by the Pelcovits Report of Data from the Wind Survey and Opinions Expressed in the Wind Report

108. On page 13 the Pelcovits Report cites the Wind Survey as suggesting that "56% of Sirius' subscriber revenues would be lost if Sirius offered no music channels." This percentage is based on Question 9 of the Wind Survey, which purports to show that 41% of the Sirius subscribers would cancel their subscriptions if there were no music available and 15% would be willing to pay at most (on average) $7.27 if there were no music available. The Pelcovits Report argues that Sirius would not offer satellite radio service if it were priced below $7.27.[107] I have demonstrated in this report that the questions upon which these opinions are based

[107] I am not expressing an opinion about whether Sirius (or XM) would offer service priced at or below $7.27.

are biased and that the Wind and Pelcovits Reports misinterpret the implications of those questions. When the flaws in the Wind Survey are corrected, the relevant values of lost revenue are much lower.

109. Exhibits N-1 and N-2 display the percent of respondents who would no longer subscribe to satellite radio if music were not available and the percent of respondents who be willing to pay something, but at most $7.27, to subscribe to satellite radio if music were no longer available.[108] The Pelcovits Report assumes that all customers who would pay less than $12.95 if music were not available would have their service cancelled, because they have an average willingness to pay of $7.27.[109] This is an incorrect assumption arising from the Pelcovits Report mistakenly attributing the average willingness to pay of $7.27 to all of these customers, when in fact their willingness to pay can fall anywhere in the range from $0.01 to $12.94. With this flaw in mind, we can nevertheless use data from the same question in the mall survey I conducted to show that $12.2% of respondents would cancel (pay nothing) and an additional 9.6% of respondents would pay less than $7.27 for their service.[110] Exhibits N-1 and N-2 provide these data using the same cut-off as in the Pelcovits Report. If I am asked to provide estimates for other cut-offs, I can do so with the data from the mall-intercept survey.

110. When music is removed on its own, ceteris paribus, as in the Wind Survey, the percent of respondents who would no longer subscribe or who would pay something less than $7.27 are 39.9% and 53.1%, respectively. When music is removed last, a procedure that is no less appropriate than that in the Wind Survey, these percentages are 4.4% and 6.7%, respectively. When we average over all possible orders, these percentages are 12.2% and 21.8%, respectively.

111. On page 25 the Pelcovits Report indicates that its analysis with the "Shapley model" is based on the results of the Wind Survey. In particular, the Pelcovits Report states that the "Survey determined the incremental revenues added by each

[108] Confidence intervals for the percents of respondents in Exhibits N are contained in Appendix 3.
[109] Pelcovits Report, n. 14.
[110] I summarize the results using the $7.27 cut-off that is used by the Pelcovits Report (Footnote 13, page 14). Data are also available to calculate results for other cut-off levels such as the $7.18 average in the Wind Report, Fig. 8, p. 24, or for any other cut-off that might be proposed. I am not opining that $7.27 is the appropriate cut-off.

type of programming, assuming that the other types of programming already were offered."[111] The questions in the Wind Survey are biased, the methodology in the Wind Report does not determine the appropriate incremental value for music, and there are other aspects of XM's and Sirius' services other than programming that add value. Thus, the inputs to the Shapley-value calculations are fundamentally flawed.

112. On page 26 the Pelcovits Report assumes "that unless content representing 50% of the total value, as calculated above, is present, the game 'fails,' i.e., the value of the game is zero." "As calculated above" refers to incremental revenue determined by the Wind Survey, "stated as a percentage of total revenues when all four program types were offered." I have shown in this report that the incremental revenue from music is substantially less than that used by Pelcovits. The data from my surveys also indicate that the relative values of other forms of programming and non-programming features are not measured reliably or validly by the Wind Survey. Thus, the Shapley-value calculations in the Pelcovits Report are based on assumptions of game failure or non-failure that are invalid.

XVI. Use by the Ordover Report of Data from the Wind Survey and Opinions Expressed in the Wind Report

113. On page 23 the Ordover Report cites the Wind Report as "highly informative regarding the role of music in attracting SDARS subscribers."[112] For example, the Ordover Report cites that "nearly one-half (43%) of all respondents indicated that they would cancel the service if it lacked music." I have demonstrated in this report that this estimate is based on biased questions and on a misinterpretation of

[111] The Pelcovits Report (page 26) uses values of 53.3% for sound recordings, 22.6% for news, 23.3% for sports, and 23.4% for talk/entertainment. The Wind Report, based on erroneous interpretations, reports willingness to pay of $6.15, $10.14, $9.99, and $9.99 for programming without music, news, sports, and talk/entertainment, respectively. Even thought the Wind Survey uses only a subset of the programming types and totally ignores other features of satellite radio service, these percentages add to more than 100% of the market price of satellite radio service. This is a "tires-on-the-car" phenomenon that the Pelcovits Report recognizes and tries to correct by renormalizing these values to 52.5%, 21.7%, 22.9%, and 22.9% respectively. However, this renormalization does not account for the "voice-of-counsel" criticism nor does it account for the other flaws in the Wind Survey. The renormalized data remain flawed.

[112] SDARS = satellite digital audio radio services.

the implications of the Question 9 in the Wind Survey. The Ordover Report further states that when respondents were asked in Question 4 to assign 100 points among seven types of programming that music received "triple the average ascribed to any other programming type." The Ordover Report further states that "74% of the respondents assigned the highest number of points to music programming." The constant-sum question in the Wind Survey conflates sound recording rights that are at issue in this case with sound recording rights that are not at issue in this case. In addition, the items in the constant-sum question were obtained by Dr. Wind primarily from counsel for SoundExchange and do not include other aspects of XM's and Sirius' service that are important to consumers. Furthermore, the 74% breaks ties arbitrarily in favor of music.[113] When importances are re-measured using features identified by customers and when the analysis done in a fair manner,[114] substantially fewer respondents assign the most points to music of the 70's, 80's, 90's, and today (5.4%).[115]

114. On page 41, the Ordover Report states: "I agree with Dr. Pelcovits that it is plausible to conclude that music accounts for approximately 55% of the value of all programming content distributed by the SDARS." This 55% estimate, which is drawn from the Pelcovits Report's interpretation of the results of Question 9 of the Wind Survey, is restated on pages 46 and 51 of the Ordover Report to substantiate the percent of revenues that is attributed to music. The Shapley-value calculations discussed on pp. 24 – 26 of the Pelcovits Report are dependent on the data in the Wind Survey which I demonstrate are flawed. Were we to use more accurate data, it is likely that the results of the simulations would be substantially different. Any conclusions by the Ordover Report that are based on the calculations

[113] For example, if the respondent allocated 15 points to each of six items, including music, and 10 points to the last item, this rule would state erroneously that the most points were allocated to music. A fairer interpretation would be to count this respondent as if $1/6^{th}$ of the time music received the most points. A conservative interpretation would not count this respondent.

[114] If two or more features are tied for first, first-place votes are distributed equally among the tied features.

[115] The features were developed based on the "voice of the customer." The feature to which I refer was "I can listen to music of the 70's, 80's, 90's, and today." The survey included features and no attempt was made to assure that the features were independent. Without further data collection it is not appropriate in this survey to combine the importances of different features as one might do in an additive model of consumer "utility." Music per se, which includes music at issue in this case and music not at issue in this case, was given the most points by only 10.7% of respondents (See Exhibit L).

in the Pelcovits Report, which are in turn based on the Wind Survey, are thus neither reliable nor valid.

XVII. Results of Correcting Data from the Wind Survey and Opinions from the Wind Report Used in the Ordover and Pelcovits Reports

115. Both the Pelcovits Report and the Ordover Report rely on data from the Wind Report. In this report I have shown that the Wind Survey is fundamentally flawed due to the "tires-on-the-car" and "voice-of-counsel" flaws. I have also shown that there are numerous biases in the Wind Survey that cause the Wind Report to overestimate the relative contribution of the sound recording rights that are at issue in this case. With the mall-intercept and Internet surveys I corrected some of the flaws in the Wind Survey and, hence, provided more-accurate data that can be used in calculating an equitable royalty.

116. I am providing opinions in this case as a marketing and marketing research expert. I am not providing opinions in this case as an economics expert. I have no opinion with respect to the Shapley-value calculations in the Pelcovits Report, other than to opine that they are based on flawed data. Similarly, I have no opinion with respect to the calculations in the Ordover Report, other than to opine that they are based on flawed data. The data provided by the mall-intercept and Internet surveys are more accurate and provide better input to the Shapley-value calculations and the other calculations in the Pelcovits and Ordover Reports.

117. As an illustration, below I redo the some of the calculations in the Howard-Stern analysis in the original and amended Pelcovits Report using the more-accurate data obtained from the mall-intercept and Internet surveys. I do not opine that these are the appropriate calculations for computing royalties. I do opine that, were we to use the more-accurate data from my surveys, the result would be substantially lower suggested royalties in the Pelcovits and Ordover Reports, to the extent those Reports rely on data from the Wind Survey.

118. The Pelcovits Report uses an estimate from the Wind Survey that 56% of the respondents would be lost if music were not available. This percentage includes

those respondents who the Wind Survey suggests would cancel their subscriptions without music and those respondents who the Wind Survey suggests would pay (on average) $7.27 or less without music.[116] The Pelcovits Report assumes, based on its analysis of the Howard Stern programming, that music content should "receive 50% of the revenue for the 56% of the customers attracted to the SDARS by music." Using the data from Paragraph 110 of this report, the 56% from the Wind Survey estimate is more accurately estimated as 21.8% (25.8% unweighted). Using the data from the Internet survey, we attribute either 60.8% (as favorable to SoundExchange) or 15.8% (as favorable to XM and Sirius) of the impact of music to the sound recording rights that are at issue in this case. Multiplying these factors reproduces the Pelcovits Report calculations, but with more-accurate data: (50% as in the Pelcovits Report) x (60.8% [or 15.8%] for music 1972 and later as opposed to music before 1972) x (21.8% [or 25.8% unweighted] lost subscribers from Paragraph 110). Depending upon the assumptions we obtain the following numbers:

i. Most favorable to SoundExchange – no reweighting for the filter question and parsing that is favorable to SoundExchange: 7.8% (less the adjustments discussed below).
ii. Reweighting to account for the lack of a filter question and parsing that is favorable to SoundExchange: 6.6% (less the adjustments discussed below).
iii. No reweighting for the filter question and parsing that is favorable to XM and Sirius: 2.0% (less the adjustments discussed below).
iv. Most favorable to XM and Sirius – reweighting to account for the lack of a filter question and parsing that is favorable to XM and Sirius: 1.7% (less the adjustments discussed below).

The Pelcovits Report then subtracts 3.5% for the publishers' royalties from these figures, and the Amended Pelcovits Report subtracts an additional 1.5% to account for the SDARS' internal production costs.[117] I have no opinion as to

[116] Pelcovits Report, page 13.
[117] Pelcovits Amended Report, page 8. SDARS = satellite digital audio radio services.

whether or not these adjustments are the correct adjustments. However, were we to make these adjustments, then the calculations in the Pelcovits Report, using assumptions that are most favorable to SoundExchange, result in a value that is 2.8% of revenue. Using assumptions that are most favorable to XM and Sirius, the calculations in the Pelcovits Report result in an estimated royalty of 0%.[118]

119. The Shapley-value calculations in the Pelcovits Report are based on the willingness-to-pay data in Figure 8, page 24 of the Wind Report. The data from the mall-intercept and Internet Surveys demonstrate that the revenue due to the sound recording rights at issue in this case is grossly inflated by the Wind Survey. Exhibits J-1, J-2, K-1, K -2 provide more-accurate estimates of the effect of music (and other programming types) on respondents' willingness to pay. I reproduce these data as Exhibit O, breaking out music into recordings before the 70's, recordings from the 70's and later.[119] If the Shapley-value calculations are redone with these values, rather than the inflated values from the Wind Report, the estimated royalty for sound recording rights for 1972 and later would be substantially different from that estimated in the Pelcovits Report. It would differ even more if the Shapley-value games included the features of satellite radio which are important to customers and which are not included in the Wind Survey. Intuitively, it is likely that the estimated royalty would be substantially less, but, confirmation would require that the Shapley-value calculations are revised based on the more-accurate data.

120. The estimates in the Ordover Report rely heavily on the estimates in the Pelcovits Report, thus, they, too, would change dramatically if we use the more-accurate data from the mall-intercept and Internet Surveys.

121. To summarize this section, the calculations in the Pelcovits Report and the Ordover Report are neither reliable nor valid because they are based on data from the Wind Survey and Wind Report that are biased substantially in favor of SoundExchange. If these calculations are redone using more-accurate data from the mall-intercept and Internet surveys, the estimates of royalties that the Pelcovits

[118] Assuming royalties are bounded from below by zero.
[119] Confidence intervals for Exhibit O are provided in Appendix 3.

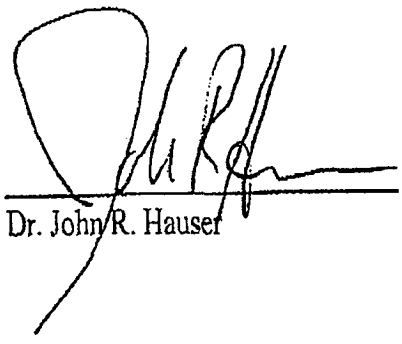
and Ordover Reports obtain would be substantially less, even putting aside whatever other errors or omissions might exist.

Before the
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LIBRARY OF CONGRESS
Washington, D.C.

In the Matter of Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services	Docket No. 2006-1 CRB DSTRA

DECLARATION OF DR. JOHN R. HAUSER

I, John Hauser, declare under penalty of perjury that the statements contained in my Written Rebuttal Testimony in the above-captioned matter are true and correct to the best of my knowledge, information and belief. Executed this 24th day of July 2007.



Dr. John R. Hauser

A

June 2007

ACADEMIC VITA (long version)

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Education

Sc.D M.I.T., 1975, Operations Research Dissertation: "A Normative Methodology for Predicting Consumer Response to Design Decisions: Issues, Models, Theory and Use."

S.M. M.I.T., 1973, Civil Engineering (Transportation Systems Division)

S.M. M.I.T., 1973, Electrical Engineering

S.B. M.I.T., 1973, Electrical Engineering
Joint Thesis (S.M.'s and S.B.): "An Efficient Method to Predict the Impacts of Operating Decisions for Conventional Bus Systems"

Lifetime Achievement Awards

Parlin Award 2001, The American Marketing Association describes this award as "the oldest and most distinguished award in the marketing research field"

Converse Award 1996, the American Marketing Association, for "outstanding contributions to the development of the science of marketing."

Fellow of the Institute for Operations Research and Management Science (INFORMS)

Highly Cited Researcher (ISI), Since 2006.

Awards for Published Papers

INFORMS:	John D.C. Little Best-paper Award, 2003, First Place
	John D.C. Little Best-paper Award, 1998, Finalist
(formerly The Institute	John D.C. Little Best-paper Award, 1994, Finalist
of Management Science)	John D.C. Little Best-paper Award, 1993, First Place
	John D.C. Little Best-paper Award, 1990, Honorable Mention
	Best paper in Marketing Sciences Literature, 1984, Honorable mention.
	Best Paper in Marketing Sciences Literature, 1983, First Place.
	Best Paper in Marketing Sciences Literature, 1982, First Place.
	Two published articles were cited in 2007 as one of "the top 20 marketing science articles in the past 25 years.
American Marketing Association:	Explor Award (Leadership is on-line market research), 2004, First-Place
	Finalist, Paul Green Award for contributions to marketing research, 2004

	MSI Award for Most Significant Contribution to Practice of Marketing in 1996. Finalist, O'dell Award for best paper in the *Journal of Marketing Research*, published in 1986, awarded in 1991.
Product Development Management Assoc.	Best Paper Award, Finalist, 2003. Best Paper Award, Finalist, 2002. One of ten most-cited papers in the *Journal of Product Innovation Management.* One of the top articles in educational citations in the last twenty years.
Sawtooth Software Conference	Best Presentation and Paper, 2006
European Society of Marketing Research:	Best Paper at Rome conference, September 1984.
Doctoral Consortia Faculty	American Marketing Association, 1979, 1984, 1985, 1986, 1988, 1989, 1991, 1993, 1995, 1997, 1998, 2001, 2003, 2004, 2005, 2006, 2007. INFORMS Society of Marketing Science, 2002 (founding member), 2003, 2004. European Marketing Academy, 1985

Awards, Teaching

Sloan School of Management:	Nominated for Excellence in Teaching Award 2000, 2007. Named "Outstanding Faculty" by *Business Week Guide to the Best Business Schools* (1995). Excellence in Teaching Award 1994 (Awarded by the Master's Student class).

Awards for Thesis Supervision

American Marketing Association (Ph.D.):	Co-winner John Howard Dissertation Award (2005, Olivier Toubia) 1st Place (1981, Ken Wisniewski) Honorable Mention (1979, Patricia Simmie).
INFORMS (Ph.D.)	Winner of the Frank Bass Award (2004, Olivier Toubia, awarded 2005) Winner of the Frank Bass Award (1989, Abbie Griffin, awarded 1995)
Sloan School of Management (Ph.D.):	1st Place (1987, Peter Fader)
Sloan School of Management (Master's):	1st Place (1991, Jon Silver and John Thompson) 1st Place (1983, Steve Gaskin) Honorable Mention (1982, Larry Kahn).

Awards, Other

Who's Who in America	Since 1997
Who's Who in Management Science	Since 2000
Who's Who in Economics	Since 2003
Harvard Business School:	Marvin Bower Fellow, 1987 - 1988.
National Science Foundation Fellowship:	1971 - 1974.
M.I.T.:	National Scholar, 1967 - 1971.

Honor Societies:	Tau Beta Pi, Eta Kappa Nu, Sigma Xi

Directorships, Trustee, Advisory Board

1988 – Present	Founder, Principal, Board Member, Applied Marketing Science, Inc.
March 2003 – Present	Trustee, Marketing Science Institute
January 2004 – Present	Advisory Board, Affinnova, Inc.

Academic Appointments

January 1989 - Present:	Kirin Professor of Marketing Alfred P. Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
July 2005 – Present:	Area Head, Management Science Area
July 1988 – June 2003:	Head, Marketing Group
September 1993 - May 2000:	co-Director, International Center for Research on the Management of Technology
September 1997 - May 2000:	Research Director, Center for Innovation in Product Development
June 2001 – June 2006:	Virtual Customer Initiative Leader, Center for Innovation in Product Development
July 1984 - January 1989:	Professor of Management Science Alfred P. Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
July 1987 - June 1988:	Marvin Bower Fellow Harvard Business School Harvard University Cambridge, Massachusetts 02163
March 1985 - May 1985:	Visiting Lecturer European Institute of Business Administration Fontainebleau, FRANCE
September 1980 - June 1984:	Associate Professor of Management Science Alfred P. Sloan School of Management Massachusetts Institute of Technology Cambridge, Massachusetts 02142
September 1975 - August 1980:	Assistant Professor of Marketing and of Transportation (granted tenure and promoted in 1980) Graduate School of Management and Transportation Center Northwestern University Evanston, Illinois 60201

Teaching Interests

Marketing Management, New Product and Service Development, Competitive Marketing Strategy, Marketing Models, Measurement and Marketing Research, Research Methodology.

Research Interests

Virtual customer methods for rapid customer feedback via the web; polyhedral methods, Greedoid methods, and related theory for the analysis of non-compensatory decision making; customer satisfaction measurement and incentive systems; quality function deployment and customer driven engineering; market measurement, especially voice of the customer; marketing strategy, especially positioning, pricing, and advertising strategy; consumer behavior including information search, agendas, and market structure; prelaunch forecasting and information acceleration for new products; and design and marketing of new products and services, hierarchical Bayes methods for continuous-time Markov processes.

Texts

Urban, G. L. and J. R. Hauser, *Design and Marketing of New Products*, Prentice-Hall, Second Edition 1993.

A comprehensive text that integrates advanced, state-of-the-art techniques to provide graduate-level students and marketing professionals with an understanding of the techniques and an operating ability to design, test, and implement new products and services.

This text has been honored by being selected for both the Prentice-Hall International Series in Management and the Series in Marketing. It has been adopted at a number of major universities. In a 1988 survey it was identified as the most widely used new product textbook at the graduate level.

The revision includes new material on designing for quality, reduced cycle times, prelaunch forecasting, quality improvement, defensive and competitive strategy, value mapping, the integration of marketing and engineering, new issues of organization, customer satisfaction, and new international examples. It is available in Korean and is being translated into Japanese and Chinese.

Urban, G. L., J. R. Hauser, and N. Dholakia, *Essentials of New Product Management*, Prentice Hall, 1986.

This is an undergraduate textbook which presents the essential concepts but written for a non-technical audience. It has been translated to Japanese and has sold well in Japan.

Hauser, J. R., *Applying Marketing Management: Four Simulations*, Scientific Press, 1986.

This mini-text and software package contains four tutorial exercises for marketing management concepts. With this package students learn positioning, competitive strategy, new product development, and life cycle forecasting while using the personal computer to simulate marketing management problems. A detailed instructor's manual and transparency masters are also available. It is available in Japanese.

Hauser, J. R., *ENTERPRISE: An Integrating Management Exercise*, Scientific Press, 1989.

This mini-text and software package contains a comprehensive competitive simulation. Students compete in six markets by making marketing and production decisions. A detailed instructor's manual and administrative software is also available. It is available in Japanese.

Journal Editor

Marketing Science, Editor-in-Chief for volumes 8, 9, 10, 11, 12, and 13 (1989-1994). Four issues per year including periodic editorials and journal management. Processed about 120 new papers per year.

Journal Publications

Toubia, Olivier, John R. Hauser and Rosanna Garcia (2006), "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," forthcoming *Marketing Science*.

Co-winner, American Marketing Association, John Howard Dissertation Award, 2005

Yee, Michael, Ely Dahan, John Hauser, and James Orlin (2006), "Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference," forthcoming, *Marketing Science*.

First Place, American Marketing Association Explor Award, 2004

Hauser, John R., Gerald Tellis, and Abbie Griffin (2006), "Research on Innovation: A Review and Agenda for Marketing Science," *Marketing Science*, 25, 6, (November-December), 687-717.

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Dahan, Ely and John R. Hauser (2002), "The Virtual Customer," *Journal of Product Innovation Management*, 19, 5, (September), 332-354.

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Hauser, John R. (2006), "Twenty-Five Years of Eclectic Growth in Marketing Science," *Marketing Science* (invited commentary), 25, 6, (November-December), 557-558.

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Hauser, John R. (1997), "The Role of Mathematical Models in the Study of Product Development," *Proceedings of the 14th Paul D. Converse Awards Conference*, University of Illinois, Champaign-Urbana, IL, 72-90.

Swanson, Derby A. and John R. Hauser (1995), "The Voice of the Customer: How Can You Be Sure You Know What Customers Really Want?," *Proceedings* of the 1st Pacific Rim Symposium of Quality Function Deployment, MacQuarie University, NSW Australia, February 15-17.

Little, John D. C., Leonard M. Lodish, John R. Hauser, and Glen L. Urban (1993), "Comment on `Marketing Science's Pilgrimage to the Ivory Tower' by Hermann Simon," in *Research Traditions in Marketing*, Gary L. Lilien, Bernard Pras, and Gilles Laurent, eds, (Kluwer), 45-51.

Hauser, John R. (1986), "Theory and Application of Defensive Strategy" in *The Economics of Strategic Planning,* Lacy G. Thomas, ed., (Lexington Books, D. C. Heath & Co.: Lexington, MA), 113-140. Reprinted by the Marketing Science Institute.

Hauser, John R. (1985), "The Coming revolution in Marketing Theory," in R. Russell, ed., *Marketing in an Electronic Age*, (Harvard Business School Press: Boston, MA), 344-363.

Hauser, John R. and Glen L. Urban (1984), "Consumer Durables: Actual Budgets Compared to Value Priority Model - Preliminary Results and Managerial Implications," *Proceedings* of the ESOMAR-Congress, Rome, Italy, (September). (Awarded Best Paper at Conference).

Hauser, John R., John H. Roberts and Glen L. Urban (1983), "Forecasting Sales of a New Consumer Durable: A Prelaunch Modeling and Measurement Methodology," *Advances and Practices of Marketing Science*, Fred S. Zufryden, ed., (The Institute of Management Science: Providence, RI), 115-128.

Hauser, John R., and Glen L. Urban (1982), "Prelaunch Forecasting of New Consumer Durables: Ideas on a Consumer Value-Priority Model," in A. D. Shocker and R. Srivastava, eds., *Analytic Approaches to Product and*

Market Planning, Vol. 2, (Marketing Science Institute: Cambridge Massachusetts), 276-296.

Hauser, John R. (1982), "Comments on 'A Survey of Experimental Market Mechanisms for Classical Environments'," *Research in Marketing, Supplement 1: Choice Models for Buyer Behavior*, L. McAlister, ed., (JAI Press: Greenwich, CT), Spring, 49-56.

Hauser, John R. (1981), "Comments on 'Violations of Regularity and the Similarity Hypothesis by Adding Asymmetrically Dominated Alternatives to the Choice Set'," *Proceedings of the Special Conference on Choice Theory*, Joel Huber, ed., (Duke University: Durham, NC), June.

Hauser, John R., and Frank S. Koppelman (1979), "An Empirical Comparison of Techniques to Model Consumer Perceptions and Preferences," in A. D. Shocker, ed., *Analytic Approaches to Product and Marketing Planning*, (Marketing Science Institute: Cambridge, Massachusetts), 216-238.

Tybout, Alice M., John R. Hauser, and Frank S. Koppelman (1977), "Consumer-Oriented Transportation Planning: An Integrated Methodology for Modeling Consumer Perceptions, Preferences and Behavior," *Advances in Consumer Research*, Vol. 5, (Chicago, Illinois), October.

Hauser, John R. and Steven M. Shugan (1977), "Extended Conjoint Analysis with Intensity Measures and Computer Assisted Interviews: Applications to Telecommunications and Travel, " *Advances in Consumer Research*, Vol. 5, (Chicago, Illinois), October.

Hauser, John R. and Frank S. Koppelman (1977), "Designing Transportation Services: A Marketing Approach." *Proceedings of the Transportation Research Forum*, (Atlanta, GA), October, 638-652.

Hauser, John R. and Peter R. Stopher (1976), "Choosing an Objective Function Based on Modeling Consumer Perceptions and Preferences," *Proceedings of the International Conference on Cybernetics and Society*, (Washington, D.C.), November, 26-31.

Magazine Articles

Hauser, John R. (2002), "Marketing Makes a Difference," *Marketing Management*, (January/February), 11, 1, 46-47.

Hauser, John R. (2000), "Going Overboard on Platforms," *AMS Voices,* 8.

Hauser, John R. (1997), "The Problem with Pinball," *AMS Voices,* 4.

Hauser, John R. (1996), "You Are What You Measure," *AMS Voices*, 1.

Hauser, John R. (1995), "Internal Customers," *Insight*, 4, 1.

Hauser, John R. (1994), "Quality Function Deployment," *Marketing Encyclopedia for the Year 2000*, Jeffrey Heilbrunn, ed., American Marketing Association, Chicago, IL, 60606.

Hauser, John R. (1993), "Are Customer-Satisfaction Programs Profitable?, *Insight*, 3.

Hauser, John R. (1988), "Customer Driven Engineering," *Design News*, (July 18), p. 50.

Hauser, John R. and Robert L. Klein (1988), "Without Good Research, Quality is a Shot in the Dark," *Marketing News*, Vol. 22, No. 1, January 4. Page 1.

Hauser, John R. (1986), "`Defender' Helps Mature Brands Ward off New Foes," *Marketing Educator*, 5, 3, (Fall), 5.

Submitted Papers and Working Papers

Ding, Min and John R. Hauser (2005), A Truth-telling Guessing Game for Survey Research," draft working paper, June.

Zettelmeyer, Florian and John R. Hauser (1995), "Metrics to Evaluate R&D Groups: Phase I, Qualitative Interviews," Working Paper, International Center for Research on the Management of Technology, MIT, Cambridge, MA, 02142, (March).

Hauser, John R. (1991), "Comparison of Importance Measurement Methodologies and their Relationship to Consumer Satisfaction," M.I.T. Sloan School of Management Working Paper, Cambridge, MA 02142. (January).

Research in Progress

Disjunctions of conjunctions: alternative models of non-compensatory decision making. With Rene Befurt, Olivier Toubia, and Theodoros Evgeniou.

The application of hierarchical Bayes continuous-time Markov-process models to the analysis of field experiments to increase consideration of automobiles. With Glen Urban and Eric Bradlow.

Morphing Websites, with Glen Urban, Guildherme Liberali, and Michael Braun.

Agent-based Models of the Diffusion of Wine Closures, with Rosanna Garcia.

Genetic Algorithms for Understanding Consumer Preferences with Kamal Malek and Kevin Karty.

Research Reports (not otherwise listed)

Hauser, John R. (1996), "R&D Metrics: An Annotated Bibliography," ICRMOT Working Paper, M.I.T., Cambridge, MA 02142. (June) Also available as a Marketing Science Institute Working Paper (November).

Hauser, John R. and Greg Cirmak (1987), "Consumer Driven Engineering for the CHEK Automobiles," Information Resources, Inc. Report to General Motors, Inc. Details the results of a major study on consumer perceptions and preferences of luxury automobiles. April.

Hauser, John R. (1983), "Critique of Market Studies for Cellular Radio Telephone:. Affidavits before the FCC evaluating market studies, June and September.

Hauser, John R. (1983), "Forecasts of Demand and Cellular Radio Telephone,: Affidavits before the FCC for five major and nine minor markets. June and April.

Hauser, John R., and J. Bertan (1982), "Auto Show Interviews," Internal Report to Buick Division of General Motors, June.

Hauser, John R., and Kenneth J. Wisniewski (1981), "Monitoring the Implementation of Innovative Transportation Services, Phase I: Final Report," Technical Report to the Urban Mass Transit Administration, Research Grant IL-11-0012, May.

Hauser, John R. and Kenneth J. Wisniewski (1979), "Consumer Analysis for General Travel Destinations," Technical Report, Transportation Center, Northwestern University, March.

Hauser, John R. and Steven M. Shugan (1978), "Designing and Building a Market Research Information System," Technical Report, Transportation Center, Northwestern University, February.

Hauser, John R. (1978), "Forecasting and Influencing the Adoption of Technological Innovations," Technical Report, Transportation Center, Northwestern University, October.

Hauser, John R., Alice M. Tybout and Frank S. Koppelman (1978), "Consumer-Oriented Transportation Services Planning: The Development and Implementation of a Questionnaire to Determine Consumer Wants and Needs," Technical Report, Transportation Center, Northwestern University, October.

Tybout, Alice M., Frank S. Koppelman and John R. Hauser (1977), "Consumer Views of Transportation in Evanston: A Report Based on Focus Group Interviews," Technical Report, Transportation Center, Northwestern University, June.

Koppelman, Frank S., John R. Hauser and Alice M. Tybout (1977), "Preliminary Analysis of Perceptions, Preferences, Beliefs and Usage of Transportation Services for Travel to Downtown Evanston," Technical, Report, Transportation Center, Northwestern University, May.

Hauser, John R. (1977), "Results of the Focus Group Interviews for Shared Ride Auto Transit," Cambridge Systematics Consultant's Report, May.

Hauser, John R. (1976), "Report on the Applicability of Attitudinal research for Improving the Effectiveness of Transportation Demand Models," Position Paper commissioned by Cambridge Systematics, Inc., April.

Wilson, Nigel, R. W. Weissberg and John R. Hauser (1976), "Advanced Dial-a-Ride Algorithms--Final Report," M.I.T. Department of Civil Engineering Technical Report, April.

Hauser, John R., et al. (1974), "The Chemung County Transit Survey." Volunteers in Technical Assistance (a division of VISTA) publication for Chemung County, NY, June. (Includes analysis of transportation options based on the results of the survey designed and implemented by the technical team.)

Hauser, John R. (1974), "A Cost Model for RTS (Rochester, NY) Conventional Bus Routes," M.I.T., Department of Civil Engineering Report, January.

Hauser, John R. (1973), "An Efficient Model for Planning Bus Routes in Communities with Populations Between 20,000 and 250,000," M.I.T., Operations Research Center Working Paper OR-029-993, November.

Research Grants

June 2000 – May 2006	Center for Innovation in Product Development, MIT, Initiative Leader, Virtual Customer.
January 2001 – May 2002	eBusiness Center at MIT. Design and Delivery of Online Promotions. (with John Little, Duncan Simester, and Glen Urban).
January 1997 – May 2000	Center for Innovation in Product Development, Engineering Research Center Grant from the National Science Foundation. Research Director. In addition, research grants for non-monetary incentives, procurement metrics, and virtual customer methods.
June 1999 – May 2000	"Metrics Thermostat," International Center for Research on the Management of Technology (Principal Investigator).
June 1999- May 2001	"New Product Metrics at Ford and the US Navy," Center for Innovation in Product Development
June 1999- May 2001	"Lean Sustainment Metrics at the USAF," Lean Sustainment Initiative at MIT

June 1994 - May 1999	"Metrics to Value R&D," International Center for Research on the Management of Technology (Principal Investigator). General topic. Detailed proposals were for various aspects of the problem.
June 1991 - May 1994	"Customer Needs, Customer Satisfaction, Sales, and Profit: Providing the Right Incentives to Engineering and R&D," International Center for Research on the Management of Technology (co-Principal Investigator with Birger Wernerfelt)
January 1990 - June 1992	"Information Acceleration and Preproduction Forecasting of New Autos, Phases I and II." General Motors Electric Vehicle Project. (Associate)
December 1988 - June 1990	"Improved Methodologies to Measure Consumer Needs," Procter & Gamble Company. (Principal Investigator)
September 1981 - December 1985	"Prelaunch Forecasting System for New Consumer Durables and Its Applications to Auto Purchases," General Motors, Buick Division (co-Principal Investigator with Glen L. Urban).
January 1981 - May 1981	"Marketing Approaches in Travel Demand," United Parcel Service Grant (Faculty Advisor).
January 1979 - August 1980	"Monitoring the Implementation of Innovative Public Transportation Services" from University Research Program of the Urban Mass Transportation Administration (Principal Investigator).
July 1975 - September 1977	"Consumer-Oriented Transportation Service Planning." from the Program of University Research, U.S. Department of Transportation (Faculty Associate).
September 1977 - January 1978	"Consumer-oriented Transportation Service: Modification and Evaluation" from Program of University Research, USDOT (Faculty Associate).
May 1976 - September 1978	"Enhancement of Communications with a Small Scientific Community Using Slow-Scan Televideo Terminals and Voice-Grade Telephone Lines" from the National Science Foundation (Faculty Associate).
January 1976 - December 1976	"A Method for Assessing Pricing and Structural Changes on Transport Mode Use," U.S. Department of Transportation (Faculty Associate).
September 1976 - June 1977	"Prediction of Urban Recreational Demand" from the National Science Foundation (Faculty Consultant).

Invited Lectures (Outside the Sloan School)

Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition, Summer Institute on Bounded Rationality in Psychology and Economics, August 2006, "Greedoid-Based Non-Compensatory Consider-then-Choice Inference."

Northwestern University, Evanston, IL, April 2006, "Greedoid-based Non-compensatory Inference."

University of Michigan, Seminar Series, October 2004, "Table Stakes: Non-compensatory Consideration-then-Choice Inference."

Management Roundtable Special Conference on "Taking the Voice of the Customer to the Next Level," Boston, MA October 2004, "The Virtual Customer."

Marketing Science Institute Research Generation Conference, Atlanta, GA, May 2004, "New Products/Innovation," (with Gerry Tellis).

Marketing Science Institute Conference on Emerging Approaches for Successful Innovation, Chicago, IL, May 2003, "'Listening-In' to Find Unmet Customer Needs and Solutions."

University of California at Los Angeles, "Polyhedral CBC (and other fun stuff), February 2003

New York University, "Polyhedral Methods," March 2003.

Industrial Liaison Program – Research Directors' Conference, April 2002, "The Virtual Customer."

University of Maryland, "Polyhedral Methods for Conjoint Analysis," March 2002.

Marketing Science Institute Trustees Meeting on Marketing Outside the Silo, Boston, MA, April 2002, "Challenges and Visions for Marketing's Role in Product Development Processes."

Managing Corporate Innovation -- ILP Symposium celebrating ten years of Management of Technology Research at MIT. "Dealing with the Virtual Customer: Fast Web-based Customer Input." April 2001

Epoch Foundation, Cambridge, MA, October 2000, "The Virtual Customer."

Yale University Research Seminar in Marketing, New Haven, CN, March 2000, "Metrics Thermostat."

Analysis Group Economics Seminar, Boston, MA, December 1999, "The Use of Marketing Research in Litigation." Also New York, NY, March 2000 and Washington, D. C., March 2002.

Boston Chapter of the Society for Concurrent Engineering, Waltham, MA, October 1999, "Metrics Thermostat."

University of Michigan DuPont Distinguished Speakers' Series, Ann Arbor, MI, March 1998, "New Product Metrics."

Kirin Brewery Co. Limited, Tokyo, JAPAN, December 1998, "You Are What You Measure!" and "Scientific Studies of the Voice of the Customer."

NEC Corporation, Tokyo, JAPA, December 1998, "Scientific Studies of the Voice of the Customer."

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Stanford University, Stanford, CA, December 1996, "Metrics to Value R,D&E"

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Duke University, Durham, NC, "Internal Customers and Internal Suppliers," Nov. 1995.

University of Minnesota, Minneapolis, MN, "Voice of the Customer," "Internal Customers and Captive Suppliers," May 1995.

Winter Retreat, University of Florida, Gainesville, FL, "Internal Customers and Captive Suppliers," December 1993.

Product Development Association - Boston, "Design and Marketing of New Products II: Advances in Product Development Management over the Last 13 Years," May 1993.

3M, Minneapolis, MN, "Incentives to Encourage a Long-term Perspective and a Customer Focus," Workshop on "Towards a World-class Research, Development, and Engineering Organization," November 1992.

Baxter Health Care, Orange County, CA, "The Voice of the Customer," August 1992.

TIMS College on the Practice of Management Science (*New Directions in Management Science*), Cambridge, MA: "The Voice of the Customer," October 1991.

IBM, Inc., Boca Raton, FL: "Voice of the Customer for Performance Graphics," May 1991.

Kirin Brewery Company, Ltd. Tokyo, JAPAN: "New Product Development" and "Customer Satisfaction and Customer Needs," April 1991.

American Iron and Steel Institute, Detroit, MI: "Satisfying the Customer -- Technical Issues," February 1991.

Warner Lambert, Inc., Mountain Laurel, PA: "Communication Among R&D and Marketing," October 1990.

Digital Equipment Corporation, Maynard, MA: "Voice of the Customer," May 1990.

Life Insurance Marketing and Research Association, Inc.: 31st Research Planning Conference, Boston, MA, "The House of Quality." June 1989.

University of Illinois: "Customer Driven Engineering." April, 1988.

Marketing Science Institute and IBM Thornwood Educational Facility: Quality through Customer Driven Engineering." April, 1988.

Harvard Business School: "Customer Driven Engineering: Integrating Marketing and Engineering." February, 1988.

Vanderbilt University: "Competitive Price and Advertising Strategies" and "Customer Driven Engineering." October, 1988.

Columbia University: "Price, Positioning, and Advertising Games: To Equilibrate of Not, Does it Pay to be Smart?" May, 1987.

New York Marketing Modelers' Club: "Would You Really Rather Have a Buick?: Prelaunch Forecasting of New Automobiles," May 1987.

M.I.T. Applied Economics: "Competitive Product Selection and Advertising Models." April, 1987.

Northwestern University: "Agendas and Consumer Choice," August, 1986.

AMA Faculty Consortium on Marketing Strategy at the University Tennessee, Knoxville. "Defender: Analyses for Competitive Strategy," July, 1986.

Ohio State University: "Defensive and Competitive Strategy." May, 1986.

Boston University: "Research in Competitive Strategy." November, 1985.

Midwest Electronics Association, Minneapolis, MN: "New Products for High-Tech Firms." October, 1985.

University of Pennsylvania: "Agendas and Consumer Choice," August, 1985.

Herstein Institute, Vienna Austria: "Competitive Strategy," May, 1985.

Cadbury-Schweppes, Birmingham, England: "New Product Development and Defensive Strategy." May, 1985.

Rhone-Poulenc and Aluminum Pechiney, Paris, France: "New Product Development." April, 1985.

University of Michigan: "Defensive and Competitive Strategy." February, 1985.

Marketing Science Institute Special Mini-Conference: "Defensive Marketing Strategies for Consumer Firms." September 1983.

University of Chicago, Graduate School of Business, Chicago, IL. "Agendas and Consumer Choice," May 1984.

European Institute for Business Administration (INSEAD), Fontainebleau, FRANCE. "Agendas and Consumer Choice," June 1984.

University of Connecticut. "Defensive Marketing: Theory, Measurement, and Models," April, 1983.

University of Osaka, JAPAN "Defensive Marketing: Theory, Measurement, and Models," August, 1983.

Kao Soap, Ltd., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Johnson & Johnson, K. K., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Analog Devices, Inc., Norwood, MA. "New Product Development," May, 1982.

University of Rochester Research Seminar, "Prelaunch Forecasting of New Consumer Durables," April 1982.

Frito-Lay R & D Laboratory, Dallas, TX, "Marketing and R & D for New Products," October 1981.

University of California at Los Angels Research Seminar, "Defensive Marketing Strategies," July, 1981.

Purdue University Research Seminar, "Product Realization," October 1979.

Stanford University Research Seminar, "Product Realization," October 1979.

Elrick and Lavidge, Inc., Chicago, Illinois, "Product Realization," October 1979.

Booz, Allen and Hamilton, Inc., Chicago, Illinois, "New Service Planning for Hospitals," April 1979.

Cornell University Research Seminar, "Intensity Measures of Consumer Preference," February 1979.

University of Rochester Research Seminar, "Product Realization: Synthesis of Marketing and Economic Theory," December 1978.

Region VI Center of Health Planning, New Orleans, LA, "Finding the Linkage Through Marketing,: August 1978.

Nebraska Hospital Association, Kearney, NE, "Hospital Marketing Surveys," May 1978.

Executive Development Group, Waterloo Management Education Centre, Toronto, Ontario, Canada, "Designing New Industrial Products," February 1978.

Academic Update, Xavier University Graduate Program in Hospital and Health Administration, Cincinnati, OH, "Designing Hospital Services: A Marketing Approach," October 1977.

The Hospital Marketing Workshop, Ireland Educational Corporation, Chicago, Illinois, "Analyzing the Hospital Markets," January 1977 and May 1977.

Association for College Unions - International, 1976 Fall Conference in Green Bay, WI, Keynote Speech - "Designing Successful Services: A Marketing Approach," October 1976.

University of Chicago, Graduate School of Business, Research Seminar, "Testing Probabilistic Models," April 1976.

Council for the Advancement and Support of Education, Conference on Marketing Alumni Program, New York, NY, Keynote Speech, February 1976.

Presentations at Professional Meetings (No published proceedings, some co-presented or presented by co-author[s])

Agent-based Models of Market Dynamics and Consumer Behaviour, University of Surrey, Guildford, UK, January 2006, "Co-opetition for the Diffusion of Resistant Innovations: A Case Study in the Global Wine Industry using an Agent-based Model." with Rosanna Garcia. Also presented at the American Marketing Association's Advanced Research Techniques (ART) Forum in June 2006 at Monterrey CA.

AMA Doctoral Consortium, University of Maryland, College Park, MD, July 2006, "Creating Value: Products and Brands."

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, "A Truth-telling Sleuthing Game for Survey Research," with Min Ding.

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, On Managerially Efficient Experimental Designs,: with Olivier Toubia.

Sawtooth Software Conference on Conjoint Analysis, Delray Beach, FL, March 2006, "Must Have" Aspects vs. Tradeoff Aspects in Models of Customer Decisions," with Michael Yee, James Orlin, Ely Dahan.

AMA Doctoral Consortium, University of Connecticut, Storrs CT, June 2005, "The Virtual Customer."

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Direct, Nonparametric Product Optimization Using Interactive Genetic Algorithms," with Kamal Malek and Kevin Karty.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Non-Deterministic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Application to the Diffusion of the New Wine Cork," with Olivier Toubia and Rosanna Garcia.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference," with Michael Yee, Jim Orlin, and Ely Dahan.

Marketing Science Doctoral Consortium, Rotterdam, The Netherlands, June 2004, "Research that Has Impact."

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "Improving Choice-Based Polyhedral Methods by Taking Response Error into Account," with Olivier Toubia.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "The Dream Versus Reality of CRM," with Glen L. Urban, Eric Bradlow, and, Mahesh Kumar.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "Non-compensatory Consideration-then-Choice Adaptive Conjoint Analysis," with Michael Yee and James Orlin.

AMA Doctoral Consortium, Texas A&M University, College Station, TX, June 2004, "Virtual Customer Initiative."

AMA Advanced Research Techniques Forum, June 2004, "Conjoint Adaptive Ranking Database System (CARDS)," with Ely Dahan, James Orlin, and Michael Yee.

AMA Doctoral Consortium, University of Minnesota, Minneapolis, MN, June 2003, "The Review Process."

Marketing Science Doctoral Consortium, University of Maryland, June 2003, "Roots of Marketing Science Thought," with John Little.

Marketing Science Conference, University of Maryland, June 12-15, 2003, "Individual-level Adaptation of Choice-Based Conjoint Questions: More Efficient Questions and More Accurate Estimation," (with Olivier Toubia and Duncan Simester).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Configurators, Utility Balance, and Managerial Use," (with Duncan Simester and Olivier Toubia).

Marketing Science Doctoral Consortium, University of Alberta, Canada, "Helping Managers Structure and Make Decisions," June 27, 2002. (Founding Consortium).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Adaptive Choice-Based Conjoint Analysis with Polyhedral Methods," (with Duncan Simester and Olivier Toubia*).

Advances in Marketing Research and Modeling: The Academic and Industry Impact of Paul E. Green, Wharton, Philadelphia, PA, May 2002, "New Methods of Data Collection and Estimation Using Polyhedral Estimation Techniques."

Production and Operations Management Society (POMS) Conference 2002 - High Tech POM, San Francisco, CA, April 2002, "The Virtual Customer," (with Ely Dahan*).

Product Development Association (PDMA) International Research Conference, Santa Clara, CA, October 2001, "The Virtual Customer," (with Ely Dahan*).

New England Marketing Conference, Cambridge, MA, September 2002, "Fast Polyhedral Adaptive Conjoint Estimation," (with Ely Dahan, Duncan Simester, and Olivier Toubia).

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Empirical Test of Web-based Conjoint Analysis Including ACA, Efficient Fixed Designs, Polyhedral Methods, and Hybrid Methods," (with Ely Dahan, Duncan Simester, and Olivier Toubia*)

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Evaluation of Fast Polyhedral Adaptive Conjoint Estimation," (with Duncan Simester and Olivier Toubia).

The 12th Annual Advanced Research Techniques Forum, Amelia Island, Florida, June 2001, "The Virtual Customer: Communication, Conceptualization, and Computation," (with Ely Dahan*).

AMA Doctoral Consortium, University of Miami, June 2001, "Role of Technology in Marketing."

Marketing Science Conference, UCLA, June 2000, "Applications of the Metrics Thermostat."

Marketing Science Conference, UCLA, June 2000, "The Virtual Customer." (with Ely Dahan and Duncan Simester).

Marketing Science Institute Marketing Metrics Workshop, Washington, D.C. October 1999, "Metrics for New Product Development: Making Agency Theory Practical," Plenary Speaker.

Marketing Science Conference, Syracuse, NY, May 1999, "Balancing Customer Input, Speed to Market, and Reduced Cost in New Product Development: What is the Most Profitable Strategy"

ICRMOT Conference on Technology Alliances and New Product Development: A Cross-cultural Perspective, Mishima, JAPAN, December 1998, "You Are What You Measure!"

AMA Doctoral Consortium, Athens, Georgia, August 1998, "Quantitative Advances in Marketing Models."

AMA Winter Educators' Conference, Austin, TX, February 1998 (Plenary Speaker), "New Challenges in the Marketing-Product Development Interface."

AMA Doctoral Consortium, Cincinnati OH, August 1997, "Working with Industry."

Marketing Science Conference, Berkeley CA, March 1997, "Cultivating Technological Managers for Customer Expertise."

Marketing Science Institute Conference on Interfunctional Interfaces: The Management of Corporate Fault Zones, Palo Alto, CA, December 1996, "Multi-Stage Modeling of R&D/Marketing Interfaces in New Product Development."

Marketing Science Conference, Berkeley CA, March 1997, "Cultivating Technological Managers for Customer Expertise."

Envisioning the Future on Internet Marketing: Research and Strategy Implications, M.I.T., September 1996, "Agents and Intermediaries: Roles, Trust, and Value."

"Can R&D be Evaluated on Market-Driven Criteria?," (with Florian Zettelmeyer). Marketing Science Conference, University of Florida, Gainesville, March 1996

"Information Acceleration," (with Glen Urban, William Qualls, Bruce Weinberg, Jon Bohlmann, and Roberta Chicos). Wharton Conference on Innovation in Product Development, Philadelphia, PA, May 1995.

"Metrics by Which Managers Evaluate R&D Groups," (with Florian Zettelmeyer). Association of Consumer Research, Boston, MA, October 1994.

"Satisfying the Internal Customer," (with Birger Wernerfelt and Duncan Simester) Marketing Science Conference, University of Arizona, Tucson, AZ, March 1994.

"Customer-Satisfaction Based Incentive Systems," AMA Educator's Conference, Boston, MA, August 1993.

"Marketing in the 1990s: Emerging Issues," AMA Doctoral Consortium, University of Illinois, August 1993.

"Quality Function Deployment and the Voice of the Customer," Pharmaceutical Management Science Association, Phoenix AZ, May 1993.

"In a World of Active Time-constrained Customers, How Can a Firm be the Great Communicator," (with Birger Wernerfelt), Marketing Science Conference, Washington University, St. Louis, MO, March 1993.

"Customer Needs, Customer Satisfaction, Sales, and Profit," (with Birger Wernerfelt, Ronit Bodner, and Duncan

Simester), ORSA/TIMS Joint National Conference, San Francisco, CA, November 1992.

"Customer Satisfaction and Employee Rewards," (with Birger Wernerfelt, Ronit Bodner, and Duncan Semester), Marketing Science Conference, London, England, June 1992.

"Information Acceleration and Preproduction Forecasting of Electric Autos," (with Glen L. Urban and Bruce Weinberg), Marketing Science Conference, London, England, June 1992.

"The Voice of the Customer and Customer Satisfaction," ORSA/TIMS Joint National Meeting, Anaheim, CA, October 1991.

"Modeling Marketing Phenomena," AMA Doctoral Consortium, University of Southern Calif. August 1991.

"Relationship of Satisfaction to Customer Needs and to Market Share," 1st Congress on Customer Satisfaction and Market-Driven Quality, American Marketing Association, Orlando FL, May 1991.

"Time Flies When You're Having Fun: How Consumers Allocate Their Time When Evaluating Products" (with Bruce Weinberg, Glen Urban, and Miguel Villas-Boas), Marketing Science Conference, Wilmington, DL, March 1991.

"Information Acceleration and Preproduction Forecasting of New Autos," (with Glen Urban, and Bruce Weinberg), Marketing Science Conference, Wilmington, DL, March 1991.

"Beyond Quality Function Deployment," ORSA/TIMS Joint National Meeting, Philadelphia, PA October 1990. (Conference-wide Tutorial)

"Competitive Marketing Strategies," Operations Research 1990 (Osterreichische Gesellschaft fur Operations Research), Vienna, Austria, August 1990. (Invited Speaker)

"New Product Development: A Quantitative Analysis of Interfunctional Communication" (with Abbie Griffin), Marketing Science Conference, Urbana, IL, March 1990.

"Integrated Product Development: New Methodological Developments" (with Abbie Griffin), Marketing Science Conference, Durham, N.C., March 1989.

"Customer Driven Engineering" (with Gregory Cirmak and Robert Klein), ORSA/TIMS Joint National Meeting, Washington, D.C., April 1988.

"Competitive Advertising and Pricing in Duopolies" (with Birger Wernerfelt), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Driven Engineering" (with Abbie Griffin), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Needs," Visions of Design Practices for the Future, Newton, MA, October 1987.

"Effective Strategies in Oligopoly" (with Peter Fader), ORSA/TIMS Joint National Meeting, Miami Beach, Florida, November 1986.

"Competitive Strategy Contest: Result and Analysis" (with Peter Fader), Marketing Science Conference, Dallas, TX, March 1986.

"The PC As a Tool to Teach Complex Marketing Science Concepts," Marketing Science Conference, Dallas, TX, March 1986.

"The Coming Revolution in Marketing Theory," Plenary Speaker, European Marketing Conference, Bielefeld, West Germany. April 1985.

"Defensive Strategy" Confer. on Economics of the Firm, Universite de Paris X, Nanterre, France, April 1985.

"Competitive Marketing Strategies" Marketing Science Conference, Nashville, Tennessee, March 1985.

"Developing New Product Management: Past Progress, Current Efforts, Current Needs" (Panel) Marketing Science Conference, Nashville, Tennessee, March 1985.

"Testing Competitive Marketing Structures: Theory and Applications" (with Glen Urban) ORSA/TIMS Joint National Meeting, Dallas, TX November 1984.

"Competitive Strategy," ORSA/TIMS Joint National Meeting, Dallas, Texas, November 1984.

"Forecasting Automobile Sales: An Application of a Value Priority Algorithm," (with Glen Urban), John Roberts and John Dabels), TIMS XXVI International Meeting, Copenhagen, Denmark, June 1984.

"Consumer Durables: The Actual Consumer Budgets Compared to the Value Priority Model," (with Glen Urban), Marketing Science Conference, Chicago, Illinois, March 1984.

"Defensive Strategy Models: Application and Predictive Text," (with Steven Gaskin, and Karl Irons) ORSA/TIMS Joint National Meeting, Orlando, Florida, November 1983.

"New Product Research: Focus on Defensive strategies," Roundtable Program, ORSA/TIMS Joint National Meeting, Orlando, FL, November 1983.

"Intensity of Preference," (with Steven Shugan) ORSA/TIMS Joint National meeting, San Diego, CA, October 1982.

"Measurement Error Theories for von Neumann-Morgenstern Utility Functions," (with Jehoshua Eliashberg) ORSA/TIMS Joint National Meeting, San Diego, CA, October 1982.

"Consumer Preference Models: Axioms and Statistics," ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Economic Models of Consumer Behavior," (panel discussion), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Defensive Marketing Strategies, Part II," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Agendas and Choice Probabilities," (with Amos Tversky), Association of Consumer Research, St. Louis, Missouri, October 1981, and Special Conference on Choice Theory, Durham, North Carolina , June 1981.

"Strategic Response to Competitive New Products," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Toronto, Ontario, Canada, May 1981.

"Applications of a Dynamic Semi-Markov Model of Consumer Choice," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Colorado Springs, Colorado, November 1980.

"Models of Consumer Behavior," (panel discussion), ORSA/TIMS joint National Meetings, Colorado Springs, Colorado, November 1980.

"Dynamic Semi-Markov Models of Consumer Behavior," (with Ken Wisniewski) TIMS International Conference on Marketing, Paris, June 1980.

"Profit Maximizing Perceptual Positioning," (with Patricia Simmie) TIMS International Conference on Marketing, Paris, June 1980.

"An Error Theory for von Neumann-Morgenstern Utility Assessment," (with Jehoshua Eliashberg), ORSA/TIMS Joint National Meeting, Washington, D.C., May 1980.

"Defender: Defensive Strategies Against New Products" (with Steven Shugan), ORSA/TIMS Second Special Interest Conference on Marketing Measurement and Analysis, Austin, Texas, March 1980.

"Adaptive Control of New Product Launches," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Milwaukee, Wisconsin, October 1979.

"The Value of Up-front Research in New Products," (with Glen Urban), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Methods for Computing Probabilities of Choice," (with Steven Shugan), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Forecasting and Improving the Adoption of New High Technology Products," (with Pat Lyon), ORSA/TIMS Joint National Meeting, New Orleans, Louisiana, May 1979.

"A Methodology for Product Realization: Multi-method Procedures," (with Patricia Simmie), ORSA/TIMS Joint National Meeting, Los Angeles, California, November 1978.

"Searching for Marketing Segments" (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"P.A.R.I.S.: An Interactive Market Research System," (with Steven Shugan), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"Extended Conjoint Analysis," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Consumer Preference Functions: Theory, Measurement, Estimation , and Application," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Measuring Consumer Preferences for Health Care Plans," (with Glen Urban), ORSA/TIMS Joint National Meeting, San Francisco, California, May 1977.

"Improved Transportation Design with Consumer Response Models: An AMTRAK Example" (with Frank Koppelman), ORSA/TIMS Joint National Meeting, Miami, Florida, November 1976.

"A Comparison of Statistical and Direct Multiattribute Utility Assessment Procedures," (with Glen Urban), ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1985.

"Measuring Consumer Preferences: An Axiomization for Describing Choice," ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1975.

"Modeling Consumer Response to Innovations," (1) Milwaukee Chapter of ORSA/TIMS, November 1985; (2) Chicago Chapter of ORSA/TIMS, December 1975.

"Modeling Decisions of Choice Among Finite Alternatives: Applications to Marketing and to Transportation Demand Theory," ORSA/TIMS Joint National Meeting, San Juan, Puerto, Rico, October 1974.

"An Efficient Model for Planning Bus Routes in Medium Sized Communities," ORSA/TIMS Joint National Meeting, San Diego, CA, November 1973.

Professional Affiliations

The Institute for Operations Research and Management Science

American Marketing Association

Product Development and Management Association, Certified New Product Development Professional

Association for Consumer Research

Professional Services

Secretary, INFORMS Society of Marketing (January 2002 – December 2005). Founding Officer.

Advisory Board, *Sloan Management Review* (2000- present)

Advisory Council, INFORMS College of Marketing (1994 - 2002)

Council of The Institute of Management Sciences (1987 - 1989)

Associate Editor for Marketing, *Management Science*, (1980 - 1981)

Department Editor for Marketing, *Management Science*, (1982 - 1988)

Editor-in-Chief, *Marketing Science*, (1989 - 1994)

Editorial Advisory Board, *Sloan Management Review* (2000-present).

Area Editor, *Journal of Marketing Research* (April 2006 – present). First time in journal history that Area Editors have been appointed.

Editorial Boards, *Marketing Science*, (1980 – 1988, Editor 1989-1995, 2003- present, including acting Area Editor), *Journal of Product Innovation Management* (1997 - present), *Journal of Marketing* (2005- present, outstanding reviewer 2006), *European Management Journal* (advisory, 1998 - present).

Reviewer: *Advances in Consumer Research, Applications in Management Science, European Journal of Research in Marketing, Journal of the Academy of Marketing Science,* Journal *of Consumer Research, Journal of Marketing, Journal of Marketing Research, Journal of Mathematical Psychology, Journal of Product Innovation Management, Management Science, Marketing Science, Operations Research, Review of Marketing, Sloan Management Review, Transportation Research Record, Transportation Science,* AMA Dissertation Prize, AMA Educators' Conference, American Institute of Decision Sciences Dissertation Prize, Nicholson Dissertation Prize, Marketing Science Institute Dissertation Award, Product Development Management Association Dissertation Prize, Prentice-Hall Books, National Science Foundation.

Conference Chairman: Conference Chair, Profitable Customer-Driven Organizations: Developing the Blueprint, Management Roundtable, May 1994.

Segment Chairman: Non-traditional Models of Consumer Preference and Choice, Adaptive Preference and Estimation,

Optimizing Product Design and Customer Targeting, Obtaining Information From or About Consumers (Atlanta, GA, 2005, co-chair four sessions)

TIMS International Meeting, Copenhagen, Denmark, June 1984 (two sessions).

TIMS College of Marketing, Houston, Texas, October 1981 (twelve sessions).

TIMS College of Marketing, Milwaukee, Wisconsin, October 1979 (five sessions).

American Marketing Association Educator's Conference, Chicago, Illinois, August 1978, (three sessions).

INFORMS Marketing Science Conference, Atlanta GA, June 2005 (four sessions)

Session Chairman: *INFORMS (Previously named ORSA or TIMS)*

Virtual Customer Initiative (Rotterdam, The Netherlands, 2004)

New Approaches to Mapping (University of Maryland, 2003)

The Virtual Customer (University of Alberta, Canada 2002)

The Virtual Customer (Wiesbaden, Germany 2001)

Building Competitive Advantage Through Product Quality and R&D (Gainesville, FL 1996)

Customer Satisfaction and Its Role in Global Competition (San Francisco, CA 1992)

Competitive R&D (Washington, D.C., April 1988)

Competitive Marketing Strategy, (St. Louis, Michigan, November 1987)

Competition in Multiattributed Spaces (Atlanta, Georgia, November 1985).

Marketing: Consumer Measurement (Copenhagen, Denmark, June 1984)

Marketing: Dynamic Structures (Copenhagen, Denmark, June 1984)

Product Policy (Orlando, Florida, November 1983)

Product Policy (San Diego, California, October 1982)

New Product Introduction and Defense in Competitive Environments, (Detroit, Michigan, April 1982)

New Product and Product Policy Models, (Houston, Texas, October 1981)

New Product Models (Toronto, Ontario, Canada, May 1981)

Models of Consumer Behavior (Colorado Springs, Colorado, November 1980)

New Product Realization and Selection (Los Angeles, California, November 1978).

Session Chairman: *Association of Consumer Research*

Mathematical Theories of Consumer Behavior (St. Louis, Missouri, October 1981)

Committee Memberships

Editor Selection Committee (chair), *Marketing Science*, INFORMS College of Marketing, 2001, 2004.

Editor Selection Committee, *Journal of Marketing Research,* American Marketing Association, 1999.

Conference Steering Committee, Duke Invitational Symposium on Choice Modeling and Behavior, June 1993.

Editor Selection Committee, *Management Science,* TIMS.

Founding Committee for *Marketing Science*, TIMS College of Marketing, (1979 - 1982).

Management Science Roundtable, TIMS, (1982 - 1988)

Marketing Strategy Steering Committee, Marketing Science Institute, (1983 - 1984).

Organizing Committee for Conference on Economics of the Firm, April 1985, Universite de Paris X Nanterre.

Organizing Committee for 1985 Conference in Bielefeld, West Germany, European Marketing Academy.

Publications Committee (1980 - 1982), Operations Society of America.

Scientific Committee for 1986 Conference in Helsinki, Finland.

Student Affairs Committee (1978 - 1979), Operations Society of America.

*Litigation Consulting (on behalf of, *deposition testimony, †court, commission, or arbitration testimony)*

American Multi-Cinema, Inc. v. American Movie Classics Company, Inc., et. al. (Confusion),
Amway v. Procter & Gamble (Damages)*,
Berlex v. Biogen, Inc. (Damages)*,
Blue Mountain Arts, Susan Polis Schutz, and Stephen Schutz v. Hallmark Card, Inc. (Trade Dress),
James And Lisa Camenson, et al.; v. Milgard Manufacturing Inc., et. al. (Class action)
Comm-Tract Corp. v. Northern Telecom, Inc. (Advice only),
Computer Aid, Inc. v. Hewlett Packard (damages)*,
Creative Laboratories, Inc. v. Apple Computer, Inc. (Intellectual Property)
CTC Communications Corporation v. Bell Atlantic Corporation (Damages),
EPD v. Curtis (Product Confusion)†,
Stephen S. Gallagher, et. al. v. State Farm Mutual Automobile Insurance Company, e.t al. (Class Action)
Geico v. Google and Overture Services (Yahoo), Inc. (Trademark Infringement),
Gillette v. S. C. Johnson (Patent Infringement),
Heublein vs. Seagrams and Gallo (Liability),
Hewlett-Packard, Inc. v. Factory Mutual Insurance Company (Insurance Coverage)

Intel v. Advanced Micro Devices (Damages)*,

J. B. D. L. Corp. d/b/a, Beckett Apothecary v. Wyeth-Ayerst Laboratories, Inc. and American Home Products Corporation, (Class Action),

Jerry Jacobs, et. al. v. Osmose Inc., et. al. (Class Action)*,

Jay Kordich, et. al. v. Salton Maxim Housewares, Inc., et. al. (Trademark)†,

LendingTree, Inc. v. The Gator Corporation (Intellectual Property),

Lotus v. Borland (Damages)*,

Marvin Lumber and Cedar Company v. PPG Industries, Inc., et. al. (Survey Design),

MasterCard International, Inc. v. First National Bank of Omaha (Product Confusion)*,

Mayo Foundation v. Mayo Health Facilities (Product Confusion)†,

Mead Johnson Nutritionals v. unnamed party (False Advertising),

Merck & Co. (Lanham Act Advice)

In Re Microsoft Corporation Antitrust Litigation (Multi-district Litigation)*,

Pacific Bell Telephone Company in New Regulatory Framework Review of Customer Satisfaction before the California Public Utility Commission†,

Pfizer Consumer Healthcare (Lanham Act Advice)

Procter & Gamble v. Amway (Liability and Damages)†,

Putnum Fund Trustees, (Investment Fraud, advice on market research)

Ram Broadcasting, Inc. (Cellular Telephone Filings),

RealPlayer, Inc. v. Microsoft Corporation (Anti-trust)

Roberts et. al. v. Enterprise Rent-a-Car Company of Boston, Inc.,

Barbara Schwab, et. al. v. Philip Morris, USA (Class Action)*

SoundExchange, Inc. v. Sirius Satellite Radio and XM Satellite Radio (Rate setting, Copyright Royalty Board)

State of Colorado, et. al. v. Warner Chilcott Holdings Company III, Ltd., et. al. (Anti-trust)*

State of Florida and Plaintiff States Antitrust Litigation for Disposable Contact Lenses (Survey Analysis)†,

Stipic, et. al. v. Behr Process Corporation and Masco International (Class Action)*,

Straumann Company v. Lifecore Biomedical, Inc. (Product Confusion)*,

Sun Microsystems, Inc. v. Microsoft Corporation (Anti-trust),

Tivo, Inc. v. Echostar Communications Corporation, et. al*.

Tropicana Products, Inc. v. Vero Beach Groves, Inc. (Lanham Act)†,

Wal-Mart Stores, Inc (and other retailers) v. Mastercard International, Inc. (Liability and Damages, Anti-trust)*,

We Media, Inc. v. We: Women's Entertainment, LLC. (Product Confusion)*.

Marketing, Marketing Research, and Product Development Consulting

American Home Foods, Inc.; American Airlines; American Hospital Supply Corporation; Analog Devices, Inc; Andersen Consulting, Inc. (Accenture), Applied Marketing Science, Inc.; A.T.&T.; Avon; Barton-Aschmann

Associates; Baxter Cardiovascular Group, Booz Allen Hamilton, Inc., Cambridge Systematics, Inc.; Colgate-Palmolive; Costello Associates, Inc.; Curtis Manufacturing, Inc.; Economic's Laboratories, Inc.; Elrick and Lavidge, Inc.; Evanston Hospital; Evanston, Illinois and Schaumburg, Illinois (Transportation Planning); Fidelity Investments; French's Inc., G.D. Searle, Inc.; General Foods, Inc.; General Motors, Inc., Buick Division, Chevrolet Division, Marketing and Product Planning; Gillette; IBM, Inc.; Information Resources, Inc.; Johnson & Johnson; Kodak; Macromedia, Inc., Management Decision Systems, Inc.; M/A/R/C, Inc.; Merck, Inc., Navistar International, Inc.; Pacific Gas and Electric Company, Pepsi-Cola, Inc.; Polaroid; Procter & Gamble Company; Product Genesis, Inc.; RAM Broadcasting, Inc.; Regional Transportation Authority; Richardson-Vicks, Inc.; Southern Company Services, Inc.; Time-Life Books; Volunteers in Technical Assistance, and Wyeth-Ayerst Laboratories, Inc. Co-founder, principal, and board member, Applied Marketing Science, Inc., Advisory Board, Affinnova, Inc.

M.I.T. Committee Work

Committee on the Undergraduate Program, 2003 – present.

MIT Sloan Committee on Educational Technology, 2004 – present.

Center for Innovation in Product Development

Leader, Virtual Customer Initiative, 2000 - present

Research Director, 1997 – 2000

Center for Transportation Studies, (1981 - 1982).

Master of Science in Transportation Committee.

Committee to Investigate Sloan-Logo Research Notes (chair), 2001-2002.

Associated Faculty Committee to Review the Organizational Learning Center, 1995.

Dean Search Committee (Sloan School of Management), 1993

Building Committee for the E51 Expansion (1992), Ad Hoc

Executive Educational Programs Committee (1983 – 1985, 1998-1999)

Faculty Council (1999 – present)

International Center on Research for the Management of Technology

Co-Director, (1993 - 2000).

Joint Steering Committee (1990 - 1993).

Management Science Area, MIT Sloan School of Management

Area Head, (2005- present)

Chairman of Subcommittee on Peer Group Comparisons, (1981 - 1982)

Committee on Management Science Curriculum Redesign, (1982 - 1983)

Marketing Group Head (1986, 1988 - 2003)

Management of Technology Program Committee (2001- 2003)

Master's Program Committee, MIT Sloan School of Management, (1980 - 1987)

Chairman: Subcommittee On Placement, (1981 - 1982).

Core Curriculum Reassessment Committee (1991-1992)

Core Curriculum Implementation Committee (1992-1994)

Subcommittee on the Management Science Core, (1982 - 1983).

Operations Research Center

Admissions Committee, (1981 - 1982).

Associated Faculty (1980 – present)

Operations Research Committee (2001- present)

President's Committee (1984).

Personnel and Policy Committee, MIT Sloan School of Management (Executive Committee, 2005 – present)

Chair of ad hoc committees for reappointment, promotion, and tenure (1983 - present)

Member of ad hoc committees for reappointment, promotion, and tenure (1981 - present)

Symposium Director, Marketing Center, Sloan School of Management, M.I.T., (1981 - 1982).

Zannetos Dissertation Award Committee, Sloan School of Management, M.I.T., (1981-82, 1996-97, chair 1997-1998).

M.I.T. Subjects Taught (sometimes multiple sections)

15.810, Marketing Management (Core)	Spring 1990, 1991, 1992, 1993, 1994, 1995, 1997, 1998, 1999, 2001, 2004, 2005. 2006. Fall 1999, 2006. (Teaching awards listed on page 2 of vita.)
15.812, Marketing Management	Fall 1981, 1982, 1984, 1985, 1986. Spring 1981, 1984, 2006.
15.813, Marketing Management in Public Sector	Fall 1980.
15.814, Marketing Mgmt (Mgmt of Technology)	Fall 1988, 1993, 1999, 2001.
15.820, Advanced Marketing Management	Spring 1990
15.828, New Product Development	Spring 1981, 1982, 1989; Fall 1982, 1984; 1985.
15.838, Ph.D. Seminar (Various Topics)	Spring 1986, 1997, 2002, 2006.

15.839, Marketing and Statistics Workshop Spring 1982; Fall 1982, 1984.

15.TH4. Thesis Project on Competitive Strategy Spring 1985, 1986.

Summer Session, ILP, and External Executive

A.T.&T Course on New Product Development, 1986.

European Institute for Business Administration (INSEAD) European Marketing Programme, 1985.

Greater Boston Area Executive Program, 1982, 1983.

M.I.T. Civil Engineering, Demand Theory, 1980, 1981, and 1982.

M.I.T. ILP, Marketing Strategy and Models in the Information age, 1983.

M.I.T., Management of R&D, 1989, 1990, 1991, 1992, 1993, 1994. 1995, 1996, 1997, 1998, 1999.

M.I.T. Marketing Science Symposium, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988.

M.I.T./M.I.P. Executive Program, 1992.

M.I.T. New Product Development, 1997.

Pedagogical Developments.

In 1990 and 1991, Prof. John D. C. Little and I redesigned the core curriculum in Marketing Management and taught the course to the entire Master's class. As structured the course builds upon the strengths of M.I.T. (international, strong disciplinary base, functional integration, and information technology) and combines case studies, problem assignments, and lectures in an eighteen-session course.

In the 1991-1992 I was part of a committee of six faculty members that redesigned the core curriculum at the Sloan School. I supervised the voice-of-the-customer analyses of students and recruiters and encouraged the committee to design a program that these customers would find exciting. The new core was implemented in the 1993-1994 academic year. Student satisfaction increased significantly.

Teaching Notes

Note on Defensive Marketing Strategy (2005, for 15.810, Marketing Management)

Note on Product Development (2005, for 15.810, Marketing Management)

Note on the Voice of the Customer (2005, for 15.810, Marketing Management)

Note on Consumer Behavior (2005, for 15.810, Marketing Management)

Note on Life Cycle Diffusion Models (2005, for 15.810, Marketing Management)

Note on Engineering Product Design (2006, for 15.810, Marketing Management)

Note on Conjoint Analysis (2007, for 15.810, Marketing Management)

M.I.T. Thesis Supervision

(a) *Sloan School of Management, Master's Theses*

Hafiz Adamjee (joint with John Scaife), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). This product was subsequently commercialized and was a finalist for the *New Media* Invision 1994 Multimedia award at COMDEX/Spring '94.

Ramay Akras, "Competitive Strategy in the Marketing of Small DDP Computers: an Analysis of Emerging Price and Product Position Patterns," - (1986).

Frederic Amerson, "Strategic Marketing Simulation: Improvements to the Enterprise Integrating Exercise," - (1989).

Andrew Anagnos (joint with Karen Van Kirk), "A Framework for Analyzing Quality in the News Media," - (1991)

Allen Aerni, "Measurement of Customer Satisfaction," - (1994).

Joel Berez, "An Investigation of Decision Hierarchies" - (1981).

Harel Beit-on, "Competitive Strategy for Small Business Jet Aircraft," - (1985).

Willy Biberstein (SDM Program), "Framework for Customer Interaction Throughout the Automotive Product Development Process," (February 2002).

Andre Borschberg (joint with Webb Elkins), "Defensive Marketing Strategy: Its Application to a financial Decision Support System" - Reader (1983).

Philippe Bosquet, "European Airline Deregulation: Defining Air France's Strategy for the 1990's," - Reader (1989)

Jill A. Christians, (joint with Cheryl M. Duckworth), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Poh-Kian Chua (MOT Program), "R,D&E Metrics: Shaping the Outcomes of Your R,D&E Investment," – (1998).

Leslie K. Cooper, "The Structure of Recruiter Needs at the Sloan School of Management: A Quantitative Assessment," - (1992).

Teruyuki Daino (Sloan Fellows Program), "How a Leading Company Can Overcome a Competitive Challenge: A Case Study of Anheuser-Busch Company." – (1998).

Laura E. Donohue, "Software Product Development: An Application of the Integration of R&D and Marketing via Quality Function Deployment" - (1990)

Cheryl M. Duckworth (joint with Jill A. Christians), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Webb Elkins (joint with Andre Borschberg), "Defensive Marketing Strategy: Its Application to a Financial Decision Support System" - Reader (1983).

Rasheed El-Moslimany (LFM Program), "Getting Value from the Value Chain: ComfortChoice," Co-Advisor. (June 2002)

Julio Faura (MOT Program), "Contribution to Web-based Conjoint Analysis for Market Research," (2000).

Richard Feldman, "Decision Support Systems for Forecasting Communications in the Home," - Reader (1985).

Anders T. Fornander, "The Continuing Operating System Battle in the Personal Computer Industry," - Reader (1994).

Carl Frank (MOT Program), "Metrics Thermostat for Strategic Priorities in Military System Acquisition Projects," (2000).

Mihaela Fulga, "Competitive Pricing and Positioning Strategies in the Dating Service Market," - (1986).

Steven P. Gaskin, "Defender: Test and Application of a Defensive Marketing Model" - (1986). 1st Place, Brooks Award.

Peter N. Goettler, "A Pre-market Forecasting Model of New Consumer Durables: Development and Application," - Reader (1986).

Patti N. Goldberger, "Competitive Strategy in the Market for Running Shoes," - (1985).

Akhil Gupta, "The Personal Computer Industry: Economic and Market Influences on Product Positioning Strategies," - (1986).

Michael Halloran (joint with Marc Silver), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Carla Heaton, "Competitive Strategy in the Facsimile Market," - (1985).

Judith Hee, "Determining Manufacturer's Coupon Strategies" - Reader (1981).

Jonathan E. Higginson, "Understanding Dependencies in Research and Development at the Charles Stark Draper Laboratory." - (1997).

Scott D. Hill, "Correlation of Core Competencies with Market-Driven or Self-Guided Research," - (1995).

Dan Isaacs, "Competitive Pricing and Positioning Strategies in the Imported Beer Marketing," - (1986).

Francois Jacques, "Marketing Strategies in Innovative Industries: The Case of Package/Document Delivery Services," - Co-Advisor (1985).

Lawrence Kahn, "Competitive Positioning: A Study of Recruiter's and Employer's Perceptions of the Sloan School of Management" - (1982). Honorable mention Brooke's Thesis Prize.

D. Darcy Kay, "Competitive Strategy for Anti-arthritic Drugs" - (1985).

Young Joo Kim (MOT Program), "R&D Management Applications of The Dynamic Metrics Framework" – (1998)

Sidney A. Kriger, "The Effect of Quality Function Deployment on Communications of the New Product Development Teams," - (1989)

Yasuke Kume, "New Marketing Strategy of Telecommunications in Japan" - Reader (1981).

Elvind Lange, "Measuring Market Response to Marketing Mix Variables Using Dynamic Modeling and Its Implications for Brand Strategy" - Reader (1981).

Stephen P. Langhans, "Defensive Marketing Strategy: A Consumer Semi-Durable Case Example" - (1983).

In-Kyu Lee, "Evaluating System for the Upstream Center of R&D for being Market-Oriented in a Consumer Electronics Company," - (1995).

Michael Leslie (joint with Joel Wachtler), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Kit Mee Lim, "Competitive Strategy among Companies Offering Credit Cards," - Reader (1985).

James A. Lutz, "Competitive Marketing Strategy in the CAD Marketplace," - (1985).

Larry D. Lyons, "Forecasting the Impact of Competitive Entries on Sales of a New Consumer Durable" - Reader (1984).

Arpita Majundar (SDM Program), "Strategic Metrics for Product Development at Ford Motor Company," - (2000).

Catherine E. Manion, "A Survey of Customer Satisfaction Incentive Systems for Salespersons," - (1993).

Maureen E. Matamoros, "Information Overload," – Reader (1986).

Meghan McArdle (LFM Program), "Internet-based Rapid Customer Feedback for Design Feature Tradeoff Analysis," – co-Advisor (2000)

Fernando Motta, "Competitive Strategy Among Panamanian Banks," - (1985).

Neil Novich, "Price and Promotion Analysis Using Scanner Data" - Reader (1981).

Kenji Nozaki, "Marketing and Technology Strategy for the Japanese Architectural Design Company," - (1989).

Seiji Nozawa, "Voice of the Customer Analysis in the Japanese Beer Market." - (1997).

Minho Park (MOT Program), "R&D Matrix at LG Electronics." - (1997)

Stephen Pearse, "Production and Sales Forecasting: A Case Study and Analysis" - Reader (1982).

Ning P. Peng, "An Exploration of the Impact and Success of Customer Satisfaction Programs," - (1994).

Homer Pien (MOT Program), "Competitive Advantage through Successful Management of R&D." - (1997)

Susan B. Poulin, "Defensive Strategy in the Automatic Test Equipment Industry" (1984).

Jill W. Roberts, "MBA Recruiters' Needs: Voice of the Customer Analysis," - (1992).

Lisa Gayle Ross, "A Voice of the Customer Analysis of M.B.A. Schools: The Student Segment," - (1992). Lisa was a runner-up for the George Hay Brown Marketing Scholar of the Year in 1992.

John Scaife (joint with Hafiz Adamjee), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). See award listed under Adamjee.

Paul E. Schoidtz, "Advertising, Price, and Positioning Equilibria," - (1986).

Hongmei Shang, "A Simulation Analysis of Optimal Task Assignment for Growing Managers from R&D Labs," – (February 2000).

Rosemarie Shield, "Competitive Pricing and Positioning Strategies in the Chromatographic Instruments Market," - , (1986).

Jon Silver (joint with John C. Thompson, Jr.), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Prize, Brooks Award.

Marc Silver (joint with Michael Halloran), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Lisa Silverman, "An Application of New Product Growth Modeling to Automobile Introductions" - (1982).

Sheryl Sligh, "An Assessment of the Analog Modem Market," - (1991).

Jamie Smith, "Industrial Buying Process of Pension Funds for Real Estate," - (1982).

Yoshihito Takahashi (MOT), "Analysis of Strategy in an Ethical Drug Industry," – Reader (2000).

Genevieve Tchang, "A Methodology for Planning and Evaluating External Relations at Business Schools" - Reader (1982).

John C. Thompson, Jr. (joint with Jon Silver), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Place, Brooks Award.

V. Mullin Traynor, "The Dissemination and Adoption of New Technology: Control Data's Computer-Based Training System, Plato, and the Electric Utilities" - (1982).

Karen Van Kirk (joint with Andrew Anagnos), "A Framework for Analyzing Quality in the News Media," - (1991)

Joel Wachtler (joint with Michael Leslie), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Tamao Watanabe, "Customer Analysis of the U.S. Cardiovascular Drug Market: Focusing on Physician's Drug Choice" - (1991)

Stephen L. Weise, "Expert Decision Support Systems for Marketing Management," – Reader (1986).

Nancy Werner, "Competitive Price and Positioning in the Integrated Office Automation Systems Market" - (1986).

Julie Wherry, "Pre-Test Marketing: Its Current State in the Consumer Goods Industry and Its Effect on Determining a Networked Good." - (2006).

Ali Yalcin, "The Potentials and Limitations of Customer Satisfaction Indices in Captive Customer-Supplier Environments," - (1995)

Sandra Yie, "The Core Curriculum at Sloan: Establishing a Hierarchy of Needs," - (1992).

Judy Young, "Responsive Marketing Strategy at AT&T" - (1982).

(b) *Aeronautics S.M. Theses*

Keith Russell (LSI), "Reengineering Metrics Systems for Aircraft Sustainment Teams: A Metrics Thermostat for Use in Strategic Priority Management," (February 2001).

(c) *Electrical Engineering, S.B. and M.Eng. Theses*

Chan, Christine W. Y. (M. Eng), "Measuring Non-Monetary Incentives Using Conjoint Analysis," Co-Advisor (1999).

Emily Hui (M.Eng.), "Application of Polyhedral Conjoint Analysis to the Design of Sloan's Executive Education Programs." June 2003.

Brian T. Miller (S. B.), "A Verification of Price Equilibria Based on Non-Zero Conjectural Variation," (1986).

(d) *Mechanical Engineering, Master's Theses*

Burt D. LaFountain, "An Empirical Exploration of Metrics for Product Development Teams" – (1999)

Tina Savage, "The Virtual Customer: A Distributed Methodology for Linking Product Design and Customer Preferences." Co-Advisor (1998).

(e) *Operations Research Center, Master's Theses*

Jeffrey Moffit (ORC), " Applying the Metrics Thermostat to Naval Acquisitions for Improving the Total Ownership Cost – Effectiveness of New Systems," (2001)

Olivier Toubia (ORC), "Interior-point Methods Applied to Internet Conjoint Analysis," (February 2001), Co-Advisor.

(f) *Urban Studies, Master's Theses*

Marijoan Bull, "Affirmative Fair Housing Marketing" - Committee Member (1982).

Barry Cosgrove, "Marketing Analysis for the Brockton Area Transportation Authority" – Committee Member (1981).

(g) *Sloan School of Management, Ph.D. Theses*

Makoto Abe, "A Marketing Mix Model Developed from Single Source Data: A Semiparametric Approach." Committee member (August 1991). Abe is on the faculty at the University of Tokyo.

Peter Fader, "Effective Strategies in Oligopolies," Chairman (February 1987). Sloan School of Management, Zannetos Prize, 1st Place. Fader is on the faculty at the University of Pennsylvania.

Fred Feinberg, "Pulsing Policies for Aggregate Advertising Models" Committee Member (August 1988). Feinberg is on the faculty of the University of Michigan.

Dave Godes, " Friend or Foe?: The Relationship Between Learning and Incentives and two additional essays in marketing," (June 2000), Committee Member. Primary advisor on listed essay. Zannetos Prize, 1st Place. Godes is on the faculty of the Harvard Business School.

Abbie Griffin, "Functionally Integrated New Product Development: Improving the Product Development Process Through Linking Marketing and Technology Development," Chairman. (June 1989). Griffin is on the faculty at the University of Illinois and was editor of *Journal of Product Innovation Management* from 1997-2003 Frank Bass Dissertation Award (INFORMS).

Gurumurthy Kalyanaram, "Empirical Modeling of the Dynamics of the Order of Entry Effect on Market Share, Trial Penetration and Repeat Purchases for Frequently Purchased Consumer Goods," Committee Member (March 1989). G. K. is on the faculty at the University of Texas, Dallas.

Eriko Kitazawa, "Customer Satisfaction at Japanese Utility Franchises," Committee Member (1996).

John H. Roberts, "A Multiattributed Utility Diffusion Model: Theory and Application to the Prelaunch Forecasting of Autos". Committee Member (February 1984). Roberts is on the faculty at the University of New South Wales, Australia.

Duncan I. Simester, "Analytical Essays on Marketing," Committee Member, (June 1993). Sloan School of Management, Zannetos Prize, Honorable Mention. Simester is on the faculty of M.I.T.

Olivier Toubia, "New Approaches to Idea Generation and Consumer Input in the Product Development Process," (June 2004). Toubia is on the faculty of Columbia University. Frank M. Bass Dissertation Award (INFORMS), 2005, John Howard Dissertation Award (AMS), 2005.

Miguel Villas-Boas, "On Promotions and Advertising Policies: A Strategic Approach." Committee member (February 1991). Villas-Boas is on the faculty at the University of California, Berkeley.

Bruce Weinberg, "An Information-Acceleration-Based Methodology for Developing Preproduction Forecasts for Durable Goods: Design, Development, and Initial Validation." Committee Member. (August 1992). Weinberg was on the faculty at Boston University.

Florian Zettelmeyer, "Three Essays on Strategic and Organizational Uses of Information in Marketing." Committee Member. Zettelmeyer is on the faculty of the University of California at Berkeley.

(h) *Civil Engineering, Ph.D. Thesis*

Karla Karash (Ph.D.), "An Application of the Lens Model in Measuring Retail Attractiveness and the Effects of Transportation Programs" - Committee Member (August 1983). Karash was at the MBTA.

(i) *Mechanical Engineering, Ph.D. Thesis*

Javier Gonzalez-Zugasti (Mechanical Engineering, Ph.D.), "Models for Product Family Design and Selection," (June 2000), Committee Member.

(j) *Operations Research Center, Ph.D. Thesis*

Yee, Michael (Operations Research, Ph.D.), "Inferring Non-Compensatory Choice Heuristics," (June 2006), Co-Advisor. Yee is at MIT's Lincoln Laboratories.

Northwestern University Ph.D. Thesis Supervision (1975 - 1980 Academic Years)

Steven M. Shugan, "A Descriptive Stochastic Preference Theory and Dynamic Optimization: Applications Toward Predicting Consumer Choice' Chairman (September 1977). Shugan is on the faculty at the University of Florida and current editor of *Marketing Science*.

Patricia Simmie, "Product Realization: Theory, Models, and Application" - Chairman (June 1979), American Marketing Association Dissertation Prize, Honorable Mention. Simmie was at York University.

Ken J. Wisniewski, "A Semi-Markov Theory of Consumer Response: New Theoretical Properties, Simulation Testing, and Empirical Application" Chairman (June 1981). American Marketing Association Dissertation Prize, First Place. Wisniewski was at the University of Chicago.

B

Exhibit B

Testimony in the Last Four Years

Hewlett-Packard Company v. Factory Mutual Insurance Company, Case No. 04-CV-02791 (TPG) : (ECFCASE), United States District Court, Southern District Of New York, Deposition testimony, June 28. 2007.

The Procter & Gamble Company, et al. vs. Randy L. Haugen, et al., Case Number 1:95-CV-0094W Judge David K. Winder, United States District Court for the Utah District, Salt Lake City, Utah, trial testimony. March 9 and 12, 2007.

State of Colorado, et al. v. Warner Chilcott Holdings Company III, LTD., et al., Civil Action No: 1:05CV02182 (CKK), United States District Court for the District of Columbia, Deposition testimony, January 19, 2007.

Barbara Schwab v. Philip Morris USA, Inc., Case No. CV-04-1945 (JBW) (SMG), United States District Court for the Eastern District of New York, Deposition testimony, March 23, March 24, May 18, and August 21, 2006.

TiVo Inc. v. EchoStar Communications Corporation, Civil Action No. 2-04cv-01 DF, United States District Court for the Eastern District of Texas, Deposition testimony, August 9, 2005.

MasterCard International, Inc. v. First National Bank of Omaha (FNBO), Civil Action No. 02 Civ 3691 (DLC) and First National Bank of Omaha (FNBO) v. MasterCard International, Inc., Civil Action No. 03 Civ 707 (DLC), United States District Court for the Southern District of New York, Deposition testimony, September 8, 2003.

In Re Microsoft Corporation Antitrust Litigation, MDL Docket No. 1332, United States District Court for the District of Maryland, Deposition testimony, January 29, 2003.

C

Exhibit C

Materials Reviewed

Deposition Of Yoram Wind, Ph.D., Friday, April 27, 2007

Hearing Testimony of Yoram (Jerry) Wind, June 14 and June 18, 2007

Quirk's Marketing Research Review, July/August 2006

SEC 10-K statements by XM and Sirius

Sirius Satellite Radio Study - Wave 2 , June 2006

Testimony of Janusz Ordover (RESTRICTED) ("Ordover Report")

Testimony of Michael Pelcovits, original and amended ("Pelcovits Report")

Testimony of Yoram (Jerry) Wind, original and amended ("Wind Report")

XM Satellite Radio Custom Study Analysis, Fall 2006

XM Satellite Radio (A & B) Harvard Business Review Case 9-504-009

D

Exhibit D. Potential Satellite Radio Features from Exploratory Research

Lots of unexplored options
Know that there are many channels and programs you can still check out and experience
Know that programming you want is available even if you don't listen to it

The music you want, when you want to listen to it
Confidence that you will always be able to hear music that you are in the mood for
At any time of day or night, you have the option to choose among types of programs such as music, sports, talk radio, news
Able to select a song you like and know when it is going to come on to one of the satellite stations

Easy Navigation
Easy to move between stations without having to remember the station number
Much less flipping through channels or hunting around the dial to find what you want to listen to

Programming
Shows with interesting and knowledgeable hosts
Shows dedicated to specific topics of interest to you
Talk radio that has interesting human interest stories

Learn more about the music you like
Makes it possible for you to identify the artist and song name

The categorization of music makes it easy for me to discover new types of music I did not know a lot about
The concentration of music and number of stations within a genre makes it easy to learn about specific types of music quickly
Helps you to identify music to add to your music collection
Able to listen to programs that are no longer played on the AM or FM stations

News
Able to get breaking news exactly when you want it (do not have to stop what you are doing to read an article on the internet)

Reception
Better sound quality than FM or AM radio
CD quality sound
Do not lose reception when traveling out of a local territory
Good clear reception even in the city (urban area)
No static

Traveling
Can have the same stations available to you when you are traveling long distances
Do not have to carry CD's , books on tape, etc. when traveling

Weather and Traffic Reports
Can get a weather report whenever you want to
Able to get weather reports about other cities/locations
Weather reports are continuously updated, no waiting

Traffic

Can get a traffic report whenever you want to
Able to get traffic reports about other cities/locations
Traffic reports are continuously updated, no waiting

Variety

Able to listen to a variety of different genres of music
When listening to a certain type of music, you have options to listen to both new songs or older songs
There is wide variety and very little redundancy in songs played on a station
Able to hear the most up to date music
Can listen to more than just the "hits"
Have access to more stations within a genre of music (deeper cuts)
Programs are nostalgic - can hear songs and shows you remember from the past

Creative Programming

More knowledgeable DJ's, with better line up of songs, who keep talk to a minimum
Able to get the perspective of celebrity hosts and artists
DJ's are informative about the music

Happier family

There are station options for everyone in my family

Programming is always available

Do not have to have programs interrupted by commercials
The DJ's do not chatter and take over the show

On-the-go

Able to listen to the same stations in the car, home, on the internet
Can listen to satellite radio when I am on the go

Uncensored programming - no language censorship

Sports Coverage

Get all, not just some of the games
Able to listen to interviews with players, get a more in-depth view of the sport

Informs me about what music, shows, and events are coming up on other channels

E

Exhibit E- Subscribers CAI Survey

RESP #: _____

QUESTIONNAIRE – Satellite Radio –Subscribers --

INTERVIEWER_____LOCATION_____DATE_____

(READ VERBATIM :)
Thank you for agreeing to participate in our study. We would like to talk to you today about satellite radio. All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. We are only interested in your opinions. If you don't know an answer or don't have an answer to a particular question, please don't guess. Just tell me you don't know and we will go on to the next question. If, at anytime, you do not understand a question or do not understand what is being asked of you, just say so and I will repeat the question.

INTERVIEWER: HAVE THE RESPONDENT SIT IN FRONT OF COMPUTER AND ANSWER QUESTIONS TO THE REMAINDER OF THE SURVEY HIM/HERSELF. BE SURE TO SIT WITH THE RESPONDENT WHILE HE/SHE IS ANSWERING IN CASE HE/SHE HAS ANY QUESTIONS.

IF THE RESPONDENT PREFERS, HAVE HIM/HER READ THE QUESTIONS ON THE SCREEN, BUT YOU WILL ENTER THE ANSWERS.

RECORD:

Interviewer entering answers	**1**
Respondent entering answers	**2**

Q1. How long have you been a Satellite Radio subscriber? **(Circle one only)**

Less than 1 year	1
1 to 2 years	2
3 to 4 years	3
More than 5 years	4
DK/Unsure	5

Q2. How many satellite radio receivers do you currently own? **(Circle one only)**

One	1
Two	2
Three	3
Four	4
5 or more	5
DK/Unsure	6

Q2a. What type or types of satellite radio receiver(s) do you own? **(Circle all that apply)**
[RANDOMIZE LIST EXCEPT OTHER/DK]

A home-use receiver	1
An in-dash car receiver	2
A plug & play unit that can be used with home audio equipment or in the car	3
A portable unit that can be used anywhere	4
Other (Specify:_____)	5
DK/Unsure	6

Q2b. Where do you listen to satellite radio? **(Circle all that apply)**
[RANDOMIZE LIST EXCEPT OTHER/DK]

At home	1
At work	2
In the car	3
On the Internet	4
Outdoors	5
Other (Specify_____)	6
DK/Unsure	7

[RANDOMIZE ORDER OF WILLINGNESS TO PAY SECTION AND IMPORTANCE SECTION]

WILLINGNESS TO PAY SECTION (Q3 - Q7g)

[SKIP TO Q7B IF S4B=2]
Q3a. Which of the following best describes how you pay for your satellite radio subscription(s)?

			[TIME UNITS FOR Q6A, Q7]
I pay monthly	1	SKIP TO Q4	monthly
I pay up front for one year's subscription	2		annually
I pay up front, for more than one year's subscription	3	SKIP TO Q3C	for the multi-year subscription
I paid for a lifetime subscription	4	SKIP TO Q4	for a lifetime subscription
Other	5	ASK Q3A OTHER	
DK/Unsure	6	SKIP TO Q4	

Q3a other. Please indicate how often you pay for your subscription? _____ [SKIP TO Q4]

[ASK IF S4B=2]
Q3b. How likely are you to continue your subscription to satellite radio when your free trial subscription is over? [SKIP TO Q6b]

	Very Likely	*Somewhat Likely*	*Neither Likely or Unlikely,*	*Somewhat Unlikely*	*Very Unlikely*
Likelihood to continue your subscription to satellite radio when your free trial subscription is over					

Q3c. How many years do you / did you pay for at a time? _____ [OPEN END] [ALLOW FOR DK/UNSURE]

Q4. How much was your most recent payment for all of your satellite radio subscription(s)? [OPEN-END]
[ALLOW FOR DK/UNSURE]

Q5. How much did you pay in total to buy all the different satellite radio receiver(s) you own? If you did not purchase any, enter zero. ? [OPEN-END]
[ALLOW FOR DK/UNSURE]

[ASK IF ANSWERED 1 – 4 ON Q3]

Q6a. What is the most you would be willing to pay for your [INSERT TIME INTERVAL FROM Q7] satellite radio subscription(s)? In other words, what price would be so high that you would cancel your subscription?

[ALLOW FOR DK/UNSURE] [ALLOW FOR 5 DIGITS]

[ASK IF ANSWERED 5 – 7 ON Q3]

Q6b. The single subscription price per month for satellite radio is $12.95. You can save money if you pay up front for a year or multiple years.
What is the most you would be willing to pay per month for a satellite radio subscription? [OPEN-END] [ALLOW FOR DK/UNSURE] [ALLOW FOR 5 DIGITS]

[RANDOMIZE THE ORDER IN WHICH CONDITIONS BUILD, INCLUDING NO MUSIC]
[RECORD ORDER OF CONDITIONS]
[Q7a-Q7g SHOULD BE SHOWN ON SEPARATE SCREENS]
[HAVE MOST RECENTLY ADDED CONDITION APPEAR IN BOLD]

Next, we will ask you a series of questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s). When giving your answers, please think only of satellite radio that you listen to over the radio. Do not think of or consider any satellite radio programming that you listen to over the Internet.

Q7a: ***How much would you pay*** [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...*** *You couldn't get reception nationally, just locally* [OPEN END: DOLLAR AMOUNT] Please assume that all other aspects of satellite radio would remain the same
Q7b: ***Now, How much would you pay*** [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...*** *You couldn't get reception nationally, just locally AND* *Sound quality was only equal to that of the FM radio you can listen to* [OPEN END: DOLLAR AMOUNT] Please assume that all other aspects of satellite radio would remain the same
Q7c: ***Now, How much would you pay*** [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...*** *You couldn't get reception nationally, just locally AND* *Sound quality was only equal to that of the FM radio you can listen to AND* *There were as many commercials as on AM or FM Radio* [OPEN END: DOLLAR AMOUNT] Please assume that all other aspects of satellite radio would remain the same

Q7d:
Now, How much would you pay [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...***
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels
[OPEN END: DOLLAR AMOUNT]
Please assume that all other aspects of satellite radio would remain the same

Q7e:
Now, How much would you pay [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...***
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts
[OPEN END: DOLLAR AMOUNT]
Please assume that all other aspects of satellite radio would remain the same

Q7f:
Now, How much would you pay [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...***
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts AND
There was no sports coverage available, not even your favorite teams
[OPEN END: DOLLAR AMOUNT]

Please assume that all other aspects of satellite radio would remain the same

Q7g:
Now, How much would you pay [INSERT TIME INTERVAL FROM Q3, if 5-7 at Q3, insert "Monthly"] ***for satellite radio if...***
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts AND
There was no sports coverage available, not even your favorite teams AND
There were no news, weather or traffic reports available
[OPEN END: DOLLAR AMOUNT]

Please assume that all other aspects of satellite radio would remain the same

IMPORTANCE SECTION (Q8)
[Interviewer read instructions to respondent]

[Intro and instructions should appear on a separate page in order to decrease amount of scrolling involved with the amount of statements. On the page with the statements need to allow respondents the ability to reference the instructions by clicking on an "instructions" button.]

Q8. Importance of Satellite Radio Attributes

Below is a list of things that people like you have said when asked why they continue to subscribe to satellite radio. As you read through this list, we would like you to rate each statement according to how important it is *to you in your decision to continue subscribing to satellite radio*

Here's how we'd like you to rate the statements:

1) First, read through the list and pick the one statement that is *most important* to you – this is the need that you feel is most critical. Give 100 points to this statement by typing the number "100" in the box next to it.

2) Second, pick the statement that is *least important* to you and give it a score between "0" and "100" based on how important it is *relative to your most important need*. For example, if it is half as important, type the number "50" next to the need -- if the need is of absolutely no importance, give it "0" points.

3) Now, rate each of the other statements relative to the ones you chose as most and least important. When you are finished, each statement should have a number between the lowest number you chose and 100.
   - *Please use as wide a range of numbers as you wish between zero (or the lowest score you assign) and 100.*
   - *Ties are okay for any needs, including the lowest and highest.*
   - *If you don't know, are unsure, if you disagree or you are unaware just check the box at the far right of the statement.*

4) When giving your answers, please think only of satellite radio that you listen to over the radio. Do not think of or consider any satellite radio programming that you listen to over the Internet.

	SCORE	**Don't Know /Unsure/ Disagree/ Unaware**
There are still many channels waiting to be explored		
I can always find what I want to listen to, when I want to listen to it		
It is easy to find what I want to listen to without a lot of hunting around		
There are talk and entertainment shows with interesting and knowledgeable hosts		
There are shows dedicated to specific topics that interest me		
The artist and song name are displayed on my screen so I know what is playing		
The organization of channels makes it easy for me to explore a specific genre		
I can listen to a lot of programs and content not available on either AM or FM radio		
The depth of the music programming helps me to find new songs to add to my collection		
Provides the latest breaking news – no need to stop what I'm doing and check the Internet		
Provides excellent sound quality (better than either AM or FM radio)		
Provides consistently clear reception no matter where I go, even in the city		
I can listen to my stations wherever I go, even when traveling long distances		
I can get weather and traffic reports whenever I want to, without waiting		
I can get weather and traffic from all around the country		
I don't hear the same things over and over		
I can hear programs and music that make me feel nostalgic for what I used listen to when I was younger		
There are programs where interesting and knowledgeable DJ's can create and control the content		
The DJ's don't talk too much		
I can listen to music channels without any commercials		

I can listen to music		
There are stations available for everyone in my family		
I can listen to the same stations in the car, at home, or on the Internet		
I can listen to uncensored programs		
I can listen to all, not just some of my favorite sport's games		
Offers more in-depth sports programming than either AM or FM radio, such as ESPN		
Informs me about what music, shows, and events are coming up on other channels		
I can listen to music from the 40's, 50's and 60's		
I can listen to music from the 70's, 80's, 90's, and today		

Error message should read: **"All answers must be whole numbers between 0 and 100 or Don't Know / Unsure / Disagree / Unaware."**

Those are all of the questions we have for you today. Thank you very much for participating in this study and have a great day.

Exhibit E-1.2. Considering Subscribers CAI Survey

RESP #: _____

QUESTIONNAIRE – Satellite Radio – Considering Subscribing --

INTERVIEWER_____LOCATION_____DATE_____

(READ VERBATIM :)
Thank you for agreeing to participate in our study. We would like to talk to you today about satellite radio. All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. We are only interested in your opinions. If you don't know an answer or don't have an answer to a particular question, please don't guess. Just tell me you don't know and we will go on to the next question. If, at anytime, you do not understand a question or do not understand what is being asked of you, just say so and I will repeat the question.

INTERVIEWER: HAVE THE RESPONDENT SIT IN FRONT OF COMPUTER AND ANSWER QUESTIONS TO THE REMAINDER OF THE SURVEY HIM/HERSELF. BE SURE TO SIT WITH THE RESPONDENT WHILE HE/SHE IS ANSWERING IN CASE HE/SHE HAS ANY QUESTIONS.

IF THE RESPONDENT PREFERS, HAVE HIM/HER READ THE QUESTIONS ON THE SCREEN, BUT YOU WILL ENTER THE ANSWERS.

RECORD:

Interviewer entering answers	**1**
Respondent entering answers	**2**

Q1. We will be asking you some questions today about satellite radio. Now please read this information about satellite radio from the **[FILL 'XM WEB SITE', 'SIRIUS WEB SITE' OR 'XM AND SIRIUS WEB SITES' FROM S6B].**

Satellite radio is more than the latest technology. It's an extraordinary new way to experience your favorite music, sports, news, talk, comedy- and it goes anywhere you go. No longer are your choices limited to where you live or travel. Satellite radio gives you the freedom to hear what you want, when you want it. Imagine dozens & dozens of commercial-free music channels playing new & old favorites. Heart-pounding coverage of your favorite pro & college teams. National news broadcasters you trust. Talk shows you rely on to inform & provoke. Even traffic & weather. That's satellite radio.

You can listen to satellite radio in your car, in your home, on the Internet, or wherever you go.
[IF S6B = 1 THEN SHOW INFORMATION ABOUT XM ONLY]
[IF S6B = 2 THEN SHOW INFORMATION ABOUT SIRIUS ONLY]
[IF S6B = 3 OR 4 THEN RANDOMIZE ORDER OF PRESENTATION OF XM AND SIRIUS. RECORD ORDER.]

XM is…

- The greatest variety of entertainment in music, sports, talk, comedy, news and entertainment
- Superior digital sound quality coast-to-coast
- Incredibly easy to use wherever you are --- at home, at work, in the car or on the go
- The most music on satellite radio
- Exciting sports coverage and detailed play-by-play reporting on your favorite teams
- Affordable at only $12.95 a month, that's less than 50¢ a day

About Sirius:
No one can match SIRIUS programming. We've got legendary DJs playing your favorite songs on 69 channels of 100% commercial-free music, plus exclusive live performances and artist interviews. Love sports? SIRIUS is home to NASCAR, the entire NFL and over 40 NBA and NHL games a week, college sports and more. Talk about star power: SIRIUS proudly presents original programming from Martha Stewart, Bill Bradley, Eminem, Tony Hawk, Jim Breuer, Jimmy Buffet, Tony Stewart and Howard Stern. Plus the biggest names in news and talk, great comedy, traffic and weather you need more and more, on over 130 channels of the best of all radio.

[RANDOMIZE ORDER OF WILLINGNESS TO PAY SECTION AND IMPORTANCE SECTION]

WILLINGNESS TO PAY SECTION (Q2 - Q4g)

Q2. The single subscription price per month for satellite radio is $12.95. You can save money if you pay up front for a year or multiple years.

Q3. Thinking about what we told you and everything else you know, what is the most you would be willing to pay per month for a satellite radio subscription? In other words, what price would be so high that you would no longer consider subscribing? [OPEN-END] [ALLOW FOR DK/UNSURE] [ALLOW FOR 5 DIGITS]

[RANDOMIZE THE ORDER IN WHICH CONDITIONS BUILD, INCLUDING NO MUSIC]
[RECORD ORDER OF CONDITIONS]
[Q4a-Q4g SHOULD BE SHOWN ON SEPARATE SCREENS]
[HAVE MOST RECENTLY ADDED CONDITION APPEAR IN BOLD]

INTRODUCTION: **Next, we will ask you a series of questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s).**

Q4a: ***How much would you pay for satellite radio if...*** *You couldn't get reception nationally, just locally* [OPEN END: DOLLAR AMOUNT] If you would cancel your subscription please either enter 0 or check here
Q4b: ***Now, How much would you pay for satellite radio if...*** *You couldn't get reception nationally, just locally AND* *Sound quality was only equal to that of the FM radio you can listen to* [OPEN END: DOLLAR AMOUNT] If you would cancel your subscription please either enter 0 in the box above or check here
Q4c: ***Now, How much would you pay for satellite radio if...*** *You couldn't get reception nationally, just locally AND* *Sound quality was only equal to that of the FM radio you can listen to AND* *There were as many commercials as on AM or FM Radio* [OPEN END: DOLLAR AMOUNT] If you would cancel your subscription please either enter 0 in the box above or check here

Q4d:
Now, How much would you pay for satellite radio if...
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels
[OPEN END: DOLLAR AMOUNT]

If you would cancel your subscription please either enter 0 in the box above or check here

Q4e:
Now, How much would you pay for satellite radio if...
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts
[OPEN END: DOLLAR AMOUNT]

If you would cancel your subscription please either enter 0 in the box above or check here

Q4f:
Now, How much would you pay for satellite radio if...
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts AND
There was no sports coverage available, not even your favorite teams
[OPEN END: DOLLAR AMOUNT]

If you would cancel your subscription please either enter 0 in the box above or check here

Q4g:
Now, How much would you pay for satellite radio if...
You couldn't get reception nationally, just locally AND
Sound quality was only equal to that of the FM radio you can listen to AND
There were as many commercials as on AM or FM Radio AND
There was no music available, not even your favorite channels AND
There were no talk shows available, not even your favorite hosts AND
There was no sports coverage available, not even your favorite teams
There were no news, weather or traffic reports available

[OPEN END: DOLLAR AMOUNT]

If you would cancel your subscription please either enter 0 in the box above or check here

IMPORTANCE SECTION (Q5)

Q5. Importance

[Interviewer read instructions to respondent]

[Intro and instructions should appear on a separate page in order to decrease amount of scrolling involved with the amount of statements. On the page with the statements need to allow respondents the ability to reference the instructions by clicking on an "instructions" button.]

Below is a list of things that people like you have said when asked why they would consider subscribing to satellite radio. As you read through this list, we would like you to rate each statement according to how important it is *to you in your decision to subscribe to satellite radio.*
Here's how we'd like you to rate the statements:

1) First, read through the list and pick the one statement that is *most important* to you – this is the need that you feel is most critical. Give 100 points to this statement by typing the number "100" in the box next to it.

2) Second, pick the statement that is *least important* to you and give it a score between "0" and "100" based on how important it is *relative to your most important need*. For example, if it is half as important, type the number "50" next to the need -- if the need is of absolutely no importance, give it "0" points.

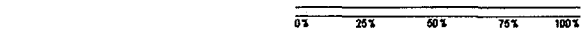
3) Now, rate each of the other statements relative to the ones you chose as most and least important. When you are finished, each statement should have a number between the lowest number you chose and 100.
   - *Please use as wide a range of numbers as you wish between zero (or the lowest score you assign) and 100.*
   - *Ties are okay for any needs, including the lowest and highest.*
   - *If you don't know, are unsure, if you disagree or you are unaware just check the box at the far right of the statement.*

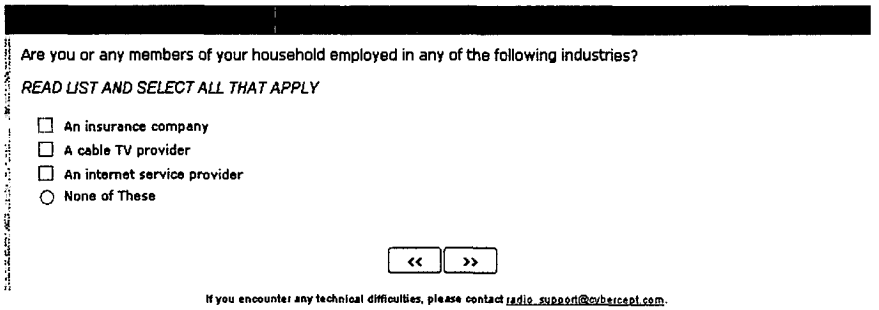
	SCORE	**Don't Know / Unsure Disagree/ Unaware**
There are still many channels waiting to be explored		
I can always find what I want to listen to, when I want to listen to it		
It is easy to find what I want to listen to without a lot of hunting around		
There are shows with interesting and knowledgeable hosts		
There are shows dedicated to specific topics that interest me		
The artist and song name are displayed on my screen so I know what is playing		
The organization of channels makes it easy for me to explore a specific genre		
I can listen to a lot of programs and content not available on either AM or FM radio		
The depth of the music programming helps me to find new songs to add to my collection		
Provides the latest breaking news – no need to stop what I'm doing and check the Internet		
Provides excellent sound quality (better than either AM or FM radio)		
Provides consistently clear reception no matter where I go, even in the city		
I can listen to my stations wherever I go, even when traveling long distances		
I can get weather and traffic reports whenever I want to, without waiting		
I can get weather and traffic from all around the country		
I don't hear the same things over and over		
I can hear programs and music that make me feel nostalgic because I haven't heard them for years		
There are programs where celebrity DJ's can create and control the content		
The DJ's don't talk too much		
I can listen to music channels without any commercials		
I can listen to music		
There are stations available for everyone in my family		
I can listen to the same stations in the car, at home, or on the Internet		
I can listen to uncensored programs		
I can listen to all, not just some of my favorite sport's games		
Offers more in-depth sports programming than either AM or FM radio		
Informs me about what music, shows, and events are coming up on other channels		

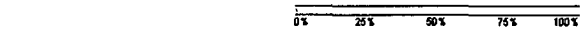
Error message should read: **"All answers must be whole numbers between 0 and 100 or Don't Know / Unsure / Disagree / Unaware."**

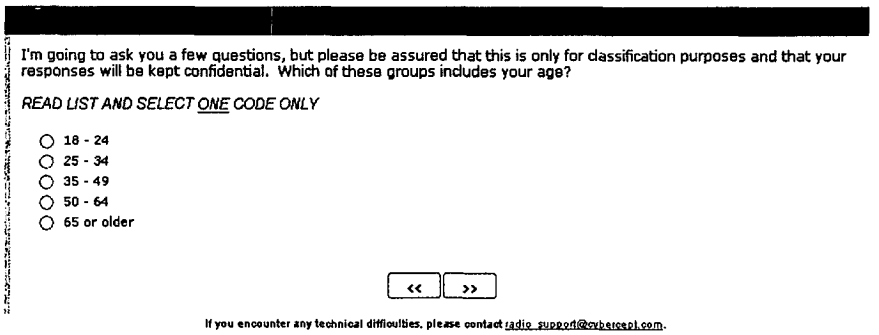
Those are all of the questions we have for you today. Thank you very much for participating in this study and have a great day.

Exhibit E-2.1. Subscribers CAI Screen Shots









0% 25% 50% 75% 100%

[redacted]

Which, if any of the following decisions do you make or take part in making for your household?

READ LIST AND SELECT ALL THAT APPLY

- ☐ Decision to subscribe to cable TV
- ☐ Decision to subscribe to Internet service
- ☐ Decision to subscribe to satellite radio
- ☐ Decision to subscribe to a wireless (cell) phone service
- ☐ Decision to subscribe to satellite TV

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

[redacted]

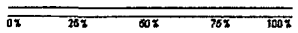
Which of these services, if any, do you currently subscribe to?

READ LIST AND SELECT ALL THAT APPLY

- ☐ Cable TV
- ☐ Satellite TV
- ☐ Broadband Internet
- ☐ Satellite radio
- ☐ Wireless (cell) phone service
- ○ None of These
- ○ Refused

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



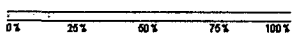
Which of the following type(s) of satellite radio do you or your household currently subscribe to?

READ LIST AND SELECT ALL THAT APPLY

- ☐ A paid subscription directly from XM or Sirius
- ☐ A trial subscription (such as from the purchase of a car) directly from XM or Sirius
- ☐ Part of a package from a third party (such as through DirecTV, DiSH Network or AOL), or directly purchased satellite radio for Internet delivery only from XM or Sirius

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Which satellite radio service(s) do you or your household currently subscribe to?

READ LIST SELECT ONE ANSWER

- ○ XM
- ○ Sirius
- ○ Both Sirius and XM

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Do you normally wear eye glasses or contact lenses when you read?

- ○ Yes
- ○ No

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

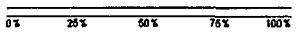
0% 25% 50% 75% 100%

RECORD GENDER OF RESPONDENT BELOW

- ○ Male
- ○ Female

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



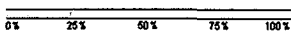
May I please have your full name, address and phone number? You can be assured that your name and phone number will not be used to sell you anything or for any marketing or telemarketing purposes. It will only be used to verify your participation in the survey.

(RECORD ON FRONT PAGE OF SCREENER. YOU MUST VERIFY RESPONDENT'S PHONE NUMBER.)

Respondent's Name:	
Phone Number:	
Address:	
City:	
State:	IL
Zip:	
Interviewer	

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



INTERVIEWER: HAVE THE RESPONDENT SIT IN FRONT OF COMPUTER AND ANSWER QUESTIONS TO THE REMAINDER OF THE SURVEY HIM/HERSELF. BE SURE TO SIT WITH THE RESPONDENT WHILE HE/SHE IS ANSWERING IN CASE HE/SHE HAS ANY QUESTIONS.

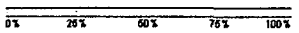
IF THE RESPONDENT PREFERS, HAVE HIM/HER READ THE QUESTIONS ON THE SCREEN, BUT YOU WILL ENTER THE ANSWERS.

(Record type of interview)

- ○ Interviewer entering answers
- ○ Respondent entering answers

<< >>

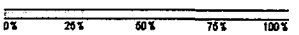
If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Thank you for agreeing to participate in our study. We would like to talk to you today about satellite radio. All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. We are only interested in your opinions. If you don't know an answer or don't have an answer to a particular question, please don't guess. Just tell me you don't know and we will go on to the next question. If, at anytime, you do not understand a question or do not understand what is being asked of you, just say so and I will repeat the question.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



How long have you been a Satellite Radio subscriber?

(Select one only)

- ◯ Less than 1 year
- ◯ 1 to 2 years
- ◯ 3 to 4 years
- ◯ More than 5 years
- ◯ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

How many satellite radio receivers do you currently own?

(Select one only)

- ◯ One
- ◯ Two
- ◯ Three
- ◯ Four
- ◯ Five or more
- ◯ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

What type or types of satellite radio receiver(s) do you own?

(Select all that apply)

- ☐ A portable unit that can be used anywhere
- ☐ A home-use receiver
- ☐ A plug & play unit that can be used with home audio equipment or in the car
- ☐ An in-dash car receiver
- ☐ Other (Specify) [ ]
- ◯ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Where do you listen to satellite radio?

(Select all that apply)

- ☐ At home
- ☐ On the Internet
- ☐ At work
- ☐ In the car
- ☐ Outdoors
- ☐ Other (Specify) [ ]
- ○ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

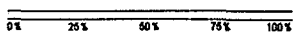
0% 25% 50% 75% 100%

Which of the following best describes how you pay for your satellite radio subscription(s)?

- ○ I pay monthly
- ○ I pay up front for one year's subscription
- ○ I pay up front, for more than one year's subscription
- ○ I paid for a lifetime subscription
- ○ Other
- ○ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



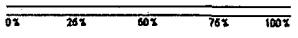
How much was your most recent payment for all of your satellite radio subscription(s)?

$[ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



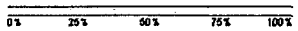
How much did you pay in total to buy all the different satellite radio receiver(s) you own? If you did not purchase any, enter zero.

$[ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



You said your most recent payment was **$12.95.**

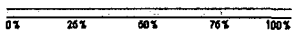
What is the most you would be willing to pay for your **monthly** satellite radio subscription(s)? In other words, what price would be so high that you would cancel your subscription?

$

☐ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Next, we will ask you a series of questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s). When giving your answers, please think only of satellite radio that you listen to over the radio. Do not think of or consider any satellite radio programming that you listen to over the Internet.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

How much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams

(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Now, how much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams ***AND***
Sound quality was only equal to that of the FM radio you can listen to

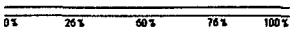
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
There were no talk shows available, not even your favorite hosts

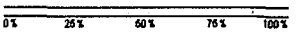
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
There was no music programming available, not even your favorite channels

(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Now, how much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams ***AND***
Sound quality was only equal to that of the FM radio you can listen to ***AND***
There were no talk shows available, not even your favorite hosts ***AND***
There was no music programming available, not even your favorite channels ***AND***
There were no news, weather or traffic reports available

(Please assume that all other aspects of satellite radio would remain the same.)

$[ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Now, how much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams ***AND***
Sound quality was only equal to that of the FM radio you can listen to ***AND***
There were no talk shows available, not even your favorite hosts ***AND***
There was no music programming available, not even your favorite channels ***AND***
There were no news, weather or traffic reports available ***AND***
There were as many commercials as on AM or FM Radio

(Please assume that all other aspects of satellite radio would remain the same.)

$[ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
*There was no music programming available, not even your favorite channels **AND***
*There were no news, weather or traffic reports available **AND***
*There were as many commercials as on AM or FM Radio **AND***
You couldn't get reception nationally, just locally

(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

[INTERVIEWER: READ INSTRUCTIONS TO RESPONDENT]

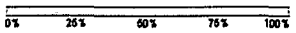
On the next page is a list of things that people like you have said when asked why they continue to subscribe to satellite radio. As you read through this list, we would like you to rate each statement according to how important it is to you in your decision to continue subscribing to satellite radio.

Here's how we'd like you to rate the statements:

1. First, read through the list and pick the one statement that is *most important* to you - this is the need that you feel is most critical. Give 100 points to this statement by typing the number "100" in the box next to it.
2. Second, pick the statement that is *least important* to you and give it a score between "0" and "100" based on how important it is *relative to your most important need*. For example, if it is half as important, type the number "50" next to the need -- if the need is of absolutely no importance, give it "0" points.
3. Now, rate each of the other statements relative to the ones you chose as most and least important. When you are finished, each statement should have a number between the lowest number you chose and 100.
   - *Please use as wide a range of numbers as you wish between zero (or the lowest score you assign) and 100.*
   - *Ties are okay for any needs, including the lowest and highest.*
   - *If you don't know, are unsure, if you disagree or you are unaware just check the box at the far right of the statement.*
4. When giving your answers, please think only of satellite radio that you listen to over the radio. Do not think of or consider any satellite radio programming that you listen to over the Internet.

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Show Directions

	SCORE	Don't Know/Unsure Disagree/Unaware
Provides excellent sound quality (better than either AM or FM radio)		☐
There are still many channels waiting to be explored		☐
I can listen to music		☐
I can get weather and traffic from all around the country		☐
There are stations available for everyone in my family		☐
I can listen to uncensored programs		☐
It is easy to find what I want to listen to without a lot of hunting around		☐
I can always find what I want to listen to, when I want to listen to it		☐
Provides the latest breaking news - no need to stop what I'm doing and check the Internet		☐
I can listen to the same stations in the car, at home, or on the Internet		☐
Informs me about what music, shows, and events are coming up on other channels		☐
I can listen to music channels without any commercials		☐
Provides consistently clear reception no matter where I go, even in the city		☐
I can listen to all, not just some of my favorite sport's games		☐
The artist and song name are displayed on my screen so I know what is playing		☐
There are talk and entertainment shows with interesting and knowledgeable hosts		☐
I can listen to music from the 70's, 80's, 90's, and today		☐
I can listen to music from the 40's, 50's and 60's		☐
The depth of the music programming helps me to find new songs to add to my collection		☐
Offers more in-depth sports programming than either AM or FM radio, such as ESPN		☐
There are shows dedicated to specific topics that interest me		☐
I can listen to my stations wherever I go, even when traveling long distances		☐
The organization of channels makes it easy for me to explore a specific genre		☐
I can listen to a lot of programs and content not available on either AM or FM radio		☐
There are programs where interesting and knowledgeable DJ's can create and control the content		☐
I can get weather and traffic reports whenever I want to, without waiting		☐
I can hear programs and music that make me feel nostalgic for what I used listen to when I was younger		☐
The DJ's don't talk too much		☐
I don't hear the same things over and over		☐

<< >>

[redacted]

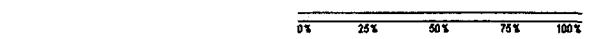
Those are all of the questions we have for you today. Thank you very much for participating in this study and have a great day.

Supervisor/Recruiter: Click ">>" to be redirected to main login page OR close your browser.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

Exhibit E-2.2. Considerers CAI Screen Shots



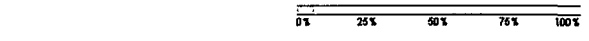
Are you or any members of your household employed in any of the following industries?

READ LIST AND SELECT ALL THAT APPLY

- ☐ An insurance company
- ☐ A cable TV provider
- ☐ An internet service provider
- ○ None of These

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



I'm going to ask you a few questions, but please be assured that this is only for classification purposes and that your responses will be kept confidential. Which of these groups includes your age?

READ LIST AND SELECT ONE CODE ONLY

- ○ 18 - 24
- ○ 25 - 34
- ○ 35 - 49
- ○ 50 - 64
- ○ 65 or older

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Which, if any of the following decisions do you make or take part in making for your household?

READ LIST AND SELECT ALL THAT APPLY

- ☐ Decision to subscribe to cable TV
- ☐ Decision to subscribe to Internet service
- ☐ Decision to subscribe to satellite radio
- ☐ Decision to subscribe to a wireless (cell) phone service
- ☐ Decision to subscribe to satellite TV

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Which of these services, if any, do you currently subscribe to?

READ LIST AND SELECT ALL THAT APPLY

- ☐ Cable TV
- ☐ Satellite TV
- ☐ Broadband Internet
- ☐ Satellite radio
- ☐ Wireless (cell) phone service
- ○ None of These
- ○ Refused

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

Are you or your household currently considering subscribing to (READ ITEMS) in the next 30 days?

READ LIST SELECT ANSWER FOR EACH LISTED ITEM

	Yes	No	Don't Know / Unsure
Satellite TV	○	○	○
Broadband Internet	○	○	○
Satellite radio	○	○	○
Wireless phone service	○	○	○

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

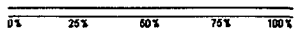
Which of the following type(s) of satellite radio are you or your household considering subscribing to?

READ LIST AND SELECT ALL THAT APPLY

- ☐ A paid subscription directly from XM or Sirius
- ☐ A trial subscription (such as from the purchase of a car) directly from XM or Sirius
- ☐ Part of a package from a third party (such as through DirecTV, DISH Network or AOL), or directly purchased satellite radio for Internet delivery only from XM or Sirius

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



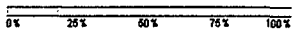
Which satellite radio service are you currently considering subscribing to?

READ LIST SELECT ONE MENTION

- ◯ XM
- ◯ Sirius
- ◯ Both Sirius and XM
- ◯ DK/Have not decided

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Do you normally wear eye glasses or contact lenses when you read?

- ◯ Yes
- ◯ No

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

RECORD GENDER OF RESPONDENT BELOW

- ○ Male
- ○ Female

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

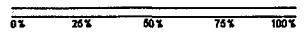
May I please have your full name, address and phone number? You can be assured that your name and phone number will not be used to sell you anything or for any marketing or telemarketing purposes. It will only be used to verify your participation in the survey.

(RECORD ON FRONT PAGE OF SCREENER. YOU MUST VERIFY RESPONDENT'S PHONE NUMBER.)

Respondent's Name:	
Phone Number:	
Address:	
City:	
State:	IL
Zip:	
Interviewer	

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



INTERVIEWER: HAVE THE RESPONDENT SIT IN FRONT OF COMPUTER AND ANSWER QUESTIONS TO THE REMAINDER OF THE SURVEY HIM/HERSELF. BE SURE TO SIT WITH THE RESPONDENT WHILE HE/SHE IS ANSWERING IN CASE HE/SHE HAS ANY QUESTIONS.

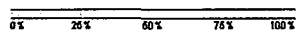
IF THE RESPONDENT PREFERS, HAVE HIM/HER READ THE QUESTIONS ON THE SCREEN, BUT YOU WILL ENTER THE ANSWERS.

(Record type of interview)

- ◯ Interviewer entering answers
- ◯ Respondent entering answers

<< >>

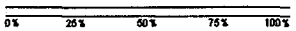
If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Thank you for agreeing to participate in our study. We would like to talk to you today about satellite radio. All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. We are only interested in your opinions. If you don't know an answer or don't have an answer to a particular question, please don't guess. Just tell me you don't know and we will go on to the next question. If, at anytime, you do not understand a question or do not understand what is being asked of you, just say so and I will repeat the question.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



We will be asking you some questions today about satellite radio. Please read this information about satellite radio from the Sirius and XM web sites.

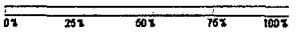
Satellite radio is more than the latest technology. It's an extraordinary new way to experience your favorite music, sports, news, talk, comedy- and it goes anywhere you go. No longer are your choices limited to where you live or travel. Satellite radio gives you the freedom to hear what you want, when you want it. Imagine dozens & dozens of commercial-free music channels playing new & old favorites. Heart-pounding coverage of your favorite pro & college teams. National news broadcasters you trust. Talk shows you rely on to inform & provoke. Even traffic & weather. That's satellite radio.

You can listen to satellite radio in your car, in your home, on the Internet, or wherever you go.

Sirius:
No one can match SIRIUS programming. We've got legendary DJs playing your favorite songs on 69 channels of 100% commercial-free music, plus exclusive live performances and artist interviews. Love sports? SIRIUS is home to NASCAR, the entire NFL and over 40 NBA and NHL games a week, college sports and more. Talk about star power: SIRIUS proudly presents original programming from Martha Stewart, Bill Bradley, Eminem, Tony Hawk, Jim Breuer, Jimmy Buffet, Tony Stewart and Howard Stern. Plus the biggest names in news and talk, great comedy, traffic and weather you need more and more, on over 130 channels of the best of all radio.

XM Is...
. The greatest variety of entertainment in music, sports, talk, comedy, news and entertainment
. Superior digital sound quality coast-to-coast
. Incredibly easy to use wherever you are — at home, at work, in the car or on the go
. The most music on satellite radio
. Exciting sports coverage and detailed play-by-play reporting on your favorite teams
. Affordable at only $12.95 a month, that's less than 50¢ a day

<< >>



The single subscription price per month for satellite radio is $12.95. You can save money if you pay up front for a year or multiple years. Thinking about what we told you and everything else you know, what is the most you would be willing to pay per month for a satellite radio subscription? In other words, what price would be so high that you would no longer consider subscribing?

$ [ ]

☐ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybersept.com.

0% 25% 50% 75% 100%

Next, we will ask you a series of questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s). When giving your answers, please think only of satellite radio that you listen to over the radio. Do not think of or consider any satellite radio programming that you listen to over the Internet.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

How much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams

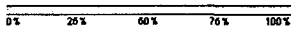
(Please assume that all other aspects of satellite radio would remain the same.)

$

☐ Don't Know / Unsure

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams ***AND***
Sound quality was only equal to that of the FM radio you can listen to

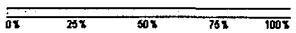
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

There was no sports coverage available, not even your favorite teams ***AND***
Sound quality was only equal to that of the FM radio you can listen to ***AND***
There were no talk shows available, not even your favorite hosts

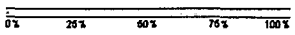
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
There was no music programming available, not even your favorite channels

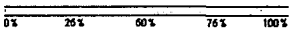
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
*There was no music programming available, not even your favorite channels **AND***
There were no news, weather or traffic reports available

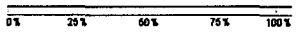
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
*There was no music programming available, not even your favorite channels **AND***
*There were no news, weather or traffic reports available **AND***
There were as many commercials as on AM or FM Radio

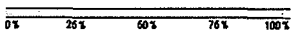
(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.



Now, how much would you pay **monthly** for satellite radio if...

*There was no sports coverage available, not even your favorite teams **AND***
*Sound quality was only equal to that of the FM radio you can listen to **AND***
*There were no talk shows available, not even your favorite hosts **AND***
*There was no music programming available, not even your favorite channels **AND***
*There were no news, weather or traffic reports available **AND***
*There were as many commercials as on AM or FM Radio **AND***
You couldn't get reception nationally, just locally

(Please assume that all other aspects of satellite radio would remain the same.)

$ [ ]

☐ Don't Know / Unsure

[<<] [>>]

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

0% 25% 50% 75% 100%

[INTERVIEWER: READ INSTRUCTIONS TO RESPONDENT]

On the next page is a list of things that people like you have said when asked why they would consider subscribing to satellite radio. As you read through this list, we would like you to rate each statement according to how important it is to you in your decision to subscribe to satellite radio.

Here's how we'd like you to rate the statements:

1. First, read through the list and pick the one statement that is *most important* to you - this is the need that you feel is most critical. Give 100 points to this statement by typing the number "100" in the box next to it.
2. Second, pick the statement that is *least important* to you and give it a score between "0" and "100" based on how important it is *relative to your most important need*. For example, if it is half as important, type the number "50" next to the need -- if the need is of absolutely no importance, give it "0" points.
3. Now, rate each of the other statements relative to the ones you chose as most and least important. When you are finished, each statement should have a number between the lowest number you chose and 100.
   - *Please use as wide a range of numbers as you wish between zero (or the lowest score you assign) and 100.*
   - *Ties are okay for any needs, including the lowest and highest.*
   - *If you don't know, are unsure, if you disagree or you are unaware just check the box at the far right of the statement.*

<< >>

If you encounter any technical difficulties, please contact radio_support@cyberscept.com.

0% 25% 50% 75% 100%

Show Directions

	SCORE	Don't Know/Unsure Disagree/Unaware
Provides excellent sound quality (better than either AM or FM radio)		☐
There are still many channels waiting to be explored		☐
I can listen to music		☐
I can get weather and traffic from all around the country		☐
There are stations available for everyone in my family		☐
I can listen to uncensored programs		☐
It is easy to find what I want to listen to without a lot of hunting around		☐
I can always find what I want to listen to, when I want to listen to it		☐
Provides the latest breaking news - no need to stop what I'm doing and check the Internet		☐
I can listen to the same stations in the car, at home, or on the Internet		☐
Informs me about what music, shows, and events are coming up on other channels		☐
I can listen to music channels without any commercials		☐
Provides consistently clear reception no matter where I go, even in the city		☐

Provides consistently clear reception no matter where I go, even in the city	☐	☐
I can listen to all, not just some of my favorite sport's games	☐	☐
The artist and song name are displayed on my screen so I know what is playing	☐	☐
There are talk and entertainment shows with interesting and knowledgeable hosts	☐	☐
I can listen to music from the 70's, 80's, 90's, and today	☐	☐
I can listen to music from the 40's, 50's and 60's	☐	☐
The depth of the music programming helps me to find new songs to add to my collection	☐	☐
Offers more in-depth sports programming than either AM or FM radio, such as ESPN	☐	☐
There are shows dedicated to specific topics that interest me	☐	☐
I can listen to my stations wherever I go, even when traveling long distances	☐	☐
The organization of channels makes it easy for me to explore a specific genre	☐	☐
I can listen to a lot of programs and content not available on either AM or FM radio	☐	☐
There are programs where interesting and knowledgeable DJ's can create and control the content	☐	☐
I can get weather and traffic reports whenever I want to, without waiting	☐	☐
I can hear programs and music that make me feel nostalgic for what I used listen to when I was younger	☐	☐
The DJ's don't talk too much	☐	☐
I don't hear the same things over and over	☐	☐

<< >>

Those are all of the questions we have for you today. Thank you very much for participating in this study and have a great day.

Supervisor/Recruiter: Click ">>" to be redirected to main login page OR close your browser.

<< >>

If you encounter any technical difficulties, please contact radio_support@cybercept.com.

F

Exhibit F-1. Mall-intercept Survey Screening Statistics and Sample Disposition

	Number of Respondents	Remaining Number of Respondents
Number of potential respondents approached	8,852	8,852
Initial Refusals	2,646	6,206
Language / hearing problem / in a hurry / refuses / appears intoxicated	282	5,924
Know respondent	39	5,885
S1a. Terminate: employment conflict	117	5,768
S1b. Terminate: past study participation	247	5,521
Terminated during demo screener (ans. DK, under 18 or refused to age question)	329	5,192
Terminated- Don't participate in the decision to subscribe to satellite radio	805	4,387
Terminated- Don't know service	260	4,127
Terminated - Not a subscriber or considerer	2,347	1,780
Terminated- Not wearing eye glasses	55	1,725
Terminated- Over quota subscriber/considerer	402	1,323
Terminated - Over quota age and sex	794	529
Terminated- Refused participation	118	411
Terminated- Refused phone number	47	364
Terminated- Did not finish survey	0	364
Terminated- Validation failed / replaced	27	337
Completed Survey	337	
Incidence Rate	**19.5%**	
Response Rate	**68.2%**	

Exhibit F-2 Satellite Radio Mall Survey Screener

SATELLITE RADIO STUDY

TOP SHEET

(THIS IS A PERSONAL INTERVIEW)

-SCREENER-

RESPONDENT ID #: _____

TERMINATION ID#:_____

S.....1

C.....2

(RECORD AT END OF INTERVIEW. PLEASE PRINT.)

RESPONDENT'S NAME: _____ TEL.# ( )_____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

INTERVIEWER: _____ DATE: _____

SATELLITE RADIO STUDY SCREENER USED BY (CITY AND MALL NAME)_____

INTERVIEWER'S SIGNATURE:_____ **DATE:**_____

TIME BEGAN:_____**AM/PM** **TIME ENDED:**_____**AM/PM**

INTRODUCTION: Hello, my name is ___from___, an independent marketing research firm _____. We are a national marketing research firm and are currently conducting a survey and would like to include your opinions. Let me assure you we are doing this for research purposes only and that no one will sell you anything as a result of this study. Your answers will be held in the strictest confidence.

RECORD ALL TERMINATIONS WHICH OCCUR IN ANY QUESTIONS BY CIRCLING THE NEXT AVAILABLE NUMBER IN GRIDS PROVIDED. RECORD ONLY ONE TERMINATION PER CONTACT. RE-USE SCREENER UNTIL YOU REACH A QUALIFIED RESPONDENT.

SPOKE TO BUT INITIAL REFUSAL, CIRCLE BELOW

INITIAL REFUSALS

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

IF RESPONDENT HAS LANGUAGE/HEARING PROBLEM, ETC., IS IN A HURRY, REFUSES INTERVIEW OR APPEARS INTOXICATED, CIRCLE BELOW

LANGUAGE / HEARING PROBLEM / IN A HURRY / REFUSES / APPEARS INTOXICATED

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

IF YOU KNOW THE RESPONDENT AT ALL, CIRCLE BELOW

KNOW RESPONDENT CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

S1a. Are you or any members of your household employed in any of the following industries? **READ LIST AND CIRCLE ALL THAT APPLY**

An insurance company	1	**CONTINUE**
A market research firm	2	**TERMINATE WITH THANKS**
An advertising agency	3	
The entertainment industry	4	
A satellite radio provider	5	
A cable TV provider	6	**CONTINUE**
An internet service provider	7	
None of these	8	

S1a. TERMINATE: EMPLOYMENT CONFLICT

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

S1b. In the past three months, have you taken part in any marketing research survey other than a political poll?

Yes.....1 **(TERMINATE)** No.....2 **(CONTINUE)**

S1b. TERMINATE: PAST STUDY PARTICIPATION

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

S2. I'm going to ask you a few questions, but please be assured that this is only for classification purposes and that your responses will be kept confidential. Which of these groups includes your age? **READ LIST AND CIRCLE ONE CODE ONLY**

Under 18 years of age	1	TERMINATE IN FIRST BOX BELOW WITH
18 - 24	2	CONTINUE – WATCH QUOTAS
25 - 34	3	
35 - 49	4	
50 - 64	5	
65 or older	6	
Refused	7	TERMINATE IN FIRST BOX BELOW WITH

IF "UNDER 18" OR "REFUSED AGE", TERMINATE. CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

MALES

TERMINATE – OVER QUOTA
MALE – 18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
MALE – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
MALE – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
MALE – 50-64 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
MALE–65+ --
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

FEMALES

TERMINATE - OVER QUOTA
FEMALE – 18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
FEMALE – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
FEMALE – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
FEMALE –50-64 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE - OVER QUOTA
FEMALE – 65+ --
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

S.3 Which, if any of the following decisions do you make or take part in making for your household? **READ LIST AND CIRCLE ALL THAT APPLY**

Decision to subscribe to cable TV	1	
Decision to subscribe to Internet service	2	
Decision to subscribe to satellite radio	**3**	**MUST SAY YES TO CONTINUE**
Decision to subscribe to a wireless (cell) phone	4	
Decision to subscribe to satellite TV	5	
None of These	6	**TERMINATE WITH THANKS**
Refused	7	

MALES

TERMINATE -- MALE – 18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- MALE – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- MALE – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE – MALE – 50-64 –
CIRCLE NEXT AVAILABLE NUMBER 01

	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- MALE– 65+ --
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

FEMALE

TERMINATE -- FEMALE – 18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- FEMALE – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- FEMALE – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- FEMALE – 50-64 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- FEMALE – 65+ --
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

S4a. Which of these services, if any, do you currently subscribe to? **READ LIST AND CIRCLE ALL THAT APPLY**

Cable TV	1	**SKIP TO S5a**	**NOTE:** ***THIS IS FOR INFO ONLY HERE*** **WILL USE ANSWERS SHOWN HERE TO CATEGORIZE IN Q7: *QUOTA QUALIFICATION GRID***
Satellite TV	2		
Broadband Internet	3		
Satellite radio	**4**	**IF CIRCLED ASK S4b**	
Wireless (cell) phone service	5	**SKIP TO S5a**	
None of These	6		
Refused	7		

S4b. Which of the following types(s) of satellite radio do you or your household currently subscribe to? **READ LIST AND CIRCLE ALL THAT APPLY**

A paid subscription directly from XM or Sirius	**1**	**SKIP TO S6a**	**NOTE:** ***THIS IS FOR INFO ONLY HERE*** **WILL USE ANSWERS SHOWN HERE TO CATEGORIZE IN Q7: *QUOTA QUALIFICATION GRID***
A trial subscription (such as from the purchase of a car) directly from XM or Sirius	**2**		
Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius	3	**SKIP TO S6a**	
Don't Know	4		

S5a.

ASK S5a. FOR EACH ITEM NOT CIRCLED IN S4a.

Are you or your household currently considering subscribing to **(INSERT ITEM(S) FROM Q.4a)** in the next 30 days? **READ LIST RECORD ANSWER FOR EACH LISTED ITEM**

	Yes	No	DK/Unsure		
Cable TV	1	2	3	**SKIP TO S7**	**NOTE:** **THIS IS FOR INFO ONLY HERE** **WILL USE ANSWERS SHOWN HERE TO CATEGORIZE IN Q7: *QUOTA QUALIFICATION GRID***
Satellite TV	1	2	3		
Broadband Internet	1	2	3		
Satellite radio	**1**	2	3	**IF 'Yes' CIRCLED ASK S5B BELOW**	
Wireless (cell) phone service	1	2	3	**SKIP TO S7**	

S5b. Which of the following type(s) of satellite radio are you or your household considering subscribing to? **READ LIST AND CIRCLE ALL THAT APPLY**

A paid subscription directly from XM or Sirius	**1**	**SKIP TO Q6b**	**NOTE:** **THIS IS FOR INFO ONLY HERE** **WILL USE ANSWERS SHOWN HERE TO CATEGORIZE IN Q7: *QUOTA QUALIFICATION GRID***
A trial subscription (such as from the purchase of a car) directly from XM or Sirius	**2**	**SKIP TO Q6b**	
Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius	3		
Don't Know	4		

S6a. Which satellite radio service(s) do you or your household currently subscribe to? **READ LIST RECORD ONE ANSWER**

XM	1	**SKIP TO S7:** **QUOTA QUALIFICATION GRID**	**NOTE:** **THIS IS FOR INFO ONLY HERE** **WILL USE ANSWERS SHOWN HERE TO CATEGORIZE IN Q7: *QUOTA QUALIFICATION GRID***
Sirius	2		
Both Sirius and XM	3		
DK/Unsure	4	**TERMINATE WITH THANKS**	

MALE

TERMINATE –DON'T KNOW SERVICE
MALES – 18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
MALES – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
MALES – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE – DON'T KNOW SERVICE
MALES – 50-64 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
MALES– 65+ --
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

FEMALE

TERMINATE --DON'T KNOW SERVICE
FEMALES –18-24 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
FEMALES – 25-34 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
FEMALES – 35-49 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE --DON'T KNOW SERVICE
FEMALES – 50-64 –
CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DON'T KNOW SERVICE
FEMALES – 65+ --
CIRCLE NEXT AVAILABLE NUMBER.

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

S6b. Which satellite radio service are you currently considering subscribing to? **(RECORD ONE MENTION)**

XM	1	**CONTINUE**
Sirius	2	
Both Sirius and XM	3	
DK/Have not decided	4	

S7. QUOTA QUALIFICATION

	S4a.	S4b.	S6a.
SATELLITE RADIO SUBSCRIBER	**REFER BACK TO S4a** **IS CODE 4 CIRCLED?** **"Satellite radio"** Yes 1 CONTINUE TO 4b No 2 TERMINATE	**REFER BACK TO S4b** **ARE ONE OR MORE CODES CIRCLED IN SHADED AREAS?** Yes 1 Continue to 6a No 2 TERMINATE	**REFER BACK TO S6a** **DID RESPONDENT ANSWER 'XM' 'SIRIUS' OR 'BOTH'** Yes 1 QUALIFIES No 2 TERMINATE

	S5a.	S5b.
SATELLITE RADIO CONSIDERING SUBSCRIBER	**REFER BACK TO S5a** **IS CODE 4 CIRCLED?** **"Satellite radio"** Yes 1 CONTINUE TO 5b No 2 TERMINATE	**REFER BACK TO S5b** **IS CODE 1 CIRCLED?** **"A paid subscription directly from XM or Sirius"** Yes 1 QUALIFIES No 2 TERMINATE

****REFER TO 'QUOTA QUALIFICATION GRID' ON PREVIOUS PAGE***

IF RESPONDENT DOES NOT QUALIFY FOR EITHER QUOTA GROUP TERMINATE, AND CIRCLE NEXT AVAILABLE NUMBER IN APPROPRIATE BOX BELOW.

MALE

TERMINATE –DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING MALES – 18-24 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING MALES – 25-34 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING MALES – 35-49 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE – DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING MALES – 50-64 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING MALES– 65+ --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

FEMALE

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING FEMALES – 18-24 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING FEMALES – 25-34 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING FEMALES – 35-49 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING FEMALES – 50-64 --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE -- DOES NOT SUBSCRIBE/CONSIDER SUBSCRIBING FEMALES – 65+ --CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

IF QUOTA FOR WHICH RESP. QUALIFIES IS FILLED, TERMINATE AND RECORD IN APPROPRIATE BOX BELOW

OVER QUOTA- SATELLITE RADIO SUBSCRIBER --CIRCLE NEXT AVAILABLE NUMBER BELOW.

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

OVER QUOTA- SATELLITE RADIO CONSIDERING SUBSCRIBER --CIRCLE NEXT AVAILABLE NUMBER BELOW.

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

S8. Do you normally wear eye glasses or contact lenses when you read?

Yes.....1 **(ASK QUESTION S9.)** No.....2 **(SKIP TO INVITATION)**

S9. Do you have your eye glasses with you or are you wearing your contact lenses now?

Yes..... 1 **(CONTINUE)** No..... 2 **(TERMINATE)**

TERMINATE—NO GLASSES / CONTACTS – SATELLITE RADIO SUBSCRIBER –

CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

TERMINATE—NO GLASSES / CONTACTS – SATELLITE RADIO CONSIDERING SUBSCRIBER

CIRCLE NEXT AVAILABLE NUMBER

01	02	03	04
05	06	07	08
09	10	11	12
13	14	15	16

S10. RECORD GENDER OF RESPONDENT BELOW

Male 1

Female..... 2

INVITATION—

ASK EVERYONE

S11 We would like to invite you to participate in a study that we think you will find interesting. The survey will take about 20 minutes. The survey we would like you to participate in requires you to read questions on a computer screen and either use a mouse to point and click your answers or tell me your answers and I will record them. Would you like to participate in this study?

Yes, I will participate .....1 **(CONTINUE WITH S12)**

No, will not participate .....* **(TERMINATE IN APPROPRIATE BOX BELOW)**

TERMINATE – REFUSED TO PARTICIPATE – SATELLITE RADIO SUBSCRIBER –
CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

TERMINATE – REFUSED TO PARTICIPATE – SATELLITE RADIO CONSIDERING SUBSCRIBER –
CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

S12 May I please have your full name, address and phone number? You can be assured that your name and phone number will not be used to sell you anything or for any marketing or telemarketing purposes. It will only be used to verify your participation in the survey. **(RECORD ON FRONT PAGE OF SCREENER. YOU MUST VERIFY RESPONDENT'S PHONE NUMBER. IF RESPONDENT REFUSES TO GIVE PHONE NUMBER, SAY:)** I'm sorry but I cannot ask you to participate in our survey as my client needs your phone number to be able to verify your participation in this study.

Gave phone number ..... 1 **(RECORD ADDRESS AND PHONE #, THEN CONTINUE)**

Refused phone number ..... * **(TERMINATE IN APPROPRIATE BOX BELOW)**

TERMINATE – REFUSED PHONE NUMBER – SATELLITE RADIO SUBSCRIBER –
CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

TERMINATE – REFUSED PHONE NUMBER – SATELLITE RADIO CONSIDERING SUBSCRIBER –
CIRCLE NEXT AVAILABLE NUMBER BELOW.

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

BRING RESPONDENT TO INTERVIEWING AREA. DO NOT DISCUSS THE SUBJECT MATTER OF THE STUDY WITH THE RESPONDENT WHILE WALKING TO FACILITY.

NOTE: IF RESPONDENT WEARS GLASSES/CONTACT LENSES, BE SURE HE/SHE IS WEARING THEM WHEN ADMINISTERING MAIN QUESTIONNAIRE

G

Exhibit G. Internet Survey

Electronics Survey

Thank you for participating in our study. The responses you give to our questions are very important to us and will be kept in confidence. The results of this study will not be used to try to sell you anything.

We ask you to answer all questions as honestly as possible. Please do not allow anyone else to fill out this survey. Thank you for your time and opinions!

Please press the NEXT button at the bottom of the page to begin.

S1a. Are you or any members of your household employed in any of the following industries? **CIRCLE ALL THAT APPLY [RANDOMIZE LIST]**

An insurance company	1	**CONTINUE**
A market research firm	2	**TERMINATE**
An advertising agency	3	
The entertainment industry	4	
A satellite radio provider	5	
A cable TV provider	6	**CONTINUE**
An internet service provider	7	
None of these	8	

S2. Which of these groups includes your age? **CIRCLE ONE CODE ONLY**

Under 18 years of age	1	**TERMINATE**
18 - 24	2	**CONTINUE – WATCH QUOTAS**
25 - 34	3	
35 - 49	4	
50 - 64	5	
65 or older	6	
Refused	7	**TERMINATE**

S2a. In what state do you currently reside? **[DROP DOWN?]**

S2b. What is your gender?

Male	1	
Female	2	

S.3 Which, if any of the following decisions do you make or take part in making for your household? **CIRCLE ALL THAT APPLY [RANDOMIZE LIST]**

Decision to subscribe to cable TV	1	
Decision to subscribe to Internet service	2	
Decision to subscribe to satellite radio	**3**	**MUST SAY YES TO CONTINUE**

Decision to subscribe to a wireless (cell)	4	
Decision to subscribe to satellite TV	5	
None of These	6	**TERMINATE WITH THANKS**

S4a. Which of these services, if any, do you currently subscribe to? **CIRCLE ALL THAT APPLY [RANDOMIZE LIST]**

Cable TV	1	**SKIP TO S5a**
Satellite TV	2	
Broadband Internet	3	
Satellite radio	**4**	**IF CIRCLED ASK S4b**
Wireless (cell) phone service	5	**SKIP TO S5a**
None of These	6	
Don't Know / Unsure	7	

S4b. Which of the following types(s) of satellite radio do you or your household currently subscribe to? **CIRCLE ALL THAT APPLY**

A paid subscription directly from XM or Sirius	**1**	**SKIP TO S6a**
A trial subscription (such as from the purchase of a car) directly from XM or Sirius	**2**	
Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius	3	**TERMINATE**
Don't Know	4	

S5a.

ASK S5a. FOR EACH ITEM NOT CIRCLED IN S4a.

Are you or your household currently considering subscribing to **(INSERT ITEM(S) FROM Q.4a)** in the next 30 days? **RECORD ANSWER FOR EACH LISTED ITEM [RANDOMIZE LIST]**

	Yes	**No**	**DK/Unsure**	
Cable TV	1	2	3	**TERMINATE**
Satellite TV	1	2	3	
Broadband Internet	1	2	3	
Satellite radio	**1**	2	3	**IF 'Yes' CIRCLED ASK S5B BELOW**
Wireless (cell) phone service	1	2	3	**TERMINATE**

S5b. Which of the following type(s) of satellite radio are you or your household considering subscribing to? **CIRCLE ALL THAT APPLY**

A paid subscription directly from XM or Sirius	**1**	**SKIP TO Q6b**
A trial subscription (such as from the purchase of a car) directly from XM or Sirius	**2**	**TERMINATE**
Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius	3	
Don't Know	4	

S6a. Which satellite radio service(s) do you or your household currently subscribe to? **RECORD ONE ANSWER**

XM	1	**SKIP TO Q1**
Sirius	2	
Both Sirius and XM	3	
DK/Unsure	4	**TERMINATE**

S6b. Which satellite radio service are you currently considering subscribing to? **RECORD ONE ANSWER**

XM	1	**SKIP TO Q3**
Sirius	2	
Both Sirius and XM	3	
DK/Have not decided	4	

Q1. How long have you been a Satellite Radio subscriber? **(Circle one only)**

Less than 1 year	1
1 to 2 years	2
3 to 4 years	3
More than 5 years	4
DK/Unsure	5

Q2. How many satellite radio receivers do you currently own? **(Circle one only)**

One	1
Two	2

Three	3
Four	4
5 or more	5
DK/Unsure	6

Q2a. What type or types of satellite radio receiver(s) do you own? **(Circle all that apply)**
[RANDOMIZE LIST EXCEPT OTHER/DK]

A home-use receiver	1
An in-dash car receiver	2
A plug & play unit that can be used with home	3
A portable unit that can be used anywhere	4
Other (Specify:_____)	5
DK/Unsure	6

Q2b. Where do you listen to satellite radio? **(Circle all that apply)**

[RANDOMIZE LIST EXCEPT OTHER/DK]

At home	1	**SKIP TO Q4a INTRO**
At work	2	
In the car	3	
On the Internet	4	
Outdoors	5	
Other (Specify_____)	6	
DK/Unsure	7	

Q3. We will be asking you some questions today about satellite radio. Now please read this information about satellite radio from the **[FILL 'XM WEB SITE', 'SIRIUS WEB SITE' OR 'XM AND SIRIUS WEB SITES' FROM S6B].**

Satellite radio is more than the latest technology. It's an extraordinary new way to experience your favorite music, sports, news, talk, comedy- and it goes anywhere you go. No longer are your choices limited to where you live or travel. Satellite radio gives you the freedom to hear what you want, when you want it. Imagine dozens & dozens of commercial-free music channels playing new & old favorites. Heart-pounding coverage of your favorite pro & college teams. National news broadcasters you trust. Talk shows you rely on to inform & provoke. Even traffic & weather. That's satellite radio.

You can listen to satellite radio in your car, in your home, on the Internet, or wherever you go.
[IF S6B = 1 THEN SHOW INFORMATION ABOUT XM ONLY]
[IF S6B = 2 THEN SHOW INFORMATION ABOUT SIRIUS ONLY]
[IF S6B = 3 OR 4 THEN RANDOMIZE ORDER OF PRESENTATION OF XM AND SIRIUS. RECORD ORDER.]

XM is...

- The greatest variety of entertainment in music, sports, talk, comedy, news and entertainment

- Superior digital sound quality coast-to-coast
- Incredibly easy to use wherever you are --- at home, at work, in the car or on the go
- The most music on satellite radio
- Exciting sports coverage and detailed play-by-play reporting on your favorite teams
- Affordable at only $12.95 a month, that's less than 50¢ a day

About Sirius:
No one can match SIRIUS programming. We've got legendary DJs playing your favorite songs on 69 channels of 100% commercial-free music, plus exclusive live performances and artist interviews. Love sports? SIRIUS is home to NASCAR, the entire NFL and over 40 NBA and NHL games a week, college sports and more. Talk about star power: SIRIUS proudly presents original programming from Martha Stewart, Bill Bradley, Eminem, Tony Hawk, Jim Breuer, Jimmy Buffet, Tony Stewart and Howard Stern. Plus the biggest names in news and talk, great comedy, traffic and weather you need more and more, on over 130 channels of the best of all radio.
[SKIP TO Q4B INTRO]

Q4a. INTRO

Reflecting on your use of satellite radio in a typical week, how much do you value the different aspects of satellite radio **music programming**? By value, we mean: what is the relative importance of each of these features in motivating you to listen to music programming on satellite radio?

Please do so by allocating 100 points among the percent value of features below. If you do not place any value on a particular feature, give it a zero. The feature you value the most should get the highest number of points, the second most should get fewer points, etc. Make sure the total adds up to 100%.

Q4b. INTRO

Thinking about your future use of satellite radio during a typical week, how much would you value the different aspects of satellite radio **music programming**? By value, we mean: what is the relative importance of each of these features that would motivate you to listen to music programming on satellite radio?

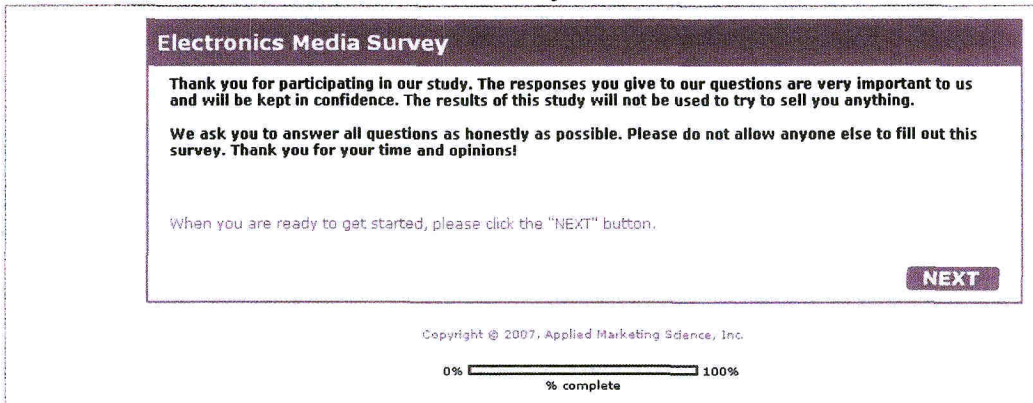
Please do so by allocating 100 points among the percent value of features below. If you do not place any value on a particular feature, give it a zero. The feature you value the most should get the highest number of points, the second most should get fewer points, etc. Make sure the total adds up to 100%.

[RANDOMIZE ORDER OF FEATURES]

Music Programming Feature	% of Value to
The artist and song title are displayed on my screen	
I can hear music from the 70's, 80's, 90's and today	
I can hear music from the 40's, 50's, 60's and earlier	
DJ's and celebrity hosts provide commentary and personality	
The selection and sequencing of the songs on the channels I listen to	
Most channels are commercial free	
The music is uncensored	
I can hear live studio performances and live concerts	
	Total must

Thank you. Those are all the questions we have for you today.

Exhibit G-2.1. Subscribers Internet Survey Screen Shots



Electronics Media Survey

Thank you for participating in our study. The responses you give to our questions are very important to us and will be kept in confidence. The results of this study will not be used to try to sell you anything.

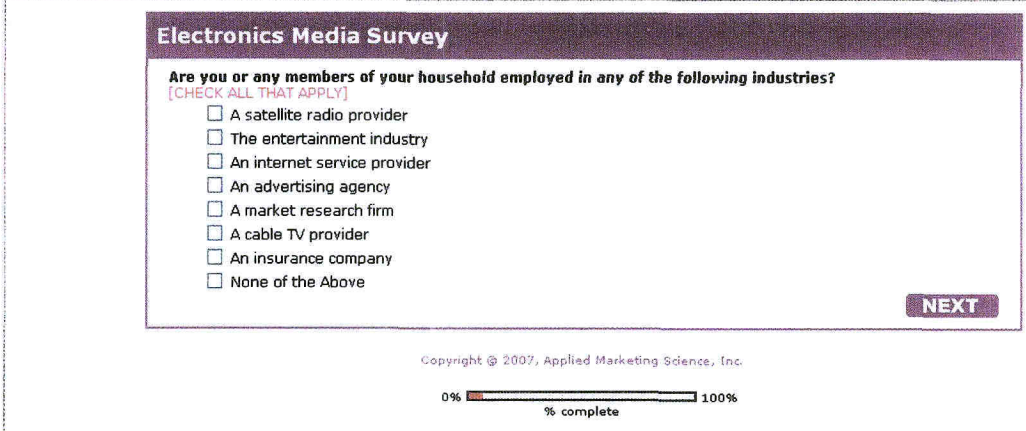
We ask you to answer all questions as honestly as possible. Please do not allow anyone else to fill out this survey. Thank you for your time and opinions!

When you are ready to get started, please click the "NEXT" button.

NEXT

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0% 100%
% complete



Electronics Media Survey

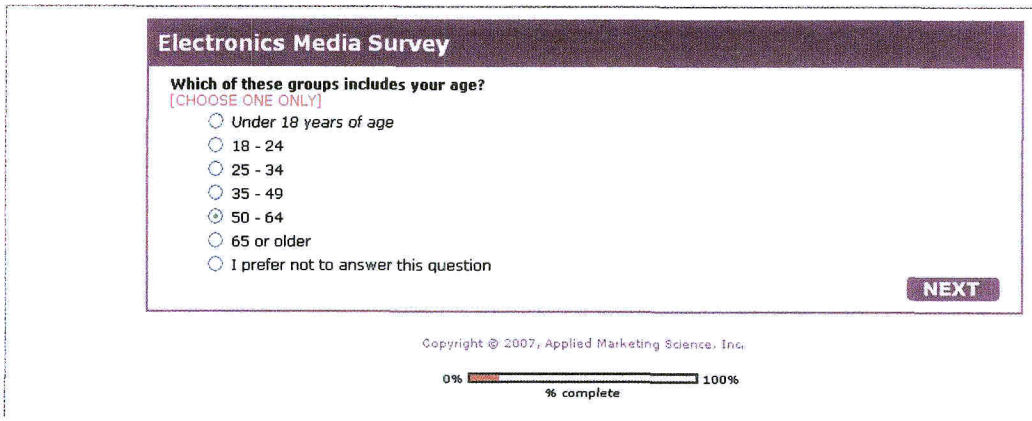
Are you or any members of your household employed *in any of the following* industries?
[CHECK ALL THAT APPLY]

- ☐ A satellite radio provider
- ☐ The entertainment industry
- ☐ An internet service provider
- ☐ An advertising agency
- ☐ A market research firm
- ☐ A cable TV provider
- ☐ An insurance company
- ☐ None of the Above

NEXT

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0% 100%
% complete



Electronics Media Survey

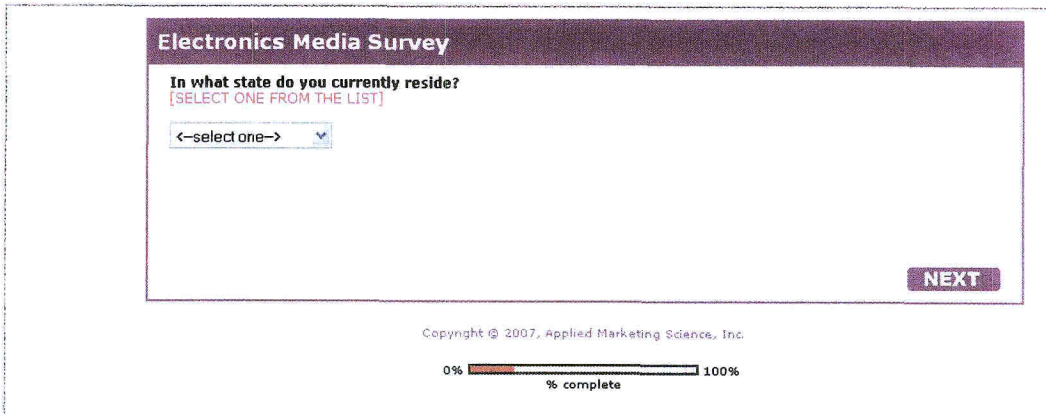
Which of these groups includes your age?
[CHOOSE ONE ONLY]

- ○ *Under 18 years of age*
- ○ 18 - 24
- ○ 25 - 34
- ○ 35 - 49
- ◉ 50 - 64
- ○ 65 or older
- ○ I prefer not to answer this question

NEXT

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0% 100%
% complete



Electronics Media Survey

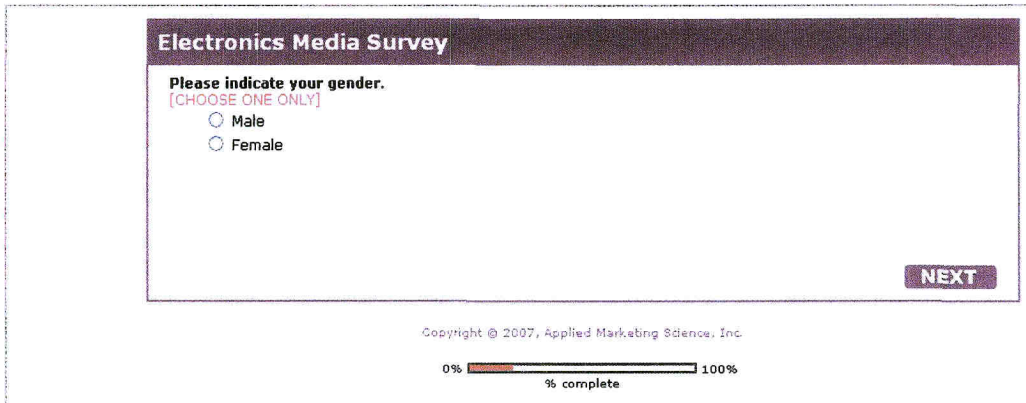
In what state do you currently reside?
[SELECT ONE FROM THE LIST]

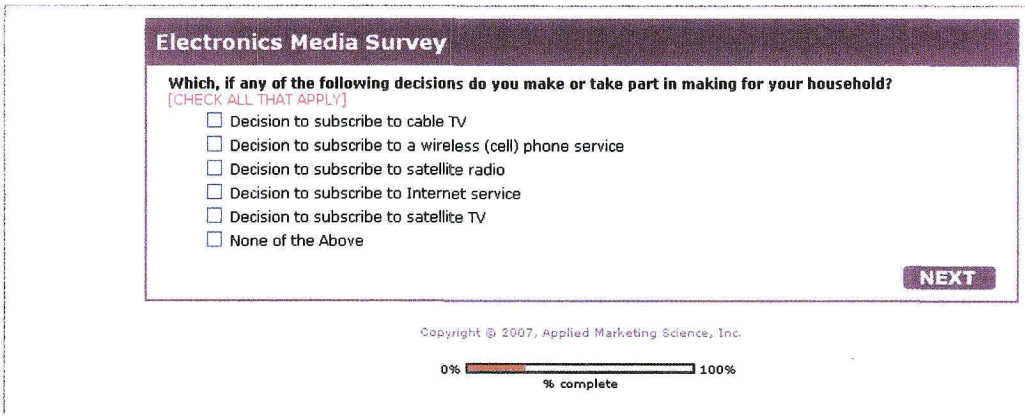
<--select one-->

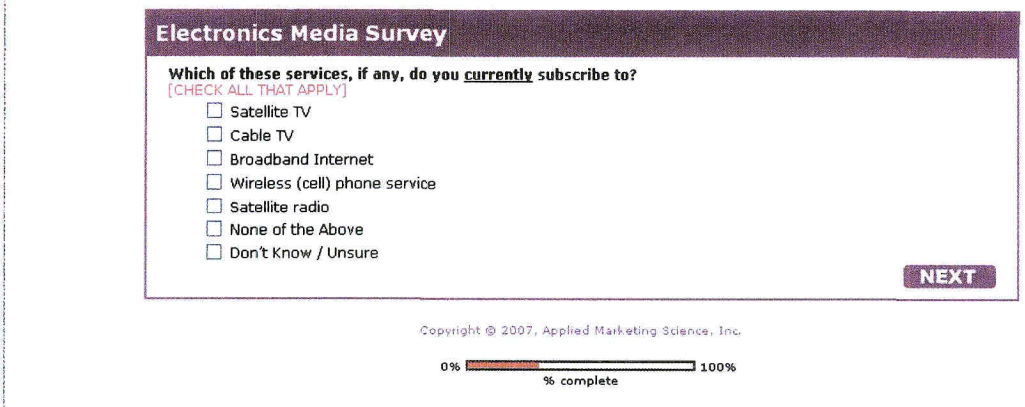
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Electronics Media Survey
Please indicate your gender.
[CHOOSE ONE ONLY]
Male
Female
NEXT
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Electronics Media Survey
Which, if any of the following decisions do you make or take part in making for your household?
[CHECK ALL THAT APPLY]
Decision to subscribe to cable TV
Decision to subscribe to a wireless (cell) phone service
Decision to subscribe to satellite radio
Decision to subscribe to Internet service
Decision to subscribe to satellite TV
None of the Above
NEXT
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Electronics Media Survey
Which of these services, if any, do you currently subscribe to?
[CHECK ALL THAT APPLY]
Satellite TV
Cable TV
Broadband Internet
Wireless (cell) phone service
Satellite radio
None of the Above
Don't Know / Unsure
NEXT
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Electronics Media Survey

Which of the following types(s) of satellite radio do you or your household currently subscribe to?
[CHECK ALL THAT APPLY]

- ☐ A paid subscription directly from XM or Sirius
- ☐ A trial subscription (such as from the purchase of a car) directly from XM or Sirius
- ☐ Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius
- ☐ Don't Know

NEXT

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Electronics Media Survey

Which satellite radio service(s) do you or your household currently subscribe to?
[CHOOSE ONE ONLY]

- ○ XM
- ○ Sirius
- ○ Both Sirius and XM
- ○ Don't know/Unsure

NEXT

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Electronics Media Survey

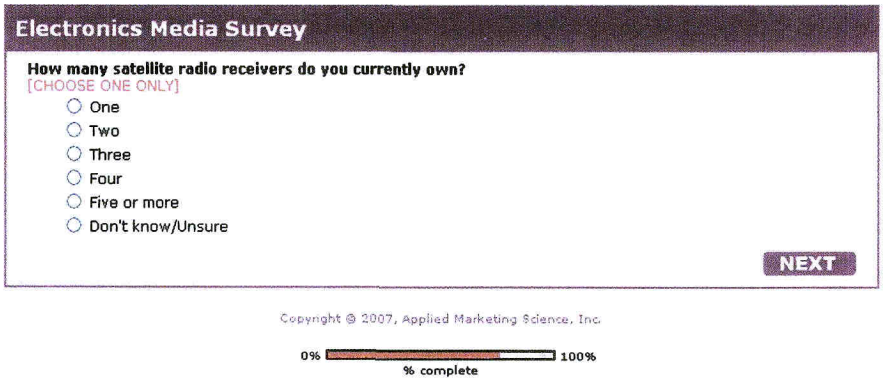
How long have you been a Satellite Radio subscriber?
[CHOOSE ONE ONLY]

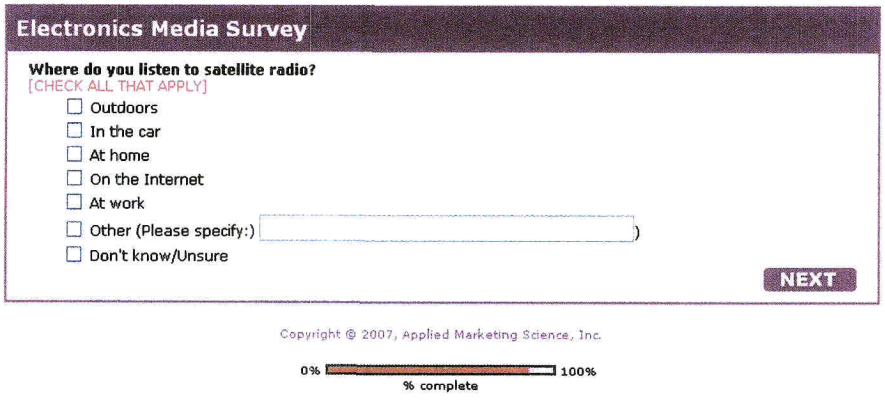
- ○ Less than 1 year
- ○ 1 to 2 years
- ○ 3 to 4 years
- ○ More than 5 years
- ○ Don't know/Unsure

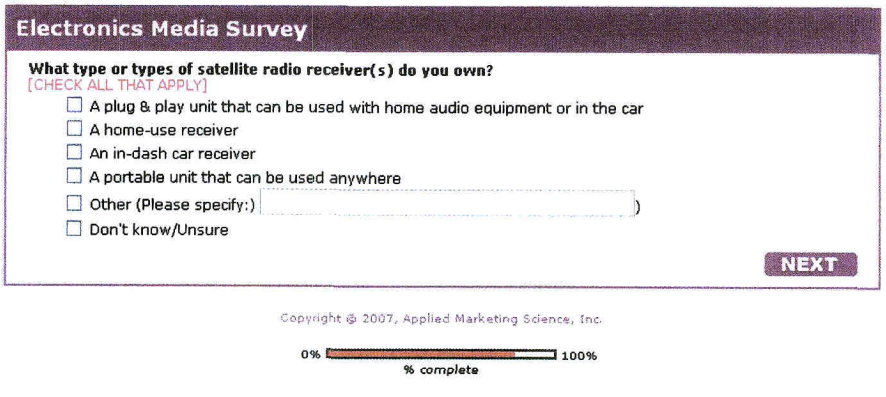
NEXT

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Electronics Media Survey
How many satellite radio receivers do you currently own?
[CHOOSE ONE ONLY]
One
Two
Three
Four
Five or more
Don't know/Unsure
NEXT
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0%
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% complete


Electronics Media Survey
Where do you listen to satellite radio?
[CHECK ALL THAT APPLY]
Outdoors
In the car
At home
On the Internet
At work
Other (Please specify:)
Don't know/Unsure
NEXT
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% complete


Electronics Media Survey
What type or types of satellite radio receiver(s) do you own?
[CHECK ALL THAT APPLY]
A plug & play unit that can be used with home audio equipment or in the car
A home-use receiver
An in-dash car receiver
A portable unit that can be used anywhere
Other (Please specify:)
Don't know/Unsure
NEXT
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Electronics Media Survey

Which of the following types(s) of satellite radio do you or your household currently subscribe to?
[CHECK ALL THAT APPLY]

- ☐ A paid subscription directly from XM or Sirius
- ☐ A trial subscription (such as from the purchase of a car) directly from XM or Sirius
- ☐ Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius
- ☐ Don't Know

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Electronics Media Survey

Which satellite radio service(s) do you or your household currently subscribe to?
[CHOOSE ONE ONLY]

- ○ XM
- ○ Sirius
- ○ Both Sirius and XM
- ○ Don't know/Unsure

NEXT

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Electronics Media Survey

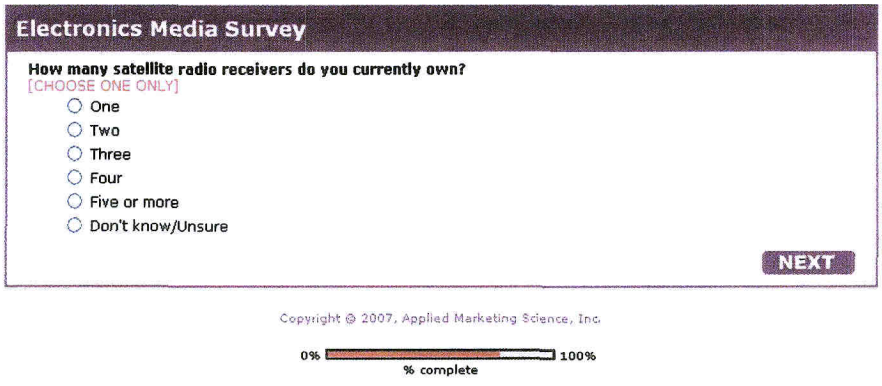
How long have you been a Satellite Radio subscriber?
[CHOOSE ONE ONLY]

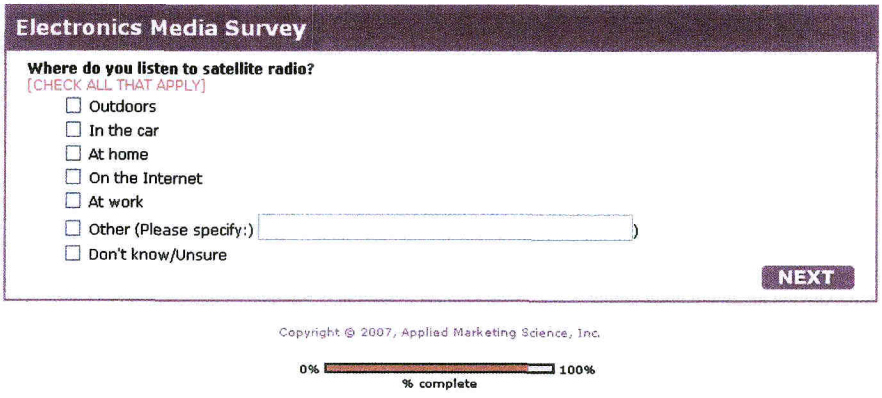
- ○ Less than 1 year
- ○ 1 to 2 years
- ○ 3 to 4 years
- ○ More than 5 years
- ○ Don't know/Unsure

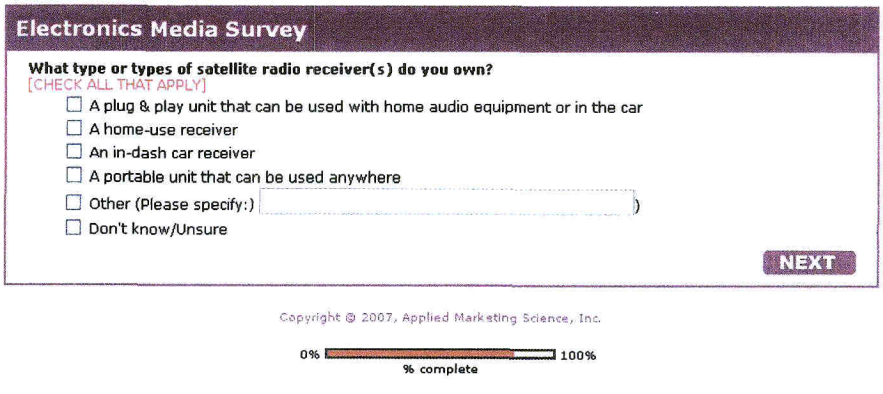
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Electronics Media Survey
How many satellite radio receivers do you currently own?
[CHOOSE ONE ONLY]
One
Two
Three
Four
Five or more
Don't know/Unsure
NEXT
Copyright © 2007, Applied Marketing Science, Inc.
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% complete


Electronics Media Survey
Where do you listen to satellite radio?
[CHECK ALL THAT APPLY]
Outdoors
In the car
At home
On the Internet
At work
Other (Please specify:)
Don't know/Unsure
NEXT
Copyright © 2007, Applied Marketing Science, Inc.
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% complete


Electronics Media Survey
What type or types of satellite radio receiver(s) do you own?
[CHECK ALL THAT APPLY]
A plug & play unit that can be used with home audio equipment or in the car
A home-use receiver
An in-dash car receiver
A portable unit that can be used anywhere
Other (Please specify:)
Don't know/Unsure
NEXT
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Electronics Media Survey

Reflecting on your use of satellite radio in a typical week, how much do you value the different aspects of satellite radio **music programming**? By value, we mean: what is the relative importance of each of these features in motivating you to listen to music programming on satellite radio?

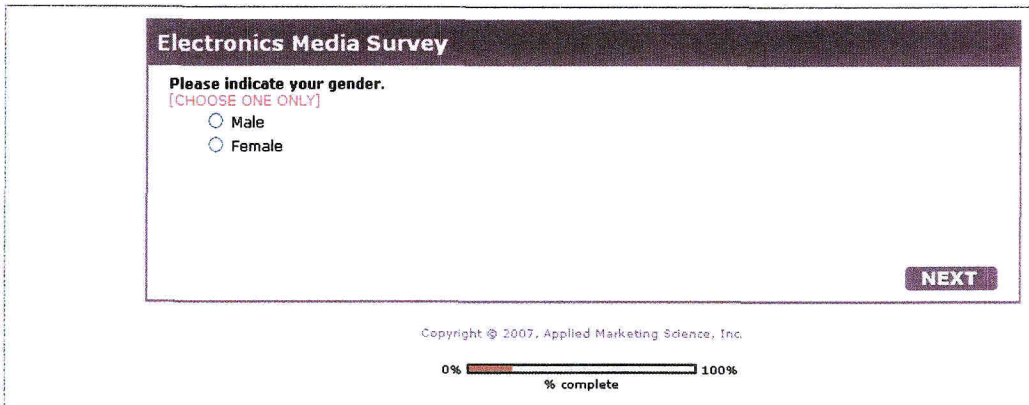
Please do so by allocating 100 points among the percent value of features below. If you do not place any value on a particular feature, *give it a* zero. The feature you value the most should get the highest number of points, the second most should get fewer points, etc. Make sure *the total adds up* to 100%.

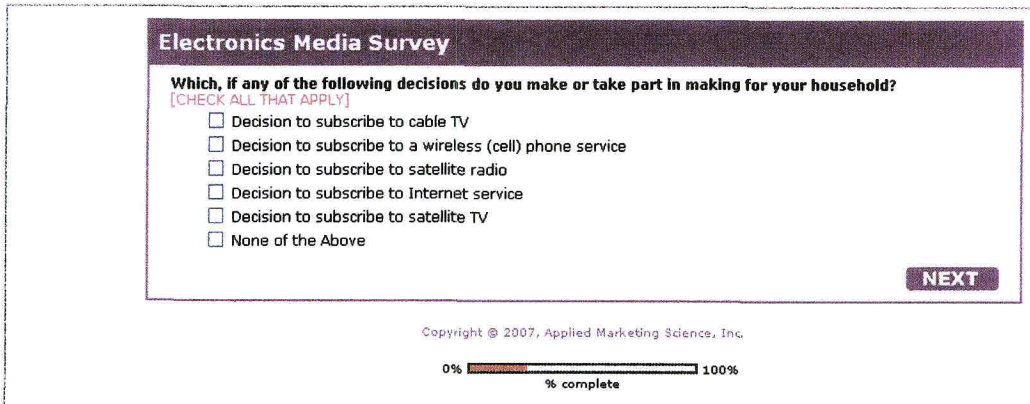
[TOTAL MUST ADD UP TO 100%]

Music Programming Feature	% of Value
I can hear live studio performances and live concerts	%
The selection and sequencing of the songs on the channels I listen to	%
I can hear music from the 70's, 80's, 90's and today	%
DJ's and celebrity hosts provide commentary and personality	%
I can hear music from the 40's, 50's, 60's and earlier	%
The artist and song title are displayed on my screen	%
The music is uncensored	%
Most channels are commercial free	%
Total:	0 %

NEXT

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Electronics Media Survey
Please indicate your gender.
[CHOOSE ONE ONLY]
Male
Female
NEXT
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0%
100%
% complete


Electronics Media Survey
Which, if any of the following decisions do you make or take part in making for your household?
[CHECK ALL THAT APPLY]
Decision to subscribe to cable TV
Decision to subscribe to a wireless (cell) phone service
Decision to subscribe to satellite radio
Decision to subscribe to Internet service
Decision to subscribe to satellite TV
None of the Above
NEXT
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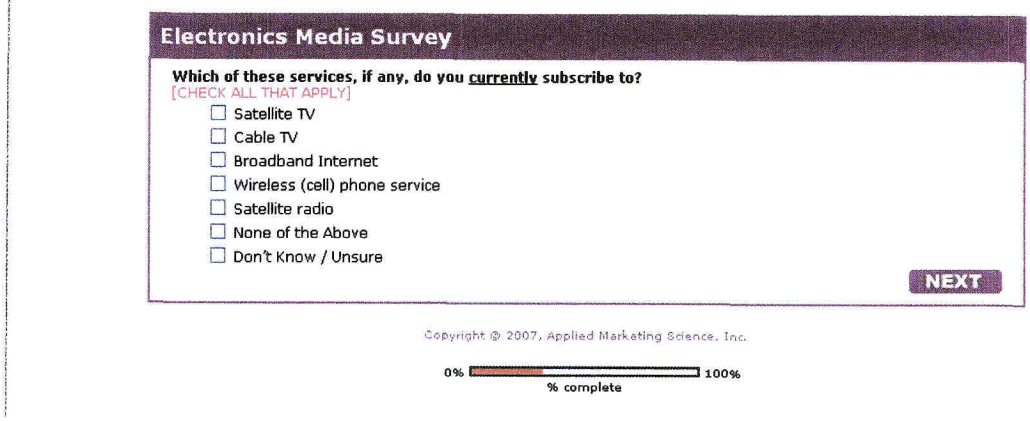
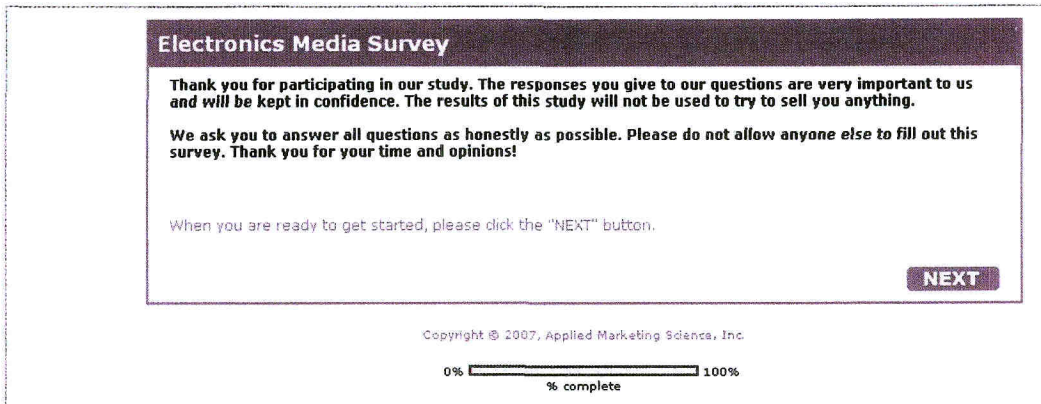
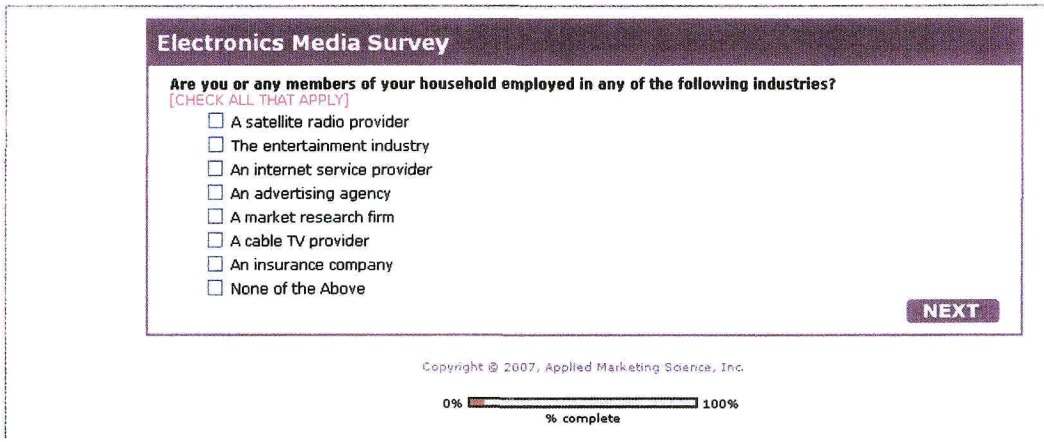
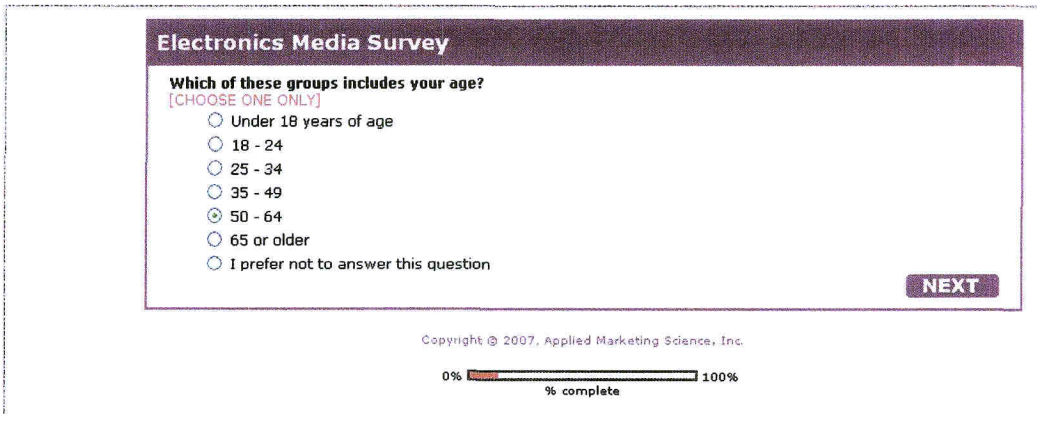
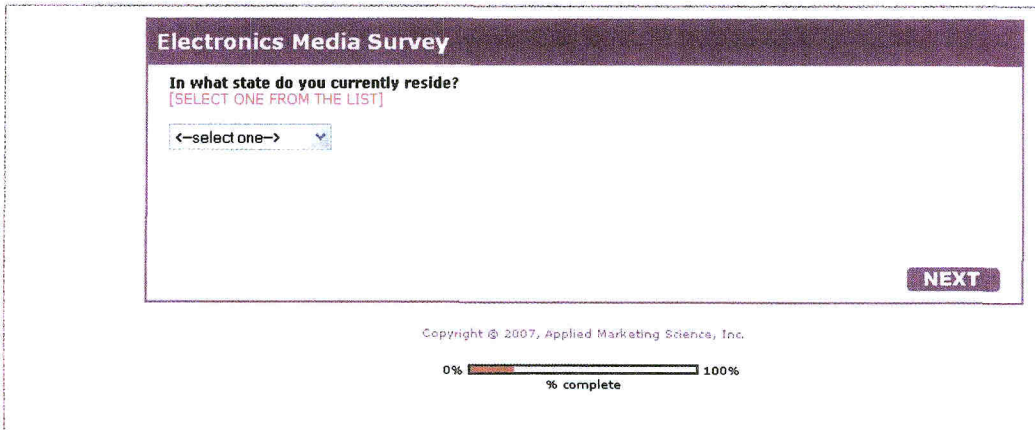

Electronics Media Survey
Which of these services, if any, do you currently subscribe to?
[CHECK ALL THAT APPLY]
Satellite TV
Cable TV
Broadband Internet
Wireless (cell) phone service
Satellite radio
None of the Above
Don't Know / Unsure
NEXT
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Exhibit G-2.2. Considerers CAI Screen Shots









Electronics Media Survey

Are you or your household currently considering subscribing to Broadband Internet, Cable TV, Satellite TV, Satellite radio, in the next 30 days?
[CHOOSE ONE ONLY FOR EACH ITEM]

	Yes	No	Don't know/ Unsure
Broadband Internet	○	○	○
Cable TV	○	○	○
Satellite TV	○	○	○
Satellite radio	○	○	○

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Electronics Media Survey

Which of the following types(s) of satellite radio are you or your household considering subscribing to?
[CHECK ALL THAT APPLY]

- ☐ A paid subscription directly from XM or Sirius
- ☐ A trial subscription (such as from the purchase of a car) directly from XM or Sirius
- ☐ Part of a package from a third party (such as through DirecTV, DiSH Network or AOL) or directly purchased satellite radio for Internet delivery only from XM or Sirius
- ☐ Don't Know

NEXT

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Electronics Media Survey

Which satellite radio service are you currently <u>considering</u> subscribing to?
[CHOOSE ONE ONLY]

- ○ XM
- ○ Sirius
- ○ Both Sirius and XM
- ○ Don't know/Have not decided

NEXT

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Electronics Media Survey

We will be asking you some questions today about satellite radio. Now please read this information about satellite radio from the **XM and Sirius Web Sites**.

Satellite radio is more than the latest technology. It's an extraordinary new way to experience your favorite music, sports, news, talk, comedy- and it goes anywhere you go. No longer are your choices limited to where you live or travel. Satellite radio gives you the freedom to hear what you want, when you want it. Imagine dozens & dozens of commercial-free music channels playing new & old favorites. Heart-pounding coverage of your favorite pro & college teams. National news broadcasters you trust. Talk shows you rely on to inform & provoke. Even traffic & weather. That's satellite radio.

You can listen to satellite radio in your car, in your home, on the Internet, or wherever you go.

XM is...

- The greatest variety of entertainment in music, sports, talk, comedy, news and entertainment
- Superior digital sound quality coast-to-coast
- Incredibly easy to use wherever you are --- at home, at work, in the car or on the go
- The most music on satellite radio
- Exciting sports coverage and detailed play-by-play reporting on your favorite teams
- Affordable at only $12.95 a month, that's less than 50¢ a day

About Sirius:

No one can match SIRIUS programming. We've got legendary DJs playing your favorite songs on 69 channels of 100% commercial-free music, plus exclusive live performances and artist interviews. Love sports? SIRIUS is home to NASCAR, the entire NFL and over 40 NBA and NHL games a week, college sports and more. Talk about star power: SIRIUS proudly presents original programming from Martha Stewart, Bill Bradley, Eminem, Tony Hawk, Jim Breuer, Jimmy Buffet, Tony Stewart and Howard Stern. Plus the biggest names in news and talk, great comedy, traffic and weather you need more and more, on over 130 channels of the best of all radio.

NEXT

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Electronics Media Survey

Thinking about your future use of satellite radio during a typical week, how much would you value the different aspects of satellite radio **music programming**? By value, we mean: what is the relative importance of each of these features that would motivate you to listen to music programming on satellite radio?

Please do so by allocating 100 points among the percent value of features below. If you do not place any value on a particular feature, give it a zero. The feature you value the most should get the highest number of points, the second most should get fewer points, etc. Make sure the total adds up to 100%.

[TOTAL MUST ADD UP TO 100%]

Music Programming Feature	% of Value
DJ's and celebrity hosts provide commentary and personality	%
The artist and song title are displayed on my screen	%
The selection and sequencing of the songs on the channels I listen to	%
I can hear music from the 40's, 50's, 60's and earlier	%
Most channels are commercial free	%
The music is uncensored	%
I can hear music from the 70's, 80's, 90's and today	%
I can hear live studio performances and live concerts	%
Total:	0 %

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H

Exhibit H. Internet Survey Invitation to Respondents

Details of today's survey:

Topic: Electronics

Reward: An Instant Win game play and an entry in the $25,000 sweepstakes.

Survey length: 5 minutes.

Click this link to start: <field>LINK</field>

Your opinion makes a difference. Thank you for taking part.
Questions? Please reference survey number 669583

Dana Jevarjian
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Survey Sampling International, LLC
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Dana_Jevarjian@surveysampling.com
surveysampling.com

1977-2007: Your trusted partner in sampling for 30 years

Exhibit I. Internet Survey Screening Statistics and Sample Disposition

	Number of Respondents	Remaining Number of Respondents
Invitations sent out by Survey Sampling	100,454	100,454
Did not respond to invitation	81,153	19,301
Exited before demo screener (Logon, Age, Sex, HH Income, State)	145	19,156
Exited when asked decision making	2	19,154
Exited when asked 'where do you listen to satellite radio'	3	19,151
Terminated - employment conflict	358	18,793
Terminated during demo screener (ans. DK or refused to age question)	62	18,731
Terminated - Over quota age, sex and region	15,902	2,829
Terminated- Don't participate in the decision to subscribe to satellite radio	1,670	1,159
Terminated- Wrong subscription type	51	1,108
Terminated - Not a considerer	789	319
Failed to Validate	40	279
Completed Survey	279	
Incidence Rate	**11.3%**	
Response Rate	**18.7%**	

J

Exhibit J-1. Willingness to Pay for Satellite Radio - Not Reweighted

Willingness to Pay for Satellite Radio in the Absence of Features							
Overall							
Order	Local Reception Only[1]	Sound Quality Equal to FM	As Many Commercials as on AM or FM	No Music	No Talk	No Sports	No News Weather or Traffic
First	$7.95	$8.34	$5.10	$3.33	$10.18	$9.52	$9.48
Last	$12.67	$12.24	$11.64	$11.61	$12.71	$12.37	$12.52
Overall	$10.95	$11.10	$10.14	$9.27	$11.57	$11.57	$11.41
Base:	295						
Willingness to Pay for Satellite Radio in the Absence of Features							
Subscribers							
Order	Local Reception Only	Sound Quality Equal to FM	As Many Commercials as on AM or FM	No Music	No Talk	No Sports	No News Weather or Traffic
First	$7.57	$7.73	$4.27	$3.17	$10.04	$9.17	$8.65
Last	$12.58	$12.03	$11.21	$11.45	$12.63	$12.17	$12.38
Overall	$10.80	$11.02	$10.16	$9.15	$11.46	$11.51	$11.22
Base:	214						
Willingness to Pay for Satellite Radio in the Absence of Features							
Considerers							
Order	Local Reception Only	Sound Quality Equal to FM	As Many Commercials as on AM or FM	No Music	No Talk	No Sports	No News Weather or Traffic
First	$9.09	$10.18	$7.60	$3.80	$10.61	$10.56	$11.97
Last	$12.95	$12.87	$12.93	$12.09	$12.95	$12.95	$12.95
Overall	$11.38	$11.34	$10.06	$9.61	$11.91	$11.75	$11.96
Base:	81						

1) The headings in this table represent satellite radio in the absence of features which were removed during the willingness to pay question in the mail survey.

1. You couldn't get reception nationally, just locally

2. Sound quality was only equal to that of the FM radio you can listen to

3. There were as many commercials as on AM or FM Radio

4. There was no music available, not even your favorite channels

5. There were no talk shows available, not even your favorite hosts

6. There was no sports coverage available, not even your favorite teams

7. There were no news, weather or traffic reports available

Exhibit J-2. Willingness to Pay for Satellite Radio - Reweighted

Willingness to pay for Music	
	Overall
Order	No Music[1]
First	$6.19
Last	$11.61
Overall	$9.73
Base:	295
Willingness to pay for Music	
	Subscribers
Order	No Music
First	$6.38
Last	$11.45
Overall	$9.69
Base:	214
Willingness to pay for Music	
	Considerers
Order	No Music
First	$5.63
Last	$12.09
Overall	$9.83
Base:	81

1) The heading in this table representa satellite radio in the absence of music: "There was no music available, not even your favorite channels"

K

Exhibit K-1. Value of Satellite Radio Features - Not Reweighted

Value of Satellite Radio Features							
Overall							
Order	National Reception[1]	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Music	Current Levels of Talk	Current Levels of Sports	Current Levels of News Weather and Traffic
First	$4.65	$4.38	$7.60	$9.21	$2.58	$3.18	$2.98
Last	$0.11	$0.43	$0.59	$0.92	$0.00	$0.34	$0.30
Overall	$1.68	$1.54	$2.50	$3.37	$1.05	$1.07	$1.22
Base:	295						
Value for Satellite Radio Features							
Subscribers							
Order	National Reception	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Music	Current Levels of Talk	Current Levels of Sports	Current Levels of News Weather and Traffic
First	$4.91	$4.92	$8.35	$9.23	$2.66	$3.30	$3.65
Last	$0.15	$0.55	$0.79	$0.94	$0.00	$0.46	$0.40
Overall	$1.72	$1.51	$2.37	$3.38	$1.06	$1.02	$1.30
Base:	214						
Value for Satellite Radio Features							
Considerers							
Order	National Reception	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Music	Current Levels of Talk	Current Levels of Sports	Current Levels of News Weather and Traffic
First	$3.86	$2.77	$5.35	$9.16	$2.34	$2.84	$0.98
Last	$0.00	$0.08	$0.02	$0.86	$0.00	$0.00	$0.00
Overall	$1.57	$1.61	$2.89	$3.34	$1.04	$1.20	$0.99
Base:	81						

1) The headings in this table represent the values of features as measured by the willingness to pay question in the mall survey. They are listed in full below.

1. You couldn't get reception nationally, just locally

2. Sound quality was only equal to that of the FM radio you can listen to

3. There were as many commercials as on AM or FM Radio

4. There was no music available, not even your favorite channels

5. There were no talk shows available, not even your favorite hosts

6. There was no sports coverage available, not even your favorite teams

7. There were no news, weather or traffic reports available

Exhibit K-2. Value of Satellite Radio Features - Reweighted

Value for Satellite Radio Features	
	Overall
Order	Current Levels of Music[1]
First	$6.48
Last	$0.92
Overall	$2.93
Base:	295
Value for Satellite Radio Features	
	Subscribers
Order	Current Levels of Music
First	$6.20
Last	$0.94
Overall	$2.87
Base:	214
Value for Satellite Radio Features	
	Considerers
Order	Current Levels of Music
First	$7.32
Last	$0.86
Overall	$3.12
Base:	81

1) The heading in this table represents the value of music measured by the willingness to pay question in the mall survey:
"There was no music available, not even your favorite channels"

L

Exhibit L. Anchored Importances as Measured in the Mall-Intercept Survey

Feature (not necessarily independent features)	Average Anchored Score Overall*	% Given Most Points Overall*	Anchored Importance Subscribers	% Given Most Points Subscribers	Anchored Importance Considerers	% Given Most Points Considerers
I can listen to music	89.0	10.7%	88.7	10.2%	90.1	12.2%
I can listen to music channels without any commercials	87.2	9.7%	86.7	10.3%	88.5	7.9%
I can always find what I want to listen to, when I want to listen to it	84.1	7.7%	84.1	8.3%	84.2	5.7%
Provides excellent sound quality (better than either AM or FM radio)	82.3	4.2%	81.5	4.2%	84.8	4.3%
I can listen to music from the 70's, 80's, 90's, and today	81.8	5.4%	81.7	5.3%	82.0	5.5%
I can listen to my stations wherever I go, even when traveling long distances	81.0	4.3%	80.2	4.6%	83.4	3.4%
Provides consistently clear reception no matter where I go, even in the city	80.9	4.2%	80.4	4.2%	82.1	4.4%
The artist and song name are displayed on my screen	80.6	3.5%	80.0	3.2%	82.2	4.5%
I can listen to a lot of programs and content not available on either AM or FM radio	79.1	5.7%	79.3	6.3%	78.7	3.9%
It is easy to find what I want to listen to without a lot of hunting around	77.1	2.4%	75.8	2.7%	81.2	1.6%
I don't hear the same things over and over	77.0	3.0%	75.1	2.6%	82.9	4.1%
The organization of channels makes it easy for me to explore a specific genre	74.4	1.6%	74.1	1.5%	75.3	1.7%
The depth of the music programming helps me to find new songs to add to my collection	72.2	2.9%	70.7	2.6%	76.9	3.7%
The DJ's don't talk too much	71.1	2.9%	69.2	2.7%	76.8	3.3%
I can listen to the same stations in the car, at home, or on the Internet	71.0	3.5%	67.9	2.8%	80.3	5.4%
I can listen to uncensored programs	69.7	3.6%	69.7	4.2%	69.5	1.8%
There are shows dedicated to specific topics that interest me	68.8	2.9%	68.0	3.0%	71.3	2.6%
There are stations available for everyone in my family	68.2	3.2%	68.1	3.3%	68.7	3.0%
I can hear programs and music that make me feel nostalgic for what I used listen to when I was younger	66.8	2.1%	66.2	2.1%	68.5	2.3%
Provides the latest breaking news – no need to stop what I'm doing and check the Internet	65.7	1.4%	64.9	1.3%	67.9	1.6%
There are still many channels waiting to be explored	64.3	1.3%	63.1	1.3%	68.0	1.4%
I can get weather and traffic reports whenever I want to, without waiting	64.0	1.8%	61.9	1.8%	70.1	1.8%
There are programs where interesting and knowledgeable DJ's can create and control the content	63.6	2.0%	63.1	1.9%	64.8	2.6%
Informs me about what music, shows, and events are coming up on other channels	61.2	1.2%	58.9	1.2%	68.3	1.4%
There are talk and entertainment shows with interesting and knowledgeable hosts	58.3	1.0%	57.0	0.8%	62.2	1.7%
Offers more in-depth sports programming than either AM or FM radio, such as ESPN	57.1	2.5%	58.3	2.6%	53.5	2.2%
I can listen to all, not just some of my favorite sport's games	55.0	2.5%	54.9	2.5%	55.5	2.6%
I can listen to music from the 40's, 50's and 60's	53.4	1.8%	52.7	1.9%	55.4	1.7%
I can get weather and traffic from all around the country	52.4	0.9%	50.7	0.9%	57.3	1.1%


M

Exhibit M. Importance of Music Programming Features (From Internet Survey)

				Percent Most Important	Percent Most Important	Percent Most Important
Attribute	Overall Average N=279	Subscribers N=219	Considerers N=60	Overall N = 279	Subscribers N=219	Considerers N=60
Most channels are commercial free	24.1%	23.5%	25.8%	34.9%	32.7%	41.5%
I can hear music from the 70's, 80's, 90's and today	15.8%	16.2%	14.9%	16.0%	16.1%	15.9%
The artist and song title are displayed on my screen	13.7%	14.3%	11.7%	11.0%	11.1%	10.8%
The selection and sequencing of the songs on the channels I listen to	12.5%	12.5%	12.5%	9.5%	9.5%	9.7%
The music is uncensored	10.5%	10.4%	10.6%	10.9%	11.7%	8.5%
I can hear music from the 40's, 50's, 60's and earlier	10.2%	11.1%	7.6%	8.2%	9.7%	3.8%
DJ's and celebrity hosts provide commentary and personality	6.7%	6.3%	7.8%	5.9%	6.0%	5.8%
I can hear live studio performances and live concerts	6.6%	5.7%	9.4%	3.4%	3.3%	4.0%


N

Exhibit N-1. Willingness to Pay Using Pelcovits Cut-off - Not Reweighted

Comparison of willingness to pay using cut-off from Pelcovits			
Across all orders:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	14.6%	14.5%	14.8%
Would pay less than $7.27	25.8%	26.6%	23.5%
Base:	295	214	81
If music shown first:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	56.0%	56.5%	54.5%
Would pay less than $7.27	74.6%	78.3%	63.6%
Base:	34	23	11
If music shown last:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	4.4%	5.9%	0.0%
Would pay less than $7.27	6.7%	5.9%	9.1%
Base:	45	34	11

** A respondent will cancel if their willingness to pay is $0.00.*

Exhibit N-2. Willingness to Pay Using Pelcovits Cut-off - Reweighted

Comparison of willingness to pay using cut-off from Pelcovits			
Across all orders:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	12.2%	11.8%	13.3%
Would pay less than $7.27	21.8%	22.3%	20.3%
N	295	214	81
If music shown first:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	39.9%	38.0%	45.6%
Would pay less than $7.27	53.1%	52.6%	54.5%
N	34	23	11
If music shown last:	**Overall**	**Subscribers**	**Considerers**
Would cancel*	4.4%	5.9%	0.0%
Would pay less than $7.27	6.7%	5.9%	9.1%
N	45	34	11

** A respondent will cancel if their willingness to pay is $0.00.*

Exhibit O. Value of Sound Recording Rights Disaggregated by Time Period

Value of Sound Recording Rights		
A. Unweighted		
Overall[1]	**Music From the 40's 50's and 60's**	**Music From the 70's, 80's, 90's and Today**
	$1.32	$2.05
B. Reweighted		
Overall[1]	**Music From the 40's 50's and 60's**	**Music From the 70's, 80's, 90's and Today**
	$1.15	$1.78

1) Base is 288

Appendix 1

Appendix 1-J-1. Willingness to Pay for Satellite Radio (demographic reweighting)

Willingness to Pay for Satellite Radio in the Absence of Features							
Subscribers	Unweighted		Matched to Demographics*		Testing for Differences		
Order	No Music	No Music	No Music	No Music	No Music	No Music	No Music
	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic
First	$3.17	$1.05	$3.09	$1.00	$0.08	$1.45	0.06
Last	$11.45	$0.55	$11.82	$0.46	($0.37)	$0.72	(0.51)
Overall	$9.15	$0.33	$9.14	$0.34	$0.01	$0.47	0.03

1) The headings in this table represent satellite radio in the absence of features which were removed during the willingness to pay question in the mall survey.

4. There was no music available, not even your favorite channels

** Matched to age and gender.*

Appendix 1-K-1. Value of Satellite Radio Features

Value of Satellite Radio Features							
Subscribers	Unweighted		Matched to Demographics*		Testing for Differences		
Order	Music	Music	Music	Music	Music	Music	Music
	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic
First	$9.23	$1.05	$9.03	$1.07	$0.20	$1.50	0.13
Last	$0.94	$0.53	$0.74	$0.47	$0.20	$0.71	0.28
Overall	$3.38	$0.33	$3.33	$0.33	$0.05	$0.46	0.12

1) The headings in this table represent satellite radio in the absence of features which were removed during the willingness to pay question in the mall survey.

4. There was no music available, not even your favorite channels

** Matched to age and gender.*

Appendix 1-L-1. Anchored Importances as Measured in the Mall-Intercept Survey (demographic reweighting)

Feature (not necessarily independent features)	Anchored Importance: Subscribers							Percent Given Most Points: Subscribers						
	Unweighted		Matched to Demographics*		Testing for Differences			Unweighted		Matched to Demographics*		Testing for Differences		
	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic
I can listen to music channels without any commercials	86.7	2.4	82.4	2.6	4.36	3.56	1.22	10.3%	1.6%	9.3%	1.3%	1.0%	2.1%	0.46
I can listen to music	88.7	2.2	84.6	2.4	4.12	3.26	1.26	10.2%	1.4%	9.8%	1.4%	0.4%	2.0%	0.22
I can listen to music from the 40's, 50's and 60's	52.7	1.8	52.0	3.2	0.74	3.67	0.20	1.9%	0.6%	2.9%	0.9%	-1.0%	1.0%	-0.97
I can listen to music from the 70's, 80's, 90's, and today	81.7	2.0	78.1	2.5	3.60	3.21	1.12	5.3%	1.1%	4.4%	0.9%	0.9%	1.4%	0.65

** Matched to age and gender.*

Appendix 1-M-1. Importance of Music Programming Features (from Internet Survey), (demographic reweighting)

Subscribers Only	Mean Anchored Importance							Percent Most Important						
Attribute	Unweighted		Matched to Demographics*		Testing for Differences			Subscribers N=219	Subscribers N=219	Matched to Demographics*		Testing for Differences		
	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic	Mean	S.E. Mean	Mean	S.E. Mean	Diff in Means	Pooled S.E.	t-statistic
I can hear music from the 70's, 80's, 90's and today	16.2%	1.2%	18.3%	1.5%	-2.1%	1.9%	-1.11	16.1%	2.3%	20.7%	2.7%	-4.6%	3.5%	-1.31
I can hear music from the 40's, 50's, 60's and earlier	11.1%	1.3%	13.1%	1.5%	-2.0%	2.0%	-1.03	9.7%	1.8%	12.2%	2.1%	-2.5%	2.8%	-0.92
Most channels are commercial free	23.5%	1.3%	24.3%	1.4%	-0.8%	1.9%	-0.43	32.7%	2.9%	32.9%	3.1%	-0.2%	4.2%	-0.05
I can hear live studio performances and live concerts	5.7%	0.7%	3.9%	0.6%	1.8%	0.9%	2.00	3.3%	1.0%	1.4%	0.7%	1.9%	1.3%	1.51

** Matched to age and gender.*

Appendix 2

Appendix 2- Validation Protocol

VALIDATION PROTOCOL - Satellite Radio Study

- Validation forms for each location include:
  - Date of Interview
  - Respondent ID
  - Quota Group
  - Respondent's first name and last initial
  - Age Group of Respondent
  - Telephone Number
  - Name of interviewer.

VALIDATION INSTRUCTIONS

We attempted to validate 100% of the names provided.

Once a call was initiated for any telephone number, at least 16 attempts were made to reach that respondent. These attempts were made at varying times (in other words, the attempts were dialed during day, evening, and weekend hours.)

IF, DURING THE COURSE OF DIALING, A SITE REACHED AN UNUSUALLY HIGH NUMBER OF RESPONDENTS WHO REFUSED VALIDATION (OR THERE WAS NO SUCH PERSON) OR THE PERSON REACHED STATED OUTRIGHT THAT THEY DID NOT PARTICIPATE, A CALL WAS MADE TO APPLIED MARKETING SCIENCE.

ANY "FAILURES TO VALIDATE" WERE REPORTED (BY SITE AND RESPONDENT NUMBER) TO APPLIED MARKETING SCIENCE.

FURTHERMORE, IF THERE WERE AN INORDINATE NUMBER OF DISCONNECTS, A CALL WAS MADE TO APPLIED MARKETING SCIENCE. (Each telephone number was "dialed" by a mall supervisor for "legitimacy as a working number" before the actual interview took place. Nevertheless, we asked that sites alert us to patterns, etc.)

SITES WERE INSTRUCTED TO NOT WAIT UNTIL THE END OF THE VALIDATION PROCEDURE TO ALERT APPLIED MARKETING SCIENCE TO CONCERNS, PROBLEMS, OR ISSUES.

Once at least 16 attempts were made to reach that respondent, the validation process for this study was completed.

IMPORTANT DEFINITIONS:

Refused to Validate:
Respondent hung up on telephone call; refused to speak to person calling.

Failed to Validate:
Respondent states they did not participate in the study; are not the age stated on the screener or validation document; or did not receive their cash incentive.

SEE NEXT PAGE FOR VALIDATION PROTOCOL

Appendix 2- Validation Protocol

VALIDATION SCRIPT

Once a respondent was reached, the following was read:

Hello, I am _____ from Applied Marketing Science, a national market research company. Recently we conducted a study in your area and I'm calling to confirm a few points in the survey.

1. Were you recently approached at the _____ and asked questions, and then asked to go to a facility to do a survey? **(ANSWER MUST BE YES.)**

2. **<u>Subscribers Only</u>: Did you tell the interviewer that you currently have satellite radio in your household?**
   <u>Considerers Only</u>: Did you tell the interviewer that you are currently considering subscribing to satellite radio?

   (ANSWERS MUST BE YES)

3. When you went to the facility were you seated at a computer to answer questions about Satellite Radio? **(ANSWER MUST BE YES)**

4. And to confirm your age, are you between the ages of _____?. **(MUST MATCH INFORMATION PROVIDED.)**

5. And, at the completion of the survey were you paid $5.00 in cash for your opinions? **(ANSWER MUST BE YES)**

THANK YOU!

Appendix 3

Appendix 3. 95% Confidence Intervals for Numbers in the Exhibits to the Hauser Report

In this Appendix, the Exhibits which present numbers used in the Hauser Report have been expanded to include standard errors of the mean, as well as 95% confidence intervals. The latter are calculated using a two-tailed test, calculated as the mean plus or minus 1.96 times the standard error of the mean.

Appendix 3. Exhibit J-1. Willingness to Pay for Satellite Radio - Not Reweighted

Willingness to Pay for Satellite Radio in the Absence of Features

Overall

Order	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	No Music	No Music	No Music	No Music	No Talk	No Talk	No Talk	No Talk	No Sports	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$7.95	$0.74	$6.50	$9.40	$8.34	$0.70	$6.97	$9.72	$5.10	$0.79	$3.56	$6.64	$3.33	$0.89	$1.59	$5.07	$10.18	$0.52	$9.17	$11.20	$9.52	$0.53	$8.47	$10.58	$9.48	$0.56	$8.37	$10.59
Last	$12.67	$0.09	$12.49	$12.86	$12.24	$0.32	$11.62	$12.86	$11.64	$0.36	$10.93	$12.35	$11.61	$0.47	$10.70	$12.52	$12.71	$0.13	$12.45	$12.97	$12.37	$0.36	$11.66	$13.07	$12.53	$0.30	$11.93	$13.12
Overall	$10.95	$0.20	$10.55	$11.34	$11.10	$0.20	$10.72	$11.48	$10.14	$0.25	$9.64	$10.63	$9.27	$0.28	$8.71	$9.82	$11.57	$0.16	$11.26	$11.89	$11.57	$0.16	$11.25	$11.89	$11.41	$0.18	$11.05	$11.76
Base:	295																											

Willingness to Pay for Satellite Radio in the Absence of Features

Subscribers

Order	Local Reception Only	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	No Music	No Music	No Music	No Music	No Talk	No Talk	No Talk	No Talk	No Sports	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$7.57	$0.86	$5.88	$9.26	$7.73	$0.84	$6.08	$9.38	$4.27	$0.92	$2.46	$6.08	$3.17	$1.05	$1.12	$5.22	$10.04	$0.62	$8.83	$11.25	$9.17	$0.62	$7.95	$10.39	$8.65	$0.74	$7.21	$10.09
Last	$12.56	$0.12	$12.34	$12.82	$12.03	$0.42	$11.20	$12.86	$11.21	$0.48	$10.26	$12.16	$11.45	$0.55	$10.37	$12.53	$12.63	$0.18	$12.29	$12.97	$12.17	$0.48	$11.24	$13.10	$12.38	$0.41	$11.59	$13.17
Overall	$10.80	$0.24	$10.33	$11.27	$11.02	$0.23	$10.57	$11.47	$10.16	$0.28	$9.60	$10.72	$9.15	$0.33	$8.51	$9.79	$11.46	$0.18	$11.10	$11.82	$11.51	$0.19	$11.15	$11.87	$11.22	$0.22	$10.79	$11.65
Base:	214																											

Willingness to Pay for Satellite Radio in the Absence of Features

Considerers

Order	Local Reception Only	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	Sound Quality Equal to FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	As Many Commercials as on AM or FM	No Music	No Music	No Music	No Music	No Talk	No Talk	No Talk	No Talk	No Sports	Local Reception Only[1]	Local Reception Only[1]	Local Reception Only[1]	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic	No News Weather or Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$9.09	$1.43	$6.29	$11.89	$10.18	$1.23	$7.77	$12.59	$7.60	$1.51	$4.65	$10.55	$3.80	$1.66	$0.54	$7.06	$10.61	$0.92	$8.80	$12.42	$10.56	$1.02	$8.56	$12.56	$11.97	$0.47	$11.05	$12.89
Last	$12.95	$0.00	$12.95	$12.95	$12.87	$0.08	$12.71	$13.03	$12.93	$0.02	$12.90	$12.96	$12.09	$0.86	$10.40	$13.78	$12.95	$0.00	$12.95	$12.95	$12.95	$0.00	$12.95	$12.95	$12.95	$0.00	$12.95	$12.95
Overall	$11.38	$0.34	$10.71	$12.05	$11.34	$0.37	$10.61	$12.07	$10.06	$0.52	$9.04	$11.08	$9.61	$0.54	$8.55	$10.67	$11.91	$0.33	$11.27	$12.55	$11.75	$0.34	$11.08	$12.42	$11.96	$0.29	$11.38	$12.54
Base:	81																											

1) The headings in this table represent satellite radio in the absence of features which were removed during the willingness to pay question in the mall survey.

1. You couldn't get reception nationally, just locally

2. Sound quality was only equal to that of the FM radio you can listen to

3. There were as many commercials as on AM or FM Radio

4. There was no music available, not even your favorite channels

5. There were no talk shows available, not even your favorite hosts

6. There was no sports coverage available, not even your favorite teams

7. There were no news, weather or traffic reports available

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit J-2. Willingness to Pay for Satellite Radio - Reweighted

Willingness to pay for Music				
	Overall			
Order	**No Music[1]**	**No Music**	**No Music**	**No Music**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
First	$6.19	$1.08	$4.07	$8.31
Last	$11.61	$0.47	$10.69	$12.53
Overall	$9.73	$0.27	$9.20	$10.25
Base:	295			
Willingness to pay for Music				
	Subscribers			
Order	**No Music**	**No Music**	**No Music**	**No Music**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
First	$6.38	$1.30	$3.83	$8.93
Last	$11.45	$0.55	$10.37	$12.53
Overall	$9.69	$0.31	$9.08	$10.30
Base:	214			
Willingness to pay for Music				
	Considerers			
Order	**No Music**	**No Music**	**No Music**	**No Music**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
First	$5.63	$1.87	$1.97	$9.29
Last	$12.09	$0.86	$10.40	$13.78
Overall	$9.83	$0.52	$8.80	$10.86
Base:	81			

1) The heading in this table representa satellite radio in the absence of music:
"There was no music available, not even your favorite channels"

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3, Exhibit K-1. Value of Satellite Radio Features - Not Reweighted

Value of Satellite Radio Features																													
Overall																													
Order	National Reception[1]	National Reception[2]	National Reception[3]	National Reception[4]	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$4.65	$0.74	$3.20	$6.10	$4.38	$0.69	$3.04	$5.73	$7.60	$0.79	$6.05	$9.15	$9.21	$0.89	$7.47	$10.96	$2.58	$0.52	$1.56	$3.60	$3.07	$0.62	$1.85	$4.29	$2.98	$0.57	$1.86	$4.11
Last	$0.11	$0.08	($0.04)	$0.27	$0.43	$0.31	($0.17)	$1.04	$0.59	$0.33	($0.06)	$1.25	$0.92	$0.45	$0.03	$1.81	$0.00	$0.00	$0.00	$0.00	$0.34	$0.33	($0.30)	$0.99	$0.30	$0.30	($0.29)	$0.89
Overall	$1.68	$0.20	$1.30	$2.07	$1.54	$0.19	$1.16	$1.91	$2.50	$0.25	$2.01	$2.99	$3.37	$0.28	$2.82	$3.92	$1.05	$0.16	$0.75	$1.36	$1.07	$0.15	$0.76	$1.37	$1.22	$0.18	$0.88	$1.57
Base:	295																											
Value for Satellite Radio Features																												
Subscribers																												
Order	National Reception	Local Reception Only[1]	Local Reception Only[2]	Local Reception Only[3]	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$4.91	$0.86	$3.22	$6.60	$4.92	$0.82	$3.31	$6.53	$8.35	$0.93	$6.53	$10.17	$9.23	$1.05	$7.17	$11.29	$2.66	$0.62	$1.44	$3.88	$3.30	$0.76	$1.81	$4.79	$3.65	$0.75	$2.18	$5.12
Last	$0.15	$0.11	($0.06)	$0.36	$0.55	$0.41	($0.25)	$1.35	$0.79	$0.44	($0.08)	$1.65	$0.94	$0.53	($0.11)	$1.99	$0.00	$0.00	$0.00	$0.00	$0.46	$0.44	($0.40)	$1.32	$0.40	$0.40	($0.39)	$1.19
Overall	$1.72	$0.23	$1.26	$2.18	$1.51	$0.22	$1.07	$1.95	$2.37	$0.28	$1.82	$2.92	$3.38	$0.33	$2.74	$4.02	$1.06	$0.18	$0.72	$1.40	$1.02	$0.17	$0.69	$1.35	$1.30	$0.21	$0.88	$1.72
Base:	214																											
Value for Satellite Radio Features																												
Considerers																												
Order	National Reception	Local Reception Only[1]	Local Reception Only[2]	Local Reception Only[3]	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Sound Quality Better than FM	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Commercials	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Music	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Talk	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of Sports	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic	Current Levels of News Weather and Traffic
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$3.86	$1.43	$1.05	$6.67	$2.77	$1.23	$0.36	$5.18	$5.35	$1.51	$2.40	$8.30	$9.16	$1.66	$5.90	$12.41	$2.34	$0.92	$0.53	$4.15	$2.39	$1.02	$0.39	$4.39	$0.98	$0.47	$0.06	$1.91
Last	$0.00	$0.00	$0.00	$0.00	$0.08	$0.08	($0.08)	$0.25	$0.02	$0.02	($0.02)	$0.05	$0.86	$0.86	($0.83)	$2.56	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Overall	$1.57	$0.34	$0.90	$2.24	$1.61	$0.37	$0.88	$2.34	$2.83	$0.52	$1.87	$3.91	$3.34	$0.54	$2.29	$4.40	$1.04	$0.33	$0.39	$1.68	$1.20	$0.34	$0.53	$1.87	$0.99	$0.29	$0.42	$1.57
Base:	81																											

1) The headings in this table represent the values of features as measured by the willingness to pay question in the mail survey. They are listed in full below.

1. You couldn't get reception nationally, just locally

2. Sound quality was only equal to that of the FM radio you can listen to

3. There were as many commercials as on AM or FM Radio

4. There was no music available, not even your favorite channels

5. There were no talk shows available, not even your favorite hosts

6. There was no sports coverage available, not even your favorite teams

7. There were no news, weather or traffic reports available

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit K-2. Value of Satellite Radio Features - Reweighted

Value for Satellite Radio Features				
	Overall			
Order	Current Levels of Music[1]	No Music	No Music	No Music
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$6.48	$1.06	$4.41	$8.55
Last	$0.92	$0.45	$0.03	$1.81
Overall	$2.93	$0.27	$2.41	$3.45
Base:	295			
Value for Satellite Radio Features				
	Subscribers			
Order	Current Levels of Music	No Music	No Music	No Music
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$6.20	$1.26	$3.72	$8.68
Last	$0.94	$0.53	($0.11)	$1.98
Overall	$2.87	$0.31	$2.27	$3.47
Base:	214			
Value for Satellite Radio Features				
	Considerers			
Order	Current Levels of Music	No Music	No Music	No Music
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
First	$7.32	$1.87	$3.66	$10.98
Last	$0.86	$0.86	($0.83)	$2.56
Overall	$3.12	$0.52	$2.09	$4.14
Base:	81			

1) The heading in this table represents the value of music measured by the willingness to pay question in the mall survey:
"There was no music available, not even your favorite channels"

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit L. Anchored Importances as Measured in the Mall-Intercept Survey

Feature (not necessarily independent features)	Average Anchored Score Overall*	Average Anchored Score Overall*	Average Anchored Score Overall*	Average Anchored Score Overall*	% Given Most Points Overall*	% Given Most Points Overall*	% Given Most Points Overall*	% Given Most Points Overall*	Anchored Importance Subscribers	Anchored Importance Subscribers	Anchored Importance Subscribers	Anchored Importance Subscribers	% Given Most Points Subscribers	% Given Most Points Subscribers	% Given Most Points Subscribers	% Given Most Points Subscribers	Anchored Importance Considerers	Anchored Importance Considerers	Anchored Importance Considerers	Anchored Importance Considerers	% Given Most Points Considerers	% Given Most Points Considerers	% Given Most Points Considerers	% Given Most Points Considerers
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
I can listen to music	89.0	1.8	85.5	92.5	10.7%	1.2%	8.3%	13.2%	88.7	2.2	84.4	92.9	10.2%	1.4%	7.4%	13.0%	90.1	2.9	84.4	95.7	12.2%	2.5%	7.3%	17.1%
I can listen to music channels without any commercials	87.2	2.0	83.3	91.0	9.7%	1.3%	7.1%	12.2%	86.7	2.4	82.0	91.4	10.3%	1.6%	7.1%	13.4%	88.5	3.1	82.5	94.5	7.9%	1.8%	4.4%	11.4%
I can always find what I want to listen to, when I want to listen to it	84.1	1.4	81.3	86.9	7.7%	1.2%	5.4%	10.0%	84.1	1.7	80.8	87.4	8.3%	1.5%	5.4%	11.3%	84.2	2.5	79.3	89.0	5.7%	1.5%	2.8%	8.7%
Provides excellent sound quality (better than either AM or FM radio)	82.3	1.5	79.4	85.2	4.2%	0.6%	3.1%	5.4%	81.5	1.8	78.0	84.9	4.2%	0.7%	2.8%	5.6%	84.8	2.4	80.0	89.5	4.3%	1.1%	2.2%	6.4%
I can listen to music from the 70's, 80's, 90's, and today	81.8	1.6	78.6	84.9	5.4%	0.9%	3.6%	7.1%	81.7	2.0	77.8	85.6	5.3%	1.1%	3.2%	7.4%	82.0	2.6	76.9	87.0	5.5%	1.7%	2.2%	8.8%
I can listen to my stations wherever I go, even when traveling long distances	81.0	1.6	77.8	84.2	4.3%	0.7%	2.8%	5.7%	80.2	2.0	76.3	84.1	4.6%	1.0%	2.7%	6.5%	83.4	2.6	78.3	88.5	3.4%	0.5%	2.5%	4.4%
Provides consistently clear reception no matter where I go, even in the city	80.9	1.5	77.9	83.8	4.2%	0.6%	3.0%	5.5%	80.4	1.8	76.9	84.0	4.2%	0.7%	2.8%	5.6%	82.1	2.5	77.2	87.0	4.4%	1.4%	1.6%	7.1%
The artist and song name are displayed on my screen	80.6	1.5	77.6	83.5	3.5%	0.6%	2.3%	4.7%	80.0	1.8	76.5	83.6	3.2%	0.6%	1.9%	4.4%	82.2	2.6	77.1	87.3	4.5%	1.4%	1.7%	7.2%
I can listen to a lot of programs and content not available on either AM or FM radio	79.1	1.6	76.0	82.3	5.7%	1.1%	3.6%	7.8%	79.3	1.9	75.5	83.0	6.3%	1.3%	3.7%	8.9%	78.7	2.8	73.2	84.1	3.9%	1.4%	1.1%	6.6%
It is easy to find what I want to listen to without a lot of hunting around	77.1	1.6	74.0	80.3	2.4%	0.6%	1.3%	3.5%	75.8	2.0	71.9	79.6	2.7%	0.7%	1.2%	4.1%	81.2	2.5	76.3	86.2	1.6%	0.3%	1.0%	2.1%
I don't hear the same things over and over	77.0	1.6	73.8	80.2	3.0%	0.4%	2.2%	3.7%	75.1	2.0	71.1	79.0	2.6%	0.4%	1.8%	3.3%	82.9	2.4	78.1	87.6	4.1%	1.1%	1.9%	6.2%
The organization of channels makes it easy for me to explore a specific genre	74.4	1.6	71.2	77.7	1.6%	0.3%	1.1%	2.1%	74.1	2.0	70.2	78.1	1.5%	0.3%	0.9%	2.1%	75.3	2.6	70.2	80.4	1.7%	0.5%	0.6%	2.8%
The depth of the music programming helps me to find new songs to add to my collection	72.2	1.8	68.7	75.8	2.9%	0.7%	1.6%	4.2%	70.7	2.2	66.3	75.1	2.6%	0.8%	1.2%	4.1%	76.9	2.8	71.4	82.3	3.7%	1.4%	0.9%	6.4%
The DJ's don't talk too much	71.1	1.6	68.0	74.3	2.9%	0.5%	1.8%	3.9%	69.2	2.0	65.3	73.1	2.7%	0.6%	1.5%	3.9%	76.8	2.5	71.9	81.8	3.3%	1.1%	1.2%	5.4%
I can listen to the same stations in the car, at home, or on the Internet	71.0	1.6	67.8	74.2	3.5%	0.6%	2.2%	4.7%	67.9	2.0	63.9	71.8	2.8%	0.7%	1.5%	4.1%	80.3	2.6	75.2	85.5	5.4%	1.5%	2.4%	8.4%
I can listen to uncensored programs	69.7	1.6	66.5	72.8	3.6%	0.8%	2.0%	5.1%	69.7	1.9	66.0	73.5	4.2%	1.0%	2.1%	6.2%	69.5	2.8	64.0	74.9	1.8%	0.4%	1.1%	2.5%
There are shows dedicated to specific topics that interest me	68.8	1.8	65.3	72.3	2.9%	0.8%	1.3%	4.5%	68.0	2.2	63.7	72.2	3.0%	1.0%	1.0%	5.0%	71.3	2.9	65.6	77.0	2.6%	1.0%	0.6%	4.6%
There are stations available for everyone in my family	68.2	1.5	65.3	71.2	3.2%	0.7%	1.9%	4.5%	68.1	1.8	64.5	71.6	3.3%	0.8%	1.7%	4.9%	68.7	2.6	63.6	73.8	3.0%	1.1%	0.9%	5.1%
I can hear programs and music that make me feel nostalgic..	66.8	1.9	63.1	70.5	2.1%	0.5%	1.1%	3.2%	66.2	2.3	61.7	70.7	2.1%	0.6%	0.8%	3.3%	68.5	2.9	62.8	74.2	2.3%	1.0%	0.3%	4.3%
Provides the latest breaking news..	65.7	1.9	62.0	69.3	1.4%	0.2%	1.0%	1.8%	64.9	2.3	60.5	69.4	1.3%	0.3%	0.8%	1.8%	67.9	3.0	61.9	73.8	1.6%	0.4%	0.9%	2.3%
There are still many channels waiting to be explored	64.3	1.9	60.7	68.0	1.3%	0.3%	0.8%	1.8%	63.1	2.3	58.6	67.7	1.3%	0.3%	0.7%	1.9%	68.0	2.9	62.3	73.7	1.4%	0.5%	0.3%	2.4%
I can get weather and traffic reports whenever I want to, without waiting	64.0	2.0	60.1	67.9	1.8%	0.4%	1.0%	2.6%	61.9	2.5	57.1	66.7	1.8%	0.5%	0.7%	2.8%	70.1	3.1	64.0	76.2	1.8%	0.3%	1.1%	2.4%
There are programs where interesting and knowledgeable DJ's..	63.6	1.4	60.8	66.3	2.0%	0.6%	0.8%	3.3%	63.1	1.7	59.8	66.5	1.9%	0.7%	0.4%	3.3%	64.8	2.5	60.0	69.7	2.6%	1.4%	0.0%	5.4%
Informs me about what music, shows, and events are coming up..	61.2	1.5	58.3	64.1	1.2%	0.3%	0.7%	1.7%	58.9	1.8	55.4	62.3	1.2%	0.3%	0.6%	1.8%	68.3	2.4	63.5	73.0	1.4%	0.5%	0.3%	2.4%
There are talk and entertainment shows with interesting and knowledgeable hosts	58.3	2.0	54.4	62.1	1.0%	0.3%	0.4%	1.6%	57.0	2.4	52.3	61.7	0.8%	0.2%	0.3%	1.2%	62.2	3.1	56.2	68.3	1.7%	1.0%	0.0%	3.6%
Offers more in-depth sports programming than either AM or FM radio..	57.1	1.9	53.5	60.8	2.5%	0.6%	1.2%	3.8%	58.3	2.3	53.9	62.8	2.6%	0.8%	1.0%	4.2%	53.5	3.0	47.6	59.5	2.2%	1.0%	0.3%	4.2%
I can listen to all, not just some of my favorite sport's games	55.0	1.8	51.5	58.6	2.5%	0.6%	1.4%	3.6%	54.9	2.2	50.5	59.3	2.5%	0.7%	1.2%	3.8%	55.5	2.8	50.1	61.0	2.6%	1.0%	0.5%	4.6%
I can listen to music from the 40's, 50's and 60's	53.4	1.5	50.5	56.3	1.8%	0.4%	1.0%	2.7%	52.7	1.8	49.2	56.2	1.9%	0.6%	0.8%	3.0%	55.4	2.5	50.5	60.3	1.7%	0.4%	0.9%	2.5%
I can get weather and traffic from all around the country	52.4	2.2	48.1	56.7	0.9%	0.1%	0.6%	1.2%	50.7	2.7	45.5	55.9	0.9%	0.2%	0.5%	1.2%	57.3	3.7	50.0	64.5	1.1%	0.2%	0.6%	1.5%

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit M. Importance of Music Programming Features (From Internet Survey)

Attribute	Overall Average N=279	Overall Average N=279	Overall Average N=279	Overall Average N=279	Subscribers N=219	Subscribers N=219	Subscribers N=219	Subscribers N=219	Considerers N=60	Considerers N=60	Considerers N=60	Considerers N=60	Percent Most Important Overall N = 279	Percent Most Important Overall N = 279	Percent Most Important Overall N = 279	Percent Most Important Overall N = 279	Percent Most Important Subscribers N=219	Percent Most Important Subscribers N=219	Percent Most Important Subscribers N=219	Percent Most Important Subscribers N=219	Percent Most Important Considerers N=60	Percent Most Important Considerers N=60	Percent Most Important Considerers N=60	Percent Most Important Considerers N=60
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
Most channels are commercial free	24.1%	1.2%	21.8%	26.3%	23.5%	1.279%	21.0%	26.0%	25.8%	2.6%	20.7%	30.8%	34.9%	2.7%	29.7%	40.1%	32.7%	2.9%	27.0%	38.5%	41.5%	6.0%	29.8%	53.2%
I can hear music from the 70's, 80's, 90's and today	15.8%	1.0%	13.9%	17.8%	16.2%	1.223%	13.8%	18.6%	14.9%	1.7%	11.6%	18.1%	16.0%	2.0%	12.1%	20.0%	16.1%	2.3%	11.7%	20.5%	15.9%	4.3%	7.5%	24.3%
The artist and song title are displayed on my screen	13.7%	0.8%	12.1%	15.2%	14.3%	0.954%	12.5%	16.2%	11.7%	1.4%	8.9%	14.4%	11.0%	1.7%	7.8%	14.3%	11.1%	1.8%	7.5%	14.7%	10.8%	3.8%	3.4%	18.2%
The selection and sequencing of the songs on the channels I listen to	12.5%	0.8%	10.9%	14.2%	12.5%	0.991%	10.6%	14.5%	12.5%	1.6%	9.3%	15.6%	9.5%	1.6%	6.4%	12.7%	9.5%	1.8%	6.0%	13.0%	9.7%	3.3%	3.2%	16.2%
The music is uncensored	10.5%	0.8%	9.0%	12.0%	10.4%	0.896%	8.7%	12.2%	10.6%	1.5%	7.6%	13.5%	10.9%	1.7%	7.6%	14.2%	11.7%	2.0%	7.7%	15.6%	8.5%	3.1%	2.5%	14.6%
I can hear music from the 40's, 50's, 60's and earlier	10.2%	1.0%	8.1%	12.2%	11.1%	1.254%	8.6%	13.5%	7.6%	1.8%	3.9%	11.2%	8.2%	1.4%	5.4%	11.0%	9.7%	1.8%	6.2%	13.2%	3.8%	2.0%	-0.1%	7.7%
DJ's and celebrity hosts provide commentary and personality	6.7%	0.7%	5.3%	8.0%	6.3%	0.786%	4.7%	7.8%	7.8%	1.5%	4.8%	10.7%	5.9%	1.3%	3.4%	8.4%	6.0%	1.4%	3.2%	8.7%	5.8%	2.9%	0.1%	11.4%
I can hear live studio performances and live concerts	6.6%	0.6%	5.4%	7.8%	5.7%	0.690%	4.3%	7.0%	9.4%	1.2%	7.1%	11.7%	3.4%	0.8%	1.8%	5.1%	3.3%	1.0%	1.3%	5.3%	4.0%	1.4%	1.3%	6.7%

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit N-1. Willingness to Pay Using Pelcovits Cut-off - Not Reweighted

Comparison of willingness to pay using cut-off from Pelcovits												
Across all orders:	**Overall**	**Overall**	**Overall**	**Overall**	**Subscribers**	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
Would cancel*	14.6%	2.1%	10.5%	18.6%	14.5%	2.4%	9.8%	19.2%	14.8%	3.9%	7.1%	22.5%
Would pay less than $7.27	25.8%	2.6%	20.8%	30.8%	26.6%	3.0%	20.7%	32.5%	23.5%	4.7%	14.2%	32.7%
Base:	295				214				81			
If music shown first:	**Overall**	**Overall**	**Overall**	**Overall**	**Subscribers**	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
*Would cancel**	56.0%	8.6%	39.1%	72.9%	56.5%	10.3%	36.2%	76.8%	54.5%	15.0%	25.1%	83.9%
Would pay less than $7.27	74.6%	7.4%	60.1%	89.1%	78.3%	8.6%	61.5%	95.1%	63.6%	14.5%	35.2%	92.0%
Base:	34				23				11			
If music shown last:	**Overall**	**Overall**	**Overall**	**Overall**	**Subscribers**	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
Would cancel*	4.4%	--	0.0%	11.1%	5.9%	--	0.0%	14.7%	0.0%	0.0%	0.0%	0.0%
Would pay less than $7.27	6.7%	--	0.0%	15.6%	5.9%	--	0.0%	14.7%	9.1%	--	0.0%	27.3%
Base:	45				34				11			

** A respondent will cancel if their willingness to pay is $0.00.*
***When percents are close to zero the exact binomial distribution is used.*

t-value for 95% confidence intervals 1.96

Appendix 3. Exhibit N-2. Willingness to Pay Using Pelcovits Cut-off - Reweighted

Comparison of willingness to pay using cut-off from Pelcovits												
Across all orders:	**Overall**	**Overall**	**Overall**	**Overall**	***Subscribers***	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
Would cancel*	12.2%	1.9%	8.4%	15.9%	11.8%	2.2%	7.5%	16.1%	13.3%	3.8%	5.9%	20.7%
Would pay less than $7.27	21.8%	2.4%	17.1%	26.5%	22.3%	2.8%	16.7%	27.9%	20.3%	4.5%	11.5%	29.1%
N	295				214				81			
If music shown first:	**Overall**	**Overall**	**Overall**	**Overall**	**Subscribers**	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
Would cancel*	39.9%	8.5%	23.3%	56.5%	38.0%	10.1%	18.2%	57.8%	45.6%	15.0%	16.2%	75.0%
Would pay less than $7.27	53.1%	8.7%	36.1%	70.1%	52.6%	10.4%	32.2%	73.0%	54.5%	15.0%	25.1%	83.9%
N	34				23				11			
If music shown last:	**Overall**	**Overall**	**Overall**	**Overall**	**Subscribers**	**Subscribers**	**Subscribers**	**Subscribers**	**Considerers**	**Considerers**	**Considerers**	**Considerers**
	Mean	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**	**Mean**	**S.E. Mean**	**95% C.I. Lower**	**95% C.I Upper**
Would cancel*	4.4%	--	0.0%	11.1%	5.9%	--	0.0%	14.7%	0.0%	0.0%	0.0%	0.0%
Would pay less than $7.27	6.7%	--	0.0%	15.6%	5.9%	--	0.0%	14.7%	9.1%	--	0.0%	27.3%
N	45				34				11			

** A respondent will cancel if their willingness to pay is $0.00.*
***When percents are close to zero the exact binomial distribution is used.*

t-value for 95% confidence intervals, 2-tailed test: 1.96

Appendix 3. Exhibit O. Value of Sound Recording Rights Disaggregated by Time Period

Value of Sound Recording Rights

A. Unweighted								
Overall[1]	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
	$1.32	$0.11	$1.10	$1.54	$2.05	$0.17	$1.72	$2.38
B. Reweighted								
Overall[1]	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 40's 50's and 60's	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today	Music From the 70's, 80's, 90's and Today
	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper	Mean	S.E. Mean	95% C.I. Lower	95% C.I Upper
	$1.15	$0.11	$0.94	$1.36	$1.78	$0.16	$1.46	$2.10

1) Base is 288

t-value for 95% confidence intervals, 2-tailed test: 1.96

Before the

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LIBRARY OF CONGRESS

Washington, D.C.

In the matter of: °

Adjustment of Rates and °

Terms for Preexisting ° Docket No. 2006-1

Subscriptions Services, ° CRB DSTRA

and °

Satellite Digital Audio °

Radio Services °

Room LM-408

Library of Congress

First and Independence Avenue, S.E.

Washington, D.C. 20540

Tuesday,

August 21, 2007

The above-entitled matter came on for hearing, pursuant to notice, at 9:30 a.m.

BEFORE:

THE HONORABLE JAMES SLEDGE, Chief Judge

THE HONORABLE WILLIAM J. ROBERTS, JR., Judge

THE HONORABLE STAN WISNIEWSKI, Judge

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T A B L E O F C O N T E N T S

WITNESS	DIRECT	CROSS	REDIRECT	RECROSS
Daryl Martin				
By Mr. DeSanctis	4			
John Hauser				
By Mr. Meyer	107			
By Mr. Handzo	194			

EXHIBIT		MARK	RECD
SoundExchange			
95	Journal of Proprietary Rights	9	12
94	Endorsement Contracts	22	23
96	Celine Dion contract	30	38
97	Forbes.com printout	32	36
98	Golf Endorsement	40	43
100	San Francisco Business Times	54	56
102	Fergie Contract	52	58
103	Issues List	198	203
104	Summary of Interviews	204	208
105	Interview Debriefing	208	
SDARS			
77	Rebuttal Testimony of John Hauser	111	112
78	Demonstrative exhibits	113	

P R O C E E D I N G S

9:33 a.m.

CHIEF JUDGE SLEDGE: Mr. Martin, I think you're due for a small questioning by Mr. DeSanctis.

CROSS EXAMINATION (continued)

BY MR. DeSANCTIS:

Q Good morning, Mr. Martin.

A Good morning.

Q Your testimony here is based on the notion of comparables, correct?

A A portion of the testimony is based on comparables.

Q Right. You do a benchmarking analysis, correct?

A For portions of the analysis, yes.

Q Right, and the benchmarking analysis that you do for portions of your analysis is based on the notion that the benchmark that you look to has to be comparable to what you're comparing it to in this case, correct?

what to ask the consumers about in a survey.
It has absolutely no effect on what the consumers are going to say in a survey as to whether they value any of these factors.
So it has no effect and finally I want to say, Your Honors, what we hope is obviously is Your Honors will deny the motion, but in any event, the motion itself was over-broad since they sought to strike all of Dr. Hauser's testimony.
Dr. Hauser's testimony essentially is critiquing the survey done by Dr. Wind. The surveys that Dr. Hauser did are important in that they demonstrate the effect of attempting to correct some of the flaws in Dr. Wind's survey but I wanted to make the point that their motion as drafted, is over-broad as it purports to apply to all of Dr. Hauser's testimony. Thank you.
CHIEF JUDGE SLEDGE: We will recess.

(Whereupon, the foregoing matter went off the record at 11:44 a.m. and went back on the record at 11:45 a.m.)
CHIEF JUDGE SLEDGE: We will come to order. This ruling is following exactly what we did in the last motion, similar to this.
The movant has failed to offer any expert testimony that the transcript should be transcribed. The determination as to what is reasonably relied upon by the expert in making the opinion is not challenged from the testimony of Dr. Hauser.
There is no transcript therefore there is no underlying data to be produced. Under the provisions of Federal Rules of Evidence 702 and 703, the motion is denied. If you'll recover the witness.
MR. MEYER: Thank you. Sir, please state your name for the record?
THE WITNESS: My name is John Richard Hauser.

DIRECT EXAMINATION
BY MR. MEYER:
Q And what's your educational background, sir?
A I was educated at MIT. I hold four degrees from MIT. The highest degree is a doctor of science in operations research.
Q Okay, and what is operations research?
A Operation research is the use of mathematics, probability and statistics to study of both business, military and other problems. But my efforts primarily business problems.
Q And by whom are you currently employed?
A I am currently employed by Massachusetts Institute of Technology.
Q And what's your position there?
A I am Area Head of the Management Science area. Management Science area includes marketing, statistics, operations

research, operations management, systems dynamics and information technology.
Q And for how long have you been at MIT?
A I've been at MIT for -- since 1980, about 27 years.
Q Now have you been published in the field of marketing and marketing research?
A Yes, I've published quite extensively in marketing, marketing research, and also survey research.
In terms of about 60 or more publications, I've published a number of books in marketing and new product development.
I've won a number of international awards for the papers that I've written and I'm -- I think I'm listed as one of the highly cited articles by ISI. Highly cited authors by ISI.
Q Now you mention in your report, one publication that you thought was particularly relevant to your work in this

case. Can you tell us about that?
A In my report I mentioned the voice of the customer article which was published in 1993 and at the time won two international awards.
And highly cited, it covers the issues of talking to consumers and trying to understand the words and phrases that they use, both in product development and survey research.
Q And can you describe generally, your past work with surveys in connection with marketing research?
A Well I've done -- I've done quite a few surveys including conjoint analysis, including voice to customer surveys.
Including telephone, internet, mall intercept surveys. This work has been done sometimes in litigation contexts, but also in terms of helping firms develop new products or evaluating their advertising.
Q Have you previously been qualified

by or as an expert in marketing, marketing research and survey design?
A Yes I have.
MR. MEYER: Your Honors, at this time I'd like to offer Dr. Hauser as an expert in marketing, marketing research and survey design.
CHIEF JUDGE SLEDGE: Any objections?
MR. HANDZO: No, Your Honor.
CHIEF JUDGE SLEDGE: Without objection, Dr. Hauser's accepted as an expert in marketing, marketing research and survey design.
MR. MEYER: Thank you, Your Honor. Can we hand out copies of Dr. Hauser's written testimony, please?
Thank you. Dr. Hauser, do you recognize this as a copy of the written rebuttal testimony that you submitted in connection with this case?
THE WITNESS: Yes, I do.

BY MR. MEYER:
Q Okay. And the exhibits thereto are exhibits that you selected for inclusion with your written rebuttal testimony?
A Yes, these are the exhibits and the appendices that I selected for inclusion.
MR. MEYER: All right, at this time I'd like to offer the rebuttal testimony of John Hauser with exhibits, as SDARS Exhibit 77.
(Whereupon, the above-referred to document was marked as SDARS Exhibit No. 77 for identification.)
CHIEF JUDGE SLEDGE: Any objection to Exhibit 77?
MR. HANDZO: None beyond the issues raised in our motion to strike, Your Honor.
CHIEF JUDGE SLEDGE: The exhibit is admitted.

(Whereupon, the above-referred to document, previously marked as SDARS Exhibit No. 77 for identification, was admitted into evidence.)
MR. MEYER: Thank you, Your Honor. Now, just to finish up on your -- thank you. On your qualifications, Dr. Hauser, is Exhibit A to your rebuttal testimony, is that a complete curriculum vitae, at least as of June of 2007?
THE WITNESS: Yes it is.
BY MR. MEYER:
Q Now what was your assignment in the case, as you understood it sir?
A My assignment was to look at the expert report and the surveys completed by Dr. Wind and to comment upon those and I did so. I also looked at additional studies that used Dr. Wind's data.
Q Okay and did anyone assist you in

connection with your work in this case?
A Yes, I was assisted by Applied Marketing Science Incorporated.
Q Okay and have you worked with them before?
A Yes I have. In fact I was one of the co-founders of Applied Marketing Science that was, I think in 1989. I'm now listed as a Senior Consultant with Applied Marketing Science.
Q Okay now if we could, I'd like to hand out just a few demonstratives. Which would be presumably SDARS Exhibit 78.
(Whereupon, the above-referred to document was marked as SDARS Exhibit No. 78 for identification.)
A Thank you.
Q Now first of all Dr. Hauser, what general conclusion did you reach with respect to the survey conducted by Dr. Wind?

A Well my general conclusion was that a number of questions and a number of -- a lot of the analysis in Dr. Wind's survey was biased in favor of SoundExchange.
Q Okay. And taking a look at the -- the first demonstrative, it talks about in conceptual flaws with Dr. Wind's survey.
The first bullet says, "order biased and the willingness to pay question the tires on the car."
And before we discuss that, I thought it would be helpful to the court if we would give out what's already been marked as Dr. Wind's written testimony and the -- particularly the exhibits, which include his survey which we're going to be talking specifically about.
So could -- for convenience, if we could hand that out. And Jen, what exhibit is that?
Ms. ELGIN: SX 51.
MR. MEYER: Okay and now

obviously, when you refer to the Wind's survey, the Wind's survey you were asked to look at was the survey that Dr. Wind did and submitted in connection with his direct written testimony, right?
THE WITNESS: Yes it is.
BY MR. MEYER:
Q Okay.
A The mall intercept survey that Dr. Wind had taken.
Q And in the -- in the demonstrative we just looked at, when you talked about the willingness to pay question, if we could look at, so everyone knows what you're talking about at Exhibit C to Dr. Wind's testimony, is that a copy of the questionnaire that Dr. Wind used which you are commenting on?
A Yes, this is a copy of the mall intercept questionnaire.
Q Okay. All right, now when you talk about the willingness to pay question, which question in Dr. Wind's survey and for

convenience, we're going to look at his subscriber survey, the first one. Which question are you referring to, as the willingness to pay question?
A Oh, the primary willingness to pay question is question 9 and I think it appears on page 7.
Q Okay. And this is the question where Dr. Wind asks, among other things, consumers to value the -- a satellite service if it had no music programming, no news programming, no sports programming or no talk and entertainment programming, right?
A Well it asks -- it asks those questions one at a time. But it does ask for the consumers to indicate what Dr. Wind defines as willingness to pay for those services.
Q Okay. All right now with that as context, can you explain what you mean by the order bias and the tires on the car criticism?
A Yes, I'd like to -- I think it's

easiest to understand the order bias with a thought experiment. And this thought experiment is mean -- meant to illustrate the type of issue that Dr. Wind -- the biased that he has built into it, it's chosen as illustrative.

Imagine that I'm buying an expensive car, say a Chrysler 300C. And that might cost something like $40,000.00. Now suppose I asked you how much -- how valuable are the tires on this car and I told you, you would buy an automobile that has no tires.

You in fact would have to drive around on your rims and just for the sake of argument assume that tires are not available for this particular car anywhere else.

Now it would be reasonable for the respondent to say well, a car without tires that I'd have drive around on the rims would be worth say for example, $1,000.00 to me.

Now just applying that mechanically in Dr. Wind's survey, where he

takes away the tires first, we get a value for the tires of $40,000.00, the price of the automobile, minus the $1,000.00 their willing to pay for an automobile without tires.

So we'd get a $39,000.00 value. Again, using Dr. Wind's methodology. Now, that clearly doesn't make sense. And we can come up with other examples.

If we look at what he did, he did exactly that in terms of the willingness to pay for the satellite radio.

He took away music, leaving everything else intact and so we sort of have a tires on the car problem.

One thing is taken away but every -- but we got a much lower value. Now, to understand that sort of a little bit further, let -- let's take another thought experiment and let's suppose that we begin with a Chrysler 3000 -- 300C and first we take away it's premium stereo system.

We take away it's powerful engine,

we take away it's comfortable seats, we take away perhaps the trunk room, a number of other things, until we're down with, sort of a low end Chrysler that might be worth something like $14,000.00.

Now we take away the tires. A consumer still says $1,000.00 but using Dr. Wind's methodology, we get a value for the tires on the car of about $13,000.00.

So just by varying the order on which I take features away from this automobile, I get a very different number. In this case only 1/3 as much.

So we can see that the order in which you take away features from the car is going to effect in a very major way, the value measure with Dr. Wind's question.

And in fact, if we take away all the features in this order, we're going to get a number that's much higher then $40,000.00 for these automobiles.

So it's just -- it's just a

question that cannot measure willingness to pay directly.

Q And specifically then, with respect to Dr. Wind's question 9 and particularly question 9(B), how does this tires on the car bias, how does that effect the value that Dr. Wind finds for the willingness to pay for music?

A Well as you can see in question 9(B), and we can talk about the other parts of this question, but in question 9(B), he takes away music from the satellite radio.

And then he says how much would you pay? And he gets a number. And he attributes that all to music. Now we can imagine -- and that -- that's going to favor SoundExchange.

Now we can imagine another situation where we take away things like commercial free, the quality of the sound, perhaps the national coverage, perhaps items like news or Howard Stern or things that are

not available on a terrestrial radio and we basically bring it down to the level of terrestrial radio or close to the level of terrestrial radio and then we ask how much would you be willing to pay, if for a service without music.

So suppose we bring that value down, a consumer says well with music, I'd be willing to pay $1.00, without music, I'd be willing to pay $.35, perhaps for comedy or something else.

So we'd measure a value of $.65 for the value of music. This clearly favors the Services and I'm not arguing that it's the correct way to do it, but it's no more correct or un-correct in the way Dr. Wind does it.

The bottom line is that the order in which you take these things away, effects the outcome of the survey.

Q Okay, now I meant to ask you this before, is it your understanding that this question, question 9 was relied upon by Dr.

Pelcovits and Dr. Ordover in their calculations of rates?

A Yes it was.

Q Okay. And do you recall the result that Dr. Wind arrived at from this question on the willingness to pay for music programming?

A Yes, Dr. Wind stated a value of $6.80 for the value of music.

Q And to be clear, was Dr. Wind valuing -- okay. I'm going to withdraw that. Now --

JUDGE ROBERTS: Let me ask you question Dr. Hauser. Assuming that there is, as you say, order bias. You always have to start with a question if you're going to be asking this removal.

It could have been how much do you value of the service without Howard Stern. How much do you value it without X.

How do you go about avoiding order bias when it's always that first question that

is going to presumably shape the subsequent ones?

THE WITNESS: Oh, I totally agree with you. The first question, as well as if it's last it also shapes it.

So one way to do this is to take all possible permutations of the features. All -- all different orders of -- that you can have and then average over those orders.

JUDGE ROBERTS: And is that asked of the same subscriber or do you ask this over different subscribers?

In other words do you -- is the first question to a subscriber, what do you value the product without Howard Stern and let them give a response, and then they fill out the remaining what do you value without music, without news programming, etc., and then you have to go to another subscriber to get that first response again.

THE WITNESS: Yes.

JUDGE ROBERTS: You can --

THE WITNESS: Yes, for --

JUDGE ROBERTS: You can --

THE WITNESS: It'd be a long survey to have it --

JUDGE ROBERTS: Yes, okay --

THE WITNESS: For each -- each respondent, so it's an across individuals to sign.

JUDGE ROBERTS: Okay. And by the way, I would ay, personally, a lot more than $1,000.00 for Chrysler 300C without tires.

(Laughter.)

THE WITNESS: My son would be -- would thank you. He works for Chrysler.

MR. MEYER: Now, Dr. Hauser did we -- we're going to come to this, but did you in fact do a survey which in fact did what you just suggested which is randomize the order and then average the values?

THE WITNESS: Yes I did.

BY MR. MEYER:

Q Okay. And did -- was the result a

number that was similar to Dr. Wind's number for willingness to pay for music?

A Well when you remove music first, you get a number -- I corrected a few other flaws. But you get a number that's in a the range of Dr. Wind's.

When you remove it last you get a much smaller number and then when you remove it in a random order, you get a number that's in between that.

Q Okay.

A Those two numbers.

Q Let's -- I'm deviating a little bit from my order, so let's just take a look at that and that would be in the third demonstrative slide that we've handed out.

It says, "Results from the Hauser mall intercept survey willingness to pay." Is that what you're describing?

A Yes. The numbers shown in red are basically -- well the first number shown in red is the 293 and that's the number that you

obtain after waiting and I can scribe waiting a second. If you remove the features in a random order.

Q Okay, and we'll get to the other two columns when we talk about your survey.

Now, just to go back then to the first slide, your other key conceptual flaw with the Wind survey, you say improper method used to select features and you call this the voice of counsel criticism. Can you explain what you're referring to?

A Yes. The basic concept here is that Dr. Wind attempts to measure percent importance or in some cases the number of people who rank something first.

And that's very sensitive to the number of features or the types of features that you include in the survey.

Again, if you forgive me, if I can again use a automobile example, suppose that for whatever reason we say please tell me which of the following is the most important,

the tires, the cup holders in the car or the floor mats.

It's very likely that most people would say the tires, although not everybody and we get a very high number for that.

Now suppose I add some features, some very reasonable features such as the power train, how fast it goes, how comfortable it is, what type of sound system it has, what type of trunk room it has, pretty much describing a complete car, perhaps the styling as well, and in that case if I now ask for tires, there may be some people who consider tires the most important but many fewer people would.

So anytime we -- we look at something like percent of importance or the percent of the people who rank most important, we have to realize that that's very sensitive to the features that you include in this list.

Now what Dr. Wind has said that he's done and I read through his deposition

transcripts, is that he had obtained these features from the counsel.

And he further admits that counsel is not unbiased in this manner so as a result we have fewer features than one might have and this tends to upwardly bias statements about percent importance or percent of people who find a feature more important.

Q Okay and we're going to look at other questions in Dr. Wind's survey, but let's -- for now, let's stay on question 9, which is what Dr. Pelcovits and Dr. Ordover primarily used. How does this voice of counsel criticism play into question 9, if at all?

A Well just as the number of features you have in an importance question impacts results, so does the number of features you have in a willingness to pay question.

And this is particularly as I'm removing them first, earlier in the order.

What you really like to have is as a complete a list as feasible of the features that the consumer considers important.

And you want to get -- you may not have every feature, but you want to have as many features as you possibly can so that it's a full description of the service that consumers are actually having as you remove these features in a random order.

Q Okay --

A And Dr. Wind does not.

Q Okay, now staying for the moment on question 9, what are the other biases that you see with the willingness to pay question, question 9 and I'll direct your attention to the second demonstrative exhibit in the package which is titled additional flaws in the willingness to pay question.

Let me go one by one. The first bullet you say the Wind survey ignored or suppressed consumer surplus? And again with reference to question 9, can you explain what

you mean by that?

A Yes. This goes to the heart of what willingness to pay is. Willingness to pay as is normally used, is how much the consumer is willing to pay for something.

And it might be that some consumers are willing to pay more than $12.95 a month and in fact there's some evidence of that.

Say they're willing to pay $20.00 per month. What Dr. Wind does, early in his survey in his pretest, if he gets an answer above $12.95, he basically decided that -- to not use those respondents and he then actually did use other pretest answers in his results.

If you then read through question 9 and it's actually fairly complicated to go through all the skip patterns, but as you read through it, you see that if the respondent does give a number higher then $12.95, the respondent is asked again, and this essentially induces what we call a demand

artifact.

A respondent's a little bit uncomfortable about giving that answer, it's ultimately accepted but we have a strong question that somewhat suppresses it.

Q If I can interrupt you for a moment, in 9(A) of Dr. Wind's questionnaire, does he ask, "As you know, the single subscription price per month for satellite radio is $12.95." Is that in the actual question?

A Yes, that's actually the second criticism and we're artificially anchoring people at $12.95 before we ask them their willingness to pay.

Q Okay. And then this is --

A And well known in survey research, if I give you a number, you're going to anchor on that.

Q And then at the end of 9(B), it says, "Type in amount in dollars and cents, note answer and question 9(B) must not be

$12.95."

A That's right.

Q Is that also a part of what you're talking about?

A Yes, he does not accept the $12.95 and $12.95 actually might be reasonable. For example, if the consumer values the service at $20.00 and you take a feature away, they may value it at $14.00, which is still above $12.95.

Q Well why would ignoring or suppressing the consumer surplus, why would that favor SoundExchange?

A Well it's going to, in most cases, it's going upwardly bias the number you get for music and a reason for that is some of the consumer surplus is soaking up this loss and a willingness to pay.

Q And when you say that the question was artificially anchored at $12.95, can you explain similarity why that would bias the survey in favor of SoundExchange?

A Yes, I've indicated, this is actually an interesting phenomenon in survey research.

I can ask you a question that you don't know the answer to like, how many fireflies there are in Dallas?

And if I just put a number in your head, say 200, you're going to give me a number closer to 200 then you are to the true answer and I actually don't know how many fireflies there are in Dallas, but, on the other hand, if I give you a million, you're going to give me an answer closer to a million.

So it's called anchoring an adjustment. It was actually first identified by Danny Conamon, who went on to win a Noble Prize for some of these issues in economics. It's a well known phenomenon sort of anchoring an adjustment effect.

Q Okay and then the next bullet point in the demonstrative says that the

cancellation question was leading. Can you tell us specifically what you're referring to there?

A Yes. In survey research, you don't want to ask leading questions. And usually what you want to do is ask a two-sided question.

The best example of this -- I actually once spent some time at USDOT and the American Automobile Association had a survey and in this survey they asked should the Highway Trust Fund be used for non-highway purposes?

And of course respondents said no, no, no. When that survey was redone, should the Highway Trust Fund be used for non-highway purposes or should some of the Highway Trust Fund be used for mass transit?

The consumers understood the question and most of them agreed with that. So what you really want to do is you want to ask two sides to the question and the bias

here is Dr. Wind has a statement, which basically says, "If you think that not having this programming type will lead you to cancel your subscription, please say so."

That's a one sided question. A better way to word that would to actually state the other side as well. And there are other places that Dr. Wind uses one sided questions as well.

Q Did Dr. Wind, based on your review, offer testimony about whether that was leading or not?

A Yes. When I read through the transcripts when he was asked, he admitted that that was potentially leading.

Q And finally, you say the Wind survey, and again we're talking about question 9, ignored pricing complexities of satellite radio services. Can you explain what you mean by that?

A Yes, the consumer can best answer willingness to pay questions based upon the

way they're actually paying for the service.

And for good business reasons, I understand that satellite radio, you can sometimes buy a yearly subscription, sometimes a lifetime subscription, some people pay by more than a month a time, some people pay by the month, some people pay both $12.95 for the first receiver and then $6.99 for the second receiver and there's also phenomenon that some consumers actually understand that part of the price they pay goes into subsidized equipment.

Just as you would with a cell phone plan. Some of that subsidizes the cell phone. So it's actually fairly complex in terms of pricing and it's not clear which way it biases it, but a better way of asking this question is to actually first ask the consumer or the respondent, how they actually pay for satellite radio and then ask the willingness to pay.

Q When you referred earlier to soaking up the surplus, can you explain more

what you mean by that? What did you mean by soaking up the surplus?

A Well again, let's take the hypothetical. If I value satellite radio at $20.00, and some people do, at least their surveys indicate that.

And then I say well how much would I pay for satellite service without music? And the person says -- I just gave this a while ago -- $14.00.

Well $14.00 is still above $12.95. So, the question then is what is the value of music there? And so by essentially making it larger, you may actually get a larger value for music, you may get a lesser value of music, but by and large it's going to be an inaccurate value of music.

Q All right now, let's turn to you're -- this survey that you did. Now, how many surveys did you conduct?

A I conducted two surveys.

Q Okay. And one of them was a mall

intercept methodology, like the one that was used by Dr. Wind, is that right?

A Yes. My goal in the mall intercept survey was to replicate as much as possible of what Dr. Wind had done, while correcting the two major flaws and as many of the minor flaws that I could correct.

But by and large, in order to make the comparisons as -- as understandable and easy as possible, I maintained the same cities, I maintained the same type of briefing, incentives, similar incentives, etc., trying to replicate that as closely as possible.

Q And did you ask a form of willingness to pay questions in your survey?

A Yes I did.

Q Okay and let's take a look at your report, exhibit e. Is that a copy of the questionnaire from the mall survey, at least with respect to subscribers to satellite radio?

A Yes. This is the subscriber's version. There was also a considerer's version.

Q And by the way, how did you conduct the survey? How was it -- logistically, how was it conducted?

A Well the logistics was very similar to what Dr. Wind had done. We -- well we began with the cities that he had selected -- there's some complexity there but -- and after we had done that, we randomly selected a mall and then we randomly selected within the mall, to the greatest extent possible and we also had the interviewers again to the greatest extent possible, interview different times of the day, days of the week, etc., just as Dr. Wind had done.

Q All right, when I cross examined Dr. Wind, I suggested to him that I thought one of the cities, he had put in the wrong census region. Did you check that?

A Yes he did. He put Baltimore in

the -- I think the northern census region and I replicated that.

Q Okay.

CHIEF JUDGE SLEDGE: So why did you select malls?

THE WITNESS: What?

CHIEF JUDGE SLEDGE: Why did you select malls?

THE WITNESS: Oh, I select -- for this particular study, I wanted to replicate what Dr. Wind had done. And he had used the mall intercept studies so I -- I just replicated the mall intercept.

CHIEF JUDGE SLEDGE: Is that a good choice to make?

THE WITNESS: Well, mall intercept, when I first began market research was -- was really quite good.

And it was probably the best you could get and I've used quite a few mall intercepts. Over time, it's become more difficult to get a random sample within a mall

and actually internet is become better over time.

Survey research has gone through phases. If I may continue, initially we did a lot of door-to-door survey research but then people no longer open their doors.

And we did a lot of random digit dialing research, but now you have no call lists and people don't answer the phones and they're on the cell phones so random digit dialing is becoming less accurate.

And the same thing is in the mall. Fewer people go to the mall. It's still accepted and it's still accepted in the courtroom. Corporations still use it.

It's still pretty reasonable, internet is just a little bit better. And what's happening is more and more people are on the internet, more and more people answer their e-mails, panels are getting more random, etc., so over time the modality's changed.

CHIEF JUDGE SLEDGE: You read the

testimony so you know my questions to Dr. Wind that the mall is biased by excluding lower economic strata of society and so first of all, is that observation correct?

THE WITNESS: To some extent it is, yes.

CHIEF JUDGE SLEDGE: And if it's correct, then your survey also excludes disproportionately the lower economic end of society and the persons that you selected to take your survey?

THE WITNESS: Yes, my survey shares the same bias as Dr. Wind. It's a moderate bias, particular for XM Radio but the mall intercept survey does share some of those biases. I did not correct those.

MR. MEYER: And Dr. Hauser, how many people did you end up with as respondents to your mall intercept survey?

THE WITNESS: Well after screening and after validation, I believe it was 337.

BY MR. MEYER:

Q Okay, now if you turn to page 3 of the mall intercept survey, it says -- we're looking at the one that went to subscribers, did you include considerers as well just like Dr. Wind did?

A Yes. Dr. Wind -- I included considerers and there's a different survey for that and he stated in his testimony that he wanted to weight those 75-25, so I used that same weighting again for comparison purposes.

Q Okay and so now is question 7 in essence your analog to Dr. Wind's question 9 that we just looked at, the willingness to pay question?

A Yes. There's some questions leading up to that where we find out how people pay for satellite radio and a few other things and this is used in the analysis but the core of the question is to remove the features one at a time.

Q Okay --

A And --

Q To address --

A I'm sorry, one at a time cumulatively.

Q To address what you just eluded to, for example, what is, in question 6, you ask what is the most you would be willing to pay for your satellite radio subscription? What was the purpose of that question?

A Well this was to avoid the $12.95 anchor and to let them state a number that may in fact include consumer surplus.

Q Okay.

JUDGE WISNIEWSKI: Potentially, if I could ask a question in connection with that, since the preliminary question asked them, and these are all subscribers and the preliminary question asked them how they pay, don't they already have a number in their mind about what seems to be a reasonable range to pay? Isn't the same --

THE WITNESS: Right --

JUDGE WISNIEWSKI: -- as giving

the $12.95?
THE WITNESS: It anchors it a little bit but it's not as much as actually stating a number. It's not quite the same demand artifact.
JUDGE WISNIEWSKI: Thank you.
MR. MEYER: Is question 6a designed to get at what has been referred to and I've -- I'm going to delight about economics during this trial as a reserve price?
THE WITNESS: Reservation price --
BY MR. MEYER:
Q Reservation price -- say that --
A Yes, yes, willingness to pay is an attempt to measure the reservation price.
Q Okay. All right so now question 7, the willingness to pay question, how did you address the tires on the car flaw that you testified about earlier?
A Well as I've indicated, and this again is just an example, that we have all --

we chose a permutations randomly, but in this example, we first remove national reception then we remove reception and sound quality and then we remove reception, sound quality and commercials.
And it's actually seven things that are removed. Again, I'd like to point out that we did this removal randomly.
Q Okay and -- and then you took the -- for the result, you took the average?
A Right. I averaged over the randomization.
Q Okay and how did you address the voice of counsel concern with respect to this willingness to pay question?
A Well what I tried to do is have a more complete list of features on this particular question and I did this by talking to consumers, some of my own experience with satellite radio, reading through some summaries that were given to me.
And basically it -- there are

features that are not on here but this is a -- a more complete list then Dr. Wind uses.
Q Okay. Now let's talk -- we heard about it while you were out of the room a little bit, about the summaries and the interviews. Who actually -- who conducted interviews with consumers?
A Well the -- there were initially, I think it was 41 qualitative interviews and these were direct conducted by three people working at my direction at Applied Marketing Science.
Q Okay. Did you participate in any of those interviews?
A No I did not.
Q And were you given summaries of those interviews by AMS?
A Yes I did.
Q Okay. What was --
A I'm sorry, yes I was.
Q Yes. What was -- what was the purpose of having those interviews done and

the summaries created?
A Well the purpose was to right the questionnaires. This information was used in both the mall intercept and the internet questionnaire. I wanted to have a more complete list of features.
Q Okay. And what would have been the effect of being over-inclusive? In other words if based on the summaries you received or -- or based on anything else, you had included too many factors, wouldn't that have biased the survey?
A Well, no not really because, I mean, suppose I had a crazy feature like satellite radio cleans my dishes --
Q We're working on that by the way --
A Well, the first thing that would have happened, is when I pretested the survey, respondents would have told me or the people pretesting that you're crazy, it just doesn't do that.

Now suppose it's not quite as extreme and it does make it through, their still free to give zero importance to this or express zero willingness to pay when it's taken away.

So it's sort of an asymmetric bias. If you include it, it doesn't hurt you that much. If you exclude it, then you never get a chance to measure it's impact.

And you're, in effect, assigning it a zero arbitrarily.

Q Okay and then, now with respect to your willingness to pay question, question 7, and we looked at this briefly before, I'm looking at the demonstrative titled results from the Hauser mall intercept survey, willingness to pay, now I've lost track of whether it's the second or third, I believe it's the second demonstrative, third, thank you, the one that looks like this.

And now, can you explain -- explain what -- well the first column, that's

what Dr. Wind got from question 9, is that right?

A Yes.

Q And that's with removing -- removing music first?

A Yes.

Q And you eluded to this before, the results from your question 7 and we just looked at using a random order and then averaging the results was 2.93?

A Yes, the weighted version.

Q Can you explain this -- these references to un-weighted numbers, what that means?

A Yes, this was -- Dr. Wind, I mean he did a number of things appropriately and one of the things he did appropriately is to use a filter question.

And the filter question is there to avoid a demand artifact, sort of a leading question. And basically asked people would you or actually would you change or would you

not change and he asked that question.

Now, because I was using all of these permutations, it was very difficult to have a filter question for each one of the permutations. So even though I have some concerns about Dr. Wind's numbers, I thought that I could use his numbers, in terms of the filter question and then apply them to my data.

And that's the number I've expressed here is 2.93. If I don't use the filter question, then we get a few people who are basically subject to that demand artifact and we get a higher number is 3.37.

Now I felt that since the lower number actually favors the Services, I thought appropriate to report both numbers, although I believe that the 2.93 is probably closer to the true value.

Q Okay and then the further adjustments you make downward, that's as a result of your internet survey which we're

going to talk about?

A Yes, there's adjustments for the fact -- it's my understanding that the music rights at issue in this case are only from I think 1992 -- 1972 onwards.

Q And where did that understanding come from?

A Oh that did come from counsel.

Q And then the -- the final number where you reduced the value of music or the willingness to pay for music to $.46 --

A Well --

Q -- adjusted to account for all features? What does that mean?

A It just accounts for all the features like choice of programming and other things that some consumers perceive along the lines of music programming.

Q Okay.

A It's a lower number.

JUDGE ROBERTS: Dr. Hauser, on the third column --

THE WITNESS: Right.
JUDGE ROBERTS: Is it intended to say adjusted to 1972 music?
MR. MEYER: Absolutely should be.
JUDGE ROBERTS: Or not, it says pre-1970 music.
THE WITNESS: Yes, that's -- we --
JUDGE ROBERTS: You're leaving out one year there of --
THE WITNESS: Yes.
JUDGE ROBERTS: -- sound recording right did not apply. Form was right?
THE WITNESS: Yes. Oh I'm sorry, I'm sorry, Your Honor. Do you want me to explain?
JUDGE ROBERTS: Yes, please.
THE WITNESS: It was very difficult to word this question in a 1972 framework.
The thing that consumers related to very well was music of the `70's, `80's, `90's and today versus music of the `40's,

`50's, `60's and earlier and so the survey actually measured that cutoff, 1970 and further and versus 1960 before.
So yes I'm including -- in some sense I'm -- this is also willingness to pay for that period from 1970 to 1972, which I think includes Stairway to Heaven, which is something that's -- but that favors SoundExchange as opposed to the Services.
JUDGE ROBERTS: Now of course there would be music from the `50's and `60's, `40's, etc., where the sound recordings themselves would be subject to the performance right because they had been re-recorded.
THE WITNESS: That's possible.
JUDGE ROBERTS: Right. So it's just a question to the subs about -- the subscribers about the music, not about the timing of the sound recording.
THE WITNESS: Right. The -- I'm a survey expert and I tend to work with what consumers can understand and it's hard to ask

a question about what is -- because consumers don't know what the right or not right -- who owns which rights but they do know this sort of decades and that's what they -- that's the best way to ask that question.
MR. MEYER: I'm sorry, to be clear Dr. Hauser, are you offering a legal opinion about which rights are subject to copyright or subject to a sound performance -- sound recording right or not?
THE WITNESS: No, I'm not a lawyer.
MR. MEYER: Okay.
THE WITNESS: I know surveys. I can tell you about surveys.
MR. MEYER: Okay.
THE WITNESS: Few other things as well.
MR. MEYER: Your Honor, it's 12:30, this would be a good breaking point if you want to break for lunch or I would be happy to keep going. I probably have another

half hour to 45 minutes.
CHIEF JUDGE SLEDGE: All right, we'll recess for one hour.
(Whereupon at 12:35 p.m. a luncheon recess was taken until 1:39 p.m.)
CHIEF JUDGE SLEDGE: Thank you. We will come to order.
BY MR. MEYER:
Q Dr. Hauser, I want to ask you about another aspect of Dr. Wind's survey. Did Dr. Wind do something called a conjoint analysis?
A Yes, Dr. Wind did a conjoint analysis.
Q And just refresh my recollection as to what a conjoint analysis is.
A There are many forms of conjoint analysis. The form that Dr. Wind used was a hybrid conjoint analysis. The concept of conjoint analysis is to decompose overall preferences into a series of features, usually so that the features can be added up.

Q Okay. And, looking back at Dr. Wind's survey, the conjoint analysis consisted of these questions five, six, and ten. Do I have that right?

A Basically five, six. He used a few other bits of data but primarily question ten.

Q And then did Dr. Wind also do what he called a constant sum question or questions?

A Yes, he did.

Q Okay. And is that question four and question seven from Dr. Wind's survey?

A Yes. Dr. -- question four and question seven.

Q Okay. Now, with respect to all of those questions, the conjoint and the constant sum, this is where Dr. Wind essentially asked consumer to rank various attributes of the service. Is that right?

A Well, he actually gets metric importances. And then in a conjoint analysis,

he asks about overall profiles, from which you can infer importances.

Q When you say "metric importances," what do you mean?

A Oh, sorry. I shouldn't -- I should avoid using technical terms. Metric means rather than rank order, which would be one, two, three, sort of how much -- how large is it, sort of like a thermometer might measure a difference in temperature.

Q Okay. And did the voice of counsel --

CHIEF JUDGE SLEDGE: I am sorry. I didn't understand that. I thought you were fixing to go on and say, "rather than this," it was something else. Apparently I misunderstood your answer.

THE WITNESS: I am sorry, Your Honor. Ordinal data would mean I'm like only first, second, third, or fourth. Metric data would be I'm first, but I'm ahead of you by 10 percent or I'm ahead of you by 20 percent. So

it sort of measures, if you can imagine, on a scale.

So thermometer if we think of it just doesn't say it's warmer today than it was yesterday. It may say it's ten degrees warmer than it was yesterday or five degrees warmer than it was yesterday.

Of course, I don't know if it is warmer today or not, but --

CHIEF JUDGE SLEDGE: I thought thermometers just gave absolute readings. I didn't know they gave comparisons.

THE WITNESS: Well, if I want to, Your Honor, if I want to compare yesterday to today, I could subtract the temperature yesterday from the temperature today.

CHIEF JUDGE SLEDGE: But that is a calculation you make, not something the thermometer reads or shows.

THE WITNESS: Exactly. And the same thing is true in conjoint analysis. What Dr. Wind does, he gives them a profile of

features. And he says, in essence, how much do you prefer this concept? And how much do you prefer the second concept? And then we can infer a difference between those.

CHIEF JUDGE SLEDGE: Thank you.

BY MR. MEYER:

Q To summarize, the conjoint analysis and the constant sum analysis done by Dr. Wind, are they basically attempts to measure the relative importance of music relative to a variety of other attributes?

A Yes. He uses them in that manner.

Q Okay. And did those methodologies as used by Dr. Wind also suffer from the voice of counsel that you testified about earlier?

A Yes, they did. If you're trying to, as he does, either percent -- measure either percent of importance or the number of people who prefer a particular feature, it's very sensitive to the number of features that you put into either of those analyses.

Q Now, in your mall intercept

survey, did you attempt to test the effect of correcting that flaw?

A Well, what I attempted to do in my mall intercept survey is demonstrate that Dr. Wind's percentages are, again, very sensitive to the number of features that you put into in this case some measure of importance.

Q So if we take a look back at exhibit E to your testimony, -- and this is the survey questionnaire that went to the subscribers -- if you look on page 5 at question 8, is this, as you said, your attempt to through a measure of importance question that corrected the voice of counsel flaw?

A Yes. It is an attempt to demonstrate the flaw in Dr. Wind's survey and to attempt to correct it somewhat. There are some caveats I can provide.

Q Since you mentioned it, I think you'd better provide them.

A Okay. Thank you.

Well, this is a list of 29

features. And we started with a slightly larger list. It's very difficult to have that long list in the survey. So these are the ones that we felt would be some of the more important ones. And I then augmented the list from my own experience and from some issues in this case.

And so in this list, we're using an anchored importance scale. That means I ask you "How important is this? Give 100 points to the most important feature. And then give some number between zero and 100 to the next most important, to any of the features."

Now, that anchored score tends to predict quite well. However, unlike a constant sum, you can't get it to add up to 100. These numbers will add up to more than 100. In addition, some of these features are -- they're not meant to be independent. So you can't do the additive calculations.

So I just wanted to illustrate how

sensitive Dr. Wind's results are to the features that are included.

Q Okay. Now, why did you choose to do an anchored survey? In other words, why did you require them to give 100 points to the highest ranked feature, as opposed to what Dr. Wind did?

A All right. Well, later on we will see a constant sum scale, but in this case there are 29 features. And it's very difficult for a consumer to assign points across 29 features so that they add up to 100. And we've done a lot of research to suggest that these scales are accurate as well when interpreted carefully.

Q And the features that you list here in question eight when they were presented to the survey subjects, were they randomized?

A Oh, yes, they were randomized.

Q And if we take a look at the demonstrative, which is the fourth page,

results from the Hauser mall intercept survey importance of music and you have a number of features on the left and then various rankings, first of all, those features that you have there, is that the full list of features that you asked about on page 5 of your survey?

A No. There are 29 features. And this is just a subset of those.

Q But is it the highest ranking set?

A Yes, that is the highest ranking.

Q Now, you say in the first column "Wind result percentage allocating the most points, question four, 74 percent." And, again, so we have the context, let's go to the Wind report and take a look at where that is. That would be on page 37 of Dr. Wind's original written testimony.

And if you'll turn to that, Dr. Hauser, and look at figure 18 on that page?

CHIEF JUDGE SLEDGE: Where is this part in your testimony?

MR. MEYER: It's in Dr. Wind's written --

CHIEF JUDGE SLEDGE: I am not asking about Dr. Wind's testimony.

MR. MEYER: In Dr. Hauser's testimony?

CHIEF JUDGE SLEDGE: Right.

MR. MEYER: I'll find it.

CHIEF JUDGE SLEDGE: You're not referring to the testimony so we can get that reference.

MR. MEYER: You mean the demonstrative?

CHIEF JUDGE SLEDGE: Right.

MR. MEYER: Okay. I'm sorry, Your Honor. If you'll look at exhibit L to Dr. Hauser's report, that presents the full data from which the demonstrative was an excerpt.

CHIEF JUDGE SLEDGE: All right.

BY MR. MEYER:

Q Now, I'm sorry, Dr. Hauser. So the 74 percent that you're comparing to, is

that from page 37 of Dr. Wind's report?

A Yes, it is.

Q Okay. So in figure 18, Dr. Wind says, am I correct, that 74 percent of the people in response to question 4 allocated the highest number of points to music? Is that correct?

A Yes, that is a correct statement of what Dr. Wind testified to --

Q Now, what did --

A -- in his testimony.

Q -- your mall intercept survey show with respect to the percentage of people allocating the most points to music?

A Well, when we re-ask the question, including other features, -- remember, some of these are not independent -- we find that the specific attribute "I can listen to music" receives 10.7 percent. And there's also an aspect "I can listen to music from the '70s, '80s, and '90s" that receives 5.4 percent.

Q And so what do you conclude from

the results of your survey?

A Well, what I conclude is that the 74 percent misrepresents the importance of music. I would also like to point out that when the 74 percent is calculated by Dr. Wind, it breaks all ties in favor of music.

Q Can you explain what you mean by that?

A Well, if two features receive the same number of points, what this number -- if, say, that, in fact, suppose he has 5 features and they all receive 20 points, he would then say that music received the highest number of points. So it breaks ties in favor of music.

Q Okay. Now let's talk about your internet survey, which we have alluded to a number of times. In fact, why don't we --

JUDGE ROBERTS: Before we get to that, just one question on the features here.

MR. MEYER: Yes, Your Honor.

JUDGE ROBERTS: You have a breakdown of "I like music from the '70s,

'80s, '90s, and today"? But why isn't there a little bit further breakdown in terms of features to "I like listening to rock and roll," "I like classical music" to get a better idea of the differentiation of the types of music?

THE WITNESS: Well, we could have. We certainly could have included that breakdown further. It would have been more features to include in the survey.

And we could have gotten the importance of those features. I just chose not to. I am trying to illustrate how if we add in other features, we change the importance result quite dramatically.

JUDGE ROBERTS: Is there a particular reason why you chose not to do that, to add those features?

THE WITNESS: Well, I didn't --

JUDGE ROBERTS: You don't think that would motivate people in terms of their subscriptions, "I like lots of channels of

rock and roll, and it's got lots of channels of rock and roll"?

THE WITNESS: That certainly could have been measured, Your Honor. In fact, there are probably 100 or so different features that if one wanted to further parse all of this down to rock and roll, the various talk channels, this is a study that could be done. I chose the I think 29 features that I felt would somewhat encapsulate the majority of the features that respondents indicated to me.

I'm not sure if that answers your question. I could have done the study, but I didn't. I did not choose not to do it, Your Honor.

JUDGE ROBERTS: Okay. All right.

CHIEF JUDGE SLEDGE: But there is no reason why you broke it into decades, as opposed to breaking it into genres?

THE WITNESS: Actually, there is a reason why I broke it into decades.

CHIEF JUDGE SLEDGE: That is what we have been asking about.

THE WITNESS: Okay.

JUDGE ROBERTS: I understand why you broke it into the decades, '70s, '80s, and '90s, because that gives you something of an assurance that at least those are going to be covered by this performance right. I assume that's why you did that, correct?

THE WITNESS: Right. In this case, I wanted to see if there were differential importance for the subfeatures. And we'll see a little bit more of that in the constant sum scale. Had the question been differential rights for classical versus rock and roll versus country or something, I could have done that greater depth.

But I did choose specifically the decades because that is a relevant issue here at this -- in these proceedings, Your Honor.

CHIEF JUDGE SLEDGE: Why?

THE WITNESS: Well, my

understanding is that the copyright issues, rights at issue in this case, begin with recordings from 1972 on.

CHIEF JUDGE SLEDGE: But you said earlier you didn't measure when the performance was. You measured the origin of the music. So you're not addressing any copyright issues.

THE WITNESS: It is not a perfect connection, but to a large extent, what respondents perceive as '70s, '80s, '90s, and today I would imagine would be recordings from the '70s, '80s, '90s, and today.

CHIEF JUDGE SLEDGE: It sounds like you are assuming a lot of sophistication by your audience that may not be there.

THE WITNESS: You're correct.

JUDGE WISNIEWSKI: Could you have focused just on one genre, which would be pop music, to the exclusion of others?

THE WITNESS: No, Your Honor. My understanding, again, from speaking to the

qualitative interviewers, is that respondents would understand many other genres as well.

JUDGE WISNIEWSKI: From this question. I'm focusing on this feature.

THE WITNESS: No. On this particular feature, my understanding is country, for example, there's old country, there's new country, there's folk. Other genres as well could be broken down by decades.

JUDGE WISNIEWSKI: I would not have taken the question that way personally, but --

JUDGE ROBERTS: I wouldn't have either if I had seen --

CHIEF JUDGE SLEDGE: Obviously none of us would have.

JUDGE ROBERTS: Music to the '80s, I'm not thinking country music of the '80s. I'm certainly not thinking classical music of the '80s. I'm thinking of top 40 from the '80s when I hear that description.

THE WITNESS: Well, it really depends. I listen to a lot more country than I do to some of the other genres. And, for example, I'm aware that Dolly Parton actually has a recent recording of Stairway to Heaven. To me --

JUDGE ROBERTS: Can't say I've heard that one.

THE WITNESS: What?

JUDGE ROBERTS: Can't say I've heard that one.

THE WITNESS: It's actually quite good. I listen to it a lot.

CHIEF JUDGE SLEDGE: What decade is that?

THE WITNESS: That decade is 1990s.

CHIEF JUDGE SLEDGE: But the general audience hearing that song is supposed to know that Dolly Parton is a '90s song?

THE WITNESS: As a country music fan who buys most of Dolly -- well, actually

listens to a lot of Dolly Parton's music or buys a lot of her CDs would probably be well aware of that. It also received a lot of play time, for example, on country music television.

JUDGE ROBERTS: Well, the whole thrust of my question here about music -- and this is something that actually has troubled me throughout a lot of testimony, not just yours, is a discussion of music as if it's just a block of the same thing and that people look at it as music, it's just music, where I think that there are certain distinct breaks to the categories of music that people prefer and I have a strong feeling that it influences their decision to purchase satellite radio, their decision to stay with satellite radio.

So I just wanted to know why, in particular, you didn't choose to list as features different kinds of music. And I understand that it was just simply not your choice to do that, but that's the thrust of

the question.

JUDGE WISNIEWSKI: Dr. Hauser, you had mentioned that there is overlap between some of these features.

THE WITNESS: Oh, yes. Yes.

JUDGE WISNIEWSKI: So how do account for the overlap when you're basically breaking these things out by percentages? Clearly there's no overlap with respect to I could listen to music in the Wind result, but you're comparing two.

THE WITNESS: Exactly. And if we get --

JUDGE WISNIEWSKI: My question is, then, is the proper comparison the 74 percent to the 10.7 or 74 percent to 10.7 plus some portion of some of these others? You've already mentioned one being this music from the '70s, '80s, and '90s.

THE WITNESS: Well, your proper comparison -- I attempted to do that in the internet survey -- is it would be part of the

10.7 because that's music rights and other things going to music. And it would be part of some of the others.

I did not design this so that we could specifically add them up. I just wanted to illustrate the flaw.

JUDGE WISNIEWSKI: But in terms of the way this is laid out here, it's laid out as a comparison. And the answer you just gave me doesn't allow for a comparison. The answer may lay out what you consider the flaw to be.

THE WITNESS: Right.

JUDGE WISNIEWSKI: But it doesn't lay out a comparison. Should I take this as a comparison? I guess maybe that's the basic question.

THE WITNESS: Well, I don't think we can say that exactly 10.7 percent -- well, let's focus on the '70s, '80s, '90s, say, notwithstanding some of the issues that have been raised.

I don't think we can take this as

5.4 percent exactly, rank this first, because some of that is picked up by the first attribute. And there might be some in some of the others.

But what it shows is that it is significantly less than 74 percent.

JUDGE WISNIEWSKI: What is significantly less than 74 percent?

THE WITNESS: The -- if I -- okay. If I go to the internet survey, where they are more independent --

JUDGE WISNIEWSKI: Well, I would like you to stick to this one --

THE WITNESS: Yes. Okay. Okay.

JUDGE WISNIEWSKI: -- because that's what we have in front of us here.

THE WITNESS: Yes, yes. I understand. Thank you.

What this says is that we can go and parse some of these. Now, that would require some judgment. And I truly doubt that that would add up to 74 percent. Okay? And

it would be significantly less, but I'm not offering a specific number.

JUDGE WISNIEWSKI: Okay. That's all I wanted to clarify. So we shouldn't take this as a direct comparison?

THE WITNESS: It's an illustration of the flaw.

JUDGE WISNIEWSKI: Exactly. Thank you.

BY MR. MEYER:

Q Just to be clear, Dr. Hauser, in that question that's reflected in the demonstrative, you also asked about not just music from the '70s, '80s, '90s, and today, but also one of the options was "I can listen to music from the '40s, '50s, and '60s," right?

A Yes. That is in exhibit L. And you can see some detail. You could also see absolute importances in exhibit L.

Q Okay. Now, the internet survey, the questionnaire, I

believe, is included as exhibit G to your report. Is that correct?

A Yes, it is.

Q And what was the purpose of doing the internet survey?

A Well, the primary purpose is to get at features that are more independent and also to parse music programming as perceived by the consumer.

Q I want to explain what you mean by "parse." In Dr. Wind's survey, at least in the willingness to pay question, is it correct that he just asks consumers about music, "What would you pay if there were no music?"; correct?

A Yes.

Q So, then, when you say that you were attempting to parse out the word "music" or the concept of music, can you explain in greater detail what you mean by that?

A Yes. When -- from talking to consumers and, again, from my own experience,

there are a number of different features that go into what consumers perceive as music programming. And, as a survey expert, I'm always trying to go to report on the way consumers perceive things.

And they certainly do make the breakdown '70s, '80s, '90s, and today versus '40s, '50s, and '60s, but, in addition to that, they also as part of music programming consider things like the selection and sequencing of songs, the DJs and celebrity hosts, providing commentary, live performances, commercial-free artist and song title displayed on the screen. So these are different features consumers indicate as part of music and programming, music programming.

Q Describe for us generally again logistically how you went about doing the internet survey.

A Okay. The internet survey is a -- it begins with a panel of internet -- of people who have agreed to complete surveys.

This comes from Survey Sampling Incorporated.
Survey Sampling goes to great extents to sort of recruit people and balance people and manage their panels so that the respondents are not overused.
So we then randomly select from the Survey Sampling panel. And Survey Sampling then on our behalf sends them invitations to come to our Web site.
They come to our Web site. They complete a series of screening questions, which include whether or not they are subscribing to satellite radio or whether they might be considering satellite radio. In addition, we have quotas on sex, on age, and on geographic region.
Again, this is an attempt to get as close as possible to the comparison to the methodology that Dr. Wind was mentioning.
Q You may have mentioned it. If so, I apologize. How many respondents did you end up with in the internet survey?

A I believe it was 279.
Q Okay. Now, if you'll turn -- unfortunately, the pages aren't numbered, but in your exhibit G, if you'll take a look at question 4, specifically 4B? Are those the features of music programming that you asked consumers to rate in this survey?
A Yes. Unfortunately, they are not numbered. But yes, these are the features that consumers are asked to rate. And this is now a constant sum methodology.
Q What do you mean by that?
A Consumers -- in previous, we were using an anchored format, where they gave 100 to the most important and a number less than 100 to the others. In this case, they are asked to allocate 100 points between the 8 features. And eight features is a task that customers are comfortable with. And we pre-tested that.
Q And just so we're clear, how does this list of features differ from the list of

features we saw in the mall intercept survey?
A Oh, in the mall intercept --
Q I'm sorry. Let me rephrase that. Obviously there are fewer features here.
A Yes.
Q It differs in that sense. But I guess my question is, how does the purpose of this question differ from the question we just looked at in the mall intercept survey?
A Okay. The purpose of this question is to have features that are closer to being independent. Again, in survey research, you can't get it perfectly independent but as close as is feasible. And consumers then allocate 100 points across these. And this then allows me to parse, break up the perception of music programming among alternative parts of music programming.
Q And to be clear, is it the case that this question in the internet survey just relates to features relating to music programming or as the list of features in the

mall intercept survey included features relating to both music and other types of programming or other types of features?
A Yes. The set of features in the mall intercept survey was much more complete. This just focuses on music programming.
Q And if we could take a look at the results and this is collected, in part, in the demonstrative. That's the fifth page, "Results From the Hauser Internet Survey." And the complete results are at exhibit M to your written direct testimony. Is that correct? I should say your written rebuttal testimony.
A Yes, that is correct.
Q And what did this question from the internet survey show?
A Well, what this shows is that if we now just focus on features of music programming, most channels for commercial-free receive on average 24 points, 24.1 points.
Music from the '70s, '80s, '90s,

and today receive about 15.8 percent of points. And you can see the points illustrated for the other features. Notice that the music from the '40s, '50s, '60s, and earlier receive about 10.2 percent of the points on average.

Q Okay. And what conclusion do you draw from this with respect to the Wind survey?

A Well, Dr. Wind -- a number of conclusions. First, Dr. Wind made no attempt at all to parse music. His feature for importance was just music, which include rights at issue in this case, include other aspects of music, et cetera.

Second, we can see here clearly on more independent features that music from the '70s, '80s, and '90s is not ranked first -- well, actually ranked first by 74 percent. It's ranked fewer. And those details are in exhibit M.

Q Okay. Let's conclude by moving

So what we're trying to do is take each feature and find something that says its partial worth so that we can add those features up to get the whole.

And in a feature, a feature will have many levels: a low level of, say, no music to a high level of substantially more music than is currently available.

And what he says is an importance -- and this is a normal definition of importance -- is the difference between substantially more music than is currently available and no music. That's sort of the part that goes to music divided by the sum of all other parts.

And the criticism here is that -- if you turn to his survey --

Q Which question are you referring to?

A If we, say, look at question 5 on page 3 of, I believe it is, exhibit C --

Q Yes.

on to the sixth and final demonstrative. This contains some additional critiques. You have the Wind survey.

I think we have talked about at least one of these, but just to complete the picture, the first one says, "The conjoint part worth definitions inflate music because they included a service better than what is currently available."

Now, first of all, when you talk about the conjoint, you're talking about Dr. Wind's conjoint, correct?

A Yes. Dr. Wind had a number of features in his conjoint analysis. And he computes importance as the difference between the highest level of the feature and the lowest level of the feature.

Q Now, can you explain, preferably in English, what you mean by "part worth"?

A Okay. A part -- in a conjoint model, again, what conjoint means is sort of to break things up into their component parts.

A -- we can see the highest level is substantially more channels and more variety of music than currently offered. So the importance that he's measuring is not importance of the amount of music that's currently there but, rather, a hypothetical where there is substantially more music.

Q So, in other words --

A That obviously inflates the measured importance of music.

Q So, in other words, do I have it right? He's asking people to compare various features of music programming as against a hypothetical service that doesn't exist?

A Yes, that's correct.

Q Okay. Now, continuing on the additional critiques, I think the second one, it says, "The Wind survey did not attempt to parse the sound recording right at issue here." I think we have covered that.

And the last three relate to Dr. Wind's open-ended questions. Is that right?

A Yes, they do.
Q Okay. Now, in Dr. Wind's survey, again, appendix C to Dr. Wind's report, just to orient us again, are the open-ended questions questions 1, 2, 3, and 11 from Dr. Wind's survey?
A Yes, they are.
Q And if you'll take a look in Dr. Wind's report on page 29? This is figure 11. Now, this just shows the responses to the first of the four open-ended questions. Is that right?
A Yes, this does.
Q And so how many people according to Dr. Wind's first open-ended question mentioned music programming as their top reason for subscribing or considering --
A Seventeen percent.
Q Okay. And without commercial-free, right?
A Yes.
Q Now, if you take a look, staying

in Dr. Wind's report and if you look at figure 9, which is on page 26 -- and Dr. Wind mentioned this table in his testimony. What does figure 9 show?
A Well, what figure 9 does is it combines four questions. The first question is his most open-ended question. And that includes all aspects of satellite radio.
Questions two and three are more narrowly focused on music -- I'm sorry -- on programming. And then question 11, which is the end of the survey, which also, again, is more open-ended -- however, it occurs in a survey where music had been talked about quite a bit.
So it's four different questions are put into the same table. And then he concludes that music programming -- he sort of adds these up. So he is essentially doing an apples and oranges comparison in this particular figure.
Q So on the demonstrative, when you

say the responses to the open-ended questions in the Wind survey were misleadingly conflated, is that what you're referring to?
A Yes, it is.
Q And I skipped one on the demonstrative. It said, "The open-ended questions in the Wind survey do not demonstrate that music predominates." Where did you draw that conclusion from?
A Well, if we refer back to figure 11, he makes some fairly strong statements in his report that when looking at figure 11, music predominates. And, however, if you look at, even in his own report, any commercial mentions or commercial-free mentions, those numbers are actually higher than the number of music mentions. So it's a technical point, but the conclusion that he draws from that table is not consistent with the table.
Q Okay. And, then, finally, on your list of additional critiques, you say, "Dr. Wind's use of a single coder." What do you

mean by "coder"?
A Well, in this case Dr. Wind asked the open-ended questions which we just reviewed. And then he had a person from DDW code these; that is, put those into buckets, different categories. And this was only a single person.
The normal sort of academic and scientific way of doing it is to have multiple coders. And so, for example, what I would do, I would set up a coding system. And from the coding system, I would have multiple independent coders who do not talk to one another. And then I compare their responses to see how reliable they are.
And in this sense, reliability is a technical term that means in lay terms reproducibility. So if my coders do exactly the same thing, I have 100 percent reliability, which is very hard to achieve, but I would normally look for something like 80 or 90 percent reliability across these

using standard measures of reliability.
Q In reviewing the testimony in this case, did you see evidence of lack of reliability in the coding that was done for Dr. Wind?
A Well, we actually can't assess reliability per se because he has no independent coders. He has only a single coder. However, in reviewing the testimony, it does appear that the coder did make some errors.
Q In conclusion, Dr. Hauser, is it your opinion that Dr. Wind's survey is a valid and reliable means of determining the value of music, either alone or relative to other attributes of satellite radio?
A No and certainly not the way that the -- it was used in Dr. Pelcovits' or Dr. Ordover's reports. Both the percent of people who view music as most important is overstated and the willingness to pay is overstated in the survey due to the fundamental flaws.

These additional flaws, they cast some doubt. And they actually when corrected would lower his estimates, although not as much as the two fundamental flaws.
MR. MEYER: I have no further questions. Thank you.
CHIEF JUDGE SLEDGE: Mr. Handzo?
MR. HANDZO: Thank you, Your Honor.
Good afternoon, Dr. Hauser.
THE WITNESS: Good afternoon.
CROSS-EXAMINATION
BY MR. HANDZO:
Q Dr. Hauser, you testified that one of your criticisms of Dr. Wind is what you called the voice of counsel problem, right?
A Yes, I did.
Q And, to remedy that, you concluded that in your mall intercept survey, you should take account of what you called the voice of the consumer, right?
A Voice of the customer, but it's

basically the respondent, yes.
Q Voice of the customer?
A Yes.
Q Okay. Now, your mall intercept survey addresses both consumers' willingness to pay for music and more generally the value of music using anchored importance scales, right?
A Well, I measured the relative -- not the relative but the anchored importance. Because of the interdependence, I don't want to go say -- and you can actually compute these as ratios and do value but yes.
Q Let me state it differently, then. You asked questions about willing to pay, and you also asked your anchored importance scales?
A Yes, that's correct.
Q And in both of those aspects of your mall intercept survey, you incorporated this voice of the customer research, right?
A That was one of the inputs, the

briefings I obtained from the interviewers as well as the summaries that I obtained plus my own experience and other sources.
Q You also told us that you conducted an internet survey, right?
A Yes, I conducted an internet survey.
Q And you also used this voice of customer data as an input to that survey. Is that right?
A Well, the voice of the customer is part of the survey design process. The survey is there. The point is that these features were drawn from talking to my interviewers, looking through the notes that they had made, my own experience, and other sources.
Q My point is in that constructing or designing your internet survey, you relied on the information that came out of the voice of the customer research?
A It was certainly an input.
Q Okay. Now, I want to talk about

those voice of the customer interviews. There were 41 conducted?

A Yes, there were 41.

Q The interviewers were employed by a company called AMS. Is that right?

A That is correct.

Q And that's a company that you actually hold a position with?

A Yes, I hold a position with it.

Q You were one of the founders of it?

A I'm one of the founders.

Q You provided the interviewers with an outline of issues that they should be asking about, did you not?

A Yes. I provided them with an interviewer guide.

Q Dr. Hauser, I want to show you what we have marked as SoundExchange trial exhibit 103.

(Whereupon, the aforementioned document

was marked for identification as SoundExchange Exhibit Number SX 103.)

BY MR. HANDZO:

Q Could you take a look at that and tell me whether this is the issues list that you provided to the interviewers?

A Well, yes, it's an issues list. It's some of the things they use to begin the conversation.

Q Was this provided to the interviewers by you?

A Well, I generated this with the interviewers. We have discussions back and forth. But this was provided by me.

Q So you participated along with the interviewers in generating this list?

A Yes, I did.

Q And this is what the interviewers then used as a way to get the interview started?

A Well, it's -- they were qualitative interviews. And they are experiential interviews, which means that the interviews were carrying on a conversation with the respondents, trying to follow the threads that respondents bring up.

And this is a guide of some of the things that they can either use to get those threads started or to start another thread. But it's quite possible the interviewees will talk about what they want to talk about.

Q This gave the interviewers some guidance on things that they might raise with the interviewees, right?

A Yes. This provides some guidance. It's certainly not the only guidance.

Q Now, the interviewers from AMS knew that this research was being conducted on behalf of XM and Sirius, correct?

A I believe they did, yes.

Q And they knew --

A At least two of the three did.

Q Okay. Well, AMS knew that the study was for litigation purposes?

A Yes, they knew it was for litigation purposes.

Q In fact, AMS may well have known that this was for the purpose of setting a rate?

A I don't know that, but, you know, that's possible.

Q There were three interviewers for AMS. Is that right?

A There were three interviewers.

Q And at least two of them knew that the study was for litigation purposes on behalf of XM and Sirius?

A Yes, at least two of them. I believe that's true. Again, I'm not sure of all of the interviewers.

Q Now, these kinds of interviews are sometimes transcribed by AMS. Isn't that right?

A Not for -- not if they are just

used for the purpose of generating a questionnaire. AMS also has a product called Vocalist. And I would be happy if you would like me to explain the difference between the two uses.

Q When AMS goes through that Vocalist process, they transcribe the interviews, don't they?

A Vocalist is a very different market research method. It's used for different techniques. It's used to find what the product development people call unarticulated needs, which really mean very hard to articulate needs.

Vocalist is used, in essence, to find a needle in a haystack. I can give you an example if you'd like.

Q Well, let me ask a more focused question. AMS sometimes transcribes the interviews that it conducts, doesn't it?

A When AMS does new product research to find a needle in a haystack, they sometimes

transcribe interviews, very different animal than we have here.

Q You decided that they would not transcribe the interviews in this case. Is that true?

A Well, this case we're generating a questionnaire. It's standard practice not to generate -- not to transcribe interviews.

Q And it was your decision not to transcribe the interviews. Is that not right?

A It was my decision to follow standard practice, both at AMS and in the academic and scientific literature.

Q So it was your decision not to transcribe the interviews, correct?

A It was my decision not to transcribe the interviews, following standard practice.

Q What you received as a result of these interviews was some summaries of the interviews?

A Yes, I received summaries of these

interviews. In addition to that, I talked at great length with the interviewers. They gave me verbal summaries of what they had obtained.

MR. HANDZO: Before I move on, Your Honor, I neglected to move the admission of SoundExchange trial exhibit 103. If I could do that now?

CHIEF JUDGE SLEDGE: Any objection to exhibit 103?

MR. MEYER: No, Your Honor.

CHIEF JUDGE SLEDGE: Without objection, it is admitted.

(Whereupon, the aforementioned document, having previously been marked for identification as SoundExchange Exhibit Number SX 103, was received in evidence.)

MR. HANDZO: Thank you.

BY MR. HANDZO:

Q Dr. Hauser, I'm going to show you what we have marked as SoundExchange trial exhibit 104.

(Whereupon, the aforementioned document was marked for identification as SoundExchange Exhibit Number SX 104.)

BY MR. HANDZO:

Q Dr. Hauser, these are the summaries of the interviews, are they not?

A Yes, they are.

Q These summaries were not created contemporaneously with the interview, were they?

A They're created soon thereafter, yes. That's, again, normal procedure. You want to focus on talking to the customer. And then you write down what --

Q And the interviewers did not write down any contemporaneous notes as they were

doing the interviews?
A Not that I'm aware of.
Q These interviews lasted generally between about 10 to 45 minutes. Is that fair?
A Yes. It depends upon the customer. If the -- the rule of thumb is when a customer stops talking, the interview is over.
Q And that could go as long as 45 minutes?
A There are some people who like to talk.
Q So the answer to my question is yes?
A Yes, yes, yes.
Q Now, each of the summaries that we have here in exhibit 104 is a quarter to a third of a page. Is that fair?
A Yes. Many of these interviews were shorter. These are summaries.
Q So you would agree, wouldn't you, that if an interview lasted 45 minutes,

there's a whole lot that was said that's not reflected in these summaries?
A That's not necessarily true.
Q Well, just paging through exhibit 104, do you see any page that looks like it's 45 minutes worth of talking?
A These are not transcripts. These are summaries. I do not see any page that is a transcript.
Q So you would agree with me that to the extent that some of those interviews lasted 45 minutes, we're not getting everything that was said?
A These are background interviews used to create the questionnaire. Again, standard practice, we're getting the summary of what was being said, but it is only one of the inputs to the questionnaire.
Q So the answer to my question is yes?
A I'm sorry. I didn't answer your question. Could you ask it again just so I

could be sure?
Q To the extent that some of these interviews lasted for as much as 45 minutes, none of these summaries is reflecting the entirety of what was said in that interview?
A You are not getting every word that was said in those interviews. You're getting a concise summary.
Q By the way, were these summaries written by the interviewers themselves or by someone else?
A To the best of my knowledge, these were written by the interviewers themselves.
Q Now, I have seen a document which refers to a debriefing after each interview. Are you familiar with that?
A Well, it's -- okay. Could you please show me the document?
Q Sure. Fair enough.
MR. HANDZO: Before I do because I don't want to get ahead of myself, Your Honor, I would move the admission of SoundExchange

trial exhibit 104.
CHIEF JUDGE SLEDGE: Any objection to exhibit 104?
MR. MEYER: No, Your Honor.
CHIEF JUDGE SLEDGE: It is admitted.
(Whereupon, the aforementioned document, having previously been marked for identification as SoundExchange Exhibit Number SX 104, was received in evidence.)
MR. HANDZO: Thank you.
BY MR. HANDZO:
Q Having done that, Dr. Hauser, let me show you what we have marked as SoundExchange trial exhibit 105.
(Whereupon, the aforementioned document was marked for

identification as
SoundExchange Exhibit
Number SX 105.)

BY MR. HANDZO:

Q Have you seen this before?

A I believe I have.

Q Do you know who prepared it?

A I don't recall.

Q You'll see there's a reference maybe a quarter of the way down the page to data synthesis process?

A Yes, I do.

Q And below that it refers to debriefing on interview?

A Yes, I do.

Q Do you know what that refers to?

A Yes, I do.

Q What does it refer to?

A The interviewers talk among themselves so that they can basically understand -- not only understand what it said, so they can explore these issues further

in subsequent interviews.

Q So, for example, if an interviewer conducted an interview and the consumer that the interviewer was talking to raised certain issues, all the interviewers would get together afterwards and discuss that?

A The goal is to identify words and phrases. What we're trying to do is not miss them. We may. And, you know, we're not trying to count how many times they said or anything, just want to get an impression of what these people are saying.

Q But what I understood you to be saying -- and correct me if I am wrong -- is before an interviewer goes on to do interview number five, they have had a discussion about interview number four with the other interviewers, right?

A Yes. This is qualitative research, which is -- again, it's not qualitative research in a study in and of itself. It's qualitative research to develop

attributes.

And, for example, if we're again talking about automobiles and we're doing a ride and handling study, which is one we may have done, we want to -- remember, we're always trying to find new features. So we're trying to get a complete list. So we'll talk about the previous ones so that the interviewers can explore other directions.

So it's not trying to answer any specific questions. There is qualitative research that's different and that can answer questions, but all the purpose of this is is to try and generate a list that's reasonably complete.

Q Okay. So what happens in an early interview may affect what happens in later interviews?

A Yes. In fact, if you look at one of the fundamental articles by Bobby Calder on this type of qualitative research where he specifies the scientific basis, it's exactly

what he recommends. And he recommends continuing the interviews until you can predict what the consumer is going to say. So this is the standard qualitative research format.

Q So if a consumer in an early interview raises an issue, the interviewer in a later interview might ask about that?

A They might explore it further. They may just the opposite. They may say, you know, "We already know that that is a need. So why explore it further? Let's explore different directions." Again, I can give you many examples I think that would illustrate the point.

Q Is it fair to say that these interviewers have considerable discretion about how they conduct these interviews and what they ask about and how they probe?

A Yes. These are trained qualitative interviewers. They do qualitative interviews for many questionnaires. They also

do qualitative interviews for product development, where they're trying to find these unarticulated needs.

What I'm really trying to do is experience the experience of consumers. And later on we'll -- in this case we're lucky. We have the questionnaire. And the questionnaire is there. And it's going to be double-blind. The early phase is just trying to generate the attributes for the questionnaire.

Q And in generating those attributes for the questionnaire, the interviewers are trained to raise issues with consumers and draw them out?

A Well, if the consumer raises an issue, they'll follow that. They have some beginnings here. So if the consumer says, you know, as some did -- some consumers said, "Gee, you know, I listen to XM radio. And while listening to XM radio, I hear some songs. And then I go out and buy CDs."

Another set of consumers said the same thing about downloading iTunes. You know, it's something we hadn't thought of, but they said that.

Now, that's not an attribute I included. There's many attributes I didn't. But the interviewers are trained to follow up these conversations.

Q So just so I'm clear, if an interview in an early interview raises some attributes, an interviewer in a later interview may ask about that?

A They may follow up. They may not. If they feel they fully understand that, again, following Dr. Calder's formats -- I have written on some of this as well -- if you understand an issue in this sort of qualitative thing, why follow up on it because you're going to generate a questionnaire to quantify those issues later on?

Q Now, one of the things that you used this voice of customer research for was

to come up with the attributes for your anchored importance scales in the mall intercept survey, right?

A It's these summaries that you see as well as the verbal briefing. They were one of the inputs into generating these features.

Q You took a list of those attributes that you got from the voice of the customer study. And you had something like 47 attributes that came out of that study?

A Well, that was another input. This is the interviews. Afterwards, I said, "Could you just put this together?" So they gave me a list of 47. They organized it.

I also read through the more primary data. And, again, I have my own experience and both from being an XM listener, from having studied it because I teach a case about XM. So there are many inputs to the questionnaire design.

Q Okay. So if I understand what you are telling me, the list of 47 attributes that

you got was actually the AMS' summary of the voice of the customer interviews, right?

A The list that you have seen, which is 47, is one of the inputs. It's certainly not the only input that I used.

Q Okay.

A But it's their summary, a partial summary, of -- since you are just listing some of these attributes.

Q That was my question.

A Okay.

Q Those 47 attributes are AMS' summary?

A One of their summaries. It's not their only summary.

Q And that AMS summary was at least one of the inputs that you used to come up with the attributes you asked about in your anchored importance scales?

A Yes. There's a lot of redundant inputs that I used. If you drop out any one of them, I probably still have enough

redundancy built in to come up with the attribute list.

Q So you reduced that number of attributes from the 47 in the AMS summary to the 29 that you used for your anchored importance scales, correct?

A Well, I used 29. The 47 was one of the inputs. I will be glad to admit that the 27 are not complete. There are other features that are not here. Now, this would, of course, favor SoundExchange because if I add -- if I include a longer list, then the number of people saying "Most important" would be a smaller number.

Q So the 47 attributes that represented the summary by AMS you said was one of the inputs to coming up with your list of 29 attributes that you tested in the mall intercept. Another input was your own judgment, correct?

A Well, my own experience in terms of interpreting. Again, I'm designing a

and after and '60s, before, that parsing, although a somewhat similar parsing was raised by consumers, that particular parsing is somewhat driven by this case.

Now, that --

Q I'm sorry. Go ahead.

A I was going to say you can see that phrase, which is actually very understandable to consumers and acknowledging some of the criticisms that have been raised today, that phrase is actually -- you can see why it's useful to talk to consumers. It's a phrase that consumers find very comfortable with.

And that's what I'm doing as a survey expert. I'm trying to find -- develop a survey that it's natural for consumers to answer and so that they then feel that it provides good input. And then my pre-test tests some of that as well.

Q To the extent that your knowledge of the issues in this case was one of the

survey that's somewhat robust with respect to these, but if I'm aware of a feature, again, if we -- if I'm a consumer and I have that, in essence, I could have been interviewed.

And we are interviewing 41 customers. That's usually enough to get a pretty comprehensive list. But as you generate these inputs to questionnaires, you want to listen to all sources.

Q Now, in addition, I just want to explore a little further how you came up with this list of 29 attributes in the mall intercept. You had the summaries that you got from AMS. That was one input. Your own judgment and experience as a consumer was another input?

A Yes.

Q And you had some knowledge of what the issues in this case are? That was also an input, right?

A Yes. As we discussed, the fact that I parsed or broke up music between '70s

inputs into choosing the 29 attributes for the mall intercept, your knowledge of the issues in this case came from counsel for SoundExchange and Sirius, right?

A My knowledge that the music was rights at issue in this case for '72 and after came from counsel.

Q Now, in your mall intercept survey, you asked respondents essentially to rank those 29 attributes based on your anchored importance scales?

A No. They weren't asked to rank those. They were asked to complete an anchored importance scale.

Q They assigned points to them?

A They assigned points.

Q And they assigned the most points to the attribute they considered most important?

A Yes, they did.

Q And we see those results recorded in exhibit L to your written testimony?

A Yes. They are -- they appear in exhibit L.
Q Now, turning to paragraphs 101 to 103 of your written testimony, these are the paragraphs where you discuss --
A I'm sorry. I'm just getting it out.
Q I'm sorry.
A One-o?
Q One-o-one through 103.
A Okay. I'm sorry.
Q Do you have that now?
A Yes, I do.
Q These are the paragraphs where you discuss the results that are depicted in exhibit F, correct?
A Yes. Other parts of the report refer to it, but these are primarily the paragraphs.
Q And at the end of paragraph 103, as you indicated earlier in your testimony, you say that the 74 percent recorded by Dr.

Ordover and found by Dr. Wind actually changes to 5.4 percent in your results. Do you see that?
A Yes. You can demonstrate that you can do this change. As I've indicated and I've indicated earlier in this paragraph, there is some complexity to that because of the 10.7 that goes directly to music. I hope I captured that complexity in this paragraph.
Q I want to explore that complexity a little bit.
A Okay.
Q Now, I think you've already indicated this, but that 5.4 percent number, that comes from exhibit L, right?
A That comes from exhibit L, yes.
Q And that 5.4 percent in exhibit L is the number, percent of people who gave the most points to "I can listen to music from the '70s, '80s, '90s, and today," right?
A Yes.
Q Okay. And you would agree with

me, would you not, that, 10.7 percent of respondents gave the most points to "I can listen to music," right?
A Yes.
Q In fact --
A In this survey, the "I can listen to music" received 10.7 percent, which is the highest number.
Q Now, some of those respondents who are among the 10.7 percent who ranked "I can listen to music" as most important were probably listening to music from the '70s, '80s, and '90s, and today, right?
A Yeah. These are an illustrative example of why you have to have more attributes. Some of the people who are listening to '70s, '80s, and '90s are "I can listen to music." But, on the other hand, "I can listen to music" also covers not only earlier music but many of the other programming features that would go into that.
So it's -- you know, I don't want

to oversell this. I just want to show that it illustrates the 74 number, 74 percent number, is grossly inflated.
Q Well, with respect to that 10.7 percent who reported that "I can listen to music" as the most important thing about satellite radio, there's simply no way to know from this survey what era of music they're talking about, right?
A No. I mean, it's actually interesting if you compare this to the internet survey that where we do parse out things more independently, we get a number such as 15.8 percent. And that's only for music programming.
So had we sort of worked with independent attributes here, it's likely we would have gotten a number somewhere around 15.8 percent, which, again, is a lot less than 74 percent.
Q I'm going to get to the internet survey in a bit. Right now I want to focus on

the mall intercept. Okay?

Q Sure. So my question was, with respect to the mall intercept, there's just no way to know with respect to that 10.7 percent of respondents what kind of music they're listening to?

A That's not quite true, but we can make some assumptions. But there's no way to know for certain. And the assumptions could be pretty reasonable.

Q So you can't really say that only 5.4 percent of respondents rank post-'60s music as the most important thing to them, right?

A In the survey, in the survey as to questions asked, 5.4 percent ranked that as the most important. As I'm happy to acknowledge, these are not independent attributes.

And I'm not saying -- I'm not offering the 5.4 percent as a number that you can take forward. What I'm trying to do is

say it's substantially less than 74 percent. And other data that I have indicate that it's roughly around sort of the 10 to 15 percent range.

Q And that other data that you are talking about is the internet survey?

A And the other data is the internet survey.

Q Well, again, I'm going to stick with the mall intercept just a little while longer. Third line down on exhibit L, do you see there's a line that says, "I can always find what I want to listen to when I want to listen to it"?

A Yes.

Q And 7.7 percent of survey respondents reported that as the most important thing?

A Yes, that's correct.

Q And you would agree that some of those people are likely to be talking about music, right?

A I would agree that some of those people are talking about music. Some of those people are talking about non-music. Some of the people who actually react to music are talking about rights at issue in this case. Some are talking about rights not at issue in the case.

Again, as was pointed out correctly, the survey research is suggestive of what some of these numbers are. And it's phrased in a word that consumers use. We have to use some judgment than to go to the actual number.

And my primary point is that Dr. Wind's numbers are much, much too high, that what I have demonstrated here is that you really get a much lower number. You can get a lower number on the percent of people who would rank the rights at issue in this case first.

Q Well, just to complete that line of questioning, again, with respect to the

people who say, "I can always find what I want to listen to when I want to listen to it," you know, some of those people may be talking about music from the '70s, '80s, '90s, and today, right?

A Some of those people may. All of these attributes -- again, I don't want to overemphasize these are not additive attributes. I've said that in a report, and I've said it in many places.

Q Okay. Eleven lines down, three percent of people said the most important thing is "I don't hear the same things over and over again."

A I'll trust you that it's the 11th line down, but I read the attribute.

Q Okay. And it's three percent?

A And it's three percent.

Q And same thing there, right? I mean, some of those people may be talking about music, and we don't know what they are talking about?

A Some of these -- these are not independent attributes. That wasn't the purpose I had in this particular demonstration. It was a demonstration that the 74 percent was far too large.

Q So the answer to my question is yes?

A The answer to your question is yes. I mean, it's not the purpose I used it for but yes.

Q So I certainly don't want to take you through every category, but the reality is that most of the categories listed in exhibit L are, as you would put it, interdependent attributes, right?

A Yes.

Q Meaning that --

A Not most but certainly a number of them are.

Q And by that you mean that there's some overlap between the different attributes on exhibit L?

A Yes. I don't feel you can do the us over us plus them calculations with this particular exhibit.

Q Okay. So you've got some features or attributes on exhibit L that clearly relate to music, right?

A Yes.

Q Some features on exhibit L that clearly relate to the non-music aspects of satellite radio?

A Yes.

Q And some features on exhibit L that are ambiguous, could relate to music, could relate to something else, right?

A There are some where some judgment would have to be made. Again, I would caution against doing this us over us plus them calculation.

Q Okay.

A I think the exhibit demonstrates very clearly what it was meant to demonstrate.

Q Okay. So just one more example,

and then I'll move on. But, for example, up near the top, you've got four percent of people saying the thing they like best or the thing they rate highest about satellite radio is the sound quality, sound quality is excellent, right?

A Yes.

Q And that may be, at least in part, because they're listening to music and the sound quality of music is important to them, right?

A Well, it's almost a tautological statement, but you said if they're listening to music. Everything that goes into listening to music is listening to music. That's, of course, tautological. But this really relates to the sound quality.

And, again, I am not an economist. So I'm not making -- you know, you can do this evaluation calculation. It's not telling you how to do that. I would think that that is kind of an attribute. Again, as a product

development person, something that people buy when they buy XM radio, they buy sound quality.

Q You would agree with me that this sound quality feature that we're just talking about is one of your interdependent factors?

A Well, I don't think sound quality is quite as interdependent as you indicate. Nothing is perfect, but I think sound quality is -- again, from having talked to my interviewers, it's something that comes up --

Q Okay.

A -- and something that is "I buy XM" or "I buy Sirius radio because it has high sound quality." Now, that -- it's true that's for all the programming. It's foe news. It's for talk. It's for weather. It's for traffic. It's for comedy. It's for -- I forget all of the stuff that they have on there, but it's for everything.

But they view it as sound quality. It's the same reason why I would buy a

high-quality CD player or a high-quality MP3 player. I buy it because of the sound quality. So if there is any overlap, it's probably a small amount, again, from my experience about -- not my experience but having talked to my interviewers.

Q Okay. So it is somewhat independent?

A Yeah.

Q I'm sorry. Let me rephrase that. Somewhat interdependent?

A Very small amount, very small amount except in the tautology we have just given.

Q So bottom line, you would agree that exhibit L doesn't tell us what the value of music is, right?

A Exhibit L -- again, let's go back. Dr. Wind makes this numbers that is 74 percent. When I read that, I thought that was a biased number. It's also quoted by, I believe it is, Dr. Ordover, although it might

be Dr. Pelcovits.

And I think it is misquoted. I think it misrepresents what is going on. And I wanted to demonstrate that, both with the thought experiment and with exhibit L.

And I think exhibit L is pretty clear in demonstrating that that number is highly biased and dependent upon the features you put in there, into the question.

Q So you would not use exhibit L to compute the value of music, right?

A I have not done a value computation. I did in my report say, "Here is what Dr. Ordover used." And he used these numbers. And I can put my numbers in there arithmetically.

I believe his numbers are based upon flawed data and, therefore, themselves flawed. If we then put my numbers in, you get a different number. But that's me putting my numbers in, which I believe are correct or close to correct and just running that

through. That's not me making an expert opinion as an economist of the value of music.

Q Okay. But not only have you not attempted to compute the value of music using the data from exhibit L. You wouldn't try to do that. You wouldn't use that data for that purpose, would you?

A I am not an economist. I am a marketing research and survey expert. Okay?

Q So no?

A No. It's not the -- the question you asked, would I do that? My question is I am not making a value computation. And I don't think I can offer an economic opinion on how one makes a value computation. I can offer an opinion that the data are accurate, and I have explained them with the complexities that are involved.

If an economist so chooses to use these data, recognizing the complexities, then I believe the data are accurate. And that's the extent of my opinion.

Q Now, if I understand correctly and turning to the internet survey, one of the reasons you performed the internet survey was that the attributes of satellite radio that you used in exhibit L to the mall intercept survey were not independent and didn't allow you to sort of parse music and music programming into its component features. Is that fair?

A It's one of the reasons I did the internet survey, yes.

Q So the point or at least one of the points of the internet survey was to look at the features of music and music programming that you thought were close to independent. Is that right?

A Yeah. Close to. As independent as is feasible within a survey research context.

JUDGE ROBERTS: Mr. Handzo, you're turning to the internet survey. Is this a good breaking point?

MR. HANDZO: It is, yes.
CHIEF JUDGE SLEDGE: We will recess ten minutes.
(Whereupon, the foregoing matter went off the record at 2:58 p.m. and went back on the record at 3:13 p.m.)
CHIEF JUDGE SLEDGE: Thank you. We will come to order.
Mr. Handzo?
MR. HANDZO: Thank you, Your Honor.
BY MR. HANDZO:
Q Dr. Hauser, I think when we left off we were just starting to talk about the internet survey. And the internet survey basically just addresses aspects of music and music programming, correct?
A Yes, it addresses aspects of music programming.
Q And I think you were telling me earlier that one of the reasons to do the internet survey was to try and look at

features of music and music programming that you thought were close to independent, correct?
A They are close to independent. And if you look at my report, I presented the numbers two different ways -- one way where they know they are independent and another way that recognizes that there may be some interdependency here, although it's much less here than it is in the --
Q I think you said independency. Did you mean interdependency?
A Did I say "independency"?
Q I think so.
A Then, my apologies. I will correct that to interdependency.
Q Okay.
A Thank you.
Q If the attributes of music programming that you tested in the mall intercept were all interdependent, the results wouldn't tell you a whole lot, would it?

A No, that's not true. If you look at the way I reported the results, there is once where I just take two of the attributes, which are independent, or as close as we can get to independent, and then another way that reports the results the other -- with all of the interdependencies in there.
And I think the numbers that I use most often are the ones where I just used those two attributes. So if you correct for some of the interdependency, the answer will be somewhere between the numbers I get when I just use the two clearly independent ones and the answer you get when you use all eight of those.
Q Well, let me -- it may be easier if we talk about this with Exhibit M in front of us, if you could flip to that. Do you have that, Dr. Hauser?
A Yes, I do.
Q Okay. And this is the list of programming features that you asked

respondents to respond to in the mall intercept, is that right?
A Yes, it is.
Q Okay. And if I understood your answer just a minute ago correctly, what you were telling me is --
MR. MEYER: I think both Mr. Handzo and Dr. Hauser misspoke when he said it was the mall intercept survey. In fact, it's the internet survey.
THE WITNESS: I'm sorry.
CHIEF JUDGE SLEDGE: Thank you.
MR. HANDZO: Thank you. To correct the record, Exhibit M is from the internet survey, right.
BY MR. HANDZO:
Q Dr. Hauser?
A Yes.
Q Exhibit M is from the internet survey, correct?
A Oh, yes, it is. It is.
Q Okay. And I think what you were

telling me before -- correct me if I'm wrong -- is that even if the attributes on Exhibit M are interdependent, you thought there would still be some value to this data because you could just compare -- I can hear music from the '70s, '80s, '90s, and today, with music from the '40s, '50s, '60s, and earlier. Am I getting that right?

A Yes. If you -- I think one of these demonstratives that we had here earlier -- I don't know the page number, but this one. It says results from the Hauser mall intercept survey, willingness to pay. The $1.78 correction just adjusts for the various decades of music, and then you -- there is also a number that adjusts for just the '70s, '80s, '90s, and today, divided by the sum of all of these attributes.

Q Right.

A The true answer is someplace in between here.

Q Let's just stick with your

calculation where you look only at music from the '70s forward and music prior to the '70s, okay?

A Okay.

Q All right. Now, one of your attributes here is music is uncensored, do you see that?

A Yes, I do.

Q Okay. Now, hypothetically -- hypothetically, let's say that everybody who said that it's important to them that music is uncensored, all of those people were actually referring to music from the '70s, '80s, '90s, and today. Wouldn't that affect your calculation even if you're just comparing music from the '70s, '80s, '90s, and today with music from before the '70s?

A That would on the -- that would push it one direction, hypothetically. Hypothetically, live studio music would push it in the other direction.

Q Okay. Fair enough. But my point

is -- and I'm trying to explore -- is if the attributes on Exhibit M are interdependent, it's going to affect your calculation even if you're just comparing the two categories of music from the '70s, '80s, '90s, and today, to music from the '40s, '50s, and '60s?

A Well, you've stated a hypothetical.

Q Yes.

A Okay. The hypothetical is not the way I used the data, and when we just make those comparisons that hypothetical doesn't apply. But if you're going to state a hypothetical, and you say, "Yes, let's do that, and let's do the arithmetic calculation," sure, you can do it.

Q Right.

A But it's not -- it's not the calculation I did, and I don't think it's relevant.

Q All right. The calculation that you did is to compare the results for post-

'70s music with the results for pre-'70s music, right?

A Yes.

Q Okay. And that calculation would change if, for example, the results for post-'70s music should have been higher because some of the people in these other categories on Exhibit M were actually talking about post-'70s music, right?

A Well, it's a hypothetical. If, in fact, the data violate simple scalability, which I don't think they do, perhaps. But I think simple scalability is a reasonable analysis here, and I believe it's true and I believe it's correct.

Q And just tell me what you mean by "simple scalability."

A Yes, this is -- again, when you're building a qual choice model and it's -- if you're building a model of choice, and it's a model that was originally developed by Professor McFadden, who is also a Nobel

Laureate, and he developed a model where it's sort of an us over us plus them analysis.

So if you look at the attributes stated in there, and then you look at the correlation and the error terms, so that -- I'm trying to explain this simply. Whether or not the errors in the estimation of this are sort of diagonal, that means they apply to each feature independently or there is some intercorrelation between those.

Now, if there is some intercorrelation between those in the errors, not in the attributes themselves, then simple scalability would not apply. Now, here I don't think the errors are -- I think the errors are pretty much independent, errors now in a technical econometric sense.

And as a result, I believe I can do the us over us plus them calculation for these two attributes.

Q Let me --

A Another way of saying that is if

the relative answers I get for the '70s, '80s, and '90s versus the '40s, '50s, and '60s, if I then remove this attribute, if those relative answers stayed the same, those ratios stayed the same, which I believe they would or they'd be approximately the same, within error bounds, then I could do those calculations.

Q Okay.

A I'm sorry for using some of the technical language.

Q That's okay. Let me make it into an example to see if I understand.

A Right.

Q Okay? So let's say you removed all of the attributes except for the two, pre-'70s and post-'70s music.

A Right.

Q Okay? The people who responded to the attributes that we removed would now be in one of those two remaining categories, right?

A If I understand your hypothetical, I think that's what you're saying, yes.

Q Okay. And you're assuming that if we removed all of those other categories except pre- and post-'70s music, the people from those categories that were removed would split up between the two remaining categories in the same proportion that we see reported in those categories in Exhibit M.

A Yes. What -- that's very similar to what I'm saying, which right now we get -- the split is about a 60/40 split. There's some decimals there, but just to make it simple it's about a 60/40 split. So if we had asked just those two attributes, I believe that it would be likely that we would also get a 60/40 split between those different decades.

Q Okay. So, for example, if we removed the attribute of the music is uncensored, you are assuming that 60 percent of those people would wind up in the post-'70s category and 40 percent would wind up in the pre-'70s category?

A No. What I'm assuming is that if

we remove all other six that they'd split 60/40.

Q Okay. And what is the basis for that assumption?

A I mean, you can't just remove one attribute and then not remove some of the others. I'm making an assumption on the aggregate here.

Q Okay. Well, you say, "We can't remove one attribute." You're the one who decided how many attributes to test, right?

A No, you're defining a hypothetical here. I tested all eight.

Q Well, you decided that there would be eight that you would test, right?

A Yes, I decided that there would be eight that I would test.

Q You could have tested seven?

A Well, actually, I --

Q You could have tested nine, right?

A Let me, again, go back to this. I decided, based upon input from the customer --

and these were attributes that came from the customer. Now, it is true that perhaps the customers -- we may have left some out. There may have been nine or 10. And if that were the case, on the number where we adjust for all the features, this number would be lower.

However, I believe that we would still have this sort of IIA or simple scalability assumption, that we would still have approximately a 60/40 split between the '70s, '80s, '90s, and today. But I didn't do that experiment. You know, you're giving me a hypothetical.

Q Okay. So just to follow up on that, your assumption that if we removed these other categories, except for the two that relate to the era of the music, your assumption that the remaining responses would split up 60/40 is just that, an assumption. It's not something you've tested, right?

A I didn't test it in this particular context. I've written quite

extensively on constant sum questions, and, you know, we've tested these in a lot of contexts. There is a big study I did for Procter & Gamble that they ultimately used to design their -- unitize their concentrated laundry detergents where we tested a variety of constant sum scales, we tested anchor scales, we tested direct rating scales, and the constant sum scales tend to have -- nothing is perfect, but tend to have approximately this property.

Q Okay.

A Okay. So in other contexts, yes, but I didn't -- in here I just asked the eight questions. But my familiarity with constant sum questions says that they tend to break out this way.

Q Okay. So, for example -- well, your last category, I can hear live studio performances and concerts, it kind of seems likely that most of those people would go to the post-'70s music category if you remove

that one, right? I mean, the people who are listening to the live concerts aren't listening to Elvis.

A Or an Elvis impersonator, which having just come back from the Michigan Dream Cruise, I listened to three on Saturday, but that's off the point. You know, you can remove some of these. On the other hand, live performances, I understand, are not part of the copyright at issue. So it's -- you know, let's go two-sided on this.

Q Okay. And let me just get --

CHIEF JUDGE SLEDGE: Mr. Handzo, I thought the hot ticket for live performances were the people -- the performers who were 60 years old and older.

MR. HANDZO: That's not my hot ticket, Your Honor, but we may have to get -- well, we may learn about the heterogeneity of markets if we explore that one --

CHIEF JUDGE SLEDGE: You get groups that are reuniting after 40 years of

being divided and going on tour. That would be the pre-'70s music, wouldn't it?

MR. HANDZO: Well, I guess, you know, Rolling Stones could be either one. We're certainly not going to hear a live performance of The Beatles. Unfortunately, a lot of the pre-'60s people that I liked are --

CHIEF JUDGE SLEDGE: Police just toured.

MR. HANDZO: Janis Joplin -- well, I think we can probably agree this is a point I don't have data on, and I know you don't want me to testify about it anyway.

BY MR. HANDZO:

Q Let me just go back, though, to a point you were talking about before, Dr. Hauser. You said you can't just remove one of these categories, and I just want to finish up asking you what I was asking you before, which is, you started off with a list of some 40-odd categories from your voice of the customer research, right?

A I think you're mischaracterizing what I said a little bit. The 47 categories were an input to the decisions that I made for the attributes that went into the total service package.

Now, this is a more narrow focus. This is just the music programming.

Q Okay. But it was your decision how many attributes to put in that internet survey, right?

A That's -- I -- had we -- there are two numbers here. Okay. One number is the parsing of the '70s, later versus earlier, and that is somewhat independent of what I put in. And then, the other number is '70s and later divided by everything.

Had I put more attributes in there, you're right, the denominator would have gotten larger, and that sort of valuation of music, that importance of music, would have gone down.

Q Okay. But --

JUDGE WISNIEWSKI: But could you have put fewer in, and then what would have happened?

THE WITNESS: Well, that's exactly what Dr. Wind had done. He put in very few, and so he got a very high number.

JUDGE WISNIEWSKI: Looks like very few, I think.

THE WITNESS: A few, yes.

JUDGE WISNIEWSKI: I think the question was one less.

THE WITNESS: Oh, if you put in one less, then -- then, the smaller of the numbers would go up, but the larger of the numbers would stay the same.

BY MR. HANDZO:

Q And my question, Dr. Hauser, was simply this. You chose eight attributes here. You could have chosen nine, you could have chosen seven. That was your call, right?

A Well, based upon all of this input, that was what I thought a good summary

of what customers said.

Q And the summary that you got was 47 some odd categories.

A No, you're mischaracterizing that 47. That 47 was one of the inputs. There are other inputs. And, furthermore, that was for all of the XM and Sirius service, it wasn't just for music.

Q Okay. And the other inputs you told us about were your own judgment and experience and learning about the issues from counsel, right?

A There were others as well. There was certainly the inputs from the customers and talking to my interviewers, reading the summaries. And the only input from counsel was the parsing of the music.

Q Isn't it fair to say that your selection of these attributes in Exhibit M was a judgment call on your part?

A It was an expert judgment based upon all of the inputs that I had.

Q Now, looking back at Exhibit M, we see that for post-'70s music you report that 15.8 percent of respondents gave that the -- ranked that the most important, right?

A No, that's misreading the figure technically.

Q Okay. Where did I go wrong?

A Okay. The -- and it's probably worthwhile going over this. Overall average, so what the 15.8 percent represents is the average across customers of the points that they assign to that -- particular features, music from the '70s and later.

If we go over to the fourth data column, the fifth column overall, percent most important, here we see it's actually -- it's close, it's 16 percent. But 16 percent ranked that as most important.

Q Okay. Now, looking at those numbers, and let's stay with the 15.8 percent, and getting back to our discussion of independent factors, when 15.8 percent of

people, I guess -- would you say, assigned the most points to post-'70s music, what you're essentially interpreting that to mean is that none of these other factors in Exhibit M involves a reference even in part to post-'60s music, right?

A That's why I calculated -- I presented the numbers both ways. One of them is just parsing the two, and it's probably high because it doesn't take into account the other aspects of -- it doesn't subtract the other aspects of music programming. The other is probably a bit too low, so the true answer is someplace in between these.

Q Okay. But to the extent that you use that 15.8 percent figure, isn't it right that you are interpreting that as being independent, meaning that the other factors don't include a reference to post-'70s music?

A If you read my report carefully, you'll see that I put -- I expressed all these caveats in there. That's why I reported the

numbers both ways. I'm a survey expert. I'm giving you the numbers. I believe the numbers are accurate relative to the questions.

If an economist wants to use these numbers in some way, I've illustrated how one can use the numbers. But I'm not the economist who is going to be using those.

The us over us plus them calculation gives the $1.78, and that one is sort of more favorable to SoundExchange. The 46 cents -- it may be a little bit too low, but it's -- you know, it's favorable towards XM and Sirius. So, you know, what I'm trying to do here is I'm trying to give numbers that are usable.

And throughout the report I always try and give a number that is favorable to SoundExchange, a number that is favorable to XM, and then a number that I believe should be in the middle. And sometimes I just give the two extremes, but I'm trying to be fair and preside both -- present both sides of this.

Q Let me just actually ask a different question, then. In your mall intercept survey, you went through this same exercise with more attributes, but you did ask about pre-'70s and post-'70s music, right?

A The mall intercept survey was a different set of questions, a different format, and I've already indicated I'm not doing an us over us plus them calculation with the mall intercept. The purpose of the mall intercept was to show the absurdity of the 74 percent.

Q Okay. So what you're saying is to the extent that the mall intercept survey asked about pre-'70s music and post-'70s music, you can't compare those two numbers. But to the extent that the internet survey did exactly the same thing, you think you can compare those two numbers here.

A No. That's not what I said. Okay. That wasn't the purpose of the mall intercept survey. The mall intercept survey

was trying to parse -- not trying to parse, but trying to get importances for the overall service.

So to the extent that we have -- we do have independent attributes, and you can pick some of the 29 and get those independent attributes, and, you know, with a few scaling things that you have to worry about, sort of complicated econometric things, you can do that to say how one would parse overall service between the two mutually exclusive and collectively exhaustive decades.

Now, the internet survey is focused just on music programming. So the numbers are going to be a little bit different. They're not totally different, you know, because in this case we're parsing decades. But, you know, they are different. It's two different -- it's two slightly different perspectives.

Q All right. Correct me if I'm wrong, but I thought I understood that the

reason you can't, in the mall intercept, compare pre-'70s music with post-'70s music is because the -- a lot of the other categories in the mall intercept are interdependent categories.

A Some of that is getting soaked up with the other attributes.

Q Okay. So that's a yes?

A I don't want to overuse -- you're trying to use the mall intercept survey for something it was never intended to --

Q Okay.

A -- be used for.

Q Okay. But was the answer to my question yes?

A Please, if you could -- I'm sorry. At this point we've bantered a little bit. If you could reask, I'll be glad to try and answer.

Q Sure.

A I thought I understood that the reason you couldn't use the mall intercept

Q Okay. But if, hypothetically, they were interdependent, you would have some difficulty comparing the pre-'70s and post-'70s categories, wouldn't you?

A Which is exactly why I reported the numbers both places, because --

Q Is my answer yes?

A Yes, I reported the numbers both directions, just -- for that and other reasons.

Q No, Dr. Hauser, I don't think you've answered my question. My question was: if the categories -- hypothetically, if the categories in Exhibit M were interdependent, that would make it very difficult to compare the pre-'70s and post-'70s categories, isn't that right?

A If the attributes were strongly independent. You just said independent.

Q I'm sorry. I meant interdependent.

A Interdependent.

results to compare pre-'70s music with post-'70s music is that a number of the categories in the mall intercept are interdependent, right?

Q You know, you can compare the raw importances, and you can see that, you know, there's a difference there, and you can see that -- some of these relative to the others. But you have to have -- you have to be very careful with those comparisons, because of the interdependency.

A Okay. That was --

Q Okay.

A -- my question.

Q Let's get an answer now.

A It's --

Q So if the attributes in Exhibit M are also interdependent, you would also have some difficulty comparing pre-'70s and post-'70s music, right?

A The attributes in Exhibit M are much less interdependent.

Q Yes.

A If the attributes were strongly interdependent, and all attributes are going to have some small amount of independence, if they were strongly independent -- interdependent, then the more accurate calculation would be the us over us plus them for just the two features.

Q Okay. But that's the calculation you didn't want to do with the mall intercept, right?

A No, I didn't say that. What I'm -- it's -- what I'm saying is there are some differences with the mall intercept in addition to these differences. Okay. For one thing, what's really complicating the mall intercept survey -- and the reason why I'm being very hesitant is because I have that attribute in there -- music. Okay. And that's clearly interdependent with the parsing.

And as you've correctly pointed

out, although I could make an assumption that you would parse proportional to that, that's an assumption I'm a little bit less -- because of those three attributes, those are the three that -- I'm a little bit more hesitant to do that in the mall intercept because of those three attributes.

Okay. Also, I want to point out, the mall intercept is overall service, so let's not compare the exact ratios there with just music. They are going to be close. They're probably close, but, you know, it's not exact.

Q Okay. So what I think I heard you say is with the mall intercept where, for example, you have the category of I like music, you are not comfortable making an assumption about how that would break out between pre-'70s and post-'70s music.

A There is some judgment in here.

Q Okay. And you're not comfortable making that judgment.

A I mean, it's probably useful to actually look at the ratios and --

Q My question, Dr. Hauser, was really fairly simple. You're not comfortable making that judgment, are you?

A Because of the first attribute, that gives me some -- that music for the mall intercept survey, and only for the mall intercept survey, that gives me some pause. I've said that time and time again, I'll keep saying that, yes.

Q Okay. Now, looking at your internet survey, you have an attribute here that says, "Artists and song title are displayed on my screen." Do you see that?

A Yes, I do.

Q And do you think that's an independent variable?

A Well, the question is: what is it in the mind of the consumer? And it's one of the things the consumers feel is an important aspect of satellite radio service. Many of

them mention it, they rave about it. From personal experience, I love it. It's sort of something that XM and Sirius is bringing to the table above and beyond playing the music.

So in consumers' minds, it's sort of something that is an attribute. I think it could be independent. However, you know, I reported numbers both ways, so you -- so it's not --

Q I'm sorry. You said you think it could be independent. Did you mean to say you think it could be interdependent?

A I think it is most likely independent.

Q Okay. Well, you don't -- you're not really suggesting, are you, that people would consider it important to have the names of artists and song titles displayed on their screen even if what was coming out of the speakers was dead silence, right?

A I mean, it's -- this kind of comes back to the wheels on the car phenomenon.

We've got a hole, and the question is: what is XM bringing to this above and beyond using the sound recording? If you want to be -- if you wanted to say, hey, there's no music, so anything -- so displaying the -- there's no music displaying the song title is irrelevant, well, that's kind of crazy, right? Of course it's true.

But it's not affecting -- it's certainly not affecting the us over us plus them on the decades. And I don't think it's affecting, in consumers' minds, a big aspect of what's being brought to the table.

Q And you said it doesn't affect the us over us plus them attribute, because you're assuming if you took that category out that those people would split up 60/40 between pre-'70 and post-'70 music.

A I -- that -- from my experience with other constant sum scales and other categories, that's what tends to happen, yes.

Q Okay. But that's your assumption.

A It's my experience.
Q Not with music.
A I have done hundreds, perhaps thousands, of surveys. And I have done this in a lot of different categories. But in this particular survey, in this particular case, I just used the eight attributes. So I didn't test that assumption for this particular set of eight attributes, but in my experience in other categories, possibly some that are not unrelated, it seems to be pretty reasonable.
Q And it is your opinion, is it not, that that attribute of artist and song title are displayed on my screen is a mostly independent attribute, even though it would have no value to people if there wasn't music playing?
A Well, if you were playing music of the '40s, '50s, and '60s, it would have value. But if you're saying no music per se, yes, I mean, it's -- I don't think it's particularly relevant, but, yes, if you want to, you know,

make that statement, sure.
Q By the way, while we're on the subject of the display on the screen, I think you indicated earlier that that's an attribute that you got from your voice of the customer research, is that right?
A Well, it -- certainly it's things that I've heard in talking to people. It's certainly my own experience. I don't recall whether it was on the list of 47 or whether it was in the 38 -- detailed 38 pages. Given some time, we can look through the detailed 38 pages, if you'd like.
Q Well, let me do something a little different. Isn't it right, Dr. Hauser, that the display was something that the interviewers were specifically instructed to discuss with the consumers?
A Well, let's see.
Q And we should just be clear on the record, are you looking at Exhibit 103?
A I am looking at Exhibit 103.

Q Thank you.
A Now, since you've raised it, if you could just find it for me and I'll comment on it.
Q Sure. About two-thirds of the way down the page, do you see a line there that says "satellite radio display, what type, likes, dislikes"?
A Yes. I mean, clearly, when we generated this list it's -- one of my interviewers is actually a fan of Sirius, to give equal time here. I am a fan of XM. And we put together some of the attributes that affected me -- us.
In addition, before doing this case, I've taught the XM case. There's a Harvard Business Review case on XM Radio, which is a pedagogical case that I use in teaching marketing management. So I was familiar with the industry long before I was asked to look at Dr. Wind's survey. So some of these attributes initially came from there,

and they go into the interviewer guide. So there is a source.
Q Okay. But I think you mentioned that some of the consumers who were interviewed in the voice of the consumer research mentioned this. Isn't it possible that they mentioned it because they were asked about it?
A Sure. I never -- I mean, that's the purpose. We're trying to find attributes. Okay. If it comes from the Harvard Business Review case, if it comes from our own experience, we're trying to find attributes.
Q So something may have become an attribute in your survey because you asked about it, and then when the consumer responded to the question it winds up being an attribute that goes into your survey.
A The survey is self-correcting. They could have given it zero. In addition to this, we are trying to cast a broad net from many different sources to get different

attributes. And if we're wrong, if we get the cleans my clothes, or whatever I said before, cleans my dishes, if it's in there, it's going to get a zero.

So, and furthermore, they would tell us in pretest -- and to make it clear, maybe I should say a few words about pretest. In a pretest situation, the consumer completes the survey, the internet survey, in front of one of our interviewers.

And they -- after they complete the survey they actually talk to the -- to our people at AMS about the survey, saying, you know, what did this question ask, was it understandable, etcetera. And even at the end they are briefed as to whether it was -- did you find it leading, was there any expectation of this question.

If that attribute wasn't something that the pretest people felt comfortable with, they would have told us, and it would have been obvious, and we would not have included

it. So there's a lot of checks and balances in this process.

Q Dr. Hauser, sometime earlier, I think in your direct testimony, you used the phrase "demand artifact," do you recall that?

A Yes, and I apologize for using a technical term.

Q That's okay.

A Demand artifact is in essence a -- it's similar to what a legal professional would call a leading question, although it could be a little bit more complex than that. It could be that the interviewer communicates by body language what he or she believes the answer to be, or it could be the structure of the questioning or something else. It's a little bit broader than a leading question.

Q So a demand artifact essentially recognizes the phenomenon that in surveys the respondents sometimes want to give the interviewer what they think the interviewer wants, right?

A Well, this is the case, and that's why in all of our pretests we are very careful to debrief for demand artifacts. And if we find any, we revise the questionnaire. We don't want them in there. And the internet survey, and the mall intercept survey, were carefully vetted, as I described in my report, in pretest.

So to the best of our ability we removed most of the demand artifacts. Now, you never get all of them out of there, but, furthermore, I then used the double-blind system on both the mall and the internet survey, which further attempts to remove demand artifacts.

Q What I'm getting at here, Dr. Hauser, is you said if you put in, let's say, artists and song title are displayed on my screen, and that wasn't really important to people, they would give it zero. Isn't it true that as a result of the sort of demand artifact phenomenon people would likely give

it some value just because you put it in there.

A We didn't see that. You know, we look for it, we debrief for it, we didn't see it. I'm trying to remember -- I certainly know that there's a lot of zeroes in the mall intercept survey, and it has been a week or so since I've looked at the internet data, so I can't remember whether there's zeroes in there.

But unlike the -- it's a much smaller list here, so zero is actually something we probably wouldn't expect on this list. But it's not -- we debrief for this, and they did not feel that they had to give a number to each of these. And certainly zero is a reasonable response.

Q Now, again going back to this question of whether the attributes in Exhibit M are independent -- one of your attributes is music is uncensored, right?

A Yes, that's one of the attributes.

Q Can't have uncensored music if you don't have music, right?
A Yes, that's --
Q So it's not --
A But, I mean, you can go through all of -- these are aspects of music programming. They are parsing music programming.
Q Okay. And so to some extent, each of them relates to the value of music, right?
A I have eight attributes that parse music programming. That's -- yes.
Q Now, just one more on this category. The top one here on Exhibit M, most channels are commercial-free, do you see that?
A Yes. Yes, most channels are commercial-free.
Q Now, isn't it fair to assume that the reason that's important to consumers is that they get to hear more music if you remove the commercials?
A That's your assumption. But, you

know, consumers also talk about commercials as something they want to avoid and they find quite annoying. So it could take things away.
And so commercials can be a negative, and a negative times a negative is a positive. So not having this negative of commercials can be a positive.
Q Well, isn't it reasonable to believe that the reason why a lot of people like not having commercials is that they get more music?
A Well, not necessarily. If you've ever listened to terrestrial radio, and I do -- again, I'm portraying 102.5 country music -- but, you know, they come on and there's times when I'm driving to school and basically I leave my house and the commercials start and I'm almost at MIT and the commercials end. I find that very onerous.
And it's not -- I mean, it's more onerous than I would -- in fact, what I do do is I hit that little mute button and

periodically hit it again to see if there is commercials there. I find commercials onerous.
Q Okay.
A There's other people I've talked to that find commercials onerous, but the attribute is what the attribute is, whether or not you value that the channels are commercial free.
Q If it were right, hypothetically, that the reason people value not having commercials is that it gives them more music, it wouldn't really be appropriate to consider this an independent variable, would it?
A Well, for one, you've stated a hypothetical.
Q I did.
A And, you know, I don't think that that's -- the hypothetical is correct. But, secondly, that's exactly why it reports numbers both ways.
Q Now, you say you don't think the

hypothetical is correct. Let me ask you to look at what we've marked as Exhibit 104.
A I'm sorry. Which one is that?
Q That's the batch of summaries there.
A Yes.
Q And let me ask you to turn to the page that's numbered at the bottom 21205. Do you have that Dr. Hauser?
A Yes, I do.
Q Okay. And the next-to-the-last bullet point in the last sentence he says he gets twice as much music per station as terrestrial radio, no commercials or talking. Do you see that?
A Yes, I see that.
Q So this is somebody who likes not having commercials, because he gets more music, right?
A Well, he also says too many commercials on regular music -- regular radio. I know when I click on a music station I'm

getting music, which is part of that but it's -- you know, there's a little bit of the pain there, but, yes, this is -- this is -- I never said that not a single person doesn't value music. In fact, you know, they -- in my survey they've got an ability to value music.

There is some independent -- interdependence here. It's less than in the mall intercept survey, which is why I report the numbers both ways.

Q Yes. And you're assuming that it's less interdependence than your mall intercept, because you're assuming, for example, that people who value no commercials sort of value no commercials just because they don't like the pain and not because they want more music.

A No, I'm not making that assumption. What I've said before is that something that many consumers say -- basically, one of the things that XM brings, XM and Sirius brings to the table, is

commercial-free versus terrestrial radio. It's a value added. Okay. It's a value added that consumers see as valuable.

Okay. We attempt to parse this, and, as I looked at this I said there's two ways to look at it. One is we just take the two decades and not worry about this potential interdependence, and there is a number. And then, we give the other extreme, favorable to XM and Sirius. We agree here. We agree that the smaller number is a little bit more favorable to XM and Sirius, and that's what I say in my report.

And I also say that the larger number -- I'm sorry. Yes, the larger number is favorable to SoundExchange, and you're attacking the smaller number, which I agree is favorable to XM and Sirius.

Q One more question on this. The attribute music is uncensored, do you see that?

A Yes, I do.

Q You would agree with me, wouldn't you, that a reference to uncensored music is likely a reference to relatively recent music?

A We can go through this again, but, yes, my son listens to music channels that I won't listen to, my youngest son. Now, my oldest son listens to Frank Sinatra, which I find amazing in a 26-year old, but what can you -- who is -- you know, he does.

Q But the Frank Sinatra channels are not the ones that are censored, right?

A No, I don't think the Rat Pack was censored. They probably should have been for other aspects, but they -- they didn't curse on the radio.

Q It's the recent music that is censored, right?

A Yes. Yes, it's my youngest son, who has just stopped being a teenager that I'm more worried about.

CHIEF JUDGE SLEDGE: Mr. Handzo, are you forgetting Louie, Louie?

MR. HANDZO: Your Honor, I'm not sure I ever figured out the lyrics to that song.

CHIEF JUDGE SLEDGE: Nobody did. That's why they censored them.

(Laughter.)

MR. HANDZO: They censored that song?

JUDGE ROBERTS: Yes, they did.

MR. HANDZO: Really?

JUDGE ROBERTS: The line actually, "We've got to go."

MR. HANDZO: That's actually a line I --

CHIEF JUDGE SLEDGE: That's the only thing you could hear.

(Laughter.)

MR. HANDZO: They must not have censored --

CHIEF JUDGE SLEDGE: I don't know why they did, but that's --

MR. HANDZO: I don't think they

censored that in New Jersey. It was on the stations I heard --

THE WITNESS: I'm from Boston. They censored everything.

(Laughter.)

BY MR. HANDZO:

Q Dr. Hauser, let me go back for a moment to the mall intercept survey.

A Yes.

Q And as I understand it, you made two primary changes to the Wind study, and one was that you added -- well, actually, let me focus specifically on the willingness to pay question for the mall intercept.

A Okay. Do we want to get it in front of us to --

Q I don't think I'm going to ask you questions that specific, but if at any point you want to refer to something let me know.

A I forgot what exhibit it is, so --

Q Well, we're talking about the mall intercept survey.

A Yes, it's in -- well, I know it's an exhibit, my report, but what --

Q Well, I believe the questionnaire --

A Was it C?

Q -- for subscribers, if you want to look at it, is Exhibit E.

A E. Okay. Okay. So I -- I have it in front of me in case you ask me about --

Q Okay. And as I understand it, with respect to the mall intercept survey and the willingness to pay questions, you made two primary changes to the wind study. And one was that you added questions about consumers' willingness to pay for nationwide coverage and sound quality and no commercials. Is that right?

A Yes.

Q Okay. And that's what you refer to as your voice of the customer correction?

A Yes, that's one of the correction. Those are attributes that consumers consider

important.

Q Okay. And the other significant change was that you rotated the order in which those attributes were removed, and that's what you call your tires on the car correction, right?

A Yes.

Q Okay. Now, with respect to those voice of the customer corrections, you did not consult with any economists in constructing that aspect of your survey, did you?

A No, I did not.

Q Okay.

A Now, I have talked to economists about measuring willingness to pay, but --

Q In a general sense?

A Oh, in a general sense, we -- you know, I hate to admit it, but I actually go to some economic seminars and many economists come to my seminars because they're interested in conjoin analysis and other methods. So there is a lot of dialogue.

In the group that I manage, we have a number of economists. So I'm always talking to them, and they always want to be paid more.

Q Okay. Well, in this case, no economist told you that getting information about the willingness to pay for nationwide coverage and sound quality and no commercials was useful to the analysis, right?

A No economists participated in generating these features that I know of.

Q Now, let me ask you to turn to Exhibit K to your testimony. And if I'm understanding correctly, this is one of the exhibits that reports the results of your willingness to pay questions. Is that right?

A Okay. This is the raw data, not reweighted for the filter question.

Q Okay.

A There is also an Exhibit K-2 -- well, you just said Exhibit K. So it's K-1 not related, K-2 related.

Q Okay. Now, if we look at -- let's look at K-1 first, which is the unweighted data. You report there that sort of overall consumers report that they are willing to pay $3.37 for the music, is that right?

A Well, unweighted, not counting for the filter question, including both subscribers and considerers, weighting them the way Dr. Wind wants them to be weighted, $3.37 is the overall value.

Q Okay. And you -- in that sort of same line there, you show that consumers are willing to pay $2.57 -- sorry, $2.50 per month for the current level of commercials, right?

A Yes, I do.

Q Okay. Which in the case of music channels means essentially no commercials, right?

A Yes.

Q Okay. I mean, it's really the music channels here that are commercial-free, correct?

A Well, yes.

Q Okay.

A Well, I -- I don't know that for sure.

Q Now, getting back to some questions I asked you earlier, isn't it plausible to read those results as people saying they're willing to pay $2.50 per month to get more music per hour of listening?

A You know, we've gone over this time and time again. Economists can use this how they believe it's appropriate, and I'm not offering an economic opinion. However, that said, I do believe that commercials, or lack thereof, is something that XM and Sirius is bringing to the table relative to things like terrestrial radio.

Q Well, I guess what I'm asking really is from the perspective of the consumer, not from the perspective of XM and Sirius.

A Oh. Well, from the perspective of

the consumer, then that's clear. They see commercial-free as an independent attribute, notwithstanding some of the few cherrypicked examples you can show me.

Q Well, and that's what I'm trying to figure out. When you see -- when you say, "They see it as an independent attribute," how do you know that they're not seeing it as when I don't have commercials, I get more music? How do you know?

A Well, you've cherrypicked one example. I mean, I -- I've taught this XM case to at this point probably 3- to 400, probably more, students. And we discuss aspects. They see commercial-free as independent, and that's part of what went into this survey.

Overall, all of the data I have is, you know, by and large, except for a few cherrypicked things, commercial-free. Wow, that's a great thing. That's kind of the reaction we get.

Q Well, people say, "That's a great thing," the question is, well, why do they say that's a great thing? Is it more music, or is it something else? And what I hear you saying is you think it's something else, because that's what your students tell you. Is that right?

A Well, some of that, some talking to my interviewers. And my interviews, unlike picking one example here, talk to all 41 respondents. You know, by and large, what we've done here is when you -- when you parse these other things out, like commercial-free, and you do it in an unbiased random order, you get $2.50 for commercial-free, $3.37 for current levels of music, and, as you can see for -- I think I just did it for music in this exhibit, it goes down to $2.93 when you correct that for the filter question.

Q Now, in the same line that we've just been looking at in Exhibit K-1, you show that the willingness to pay for sound quality

better than FM is $1.54, do you see that?
A Yes.
Q Okay. And it's right, isn't it, that sound quality has no value and no one would pay for it independent of the content that people are listening to?
A Well, if you want to get these tautologies, okay, there's no question in my mind that XM has -- XM and Sirius have content, and content is important. Okay. But the question is: what are they providing relative to other sources of the same, or sometimes they have exclusive content. What are they bringing to the table, and what do people see?
So, in essence, sound quality is the ability to hear good content, whether it be news, whether it be weather, or whether it be sports -- I won't tell you what my favorite sport is, but -- etcetera.
Q Red Sox?
A No. Actually, it's NASCAR, but I

don't think -- figure that one out. My son is in the business.
Q Okay. Well, is it your testimony that each of the satellite radio features listed here on Exhibit K-1 are largely independent of the other?
A Well, largely independent in the consumer's mind. They are various aspects that consumers value, and we can see different values here. And as a survey expert, people understood this question, they understood these to be independent attributes.
When we remove music, they give us an answer, the answer makes sense. I think it's also useful to look and see that when we remove music first we get $6.48, which is about 10 percent -- well, a little bit less than 10 percent, but order of magnitude 10 percent lower than what Dr. Wind does, which illustrates the other biases.
But by and large, when you remove it first, you get not all that different

answer, a little bit less. But then, when we correct for the major flaws, the voice of the customer and the wheels on the car phenomena, we get a smaller number. And I believe the smaller number is a more accurate number, because it's randomly removing these orders. I'm sorry. It's randomly removing the features, and we're averaging over all possible orders.
Q Dr. Hauser, I apologize, I got lost there a little bit. So let me just make sure I'm clear. I take it, then, that the answer to my question is yes, you think that each of the attributes listed on Exhibit K-1 are largely independent of each other.
A What I have said is when we remove these features one at a time in a cumulative manner, I get the answers that I got. Okay.
Q And do you -- well, do you have an opinion about whether these attributes are independent or not?
A My understanding is that -- and,

again, from debriefing the consumers on the survey, we did a lot of pretesting, they fully understood what it meant to remove these features one at a time.
Q Okay. And --
A Now, let me give you an example. I think an example will illustrate this. Suppose we remove music first, okay, and we get some value for that. In fact, we've shown it's a little bit less than Wind's, but not out of the ballpark.
Okay. Now, the consumer knows we've removed music, and now we remove something like commercial-free. Now, for subscribers, the consumers are familiar with -- with all of the offerings. Considerers, it's a little bit different issue, but for subscribers they certainly are.
So now they say, "Well, there's no music commercial-free." They're free to value that any way they want. If it is interdependent, right, and they say, well, you

know, then, I give it no value, if they understand that.

Similarly, if we remove consumer -- if we remove commercial-free, we get just the opposite, but all of the questions make sense.

Q Well --

A Now --

Q -- did you actually go back and check your results to see whether that's, in fact, what happened?

A No, I have not checked it. I'm giving you, in some sense, what they're free to do.

Q Okay.

A Now --

Q And just to turn it around, if you removed music first, and people gave that a certain value, it wouldn't actually make any sense to then ask consumers to remove commercial-free, because it was already gone when you took out the music, right?

A And they -- well, I have looked at data to this extent, and if you look across in that file you'll get the same number sometimes appearing both places. Now, what that means is that nothing more has been gone, so it's totally rational. You remove music, and if what you say is commercial-free, then I'll get a zero for that commercial-free. That zero is already in here, okay, in that ordering.

Q But my question is: you haven't actually gone back and checked your data to see whether it always worked out that when you logically shouldn't have gotten a change when you removed another factor that you in fact didn't get a change?

A Well, I spot-checked the data. Okay. And I spot-checked the data and the data seemed reasonable. Now, of course, sometimes you might, because of survey error, you may survey the error, just respondent small changes in your way, you may get a slightly different number.

But there were a lot of cases where you got the same number in column A and column B, and then a change in column C. There was also some fluctuation around, and I -- I looked at that, and so, you know, I've looked at these data.

Q You said you spot-checked them, I believe.

A Well, I mean, I spot-checked them. I looked at attributes, I ran the analyses, I reported on a lot of analyses here. I've run analyses since, issues you raised in deposition, you know.

Q Well, let me inject a bit of jargon. What's a non-monotonic response?

A It's one of the analyses I ran recently. A non-monotonic -- it's easier to define monotonic.

Q Fine.

A Okay. If I plot a line, and the line goes up or it goes sort of straight, and it never goes down and vibrates, or it goes

straight down, that's monotonic. There are a few, and this is what I mentioned -- there are some survey errors where we go up and then we go down a little bit.

And in any survey you're going to expect some small numbers of those. So the question is: do you include those, or do you not include those? And I ran the analysis. You have to have all of the variables in there to turn them into valid respondents, etcetera. But when you do that, they're not -- it's not statistically significant either way.

Q Well, correct me if I'm wrong, my understanding in the context of your survey of a non-monotonic response would be you remove a variable and the price is X.

A Yes.

Q And then, you remove another variable and the price goes up.

A That happens a few times.

Q Well, let me just ask you, is that the right definition of non-monotonic in this

context?
A Yes, and I can explain why it happens. It's very reasonable, we've seen it, and so you can cut the data. You could say, "Let's just remove any non -- any monotonic -- any non-monotonic respondent, get a number. Let's calculate the same number for the non-monotonic respondents and do a statistical test to see if there's a statistically significant difference," and there isn't.
So you could really report it either way. It's all within error bounds.
Q You had about 30 non-monotonic responses in your mall intercept?
A As I recall, it was between 80 and 85 percent were monotonic.
Q 80 to 85 percent of -- and what was the total respondents?
A 337. So yes, you know, maybe it's a little bit higher for non-monotonic.
Q Okay. And you decided to leave those non-monotonic respondents in the data?

A You can report it either way.
Q Okay. You left it in.
A I left it in, because we always know that in any survey there is going to be little bumps either way, and what happens is people kind of learn what the question means as it goes along. If it were a significant difference, I would be worried about it. We can report it without the -- it's just the nature of surveys.
Q Okay. Let me go back to a question which I don't actually think I got an answer to, I know I asked it, and that is, looking back at Exhibit K-1, is it your opinion that the attributes listed on Exhibit K-1 are essentially independent of each other?
A I'm sorry. You'll have to speak up. I could hardly hear you.
Q I'm sorry. I'll repeat it. Is it your opinion, Dr. Hauser, that each of the seven attributes listed on Exhibit K-1 is independent of the other?

MR. MEYER: Your Honor, I was hoping to get through this whole thing without an objection, but I will rise to object at this point. I do think this was asked and answered.
CHIEF JUDGE SLEDGE: It has been asked many times, and there has been -- overruled.
BY MR. HANDZO:
Q Do you recall the question, Dr. Hauser?
A The question is, if we're looking at the willingness to pay question --
Q Yes.
A -- are they totally independent, and the answer, with the examples I've just given, says they don't need to be. They are approximately independent, but I've given examples where they could be interdependent and the survey still works. But I've answered your question.
Q Okay. So the answer is they are

approximately independent.
A Well, they are approximately independent in the minds of the consumers. There are always caveats. There are a few consumers where they are going to be interdependent. I'm sorry I can't give you a clean yes or no answer to that. I'm trying to explain it as best I can.
Q Okay. And to the extent that they -- these variables are independent, it is the result of your survey, and let's look at K-2, that the value of music is $2.93?
A Okay. Independence is a sufficient but not necessary condition. So you've just stated a hypothetical where they are independent. So since it's a sufficient condition, then the answer is $2.93, subject to all of the caveats we've discussed all -- all day.
Q Okay. And, I'm sorry, you said it's sufficient but --
A It's not necessary.

Q -- not necessary. And why is that?

A Well, as I just gave the example, suppose I remove music first, and the person gives an answer. And now I -- and let's take your hypothetical that it is interdependent, that commercial-free is no longer valued, and suppose they said, "Okay. Without music, it's worth $8." And so now I take away the next thing, it's natural for them to respond $8.

Okay. So that zero goes into the survey in a very natural way, and it gets averaged in.

Q Okay. And the example that you were just giving me is where the variables are interdependent, right?

A Yes. Yes.

Q Okay.

A So the question works either way.

Q Okay. And I guess my question was simply: if we assume that the variables are independent, then your survey results show the

value of music to be $2.93.

A Well, this is actually a fundamental point. The wheels on the car criticism recognizes interdependence. Okay. The wheel -- the wheels are useless without the car. Okay. Unless you're going to make a tire swing or something, by and large tires are made for cars. Okay.

And a car is useless without the tires. If you take away these things one at a time first, you're just going to get the value of the car being, you know, $500,000 or something. That's what happens with Wind. He has a limited set of attributes, and it adds up to more than 100 percent. Even the economics experts renormalize this.

Now, renormalization doesn't work because it doesn't have all the attributes in there, and for other reasons as well. So the question -- in fact, interdependency in the wheels on the car criticism is somewhat fundamental. It's the same thing with -- I

can give lots of examples -- the heater in an apartment. The apartment is useless, at least in Boston, without a heater.

Garbage men in New York -- you know, New York is useless if they don't take the garbage away. And as you recall in the strike it went to zero, but the garbage men are useless without the city of New York.

You know, God, a bed in a hotel -- there's just lots of examples. This wheels on the car is kind of a fundamental interdependency issue, and that's why you do it. And the question works. It's a rational question.

Q The $2.93 number that were just talking about, that is a result from your correcting what you view to be the tires on the car problem, right?

A Yes, it's -- there's this -- it's a fundamental, almost philosophical issue, of how do you value something where you've got a lot of interdependent components when you take

-- think of it as -- well, we said a three-legged stool, but I -- you know, I -- you take away a leg and the stool falls. Do you give all of the value to that one leg? Well, you could, but then you've got to give all of the value to the other leg, and you've got to give all of the value to the third leg.

So I think most of us would agree that the legs have equal value and then are worth about a third of that. So somehow we've got to get around this logical problem that the stool can't stand with only two legs, and that's the wheels on the car criticism.

It's something we discuss at -- this is one of these philosophical points that you sit around and you talk about. What is the value when you take away something, when you can take away any of these components and it just won't work?

Q Okay.

A I mean --

CHIEF JUDGE SLEDGE: Does K-2

include your correction?
THE WITNESS: Yes, K-2 includes my correction.
CHIEF JUDGE SLEDGE: That was the question.
BY MR. HANDZO:
Q Okay. And since K-2 includes your --
A Yes, Your Honor.
Q Since K-2 includes your correction, is it fair to say that $2.93 represents your best effort to determine the value of music assuming that the attributes you tested listed on Exhibit K are independent?
A $2.93 is my best effort to measure the willingness to pay for music.
Q Okay. Assuming the independence of those variables.
A No.
Q Dr. Hauser, just a couple of other subjects. One is, in response to some

questions from Judge Sledge you talked about mall intercept surveys versus internet surveys, and the advantages and disadvantages. With an internet survey, isn't it fair to say that you can only survey people who own a computer and have an internet connection?
A Technical issue there, but by and large that's the case.
Q Okay. And even now, not everybody in this country has a computer and an internet connection.
A Currently, I think the last numbers I have are about 77 percent of the population, and I can speak to whether or not that biases things. But it's something that, believe me, I've ran a whole NSF center on this issue.
Q Okay. And is it fair to say that --
JUDGE ROBERTS: Dr. Hauser, is that 77 percent of people have it or have access to it?

THE WITNESS: You know, I'm trying to remember. I'm sorry, I don't, whether it's have it or have access to it. That was my technical issue, that some people have access to internet through libraries and other things rather than -- or particularly universities.
BY MR. HANDZO:
Q Okay. And the number that you just gave us, you're not sure whether that's access or --
A I'm sorry, I just don't remember.
Q Okay.
A It's in my report, and we can look up the final.
Q And is it reasonable to expect that the people who do not have internet access likely skew towards lower incomes?
A Well, except that these panels tend to be balanced to correct for that. It's something I've been worried about. When we first started internet surveys, that was a problem back in the mid-'90s. It's much less

of a problem today. We haven't totally removed the problem. It's probably less of a bias in internet than it is in mall intercept.
And currently a lot of research is moving to internet, because it's the least biased of the methods, believe it or not.
Q Okay. And with these internet panels -- well, I guess let me back up. When you do an internet survey, you're not just sending out the survey to randomly selected e-mail addresses, right?
A No, I don't even know if that would be legal.
Q One would hope not, but --
A Yes.
Q What you're doing --
A It certainly wouldn't be ethical.
Q What you're doing is you're running the survey with a panel of people who have previously agreed to be part of a panel, right?
A Yes. And, again, this has been

well studied, but, yes, that's the case.
Q Okay. So unlike a mall survey where you're actually randomly selecting people who happen to be in the mall, with an internet survey you're getting people who decided they want to be part of surveys.
A No, that's true in a mall survey, too. You get a lot of refusals in a mall survey.
Q But you are approaching people randomly, right?
A Right. And the panel companies, like Survey Sampling, try as best as possible to approach people randomly. Now, they don't spam either, so they've got a lot of methods to get this. Some panels actually use RDD -- I'm sorry, random digit dialing -- to try and get people for the internet panel. I don't recall if Survey Sampling does that.
But the -- basically, places like Survey Sampling or Greenfield or Knowledge Networks, or any of these big panels, or

Harris International, would not stay in business very long if they didn't put a lot of effort into trying to balance their panels.
Q Okay. Now, Dr. Hauser, let me ask you to look, if you still have it, at the demonstrative exhibit Mr. Meyer gave you. And I'm going to ask you to look at the second page of that.
A I am -- I apologize. Mine is -- I've taken the clip off.
Q It is the second page --
A If you read the title --
Q -- is headed "Additional Critiques of Wind Survey."
A Yes.
Q Do you have that page?
A Yes, I do.
Q Okay. And you list a number of things that you believe are flaws there, is that right?
A Yes.
Q Okay. And in your mall intercept

survey, you corrected these things in your view, did you not?
A Well, I corrected some -- some of them. And the mall intercept is not perfect, but I think this was correctly pointed out by the panel this morning, there is a slight anchoring effect, for example.
Q Okay. But otherwise, you attempted to correct everything that's listed here on this page?
A Well, by and large, yes. I mean, we can get the -- if you ask me specifics, I can answer them.
Q Okay. Well, other than the issue that the Judges identified this morning, is there anything on this page that you think you didn't fix?
A Well, let's go through these one by one. I made an attempt to -- if that's okay.
Q Sure.
A I made an attempt to actually ask

for the reservation price, their overall willingness to pay. I didn't anchor at $12.95, but I admit there might be some slight anchoring at their current payment level, although, again, I got -- allowed some consumer surplus. I corrected the cancellation question, and I attempted to capture some of the complexities in pricing.
Q Okay. Now, having made those changes, would you expect your results to be any different from what Dr. Wind found?
A Well, you know, there could be -- the real big ones are the wheels on the car and the voice of counsel. These I think as we find, you know -- it's an effect. It's not a gigantic effect, but it's an effect. It tends to bias things up.
Q Okay. Well, let's look at that if we can. Let me ask you to turn to Exhibit J-2. Do you have that?
A Yes.
Q Okay. And this is the result from

your redoing the willingness to pay question of the Wind survey, correct?

A Yes.

Q Okay. And J-2 represents the results weighted or reweighted using Dr. Wind's filter, right?

A Yes. I mean, it's -- what this is is just a willingness -- it says willingness to pay for music. It's actually willingness to pay for a service without music.

Q Okay.

A So, as you can see in the column it's labeled no music.

Q Right. And doing it the way Dr. Wind did it -- that is, removing music first -- you came up with a willingness to pay of $6.19, right?

A Yes.

Q Okay. Now, if you turn to the Wind report, which I believe you have --

A Yes, I do someplace.

Q It's a big package there.

A Yes. I'm sorry.

Q Do you have that?

A Yes, I do.

Q All right. And if you'd turn to page 24 --

A Actually, I'm sorry, this is -- yes, okay.

Q Are you with me?

A Yes, I am.

Q Okay. And Dr. Wind reports that the average willingness to pay for a service without music is $6.15, right?

A Yes, with two differences, but --

Q Okay. And your result, making the corrections you just discussed, and removing music first, as Dr. Wind did, was $6.19, right?

A Right. But recall that mine is out of a smaller price on average, because not everybody pays $12.95.

Q Okay. Dr. Hauser, a few questions about your tires on the car thought

experiment, if I may. Now, in your tires on the car thought experiment, you start your thought experiment with a premium Chrysler 300C, is that right?

A Yes, I do.

Q Okay. And you conclude that the tires on that car would be worth a lot if consumers had no alternative market in which to buy them, right?

A Well, I -- I mean, this is -- the purpose of the thought experiment, as is often the case in economics or other -- in the marketing sciences as well, is I want to focus on -- I want to make the example as clean as possible to illustrate the point. It's not unlike a physicist would choose a frictionless plane to illustrate essentially Newton's laws.

So -- you know, so I'm making some other assumptions just to illustrate the point. Now, there are other examples, too.

Q But in your thought experiment, you conclude that consumers would assign a

high value to tires on your premium Chrysler 300C if they couldn't get the tires elsewhere, right?

A If we mechanically use Dr. Wind's logic, in the thought experiment I set up, they would get a high value. And I'm certainly not saying the tires are worth $39,000. I'm trying to illustrate the absurdity of the -- of Dr. Wind's computations.

Q Okay. And then, just taking your thought experiment a little further, I think what you said is if you -- you can think of the thought experiment as let's take away the high-powered engine and the leather interior and the sound system, right?

A Those features -- I can't remember what features I took away, but --

Q I don't either, but those will work, right?

A Yes.

Q And let's call the car without

those features our low end Chrysler, okay?
A Yes.
Q And your conclusion was that if you took away those features and you have the low end Chrysler, in your thought experiment the tires on the car would be worth less in consumer's view, right?
A No, I didn't say the tires are worth less. I just said that using Dr. Wind's logic you would come up with a number that indicates a smaller number. So I'm really trying to show the absurdity of the logic.
Q Okay. And you think the reason that you would come up with a lower number is that the low end Chrysler has less value to consumers, and, therefore, they will value the tires on the car less, right?
A No, I'm trying to show that the computations he uses just are -- you can just -- you can run them all over the place with a number of examples. And I could have used a lot of other examples. I'm not trying to say

that thought experiment to satellite radio, do you not?
A I'm sorry?
Q Paragraph 24 of your written testimony.
A Okay.
Q You extend that thought experiment to satellite radio?
A Well, it's a different thought experiment, but it's related in the argument.
Q And in that thought experiment, that involves removing the features in satellite radio in a way that makes it much more like AM or FM radio, right?
A Yes.
Q And you are assuming, are you not, that if you had a service that looked a lot like AM or FM radio, the consumers' willingness to pay for music on that service would be relatively low, right?
A What I'm showing is that if we use Dr. Wind's methodology, and we remove the

the value -- the value of the tires change.
What I'm trying to show is that the logic doesn't make sense. That's the purpose of that thought experiment.
Q Well, I understand the purpose, Dr. Hauser. What I'm trying to get at is why you think, in this thought experiment, the tires get valued less for the low end Chrysler. And the reason that you think they get valued less is because consumers value the Chrysler itself less, right?
A The consumers give a smaller value to the Chrysler, because we've taken away other features. So what I've shown -- what the thought experiment I think shows very clearly is the order in which you take away features gives different numbers.
Now, you can take away features first, you can take away features last, or you can take away features in some random order.
Q Okay. And then, in paragraph 24 I think of your written testimony, you extend

features in a different order, we get a different answer. I'm really trying to use these thought experiments to show the absurdity of the logic.
Q Okay. But my question was this: in your thought experiment, it is your belief, right, that if you removed the features of satellite radio such that it now looks like AM or FM radio, a consumer's value for the music on that service would be relatively low, right?
A What I'm saying is if we do it that way we get a number using the questionnaire that's a very low number. It's no more or no less accurate than the number that Dr. Wind gets, but I don't think that I say it's the appropriate number.
Q Okay. So in your survey, one of the things you do by sort of taking away features in different orders is that at some point consumers are asked -- or I should say respondents are asked what they would be

willing to pay for music on a service that looks a lot like AM or FM radio, right?

A A small percentage of the consumers are asked that, yes.

Q Okay. And their responses are averaged in with all of the other responses to come out with the numbers that you report in Exhibit J.

A Yes. In fact, I report that number in Exhibit J.

Q Okay.

A I mean, I think it's like 92 cents. It's not -- it's no more or no less accurate than the $6.80, but I average all of these numbers, including the $6.80, which is high, and the 92 that's low.

Q Okay. And just to be clear, the 92 cents is the reported --

A Well, let's make sure it's 92, but --

Q Okay. That's Exhibit --

A I think it's J-2. Well, no, it's

K.

Q K-2.

A K-2. Yes, it's 92.

Q It appears to be 92 cents, right?

A A lot of numbers running around. I'm doing my best to remember them.

Q Okay. But you remembered that one correctly, right?

A I was fortunate.

Q Okay. And so that 92 cents is the reported willingness to pay for music by consumers for a service that looks a lot like AM or FM radio, right?

A A lot. There are some things that it has, because we haven't taken away everything. It has comedy on it, it has a few other things on it. So it's not exactly AM/FM radio, but of the seven features that we have it's when music is taken away last. So that's the value of music. So you take away everything, you get some residual value, which is sort of the comedy value, the value of

comedy programming and other things.

Q Okay. But again, just so I'm clear, that 92 cents represents in your view the value that the customer is willing to pay for music on a service that's similar, if not exactly, like AM or FM radio.

A That's the number you get when you remove it last. Okay. I don't want to say that that's the willingness to pay for music. What I'm saying is the overall randomization is probably the best way of getting at this.

Q Okay.

A But in this case, it's not all that different from a willingness to pay for music on terrestrial radio.

Q Okay. And maybe I didn't state my question artfully. I'm not asking for your opinion about what the value is. I'm asking for what the respondents reported.

A The respondents reported 92 cents when music is removed last.

Q And when music is removed last,

you have a service that looks like AM or FM radio.

A A lot like it. It still has some features that are different.

Q Okay.

CHIEF JUDGE SLEDGE: The question assumes that AM radio has music. Is that a valid assumption?

MR. HANDZO: I actually don't know, Your Honor.

BY MR. HANDZO:

Q But if we assume, Dr. Hauser, that AM radio doesn't have music, then what you'd really be saying is that 92 cents represents what consumers report they would be willing to pay for a service that looks a lot like FM radio.

A Yes. I mean, I didn't use the words AM or FM in the actual survey, so --

Q Sure.

A -- but thank you.

Q Dr. Hauser, let me ask you to go

back to SoundExchange Trial Exhibit 103. Do you have that?

A I have that in front of me.

Q Do you see at the bottom there that one of the exploratory research issues listed there at the very bottom is types of music purchased by respondent's household by buying CDs or downloading, etcetera, before and after the acquisition of satellite radio, do you see that?

A Yes, I do.

Q Okay. Is that a subject your interviewers were instructed to explore in the voice of the customer interviews?

A They explored it. And if you read the 38 pages, there's some of that aspects in there.

Q Okay.

A As I mentioned earlier, some people do mention that satellite radio causes them to buy more CDs or more iTunes. But we didn't fully explore it on all 48 respondents.

Q Why was that?

A Well, remember, we just -- we're looking -- we're not doing a study of importances. We're just trying to generate a questionnaire in the qualitative interviews. The questionnaire is a study of importances. So once we hear it from respondents, we're not going to push further on it.

Q One last thing, Dr. Hauser. Going back to the demonstrative --

A Yes.

Q -- and if you can look at the third page, and I know you have them mixed up, but it's the page that says, "Results from the Hauser mall intercept survey willingness to pay."

A Yes, I have it.

Q Okay. And the first red number of $2.93, that comes from the mall intercept survey, right?

A Yes, it does.

Q Okay. And that represents the

results for music where in that survey commercial-free was a separate category, right?

A Yes, it does.

Q Okay. So this number of $2.93 should represent the responses -- the willingness to pay for music independent of it being commercial-free, right?

A I think we've gone through that. Independence is a sufficient but not a necessary condition.

Q Okay. Well, my question is this: then, in the next two results that you report here, the $1.78 and the 46 cents --

A Right.

Q -- that essentially is the $2.93 essentially parsed by using the result of your internet survey, right?

A This is the approximately 60/40 parsing due to the decades.

Q Okay.

A And that's how we get the $1.78.

Q Right. And that 60/40 parsing comes from the internet survey, right?

A Yes, $1.78 is approximately 60 percent of the $2.93.

Q Okay. And my question is this: in the mall intercept, to get this $2.93, you had a separate question about willingness to pay for commercial-free, right?

A Yes.

Q Okay. And then, in the mall intercept -- I'm sorry. In the internet survey, you also, then, asked people to assign a value to commercial-free, right?

A Yes.

Q Okay. So aren't you essentially removing the value of commercial-free twice here?

A Well, that only applies to the last number, the 46 cents. That certainly doesn't apply to the $1.78. And I've already said that the 46 cents is one extreme favorable to XM and Sirius. The $1.78 is the

other extreme, favorable to SoundExchange.
Q Okay. But you would agree that at least with respect to the 46 cents, essentially we're addressing willingness to -- we're addressing commercial-free twice.
A The 46 cents is the low end. You know, I'm trying to bound -- I'm trying to find bounds where the true number is between these bounds, and I believe that the true number is between 46 and $1.78. So I agree that the 46 cents has -- might be a bit too low.
Q Okay. And one of the reasons the 46 cents might be a little bit too low is because you counted commercial-free twice.
A Well, sort of. Sort of. It's a complexity of -- these things are never quite as simple, but there is some of it and the 46 cents is a little bit too low.
Q Okay.
A It's a bound. It's meant to be a bound.

MR. HANDZO: Thank you, Dr. Hauser. That's all I have.
THE WITNESS: Thank you.
CHIEF JUDGE SLEDGE: Any redirect?
MR. MEYER: No, Your Honor.
CHIEF JUDGE SLEDGE: Dr. Hauser, marketing -- people in the marketing field try to communicate well, don't they?
THE WITNESS: Yes.
CHIEF JUDGE SLEDGE: Why do you call your survey a marketing -- I'm sorry, a mall internet -- a mall intercept survey, what does the word "intercept" add to the communication?
THE WITNESS: That's a very good question, Your Honor. It's standard usage in the field. I really don't know where it came from initially. It's -- I wouldn't say it's a technical term, but marketing research people refer to surveys in the mall as mall intercept, because they're intercepting people as they walk through the mall.

CHIEF JUDGE SLEDGE: Well, sometimes they intercept people and sometimes they wait for people to come to them, don't they?
THE WITNESS: Yes, I think that's correct.
CHIEF JUDGE SLEDGE: So not only is it extraneous, but it's confusing.
THE WITNESS: I certainly wouldn't disagree with that standard term.
CHIEF JUDGE SLEDGE: And that comes from marketing people.
(Laughter.)
THE WITNESS: Yes, it does, Your Honor.
CHIEF JUDGE SLEDGE: Any other questions from the bench?
(No response.)
No? All right. Thank you. That ends your testimony.
THE WITNESS: Thank you.
(Whereupon, the witness was

excused.)
CHIEF JUDGE SLEDGE: All right. And who will be our next witness?
MR. MEYER: Your Honor, the next witness is -- the next witness for the Services is Mr. Bruce Silverman.
CHIEF JUDGE SLEDGE: We will recess until 9:30, to begin with Mr. Silverman's testimony.
(Whereupon, at 4:55 p.m., the proceedings in the foregoing matter were adjourned, to reconvene at 9:30 a.m., the following day.)

Restricted: Subject to Protective Order in Docket No. 2011-1
CRB PSS/Satellite II

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
DETERMINATION OF RATES AND TERMS FOR PREEXISTING SUBSCRIPTION AND SATELLITE DIGITAL AUDIO RADIO SERVICES	)	Docket No. 2011-1 CRB PSS/Satellite II

JOHN R. HAUSER
CORRECTED WRITTEN DIRECT TESTIMONY

SXM DIR TRIAL EX
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Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
DETERMINATION OF RATES AND TERMS FOR PREEXISTING SUBSCRIPTION AND SATELLITE DIGITAL AUDIO RADIO SERVICES	)	**Docket No. 2011-1** **CRB PSS/Satellite II**

CORRECTED TESTIMONY OF

JOHN R. HAUSER, SC.D.

January 10, 2012

TABLE OF CONTENTS

I. Introduction 3

A. Qualifications 3

B. Assignment 5

II. Summary of Opinions 6

III. Survey Methodology 8

A. Survey Design 10

B. Survey Administration and Sample 16

C. Survey Procedure 20

IV. Analysis of Survey Results 22

A. Overview of Qualified Survey Responses 22

B. Willingness to Pay for Music 25

C. Consistency of Survey Findings 30

V. Conclusions 32

I. Introduction

A. Qualifications

1. I am the Kirin Professor of Marketing at the MIT Sloan School of Management at the Massachusetts Institute of Technology ("MIT"). I have served MIT in a number of capacities, including Group Head of the Marketing, Research Director of the Center for Innovation in Product Development, Co-Director of the International Center for Research on the Management of Technology, and Area Head for Management Science at MIT. The Management Science Area at the MIT Sloan School of Management includes, among other groups, the Marketing Group, the Information Technologies Group, and the Statistics Group. The principal focus of my research and teaching at MIT has been in the areas of marketing management, new product and service development, customer satisfaction, marketing research, and competitive marketing strategy. Specifically, my research includes the evaluation of consumer decision-making, product and service development designed around customers' cognitive styles, and determination of relative feature preferences and implicit product valuations.

2. I am the co-author of two textbooks, *Design and Marketing of New Products* and *Essentials of New Product Management*, as well as over eighty articles and papers, including articles on various methods used to determine the importance of product features in consumer decision-making. I have developed market research techniques that enable predicting the value of individual features in both existing and hypothetical products. These methods have been employed numerous times by academic researchers, as well as practitioners from major international corporations.[1]

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[1] See, among others, Toubia, Olivier, John Hauser and Rosanna Garcia, "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," *Marketing Science*, Vol. 26, No. 5, September-October, 2007, pp. 596-610; Urban, Glen L., and John R. Hauser, "'Listening-In' to Find and Explore New Combinations of Customer Needs," *Journal of Marketing*, Vol. 68, No. 2, April 2004, pp. 72-87; Griffin, Abbie and John R. Hauser, "The Voice of the Customer," *Marketing Science*, Vol. 12, No. 1, Winter 1993, pp. 1-27; and Hauser, John R., Olivier Toubia, Theodoros Evgeniou, Rene Befurt, and Daria Dzyabura, "Disjunctions of Conjunctions, Cognitive Simplicity and Consideration Sets," *Journal of Marketing Research*, Vol. 47, June 2010, pp. 485-496.

3. I have served as editor-in-chief of *Marketing Science* and have held senior editorial positions with *Management Science*, the *Journal of Marketing Research*, and the *Journal of Product Innovation Management*. I have received numerous awards for excellence in research and teaching in Marketing and was recognized by the American Marketing Association with the Paul D. Converse Award for "outstanding contributions to marketing scholarship."[2] In 2001, I received the Parlin Award, which is "the oldest and most distinguished award in the [marketing research] field," according to the American Marketing Association.[3] I am a Fellow of the Institute for Operations Research and Management Science ("INFORMS") and an Inaugural Fellow of the INFORMS Society of Marketing Science. I have also served as a Trustee of the Marketing Science Institute.

4. I have served as an expert witness or offered consulting services in numerous litigations, including, but not limited to, cases on trademark and patent infringement, copyright infringement, intellectual property, market research, survey design, consumer confusion and false advertisement, product confusion, claims substantiation, and Lanham Act cases. Most of this expert testimony has involved surveys and other market research to measure consumers' attitudes, beliefs, and intentions. In these prior matters, I have been called upon to project what consumer behavior would have been under different market scenarios, to measure the importance and value of product features, to measure the impact of rumors, to evaluate marketing research with respect to advertising claims, and to investigate the potential for customer confusion. I have provided survey evidence that has been used to estimate the relative value of product features, for example, in both anti-trust cases and in patent infringement cases. I have advised major corporations, including American Airlines, Fidelity Investments, Ford, General Motors, IBM, Proctor

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[2] "The Paul D. Converse Awards," American Marketing Association, http://www.marketingpower.com/Community/ARC/Pages/Career/Awards/Converse.aspx, visited on March 28, 2011; "Previous Recipients," 16th Paul D. Converse Marketing Symposium, http://business.illinois.edu/converse/previous.htm, visited on April 20, 2011.

[3] "2009 Charles Coolidge Parlin Marketing Research Award," American Marketing Association, January 14, 2009, http://www.marketingpower.com/ResourceLibrary/Pages/MarketingThoughtLeaders/MarketingThoughtLeaders11409/Parlin_Marketing_Research_Award.aspx, visited on April 14, 2011; "Charles Coolidge Parlin - Marketing Research Award," American Marketing Association, http://www.marketingpower.com/Calendar/Pages/CharlesCoolidgeParlinAward.aspx, visited on April 19, 2011.

& Gamble, and Xerox. I served as an expert witness in the prior SDARS rate-setting proceeding before the Copyright Royalty Judges, "Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services," and testified before the Judges on August 21, 2007. My professional qualifications are described in my curriculum vita, which is attached as Appendix A. A list of cases in which I have testified within the last four years at deposition or trial is attached as Appendix B.

5. The subject area headings in this report are intended to assist the reader and no inference should be drawn from the use or omission of any wording or description in these headings.

B. Assignment

6. I was retained by Sirius XM Radio, Inc. ("Sirius XM") to conduct an Internet survey to examine the value that current subscribers of satellite radio place on music, other types of programming, and non-programming features of satellite radio. It is my understanding that the license at issue in this proceeding covers broadcasts on Sirius XM satellite radio of sound recordings fixed on or after February 15, 1972. My understanding is that it does not include the broadcast of live performances, or music on Sirius XM satellite radio that is received over the Internet or through a cellular telephone or smart phone.

7. The survey was based on scientific principles and was executed according to those principles. The purpose of the survey is to provide an accurate estimate of the value of the music programming at issue in this proceeding.

8. In undertaking this assignment, I utilized my extensive expertise in developing, testing, and analyzing surveys, as well as my experience in interpreting qualitative and quantitative research about consumer attitudes, intentions, and behavior. Appendix C includes a list of materials I have relied upon to date in connection with this particular assignment. To the extent that I review additional information after this report is filed, I will supplement this list.

9. Part of the survey work for this investigation was performed under my direction by Applied Marketing Science, Inc. ("AMS").[4] Since 1989, AMS has conducted market research and surveys designed to gauge consumers' wants and needs for new products in dozens of industries. Since 1994, AMS has been conducting surveys to support expert testimony in litigation. I am a Senior Consultant, Board Member, and Co-Founder of AMS. I am a minority stockholder in AMS, but I do not receive any compensation from AMS that is directly tied to this case. Part of the empirical analysis supporting my opinions in this report was performed by Cornerstone Research working under my direction.

10. My rate of compensation for this assignment is $800 per hour. My compensation is not contingent on the nature of my findings or on the outcome of this litigation.

11. My work is ongoing; I may update and revise my results and conclusions as I review additional data and information.

II. Summary of Opinions

12. An Internet survey was conducted under my direction between September 16 and 19, 2011 to measure the value consumers place on the various features of satellite radio, including music, non-music entertainment-talk, or comedy shows, news, weather or traffic reports, sports coverage, commercial-free programming, excellent sound quality, and the ability to listen to the same stations everywhere. The survey was carefully designed and executed, adhering to scientific principles of survey research to ensure reliability and validity of the results. A representative sample of 348 satellite radio subscribers was obtained and their responses were analyzed.

13. The survey results demonstrate that respondents are willing to pay $3.24 for all types of music currently played on XM and Sirius, which is 26% of the anchor price. Moreover, I find that 34.9% of the $3.24 in willingness to pay for all types of music is

[4] See http://www.ams-inc.com.

attributed to music released before 1970. When the music category is limited to music from 1970 through today, respondents' willingness to pay is reduced to $2.11.[5]

14. This estimate of willingness to pay of $2.11 is an upper-bound estimate because only music recorded on or after February 15, 1972 is at issue in this matter, whereas the $2.11 includes all music recorded during or after 1970. The estimate is also an upper bound because it does not exclude live performances, which are not covered by sound recording rights at issue in this case.

15. The estimated value of music and the estimated parsing of post-1970 music are remarkably similar in the current survey and the survey I conducted for the previous CRB proceeding in 2007. The 2007 survey found the value of music to be $3.38 (for subscribers, unweighted).[6] The difference between that figure and the $3.24 calculated in this survey is not statistically significant.[7] The relative importance of music from the 70s, 80s, 90s and today, as calculated in the current survey, is 65.1%, compared with 63.9% in the prior study.[8] The difference between these two values is not statistically significant either.[9] Using these figures gives a value of $2.16 for music from 1970 onward for subscribers in the old survey, and $2.11 from the latest survey. The difference between these two values is not statistically significant.[10]

16. In the previous proceeding, the CRB voiced concerns that Dr. Wind's survey was based on "an imperfect snapshot of consumer preferences…at one point in time, without any justification for the implied assumption that such preferences have remained or will remain stable across Sirius' subscribership over time or even over any limited relevant

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[5] As noted above, I understand that the sound recording rights at issue in this case are for sound recordings fixed from February 15th, 1972 onward. I have included sound recordings from January 1, 1970 up through February 14th, 1972 because I believe that it is unlikely that most respondents have sufficient knowledge to be able to judge the value of recordings on a year by year basis (e.g., 1971 versus 1973), let alone on a day by day basis.

[6] Hauser 2007 report, Exhibit K-1. The value of $3.38 is unweighted and is for subscribers only.

[7] t-statistic = –0.327, p-value = 0.743.

[8] The estimate of 63.9% corresponds to subscribers only. Respondents who reported an importance value of 0 for both pre-1970 and post-1970 music were excluded from this calculation.

[9] t-statistic = 0.414, p-value = 0.679.

[10] t-statistic = –0.162, p-value = 0.872. The formula for the variance of the product of two independent random variables used in the calculation is $Var(XY) = [E(X)^2]Var(Y) + [E(Y)^2]Var(X) + Var(X)Var(Y)$. See, for example, Goodman, Leo A., "On the exact variance of products," *Journal of the American Statistical Association*, December 1960, 708-713.

time period."[11] Although any survey by construction will only provide a snapshot of consumer preferences at that time, there is remarkable consistency between the current survey and the survey I conducted for the previous CRB proceeding in 2007, which demonstrates that my findings are reasonably consistent over time.

III. Survey Methodology

17. Satellite radio, like many other products, is a bundle of features. Consumers' willingness to pay is defined as the largest amount that consumers will pay for this bundle, which depends on the value consumers place on the various features in the bundle, such as music, non-music entertainment-talk, or comedy shows, news, weather or traffic reports, sports coverage, commercial-free programming, excellent sound quality, and the ability to listen to the same stations everywhere. Notably, consumers might be willing to pay more than the market price for a service – their willingness to pay is not necessarily limited by the market price. Established empirical market research methods, such as the survey described in this report, can be used to determine the value placed by subscribers of satellite radio on the various features of satellite radio. Such methods can be used to parse either the overall willingness to pay or the market price into the contribution that the various features of satellite radio make to the whole. In this exercise, I designed and executed a scientific survey to parse the market price of satellite radio into the contribution from various specific features.

18. In order to understand the survey methodology to determine consumers' willingness to pay for a specific feature, consider the following thought experiment.[12] Imagine that a consumer is considering purchasing a new automobile, such as a Chrysler 300 SRT8. The consumer might be willing to pay $50,000 for a Chrysler 300 SRT8, suitably equipped with a powerful engine, a touch-screen navigation system, a state-of-the-art audio system with six premium speakers, and leather seats with heating, among

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[11] See Final Determination of Rates and Terms in the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, 1/10/08, pp. 44-45.

[12] A thought experiment is an important tool to check the implications of a theory. Many of Einstein's arguments for relativity are based on thought experiments.

other things. Now consider a feature, such as the touch-screen navigation system, that is separable both in the consumer's mind and as a technological matter. The consumer might be willing to purchase a Chrysler 300 SRT8 without the touch-screen navigation system and the Chrysler Group LLC might be able to provide such a car. Suppose that the consumer is told that the Chrysler 300 SRT8 will come with everything but the touch-screen navigation system. Instead, it will have no navigation system (but will have other "Uconnect" touch controls). The consumer may be willing to pay less for the Chrysler 300 SRT8 without the touch-screen navigation system. If asked in a survey the consumer might be willing to pay, say $49,000. We can therefore estimate the value to the consumer of the touch-screen navigation system. We do so by comparing the initial willingness to pay for a Chrysler 300 SRT8 ($50,000) to the willingness to pay ($49,000) for a Chrysler 300 SRT8 without the touch-screen navigation system. We compute a value of $1,000 for the incremental value due to the touch-screen navigation system.

19. In this example, the touch-screen navigation system was both separable in the consumer's mind and could be offered separately by the Chrysler Group LLC. However, not all features are separable in this way. For example, to get the full "SRT8 experience," the consumer might want to have leather seats with heating, a premium instrument cluster, and a powerful engine (6.4 liter Hemi V8). If any one of these features were taken away, the consumer might value the Chrysler 300 SRT8 with the remaining features merely as an improved base model – for illustrative purposes, say $36,000. (The Chrysler 300 starts around $27,000.) Most of the value of the full package is lost in the consumer's mind from losing the first feature. Taking away another feature might lower the value only another $2000, to $34,000, and taking away a third feature might lower the value only another $2000, to $32,000. Suppose now that we get to $36,000, $34,000, and $32,000 regardless of the order in which the three features are taken away. It would be reasonable to estimate the value of the three features as the initial price ($50,000) minus the price without any of the three features ($32,000). The joint value of the three features would be $18,000 and, because the order did not matter, we could assign $6,000 to each of the three features, which is $18,000 divided by 3 (rather than $14,000 to one feature and $2000 to the other two).

20. The three-feature example illustrates a pitfall and suggests a solution. It would be a pitfall to have a pre-defined order. The predefined order would assign $14,000 to the first feature that is removed and $2,000 to each of the subsequent features. However, if we get to the same joint valuation independent of order, then it is fair to assign $6,000 to each of the three automotive features. We can eliminate a prior bias by removing features in a random order and averaging over all orders. This is the strategy that I used in the survey that I designed to remove order bias.

21. The effect of predefined feature orders applies to the features of satellite radio as well. In the case of music, we could get different valuations depending on whether music is removed from the full satellite radio package first (which would estimate too high a value) or last (which would estimate too low a value). The value of satellite radio is enhanced by the joint availability of music, great sound quality, the lack of commercials, and the ability of listen to the same content throughout the country. Removing any one of the features would make satellite radio appear less attractive. Removing music first could have a misleadingly large impact on respondents' willingness to pay for satellite radio, leading to a misleadingly high estimate of the value of music. On the other hand, removing all other features and types of programming first (other than music) would leave a service that is more or less comparable to FM radio. It is reasonable to expect that the consumer could be unwilling to pay more than they pay now for FM radio – $0 after they have purchased the equipment. Removing music last would cause us to estimate a low value on music. To get an unbiased value of music, it is necessary to remove features in a random order.

C. Survey Design

22. In designing and implementing the survey, I followed standard scientific methods to maximize the reliability of the survey instrument. My survey design adopted the scientific guidelines for surveys conducted for academic, commercial, and litigation purposes.[13] For example, I used a "blind" methodology and included question and answer

[13] See, e.g., many of the recommendations in Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423.

options unrelated to the study's objective to avoid any unintended biases or "demand artifacts." Demand artifacts are aspects of the study that influence research results based on the chosen procedure rather than based on the phenomenon under study.[14] I also used screening questions to identify and categorize respondents, "filters," and rotation of answer options when appropriate. To draw statistical inferences for a target population, I ensured that my sample was representative of Sirius XM's customers by using a reliable panel of market research respondents and ensuring a diverse respondent population. The panel is used by major corporations to make important decisions. I have used this panel before and have been satisfied with the results.[15] To ensure that the questions were understood by respondents and relevant to their decision making, the survey was pretested. Respondents understood and could respond accurately to the questions and no demand artifacts were detected. I describe my methodology in greater detail below. For the full sequence of survey questions, see Appendix D.

23. **Double-blind design.** It is standard survey practice to avoid indicating the sponsor and/or purpose of the survey to ensure respondents' objectivity. According to the *Reference Manual on Scientific Evidence*, "the survey instrument should provide no explicit clues (e.g., a sponsor's letterhead appearing on the survey) and no implicit clues (e.g., reversing the usual order of the yes and no response boxes on the interviewer's form next to a crucial question, thereby potentially increasing the likelihood that *no* will be checked) about the sponsorship of the survey or the expected responses" (emphasis in original; footnote omitted). The goal of the survey design is to make the respondent "blind" to the sponsor and purpose of the survey.[16]

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[14] Demand artifacts are analogous to leading questions asked to a witness during testimony. For a discussion of demand artifacts, see, e.g., Sawyer, Alan G., "Demand Artifacts in Laboratory Experiments in Consumer Research," *Journal of Consumer Research*, 1, 4, March 1975, pp. 20-30; Shrimp, Terence A., Eva M. Hyatt, and David J. Snyder, "A Critical Appraisal of Demand Artifacts in Consumer Research," *Journal of Consumer Research*, 18, 3, December 1991, pp. 273-283.

[15] For example, I recently testified (on October 13, 2011) in the United States District Court for the Eastern District of Texas Tyler Division in the matter *Alcatel Lucent, Inc. v. Amazon.com, Inc. et al.*, about the value of a patented technology. The study upon which that testimony was based used respondents from the same panel I use in this study.

[16] See, e.g., Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423, at pp. 410-411.

24. The design and administration of my survey can be characterized as blind. Because the survey was administered via the Internet, respondents were not exposed to human interviewers, thereby eliminating the possibility of an interviewer communicating the sponsor or purpose of the survey and influencing the outcome (intentionally or not). An Internet-based survey avoids demand artifacts that might be induced by means of intonation or facial expressions during the delivery of particular questions or answers. An Internet-based survey removes, or at least greatly diminishes, any "interviewer bias" which may arise from the desire of the respondents to please, displease, or impress the interviewer.

25. **Introductory/screener questions.** Introductory or "screener" questions help to identify members of the target population and determine whether respondents meet the criteria (qualify) for inclusion. Such questions may include demographic questions such as age and gender, and questions that help identify the respondents' ownership of certain products and knowledge about those products. In drafting introductory questions, I was careful not to convey information that would influence responses to the main survey or otherwise provide respondents with information that otherwise would not occur to them.[17]

26. The inclusion of unrelated answer options in closed-ended respondent qualification questions serves to distract respondents from an item of interest.[18] Such questions and answer options help to conceal from the respondents the intention of the survey and to minimize the potential for demand artifacts. For example, if a survey is conducted to determine whether respondents might be interested in a particular movie, the survey can ask the respondent to select the movies in which he or she is interested, providing a set of movie options including the movie of interest. The other movies within the option set would help mask the target of the survey, and would therefore serve to

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[17] See, for example, Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-387, at pp. 386-387; Smith, D.M., N. Schwarz, T.R. Roberts, and P.A. Ubel, "Why are you calling me? How study introductions change response patterns," *Quality of Life Research*, 15, 2006, pp. 621-630.

[18] "Closed-ended" questions provide the respondent with a set of potential responses (answer options) from which to choose. These are distinct from "open-ended" questions, which allow the respondent to formulate his/her own answers. For a discussion of closed-ended and open-ended questions, see Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423, at pp. 391-394.

distract the respondent from the purpose of the study. To restrict the sample to the target group, i.e., subscribers of satellite radio, I asked respondents in Question S7 "To which of these services, if any, does your household currently subscribe?" To minimize demand artifacts, I provided unrelated options such as satellite TV, broadband internet, and cable TV, in addition to satellite radio.

27. As discussed below (see paragraph 40), demographic criteria such as location , gender, and age group were used to determine whether the participants qualified for inclusion. In addition, participants were required to have accessed the survey from a computer rather than a mobile device, and could not be employed by (or have a member of their household who was employed by) a satellite radio company, a music recording studio, or be an owner of copyrighted music. These screens are standard security questions and do not bias the results. Respondents were also required to have at least one paid satellite radio subscription for Sirius XM, Sirius, or XM, listen to satellite radio on a satellite radio receiver, and play a substantial role in the decision to subscribe to satellite radio. Respondents' answers to these questions allowed me to include only appropriate respondents in the survey and to tailor my questions to each respondent.

28. **Filters.** To avoid influencing respondents' answers and survey results and to minimize answers from uninformed respondents, carefully designed surveys include "filters" and "quasi-filters." Filters are questions and/or answer options that eliminate respondents who are not relevant or who do not have opinions. Quasi-filters avoid speculation and guessing that may arise when a respondent is forced to offer an opinion or answer a question on which he or she has no opinion. For example, typical quasi-filters offer answer options such as "don't know" or "no opinion." Quoting from the Reference Manual on Scientific Evidence, "[b]y signaling to the respondent that it is appropriate not to have an opinion, the question reduces the demand for an answer and, as a result, the inclination to hazard a guess just to comply."[19]

29. I used numerous filters in my survey questions and answer options. For example, appropriate questions in the main part of my survey (i.e., after the introductory questions)

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[19] Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423, at pp. 389-391.

included quasi-filters (i.e., the option of "Don't know/Unsure"). The surveys' screener questions served as full-filters. For example, in Question S11 I ask respondents "Is your … satellite radio subscription XM or Sirius?" Respondents that say "Don't Know/Unsure" are terminated.[20] By employing filters, I carefully avoided asking questions of respondents that might not be relevant and I avoided asking respondents to express a belief when the respondent had none or was not sure.

30. **Rotation of answer options.** In closed-ended questions with several answer options, respondents might be more likely to choose a certain option simply because it is first or last on the list. Such phenomena are known as "order effects."[21] To avoid order effects, I rotated answer options so that different respondents see the options in different orders and any possible order effects cancel out across respondents. There are standard exceptions to the rotation rules. For example, certain options – such as "Other," "None of the above," and "Don't know / Unsure" – always come last in order for the question to preserve logical flow. Another exception to answer rotation occurs when answer options come in a certain logical order, such as those for age or income brackets. In such circumstances, answer options are usually not rotated.

31. I rotated answer options in the introductory questions and closed-ended filter questions, where it was appropriate. For example, in question S9 I asked the respondents "Which of the following type(s) of satellite radio subscriptions does your household currently have?" Although I am interested only in respondents that have a paid subscription directly from Sirius XM, Sirius, or XM, I included other options that respondents could choose from, such as "A trial subscription … directly from Sirius XM, Sirius, or XM," and "Sirius XM, Sirius, or XM as part of a package from a third party …." Not only do these questions filter respondents, but they minimize demand artifacts.

32. **Pretest of the survey.** Questionnaires should use language that respondents find easy to understand and relevant. If the questions of interest are ambiguous or otherwise

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[20] 12 respondents were eliminated because they chose "Don't Know/Unsure" for Question S11. They were eliminated to ensure that the respondents in the final sample were knowledgeable about the product they were using.

[21] For a discussion of order effects, see Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423, at pp. 395-396.

unclear, the results of the survey may be distorted due to guessing or misunderstanding on the part of the respondent. To maximize the clarity of the survey, background research, including secondary-source data and sales data, is useful to gain insight into, for example, how potential respondents think about issues relevant to the target of the study, the extent to which potential respondents are aware of those issues, and the vocabulary used by potential respondents regarding the study target. Similarly, prior to administering the final survey, it is important to evaluate (or "pretest") the proposed series of questions with a small sample of "the same type of respondents who would be eligible to participate in the full-scale survey."[22] Such pretests help to assess the potential for demand artifacts and to ensure that all survey questions were understood as intended.[23]

33. To design the survey properly, I instructed AMS to conduct background research and a pretest of the survey instrument, as summarized below.

34. AMS examined questions that had been asked of respondents in 2007, questions that had been pretested.[24] I reviewed documents from Sirius XM (as described in Appendix C) to assure that the basic structure of the questions remained valid. Between September 7 and 12, 2011, at my direction experienced interviewers from AMS pretested the survey with seven adults in the United States. To qualify for a pretest interview, the interviewee was required to have a current subscription to satellite radio. The goal of this evaluation was to ensure that respondents could understand and answer questions as the questions were intended to be asked. Note that these responses were used solely for pretesting and are not included in the final survey results. The pretest interviews themselves are open-ended verbal debriefs of pretest respondents after the respondents have answered the survey questions.[25] These results are typically reported to me orally by

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[22] Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp.359-423, at pp. 388-389.

[23] Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011, pp. 359-423, at pp. 387-389.

[24] The mall-intercept questionnaire in the 2007 survey was pretested with 16 respondents. See Hauser 2007 report, p. 29.

[25] Glen L. Urban and John R. Hauser, *Design and Marketing of New Products*, (Englewood Cliffs, NJ; Prentice-Hall, Inc.), 1980, p. 179: "A sample size of 10 is common. After a question is answered you can ask respondents what they thought each question asked. You can try different forms of the questions. You can watch for careless response or no response. … You can do whatever is necessary to ensure that what you think is being asked is actually being answered."

experienced interviewers who debrief respondents under my direction. I have worked with these interviewers before, participated in their training, and provided instructions on how to carry out these pretests.

35. Pretesting continues until respondents answer the survey questions easily, do not find the questions difficult or ambiguous, and feel that their answers represent their opinions. In this instance, seven respondents were sufficient for the purpose of ensuring that the questions were understood. In my experience, seven pretest debriefs are reasonable for a survey that is modified from a previous survey that itself had been pretested.

36. Pretesting provided the appropriate vocabulary used in the survey instrument. Based on the findings from the pretests, AMS fine-tuned the phrasing and words used in the survey to reflect the way in which consumers think about and understand satellite radio. I am confident that the phrasing of the questionnaire was comprehensible and minimized the potential for guessing. Further, information from pretesting helped with the design of instructions and error messages to ensure that the data were reliable.

37. During the pretest debriefs, at my direction, experienced interviewers from AMS tested explicitly for demand artifacts. No demand artifacts were detected in the final phrasing and layout of the questions. Respondents did not find the questions to be leading and respondents were not able to guess that any particular result was desired by the survey designer.

D. Survey Administration and Sample

38. **Use of the Internet for the survey.** The survey was administered via the Internet. Internet surveys are used widely by major corporations to make substantial business decisions. I have extensive experience with online surveys in the contexts of litigation, corporate applications, and academic research.[26] In my experience, if best practices are

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[26] For many years, I headed the Virtual Customer Initiative (VCI), a key initiative within MIT's Center for Innovation in Product Development. The VCI studies the use of Internet-based surveys and methods that are developed explicitly for such surveys. An article on the virtual customer that I co-authored (Dahan, Ely, and John R. Hauser, "The Virtual Customer," *Journal of Product Innovation Management*, 19, 2002, pp. 332-353) is highly cited. I have won many awards for research that relied upon Internet-based surveys. Another article compares respondents' answers in an Internet survey to their actual choices of a product worth approximately $100. In addition, projections from the study were compared to market-place results.

followed, Internet-based samples are representative of target populations and can be used to project to target populations both reliably and validly. Online survey instruments have many benefits: they eliminate interviewer bias (i.e., they create a "blind" environment); they produce acceptable response rates; and, due to the anonymous nature of the Internet, they allow for truthful responses, particularly when the subject matter is sensitive. Online survey instruments allow researchers instant access to results and enable the use of advanced design capabilities, such as complex randomization, screening logic, and error checking. Internet surveys are an increasingly common form of market research. Over 77.3% of the U.S. population has access to the Internet.[27] The largest corporations use Internet surveys to support multi-million dollar marketing decisions.[28] Courts accept the results of Internet surveys in a wide range of cases.[29,30] I have personal prior experience in formulating Internet surveys for litigation which have been accepted by the courts.

39. The Internet survey was conducted by contracting with one of the numerous companies that have pre-recruited potential respondents who have indicated their willingness to participate in market research surveys. In this case, I selected Research Now, a well-established international market research service firm that maintains an invitation-only panel of over 3.6 million consumers in the United States and over 6 million panelists worldwide.[31] Both AMS and I have worked with Research Now on a number of other projects. We have each found them to be consistently reliable and a high quality supplier of qualified survey respondents. As part of the panel recruitment process, all panel members complete a questionnaire that includes basic demographic information (age, gender, etc). In addition, panel members have the option to answer questions about

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This article is highly cited and has won international awards. (See Toubia, Olivier, Duncan I. Simester, John R. Hauser, and Ely Dahan, "Fast Polyhedral Adaptive Conjoint Estimation," *Marketing Science*, 22, 3, Summer 2003, 273-303.)

[27] http://www.internetworldstats.com/stats14.htm as of June 30, 2010 (viewed 10/6/2010)

[28] According to an annual study conducted by Inside Research®, 46% of the dollars spent for survey research in the U.S. was on online surveys in 2010.

[29] Robert H. Thornburg, Trademark Surveys: Development of Computer-Based Survey Methods, 4 J. Marshall Rev. Intell. Prop. L. 91 (2005)

[30] Gabriel M. Gelb and Betsy D. Gelb, "Internet Surveys for Trademark Litigation: Ready or Not, Here They Come," *The Trademark Reporter*, 97, 5, September-October, 2007, p. 1073

[31] Research Now, owned by e-Rewards, Inc., is a leading online sampling and online data collection company (see "e-Rewards, Inc. Announces Agreement to Acquire Peanut Labs," Research Now, September 27, 2010, http://www.researchnow.com/en-US/PressAndEvents/News/2010/10/Peanut%20Labs%20Aquisition.aspx, visited on October 5, 2011)

their personal habits and behaviors (e.g., drinking habits, cell phone usage). Using this information, Research Now was able to target survey invitations to people who had indicated that they subscribe to satellite radio.[32] This invitation included a link to the actual survey which was hosted on a website maintained by Bernett Research, Inc.[33] This link contained an embedded identification number that assured that only invited respondents could answer the survey and that each respondent could only complete the survey once. I describe below how I assured that the survey was not completed automatically by a computer "bot." Respondents who qualified and completed the survey were awarded $2.50 in e-Rewards (Research Now) currency. In my experience, such honoraria are common in survey research and do not influence the accuracy of the responses.

40. **Identification of the target population.** I understand that the target population in this matter includes United States residents over the age of 18 who subscribe to satellite radio. To ensure the representativeness of the survey population the inbound sample was "click-balanced" (i.e., targeting a representative sample from the market research panel based on the distribution of individuals by validated demographics) using U.S. Census data based. The demographic variables used for balancing were gender, age, and census region.[34]

41. **Survey rollout.** The pretest interviews ensured that the questions were understood by the respondents. To ensure that the survey operated properly, AMS, at my direction, extensively tested the links, skip logic, and screening questions.

42. An invitation to participate in the survey was emailed to 13,222 potential participants. (See Appendix E for the text of the email.) The invitation included the personally encoded link that established survey security. The responses to the survey were recorded between September 16 and 19, 2011.

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[32] Research Now projects having over 165,000 of its members with a satellite radio subscription.
[33] www.bernett.com. Bernett Research programmed and hosted the survey.
[34] Gender, age, and census region quotas for the Consumer Survey were set using U.S. Census Bureau data from 2005 to 2009 and applied to inbound "clicks" (i.e., responses to the survey invitation) (see "2005-2009 American Community Survey 5-Year Estimates," U.S. Census Bureau, http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS; and "Census Regions and Divisions of the United States," U.S. Census Bureau, http://www.census.gov/geo/www/us_regdiv.pdf).

43. After clicking on the link from the email invitation, respondents were prompted to a browser window with a CAPTCHA challenge to ensure that responses were not computer-generated.[35] After completing the CAPTCHA challenge, respondents moved to the survey.

44. **Validation.** The validation process for an Internet survey is different from that for telephone, mall or mail surveys, because only the Internet panel provider is allowed to contact the respondents. The security steps described above assure that only panel members receive invitations, that the survey is not answered by a "bot," and that the survey taker cannot take the survey more than once. In addition, Research Now is a reputable panel provider which itself employs security procedures.[36] To provide further validation, each respondent's age, gender and state of residence were compared to values for those respondents in the panel provider's database. Any respondents whose stated age, gender, and state of residence did not match the values in the database were terminated from the survey.

45. Ultimately, 348 qualified respondents completed the survey.[37] This sample size was adequate to enable me to provide statistically significant estimates of the value of music. (Confidence intervals on key estimates are reported in Appendix H) Detailed screening statistics are shown in Appendix F. Response rates and complete rates are discussed in a subsequent paragraph.

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[35] A CAPTCHA challenge refers to a program that protects websites against bots (i.e., computer-generated responses) by generating and grading tests that humans can pass, but current computer programs cannot. The acronym CAPTCHA stands for Completely Automated Public Turing Test To Tell Computers and Humans Apart. See, e.g., "CAPTCHA: Telling Humans and Computers Apart Automatically," CAPTCHA, http://www.captcha.net/, visited on October 5, 2011.

[36] Research Now uses several techniques to identify legitimate respondents. They have an extensive panel member verification process, and use "Digital Fingerprinting" to ensure that multiple responses are not obtained from the same computer. They also use "Geo-IP Validation" to identify the geographic location of the respondent. If there is a discrepancy between the targeted location of the survey and the location of the respondent's computer, the respondent is blocked from taking the survey. See: http://www.researchnow.com/en-gb/Panels/PanelQuality/ResearchIntegrity.aspx (accessed on November 2, 2011).

[37] A small number of respondents were eliminated from the survey based upon what I judged to be unreasonable responses. Inclusion of such responses would have lowered the value of music, so their exclusion favors SoundExchange. See paragraphs 56-58 for details.

E. Survey Procedure

46. Respondents' answers to the survey questions provided the basis for my analysis and opinions. Using skip logic, questions were tailored to respondents in a logical way based on their answers to previous questions. The skip logic enabled me to tailor questions to respondents based on (1) whether they had one or multiple subscriptions to satellite radio;[38] (2) whether their primary subscription was with XM or Sirius;[39] and (3) whether they subscribed to Select or Premier service.

47. After responding to initial screener questions, respondents were asked to specify how often they pay for their primary satellite radio subscription.[40] This information was used, along with the information previously provided about the service provider (Sirius or XM) and level (Select or Premier) of a respondent's subscription, to provide a relevant monthly anchor market price for evaluating the value of satellite radio subscription features.[41] The standard monthly prices did not include any taxes, promotional discounts, multiple receiver discounts, feeds, music royalty fees, or add-on services such as Internet listening. This amount represented the anchor market price upon which future responses regarding willingness to pay would depend.

48. Customers who currently pay based on a promotional pricing program indicated whether they would be willing to pay the standard monthly fee upon the expiration of their promotional term.[42] Those respondents who replied affirmatively were associated with an anchor market price reflective of their service provider, service type, and payment cycle. Those who indicated that they would not be willing to pay the standard

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[38] The difference between the two groups for the value of music and the relative proportion of post-1970 music is not statistically significant. For the value of music, t-statistic = 0.142, p-value = 0.887. For the relative proportion of post-1970 music, t-statistic = –0.650, p-value = 0.516.

[39] The difference between the two groups for the value of music and the relative proportion of post-1970 music is not statistically significant. For the value of music, t-statistic = 0.012, p-value = 0.990. For the relative proportion of post-1970 music, t-statistic = 0.918, p-value = 0.360.

[40] Question 1: "Which of the following best describes how often you pay for your [primary] satellite radio subscription?"

[41] Respondents paying monthly, quarterly, and upfront for one, two, or three years comprise over 90% of Sirius XM self-pay customer base. Respondents with non-standard billing cycles (e.g., semi-annual or lifetime) were excluded from the survey. Source: Sirius XM Consolidated – Package Report, November 23, 2010, sheet "Consolidated Plan Detail."

[42] Question 5: "Would you be willing to pay the standard price of [FILL BASED ON PAYMENT CYCLE] per month for your [FILL 'Sirius' or 'XM'] when the promotional period ends, or would you cancel your subscription when the promotional period ends?"

market price upon the expiration of the promotional period were asked how much they would pay before deciding the subscription was too expensive.[43] This amount became the anchor reservation price upon which future willingness-to-pay responses would depend for this subgroup of respondents.[44]

49. Next, respondents were asked a series of seven questions to measure how much they would be willing to pay under a number of different conditions. The conditions involved the randomized removal of various programming and non-programming features of satellite radio one at a time.[45] These conditions built cumulatively upon one another, with each question including all the conditions in the previous question.[46] For example, in Q7b a respondent was asked "How much would you pay per month for satellite radio if … You couldn't listen to the same stations everywhere AND Sound quality was only equal to that of standard FM radio you can listen to …" Following this question, the respondent was asked in Q7c "How much would you pay per month for satellite radio if … You couldn't listen to the same stations everywhere AND Sound quality was only equal to that of standard FM radio you can listen to AND There were as many commercials as on AM or FM radio …" All conditions were presented in random

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[43] Question 6: "You just indicated that you would cancel your satellite radio service if the price were [FILL MONTHLY anchor price]. What is the most you would be willing to pay monthly for your [primary] satellite radio subscription before deciding it was too expensive; in other words, if the price was any higher you would cancel your subscription?"

[44] Individuals currently paying a standard price, and those currently paying a promotional price but indicated willingness to pay the standard price when the promotion period ends, were asked to specify a reservation price later in the survey sequence.

[45] Example text for Question 7, including all conditions and one randomized order is: "How much would you pay per month for satellite radio if…

- You couldn't listen to the same stations everywhere AND
- Sound quality was only equal to that of standard FM radio you can listen to AND
- There were as many commercials as on AM or FM Radio AND
- There was no music available, not even your favorite channels AND
- There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts AND
- There was no sports coverage available, not even your favorite teams AND
- There were no news, weather or traffic reports available

Please assume that all other aspects of satellite radio would remain the same."

[46] Respondents were instructed to think only about their primary subscription for satellite radio that they listen to over a satellite radio receiver, excluding any satellite radio programming listened to over the Internet on a computer or cell phone.

order and the respondents were asked how much they would be willing to pay relative to their anchor price or their previous response.[47]

50. The availability of music programming based on when the music was recorded and released (not necessarily composed or written) is relevant to these proceedings. To parse the willingness to pay over different periods, respondents reported the relative importance of being able to listen to music that was recorded and released from the 1970 through today, compared with the ability to listen to music what was recorded and released before 1970.[48] Pretesting indicated that this phrasing was natural to respondents and that they felt that it enabled them to express their opinions more accurately. Based on the pretests and prior survey-research experience, I judged that it was most accurate to have only a moderate number of features to be removed in Question 7. Thus, I did not parse the time frame in Question 7.

51. Respondents also self-reported the number of online surveys they had completed in the past three months with Research Now or any other survey panel provider. These data enable me to evaluate any potential effect related to the varied frequency of taking online surveys.

IV. Analysis of Survey Results

A. Overview of Qua lified Survey Responses

52. Through the survey, I was able to collect data on the value that satellite radio subscribers attribute to the availability of music programming. A total of 1,358 respondents started filling out the survey (representing a response rate of approximately 10%). Of these, 354 respondents completed the survey. Out of these 354 respondents, six respondents were dropped because of straight-lining or unreasonable responses (see

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[47] Instructions and error messages permitted the respondent to pay the same amount or less per month for their satellite radio subscription based on the current set of conditions. If the individual was no longer inclined to pay for his/her subscription based on the latest condition, he/she was instructed to enter $0.00 and did not evaluate further conditions.

[48] Question 9: "Please allocate 100 percentage points based on the relative importance of each statement below regarding your decision to subscribe to satellite radio.
I can listen to music that was recorded and released (not necessarily composed/written) from 1970 through today
I can listen to music that was recorded and released (not necessarily composed/written) before 1970."

paragraphs 57-58), resulting in a sample of 348 qualified respondents.[49] This represents a qualification rate of approximately 26% and a completion rate of approximately 97%.[50] These response and completion rates are within the rates normally observed in Internet surveys.

53. To increase the precision of the study, prior to analyzing the results of the survey, I considered respondents with results and responses that suggested that it was possible that they may not have been sufficiently engaged in the survey to provide reliable and accurate answers. I describe below the basis for evaluation and, when deemed appropriate, the exclusion of certain respondents to obtain the final sample 348 respondents.

54. **Analysis of time taken to complete the survey.** Based on my experience conducting surveys, extremely long completion times suggest that respondents may have been interrupted. This does not necessarily bias the results, but it is appropriate to examine the results carefully in such a situation. On the other hand, extremely short completion times suggest that either respondents were sure of their answers and answered rapidly or that respondents may not have paid attention to the questions or may not have been sufficiently engaged in the survey. This, too, does not necessarily bias the results, but it is appropriate to examine the results carefully. Hence, responses provided by respondents with extremely long and extremely short completion times should be examined more closely. I examined the times that each respondent took to complete the survey. The median time to complete the survey was 7.2 minutes. I compared the willingness to pay for music (Q7) for the group comprising of the fastest 5% respondents (17 respondents with less than 3.92 minutes completion time) and slowest 5% respondents (18 respondents with more than 17.58 minutes completion time) with the willingness to pay for music for the remaining 90% and did not find any significant

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[49] A total of 962 respondents did not qualify because (1) they did not have a current satellite radio subscription (296 respondents), (2) they did not meet other screening criteria (e.g., insufficient decision influence) (578 respondents), or (3) their response to introductory questions regarding age or gender could not be validated (88 respondents). An additional 42 respondents began the survey but opted not to complete it. Quotas were used to demographically balance the incoming sample (see paragraph 40). Decisions on quotas were made prior to any data analysis.

[50] Out of 1,358 respondents only 42 chose to terminate the survey themselves, resulting in a completion rate of approximately 97%.

differences.[51] In addition, the responses of the fastest and slowest respondents, upon examination, were not qualitatively out of line compared to those of other respondents. Including these 35 individuals raised the average willingness to pay for music slightly, thus it was directionally conservative (favoring SoundExchange) to include the fast and slow respondents. Therefore, no respondents were removed because of the amount of time it took to execute the survey.

55. **Analysis based on number of surveys completed.** Being part of an online respondent panel provides the opportunity for individuals to receive a range of invitations to participate in studies for which they might qualify. To ensure that the results are not dependent on the overall survey participation propensity of respondents, i.e., to ensure that responses of respondents who participate very frequently in surveys are not different than responses of respondents who do not, I examined the data about how many surveys each respondent participated in the past three months. The median number of surveys completed in this timeframe was seven. The value of music did not differ statistically significantly between the top 20 most prolific survey participants (with 30 or more surveys) and the other respondents.[52] Including these 20 individuals was directionally conservative. An additional sensitivity analysis was conducted, splitting the sample into two groups – one group who answered up to and including the median number of surveys (7 surveys) and one group who answered more than the median number of surveys. Based on this split, I compared the effect of the number of surveys taken on the value of music. Again, there was no statistically significant difference.[53] Therefore, no respondents were removed because of the number of surveys the respondent had completed in the past three months.

56. **Quality control by the exclusion based on inconsistent or unlikely answers.** Prior to the analysis of any data and based on a review of the screener criteria, I removed from the study respondents who provided answers that were internally inconsistent and/or

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[51] t-statistic = –1.099, p-value = 0.273. This test was conducted for all types of music – released before and after 1970.

[52] t-statistic = –0.348, p-value = 0.728. The 95th percentile of the number of surveys taken by respondents in the past 3 months was 30.

[53] t-statistic = –0.026, p-value = 0.979. This test was conducted for all types of music – released before and after 1970.

unlikely, as described below. In each case, removal of the respondents was conservative in the sense of favoring SoundExchange. The removal of these respondents increased the overall average willingness to pay for music slightly.[54]

57. I removed one respondent who indicated that the most that respondent would be willing to pay per month is $0.01 for a satellite radio subscription once the respondent's promotional period ended. Although it is theoretically possible that a respondent would place only a 1 cent valuation on satellite radio, removing this respondent raises the value of music and therefore favors SoundExchange.

58. I removed five respondents whose willingness to pay did not change even after removing a series of satellite radio features from their subscription. This "straight-lining" (filling in a series of data with the same response value) suggests that theses respondents were not engaged in the survey. Removing these respondents raises the value of music and therefore favors SoundExchange.

B. Willingness to Pay for Music

59. To calculate the willingness to pay for the music programming, I subtracted the amount each respondent was willing to pay for satellite radio in Question 7d, after music was removed,[55] from the amount each respondent was willing to pay just before music was removed in Question 7c. Recall that the order of the removal of the features of satellite radio in Question 7 was randomized across respondents. This randomization is an unbiased method to deal with the potential that the valuation of music is not always independent of all other features. For example, music might be valued at one level when satellite radio provides a high sound quality, with stations that are available everywhere, and with no commercials. Music might be valued differently in the absence of these features. When the randomization was such that music was the first item removed for a respondent, the amount the respondent was willing to pay after music was removed was

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[54] WTP inclusive (all respondents) =$3.19; WTP exclusive of the respondent with the $0.01 response=$3.20; WTP exclusive of the five respondents who straight-lined (that is, filling in a series of data with the same response value) =$3.24.

[55] The exact wording in the survey for the removal of music in Question 7d was "...There was no music available, not even your favorite channels."

subtracted from the anchor market price gathered in Question 3 ("The standard price for your … satellite radio subscription … is [FILL WITH ANCHOR FROM CHART BASED ON ANSWER TO Q1] … Are you currently paying the standard price … for your … satellite radio subscription, or are you on a special promotional price …") or Question 6 ("You just indicated that you would cancel your satellite radio service if the price were [MONTHLY ANCHOR PRICE]. What is the most you would be willing to pay monthly for your … satellite radio subscription before deciding it was too expensive …") The resulting willingness to pay for music programming was then averaged across respondents.

60. For example, assume a respondent indicates in Question 3 that he or she pays the standard price of $12.95 per month as part of his or her monthly subscription plan. This price then becomes the anchor price for that respondent for subsequent questions. Some respondents are asked first about music while other respondents are asked first about other features of satellite radio. Suppose that this respondent is one of the respondents who, when asked Question 7, is a respondent who answers the question with music being the first item to be removed. As an illustration, assume the respondent indicates that he or she would be willing to pay $2.95, which implies that the respondent's conditional willingness to pay for music programming is $10.00. The $10.00 is numerically equal to $12.95 minus $2.95. Now, as a second illustration, assume there is another respondent who is also paying the standard price of $12.95 per month as part of his or her monthly subscription and is asked the same sequence of questions. This respondent indicates that he or she would be willing to pay $1.95. Using parallel arithmetic computations we compute that respondent's conditional willingness to pay for music programming as $11.00. These two examples are illustrative. In the actual survey 43 respondents were asked first about music. When we average the implied conditional willingness to pay over these 43 respondents we obtain a first-removal conditional estimate of $10.37. Because of arguments advanced earlier in this report, this conditional estimate of the value of music includes the complementary effect of other features of satellite radio. It is a conditional estimate given one of many randomized removal scenarios. To obtain a fair estimate we must consider all possible conditional orders of removal.

61. We now consider other respondents who had music removed last. As an illustration suppose that non-music entertainment-talk, or comedy shows, news, weather or traffic reports, sports coverage, commercial-free programming, excellent sound quality, and the ability to listen to the same stations everywhere had already been removed. This is another of the possible randomizations in the questioning sequence. Suppose that a respondent had indicated that he or she would pay only $1.00 for such a hypothetical satellite radio service. We then ask that respondent what he or she would pay when music was removed. As an illustration, suppose that the respondent says he or she would pay $0.50. We would then estimate that respondent's conditional willingness to pay as $0.50 computed by $1.00 before music was removed minus $0.50 after music was removed. Like the music-first scenario, this conditional estimate represents one of many randomized removal scenarios. In the actual survey 43 respondents were asked about music last. When we average the implied conditional willingness to pay over these 43 respondents we obtain a last-removal conditional estimate of $0.51. We can continue to compute these conditional willingness-to-pay estimates for all of the randomized removal orders in the survey. Because these removal orders were randomized the resulting estimate of willingness to pay is an unconditional estimate, that is, an estimate that is not conditional on the removal order. This unconditional estimate is a fair estimate of the value of music that takes into account the complementary nature of music, complementary with respect to the other features of satellite radio.

62. Appendix G summarizes two conditional willingness-to-pay estimates (first in the order, last in the order) and the unconditional willingness-to-pay estimates for music. For completeness and for a relative comparison to the other features in the survey, Appendix G provides conditional and unconditional willingness-to-pay estimates for all features in the survey. The unconditional estimate of the value of music is $3.24, which is larger than for other forms of programming taken one at a time and larger than other features of satellite radio. The unconditional estimate of the value of other programming (non-music entertainment-talk, or comedy shows, news, weather or traffic reports, sports coverage) is $3.60, slightly larger than the value of music. The value of commercial-free

programming, excellent sound quality, and the ability to listen to the same stations everywhere is together $5.63.

63. Finally, the summed value of all of the features of satellite radio is $12.47. This value is close to the standard monthly price of $12.95. The fact that the summed value of various features included in the survey is close to the standard monthly price corroborates the robustness of my survey design. It suggests that the features used in the survey are a relatively complete set of features and that the value of satellite radio can be decomposed into this set of features. The summed value of individual features is not equal to $12.95 for two reasons. First, not everyone was paying the full price and their reservation price may not have been $12.95. For example, approximately 22% of the respondents were paying a special promotional price.[56] Second, there is sometimes a residual value due to the other features of satellite radio, e.g., a value that might be due to the quality of the music programming. For example, the residual value was 25 cents or less for over 95% of the respondents; the average residual value was 13 cents. The small magnitude of the observed residual value for almost all respondents suggests that the residual value due to other features is not large and, hence, the list of included features is reasonably complete.

64. The unconditional willingness to pay based on the feature-removal questions estimates the unconditional value for all music broadcast on satellite radio. I am informed that there is music broadcast on satellite radio that is not subject to the license at issue in this proceeding. Specifically, rights to music recorded prior to February 15, 1972 are not covered by the license, nor are rights for live studio performances or live concerts.

65. To parse the value of music further, I asked an additional question of respondents. I asked respondents to:

> Please allocate 100 percentage points based on the relative importance of each statement below regarding your decision to subscribe to satellite radio. Make sure the total adds up to 100%. If you don't know or are unsure, please check the box.

66. Prior to being asked this question, respondents were asked to read the preamble:

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[56] Based on the responses to Question 3: "... Are you currently paying the standard price.... for your ... satellite radio subscription, or are you on a special promotional price that lowers the cost of your subscription for a limited period of time..."

Now, think about the music that can be found on satellite radio. After a song has been written, it can be recorded many times, by the same artist or different artists. Some examples include classical music being recorded and released long after it was originally composed, popular artists releasing cover versions of previously recorded songs, and technology advances making it possible to re-release music with improved sound quality.

Once again, when giving your answers to the following questions, please think only of satellite radio that you listen to over the satellite receiver. Do not consider any satellite radio programming that you listen to over the Internet on a computer or on a cell phone.

67. Respondents then allocated the 100% between "music that was recorded and released (not necessarily composed/written) from 1970 through today" and "music that was recorded and released (not necessarily composed/written) before 1970." I chose 1970 instead of 1972 because pretests suggested that consumers could not fully parse music by year, but appeared to be able to express opinions about decades. The choice of 1970 is also conservative, i.e., it is likely to favor SoundExchange, because it includes music recorded from January 1, 1970 to February 14, 1972 (e.g., "Stairway to Heaven" by Led Zeppelin was recorded in 1971), live studio performances, and live concerts.

68. Based on the results of Question 9, I estimate that at most 65.1% of the value of music is due to music recorded on or after February 15, 1972.

69. Combining the unconditional willingness to pay for music from the feature-removal questions with the relative valuation of post-1970 music from Question 9, I estimate that the net value of music as claimed by SoundExchange is at most $2.11.[57] The statement "at most" reflects that I have made data inclusion and coverage inclusion decisions to favor SoundExchange.

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[57] If we make this calculation on an individual basis and then take the overall mean, we get a value of $2.19. The two estimates of $2.11 and $2.19 are not significantly different (t-statistic = 0.284, p-value = 0.776) Moreover, the relative valuation of post-1970 music does not systematically vary depending on the order in which satellite radio features were removed. A chi-square test of order effects in the relative valuation of post-1970 music did not yield statistically significant results (Pearson chi-square statistic = 141.196, p-value = 0.551). Therefore, it may be appropriate to use either of the two calculations.

C. Consistency of Survey Findings

70. In 2007 I conducted a survey to estimate the value of music for satellite radio. There was no guarantee that the numbers estimated in 2007 would be the same as 2011. For example, changes in music usage, changes in the way music is delivered (such as iTunes and streaming music websites), changes in hardware (such as iPods, other digital music players, and smart phones), and even changes in the particular music content could explain differences between the value of music in 2007 and 2011. Also, there is now relatively more music created after 1970 (31 years) than there was in 2007 (27 years).[58] There were also differences in sampling methods (Internet survey vs. mall-intercept survey) and the detailed wording of the questions.[59] Finally, there was a difference in the manner in which the construct of willingness to pay was measured. As I explain below, my 2007 survey anchored respondents to their stated reservation price while my 2011 survey anchored respondents to the market price. Despite these differences, the estimated value of music and the estimated parsing are remarkably similar.

71. In my 2007 survey I estimated the value of music to be at most $3.38.[60,61] In my 2011 survey, I estimate the value of music to be at most $3.24. The difference between these two values is not statistically significant.[62] The relative importance of music recorded in 1970 or later was estimated in the 2011 survey to be 65.1%. This estimate

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[58] This is an increase of approximately 15% more years. It may or may not mean 15% more music. It is also possible that recent music is valued either more highly or less highly than prior music and it is possible that recent music plays a larger or smaller role in the respondents' music valuations. Thus, the effect of increased years can be ambiguous.

[59] Both mall-intercept and Internet surveys can provide representative samples when done to high standards. I opine that both were done to high standards and, hence, both should be representative.

[60] Hauser 2007 report, Exhibit K-1. The value of $3.38 is unweighted and is for subscribers only.

[61] In my 2007 report I reported two estimates. One was an unweighted estimate that reflected the population average. The other was an estimate that adjusted for a filter question that was used in a survey by Wind. As detailed in my 2007 report such filter questions enhance accuracy and lower the estimate of willingness to pay. However, while such filter questions are feasible for a situation when only one feature is removed, they are not feasible when there are multiple features removed sequentially. Because the filter questions lower the estimate and favor SoundExchange, my decision not to use such questions means that the estimate is at most $3.38. Furthermore, this estimate of $3.38 is the appropriate comparison to the estimates that I obtain in my 2011 survey. (Reweighting to account for Dr. Wind's filter question results in an estimate of $2.87 rather than $3.38.) Using the unweighted estimates in the 2011 survey is likewise conservative in the sense that it favors SoundExchange.

[62] t-statistic = – 0.327, p-value = 0.743.

compares to 63.9% in the 2007 survey.[63] The difference between these two values is not statistically significant.[64] Using these figures gives a value of $2.16 for music from 1970 onward for subscribers in the old survey, and $2.11 from the latest survey. The difference between these two values is not statistically significant.[65]

72. When comparing the 2007 and the 2011 surveys there was a difference in the manner in which the construct of willingness to pay was measured. The difference is in the initial anchors. In my 2007 survey, I anchored the first feature-removal question to the respondents' "reservation price," that is, the most that that respondent would be willing to pay without canceling his or her subscription. In my 2011 survey I anchored the first feature-removal question to the respondents' revealed market price. Both measures are indicators of a type of willingness to pay and, given the definition of the construct, the questions that were used to measure these constructs were valid. As a marketing research expert, I have provided the best estimate of the value of music based on the choice of the initial-price anchor. My decision to use the market price is based on a request of the economics and royalty expert in this case. The market-price anchor has the advantage that it parses the market price among the various features of satellite radio. This is indicated in Appendix G – the unconditional values of the seven features parse the approximately $12.95 market price of satellite radio.

73. As I mentioned earlier, in the previous proceeding, the CRB voiced concerns that Dr. Wind's survey was based on "an imperfect snapshot of consumer preferences…at one point in time, without any justification for the implied assumption that such preferences have remained or will remain stable across Sirius' subscribership over time or even over any limited relevant time period."[66] Although any survey by construction will only provide a snapshot of consumer preferences at that time, there is remarkable consistency

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[63] The estimate of 63.9% corresponds to subscribers only. Respondents who reported an importance value of 0 for both pre-1970 and post-1970 music were excluded from this calculation.

[64] t-statistic = 0.414, p-value = 0.679.

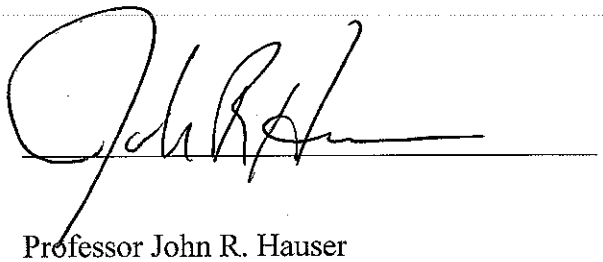
[65] t-statistic = –0.162, p-value = 0.872. The difference between the value of music calculated at the individual level ($2.19) and $2.16 is also not statistically significant (t-statistic = 0.083, p-value = 0.934). The formula for the variance of the product of two independent random variables used in the calculation is $Var(XY) = [E(X)^2]Var(Y) + [E(Y)^2]Var(X) + Var(X)Var(Y)$. See, for example, Goodman, Leo A., "On the exact variance of products," Journal of the American Statistical Association, December 1960, 708-713.

[66] See Final Determination of Rates and Terms in the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, 1/10/08, pp. 44-45.

between the current survey and the survey I conducted for the previous CRB proceeding in 2007, which implies that my findings are reasonably consistent over time.

V. Conclusions

74. The Internet survey conducted under my directions shows that, in general, respondents are willing to pay $3.24 for music, which is reduced to $2.11 when music is limited to music recorded since 1970.[67]



Professor John R. Hauser
January 10, 2012

[67] I understand that the sound recording rights at issue in this case are for sound recordings created from February 15, 1972 onward. The sound recording rights at issue do not cover sound recordings prior to February 15, 1972 nor do they cover studio performances and live concerts.

Before the
UNITED STATES COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
DETERMINATION OF RATES AND TERMS FOR PREEXISTING SUBSCRIPTION AND SATELLITE DIGITAL AUDIO RADIO SERVICES	)	**Docket No. 2011-1** **CRB PSS/Satellite II**

DECLARATION OF JOHN R. HAUSER, SC.D

I, John R. Hauser, declare under penalty of perjury that the statements contained in my Written Direct Testimony in the above-captioned matter are true and correct to the best of my knowledge, information and belief. Executed this 10 day of January 2012 at New York, NY.

John R. Hauser, SC.D

Appendix A

Curriculum Vitae of Prof. John R. Hauser

October 2011

ACADEMIC VITA (long version)

John R. Hauser

Address

MIT Sloan School of Management
Massachusetts Institute of Technology, E62-538
Cambridge, Massachusetts 02142
(617) 253-2929 Fax: (617) 258-7597
hauser@mit.edu; web.mit.edu/hauser/www

Education

Sc.D. M.I.T., 1975, Operations Research Dissertation: "A Normative Methodology for Predicting Consumer Response to Design Decisions: Issues, Models, Theory and Use."

Advisor: John D. C. Little. Committee members: Glen L. Urban and Moshe Ben-Akiva.

S.M. M.I.T., 1973, Civil Engineering (Transportation Systems Division)

S.M. M.I.T., 1973, Electrical Engineering

S.B. M.I.T., 1973, Electrical Engineering
Joint Thesis (S.M.'s and S.B.): "An Efficient Method to Predict the Impacts of Operating Decisions for Conventional Bus Systems." Advisor: Nigel Wilson.

Lifetime Achievement Awards

Parlin Award 2001, The American Marketing Association describes this award as "the oldest and most distinguished award in the marketing research field."

Converse Award 1996, the American Marketing Association, for "outstanding contributions to the development of the science of marketing."

Churchill Award 2011, the American Marketing Association, Market Research Special Interest Group, for "Lifetime achievement in the academic study of marketing research."

Fellow of the Institute for Operations Research and Management Science (INFORMS)

Inaugural Fellow of the INFORMS Society of Marketing Science (ISMS)

Highly Cited Researcher (ISI Web of Science), Since 2006.

Awards for Published Papers

INFORMS:	ISMS Long Term Impact Award, 2011, Finalist
	John D.C. Little Best-paper Award, 2009, Finalist
	John D.C. Little Best-paper Award, 2003, First Place
	John D.C. Little Best-paper Award, 1998, Finalist
(formerly The Institute	John D.C. Little Best-paper Award, 1994, Finalist

of Management Science)	John D.C. Little Best-paper Award, 1993, First Place John D.C. Little Best-paper Award, 1990, Honorable Mention Best paper in Marketing Sciences Literature, 1984, Honorable mention. Best Paper in Marketing Sciences Literature, 1983, First Place. Best Paper in Marketing Sciences Literature, 1982, First Place. Two published articles were cited in 2007 as one of "the top 20 marketing science articles in the past 25 years.
American Marketing Association:	Explor Award (Leadership is on-line market research), 2004, First-Place Finalist, Paul Green Award for contributions to marketing research, 2004 MSI Award for Most Significant Contribution to Practice of Marketing in 1996. Finalist, O'dell Award for best paper in the *Journal of Marketing Research*, published in 1986, awarded in 1991. One of the top 50 most prolific marketing scholars (top journals) in the last 25 years (1982-2006). Total articles, rate of publication, and author-adjusted rate.
Product Development Management Assoc.	Best Paper Award, Finalist, 2003. Best Paper Award, Finalist, 2002. One of ten most-cited papers in the *Journal of Product Innovation Management*. One of the top articles in educational citations in the last twenty years.
Sawtooth Software Conference	Best Presentation and Paper, 2006; Runner-up, 2008.
European Society of Marketing Research:	Best Paper at Rome conference, September 1984.
Emerald Management Reviews	2010 Citation of Excellence (top 50 of 15,000 published papers in 2009)
Doctoral Consortia Faculty	American Marketing Association, 1979, 1984, 1985, 1986, 1988, 1989, 1991, 1993, 1995, 1997, 1998, 2001, 2003, 2004, 2005, 2006, 2007, 2008, 2009. INFORMS Society of Marketing Science, 2002 (founding member), 2003, 2004. European Marketing Academy, 1985
Awards, Teaching	
MIT Sloan School of Management:	Nominated for Excellence in Teaching Award 2000, 2007, 2008. Named "Outstanding Faculty" by *Business Week Guide to the Best Business Schools* (1995). Excellence in Teaching Award 1994 (Awarded by the Master's Student class).
Awards for Thesis Supervision	

American Marketing Association (Ph.D.):	Winner John Howard Dissertation Award (2010, Matt Selove, Committee)
	Co-winner John Howard Dissertation Award (2005, Olivier Toubia)
	1st Place (1981, Ken Wisniewski) Honorable Mention (1979, Patricia Simmie).
INFORMS (Ph.D.) awarded 2005)	Winner of the Frank Bass Award (2004, Olivier Toubia,
	Winner of the Frank Bass Award (1989, Abbie Griffin, awarded 1995)
MIT Sloan School of Management (Ph.D.):	1st Place (1987, Peter Fader)
MIT Sloan School of Management (Master's):	1st Place (1991, Jon Silver and John Thompson) 1st Place (1983, Steve Gaskin) Honorable Mention (1982, Larry Kahn).

Awards, Other

Who's Who in America	Since 1997
Who's Who in Management Science	Since 2000
Who's Who in Economics	Since 2003
Who's Who in Finance and Business	Since 2009
Harvard Business School:	Marvin Bower Fellow, 1987 - 1988.
National Science Foundation Fellowship:	1971 - 1974.
M.I.T.:	National Scholar, 1967 - 1971.
Honor Societies:	Tau Beta Pi, Eta Kappa Nu, Sigma Xi

Directorships, Trustee, Advisory Board

1988 – Present	Founder, Principal, Board Member, Applied Marketing Science, Inc.
March 2003 – July 2009	Trustee, Marketing Science Institute

Academic Appointments

January 1989 - Present:	Kirin Professor of Marketing MIT Sloan School of Management Massachusetts Institute of Technology
July 2010 – June 2011	Head, Marketing Group
July 2005 – June 2009:	Area Head, Management Science Area
July 1988 – June 2003:	Head, Marketing Group
September 1993 - May 2000:	co-Director, International Center for Research on the Management of Technology

September 1997 - May 2000:	Research Director, Center for Innovation in Product Development
June 2001 – June 2006:	Virtual Customer Initiative Leader, Center for Innovation in Product Development
July 1984 - January 1989:	Professor of Management Science MIT Sloan School of Management Massachusetts Institute of Technology
July 1987 - June 1988:	Marvin Bower Fellow Harvard Business School Cambridge, Massachusetts 02163
March 1985 - May 1985:	Visiting Lecturer European Institute of Business Administration Fontainebleau, FRANCE
September 1980 - June 1984:	Associate Professor of Management Science Massachusetts Institute of Technology Cambridge, Massachusetts 02142
September 1975 - August 1980:	Assistant Professor of Marketing and of Transportation (granted tenure and promoted in 1980) Graduate School of Management and Transportation Center Northwestern University Evanston, Illinois 60201

Teaching Interests

Marketing Management, New Product and Service Development, Competitive Marketing Strategy, Marketing Models, Measurement and Marketing Research, Research Methodology.

Research Interests

Virtual customer methods for rapid customer feedback via the web; polyhedral methods, Greedoid methods, and related theory for the analysis of non-compensatory decision making; customer satisfaction measurement and incentive systems; quality function deployment and customer driven engineering; market measurement, especially voice of the customer; marketing strategy, especially positioning, pricing, and advertising strategy; consumer behavior including information search, agendas, and market structure; prelaunch forecasting and information acceleration for new products; and design and marketing of new products and services, hierarchical Bayes methods for continuous-time Markov processes, website morphing, logical analysis of data, cognitive complexity.

Texts

Urban, Glen L. and John R. Hauser, *Design and Marketing of New Products*, Prentice-Hall, Second Edition 1993.

A comprehensive text that integrates advanced, state-of-the-art techniques to provide graduate-level students and marketing professionals with an understanding of the techniques and an operating ability to design, test, and implement new products and services.

This text has been honored by being selected for both the Prentice-Hall International Series in

Management and the Series in Marketing. It has been adopted at a number of major universities. In a 1988 survey it was identified as the most widely used new product textbook at the graduate level.

The revision includes new material on designing for quality, reduced cycle times, prelaunch forecasting, quality improvement, defensive and competitive strategy, value mapping, the integration of marketing and engineering, new issues of organization, customer satisfaction, and new international examples. It is available in Korean and is being translated into Japanese and Chinese.

Third most cited work in the *Journal of Product Innovation*, 1984-2004. (Cited May 2010.)

Urban, Glen L., John R. Hauser, and Niki Dholakia, *Essentials of New Product Management*, Prentice Hall, 1986.

This is an undergraduate textbook which presents the essential concepts but written for a non-technical audience. It has been translated to Japanese and has sold well in Japan.

Hauser, John R., *Applying Marketing Management: Four Simulations*, Scientific Press, 1986.

This mini-text and software package contains four tutorial exercises for marketing management concepts. With this package students learn positioning, competitive strategy, new product development, and life cycle forecasting while using the personal computer to simulate marketing management problems. A detailed instructor's manual and transparency masters are also available. It is available in Japanese.

Hauser, John R., *ENTERPRISE: An Integrating Management Exercise*, Scientific Press, 1989.

This mini-text and software package contains a comprehensive competitive simulation. Students compete in six markets by making marketing and production decisions. A detailed instructor's manual and administrative software is also available. It is available in Japanese.

Journal Editor

Marketing Science, Editor-in-Chief for volumes 8, 9, 10, 11, 12, and 13 (1989-1994). Four issues per year including periodic editorials and journal management. Processed about 120 new papers per year.

Journal Publications (January 2011 Citation counts including books, articles in the first five years of Marketing Science, and total cites to "House of Quality" (e.g., "Defensive Marketing Strategy" has 184 cites). ISI: 3,920, H-index 30 (automatic H-index is 27), Google Scholar, 9,655, H-index 40, using "Publish or Perish".

Dzyabura, Daria and John R. Hauser (2011), "Active Machine Learning for Consideration Heuristics," *Marketing Science*, 30, 5, (September-October), 801-819.

Hauser, John R. (2011), "A Marketing Science Perspective on Recognition-Based Heuristics (and the Fast and Frugal Paradigm)," *Judgment and Decision Making*, 6, 5, (July), 396-408.

Hauser, John R. (2011), "Consideration-Set Heuristics," forthcoming, *Journal of Business Research*.

Ding, Min, John Hauser, Songting Dong, Daria Dzyabura, Zhilin Yang, Chenting Su, and Steven Gaskin (2011), "Unstructured Direct Elicitation of Decision Rules," *Journal of Marketing Research*, 48, (February), 116-127.

Hauser, John R., Olivier Toubia, Theodoros Evgeniou, Daria Dzyabura, and Rene Befurt (2010),

"Cognitive Simplicity and Consideration Sets," *Journal of Marketing Research*, 47, (June), 485-496.

Urban, Glen L., John R. Hauser, Guilherme Liberali, Michael Braun, and Fareena Sultan (2009), "Morph the Web to Build Empathy, Trust, and Sales," *Sloan Management Review*, 50, 4, (Summer), 53-61.

Hauser, John R., Glen L. Urban, Guilherme Liberali, and Michael Braun (2009), "Website Morphing," *Marketing Science.*, 28, 2, (March-April), 202-224. Lead article with commentaries by Andrew Gelman, John Gittins, and Hal Varian. Includes rejoinder.

Finalist, John D. C. Little Award for Best Article in the Marketing Sciences Literature, 2009.

2010 Emerald Management Reviews Citation of Excellence for one of best articles published in the top 400 business and management journals in 2009. (Top 50 of 15,000 articles.)

Toubia, Olivier, John R. Hauser and Rosanna Garcia (2007), "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," *Marketing Science*, 26, 5, (September-October), 596-610.

Co-winner, American Marketing Association, John Howard Dissertation Award, 2005

Yee, Michael, Ely Dahan, John Hauser, and James Orlin (2007), "Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference," *Marketing Science*, 26, 4, (July-August), 532-549.

First Place, American Marketing Association Explor Award, 2004

Toubia, Olivier and John R. Hauser (2007), "On Managerial Efficient Designs," *Marketing Science*, 26, 6, (November-December), 851-858.

Garcia, Rosanna, Paul Rummel, and John R. Hauser (2007), "Validating Agent-Based Marketing Models Using Conjoint-Analysis," *Journal of Business Research*, 60, 8, (August), 848-857.

Hauser, John R., Gerald Tellis, and Abbie Griffin (2006), "Research on Innovation: A Review and Agenda for Marketing Science," *Marketing Science*, 25, 6, (November-December), 687-717.

Cited by Thomson Reuters' Essential Science Indicators as a Fast Breaking Paper in Economics and Business in April 2009.

Hauser, John R. and Olivier Toubia (2005), "The Impact of Utility Balance and Endogeneity in Conjoint Analysis," *Marketing Science*, 24, 3, (Summer), 498-507.

Glen L. Urban and John R. Hauser (2004), "'Listening-In' to Find and Explore New Combinations of Customer Needs," *Journal of Marketing*, 68, (April), 72-87.

Toubia, Olivier, John R. Hauser, and Duncan Simester (2004), "Polyhedral Methods for Adaptive Choice-based Conjoint Analysis," *Journal of Marketing Research*, 41, 1, (February), 116-131.

Finalist, Paul Green Award for contributions to the practice of marketing research.

Toubia, Olivier, Duncan I. Simester, John R. Hauser, and Ely Dahan (2003), "Fast Polyhedral Adaptive Conjoint Estimation," *Marketing Science*, 22, 3, (Summer), 273-303.

First Place, John D. C. Little Award for Best Article in the Marketing Sciences Literature, 2003

First Place, Frank M. Bass Award for Best Article Based on a Dissertation, 2005.

Finalist, INFORMS Society for Marketing Science Long Term Impact Award, 2011

Dahan, Ely and John R. Hauser (2002), "The Virtual Customer," *Journal of Product Innovation Management*, 19, 5, (September), 332-354.

Finalist, PDMA Best Paper Award in 2003.

Hauser, John R. (2001), "Metrics Thermostat," *Journal of Product Innovation Management*, 18, 3. (May), 134-153.

Finalist PDMA Best Paper Award in 2002.

Cited by the PDMA in 2007 as one of the top articles in the last twenty years in educational citations.

Simester, Duncan I, John R. Hauser, Birger Wernerfelt, and Roland Rust (2000), "Implementing Quality Improvement Programs Designed to Enhance Customer Satisfaction: Quasi-experiments in the United States and Spain," *Journal of Marketing Research*, 37, 1, (February), 102-112.

Hauser, John R. (1998), "Research, Development, and Engineering Metrics." *Management Science*, 44, 12, December, 1670-1689.

Hauser, John R. and Gerry Katz (1998), "Metrics: You Are What You Measure!." *European Management Journal*, 16, 5, (October), 516-528. Highlighted in "A Round-up of Important Articles from Business Periodicals," in *Mastering Management Review* published by the *Financial Times*.

Hauser, John R., Duncan I. Simester, and Birger Wernerfelt (1997), "Side Payments in Marketing," *Marketing Science*, 16, 3, 246-255.

Finalist, John D. C. Little Award for Best Article in the Marketing Sciences Literature, 1997.

Urban, Glen L., John R. Hauser, William J. Qualls, Bruce D. Weinberg, Jonathan D. Bohlmann and Roberta A. Chicos (1997), "Validation and Lessons from the Field: Applications of Information Acceleration," *Journal of Marketing Research*, 34, 1, (February), 143-153.

Hauser, John R. and Florian Zettelmeyer (1997), "Metrics to Evaluate R,D&E," *Research Technology Management*, 40, 4, (July-August), 32-38.

Griffin, Abbie, and John R. Hauser (1996), "Integrating Mechanisms for Marketing and R&D," *Journal of Product Innovation Management*, 13, 3, (May), 191-215.

One of ten most-cited papers in the *Journal of Product Innovation Management* (JPIM 24, 3, 2007, p.209)

Hauser, John R., Duncan I. Simester, and Birger Wernerfelt (1996), "Internal Customers and Internal Suppliers," *Journal of Marketing Research,* 33, 3, (August), 268-280.

Urban, Glen L., Bruce Weinberg and John R. Hauser (1996), "Premarket Forecasting of Really-New Products," *Journal of Marketing,* 60,1, (January), 47-60. Abstracted in the Journal of Financial Abstracts, 2, 23A, (June) 1995.

1996 MSI Award for the most significant contribution to the advancement of the practice of marketing.

Hauser, John R., Duncan I. Simester, and Birger Wernerfelt (1994), "Customer Satisfaction Incentives," *Marketing Science*, 13, 4, (Fall), 327-350.

Finalist, John D. C. Little Award for Best Article in the Marketing Sciences Literature, 1994.

Hauser, John R., Glen L. Urban, and Bruce Weinberg (1993), "How Consumers Allocate their Time When Searching for Information," *Journal of Marketing Research,*30, 4, (November), 452-466.

Hauser, John R. (1993), "How Puritan Bennett Used the House of Quality," *Sloan Management Review*, 34, 3, (Spring), 61-70. Reprinted in *Taiwan Philips News* (in Chinese), 23, 1, (Feb), 1994.

Griffin, Abbie and John R. Hauser (1993), "The Voice of the Customer," *Marketing Science*, 12, 1, (Winter), 1-27.

First-place, John D. C. Little Award for Best Article in Marketing Sciences Literature, 1993.

First Place, Frank M. Bass Award for Best Article Based on a Dissertation, 1995.

Cited in 2007 by the INFORMS Society of Marketing Science as one "of the top 20 marketing science articles in the past 25 years.

Griffin, Abbie and John R. Hauser (1992), "Patterns of Communication Among Marketing, Engineering, and Manufacturing -- A Comparison between Two New Product Teams," *Management Science*, 38, 3, (March), 360-373.

One of the 500 most-cited articles in the first 50 years of *Management Science*.

Urban, Glen. L., John. R. Hauser, and John. H. Roberts (1990), "Prelaunch Forecasting of New Automobiles: Models and Implementation," *Management Science*, 36, 4, (April), 401-421. Reprinted in *Modeling for Management, Vol. 1*, George P. Richardson, ed., Dartmouth Publishing Co., Hampshire England.

INFORMS (TIMS) Finalist, Best Article in Marketing Science Literature, 1990.

Hauser, John R. and Birger Wernerfelt (1990), "An Evaluation Cost Model of Consideration Sets," *Journal of Consumer Research*, 16, (March), 393-408.

Hauser, John R. and Birger Wernerfelt (1989), "The Competitive Implications of Relevant-Set/Response Analysis," *Journal of Marketing Research*, 26, 4, (November), 391-405.

Hauser, John R. and Don Clausing (1988), "The House of Quality," *Harvard Business Review*, 66, 3, (May-June), 63-73. Reprinted in *The Product Development Challenge*, Kim B. Clark and Steven C. Wheelwright, eds., Harvard Business Review Book, Boston MA 1995. Reprinted in *IEEE Engineering Management Review*, 24, 1, Spring 1996. Translated into German and published in Hermann Simon and Christian Homburg (1998), *Kunderzufriedenheit*, (Druck and Buchbinder, Hubert & Co.: Gottingen, Germany).

Fader, Peter and John R. Hauser (1988), "Implicit Coalitions in a Generalized Prisoner's Dilemma," *Journal of Conflict Resolution*, 32, 3, (September), 553-582.

Hauser, John R. (1988), "Competitive Price and Positioning Strategies," *Marketing Science*, 7, 1, (Winter), 76-91.

Hauser, John R. (1986), "Agendas and Consumer Choice," *Journal of Marketing Research*, 2 , 3, (August), 199-212. (Includes unpublished appendix containing "Proofs of Theorems and Other Results.") Reprinted in Gregory S. Carpenter, Rashi Glazer, and Kent Nakamota (1997), *Readings on Market-Driving Strategies, Towards a New Theory of Competitive Advantage,* (Reading, MA: Addison-Wesley Longman ,Inc.)

Finalist, 1991 American Marketing Associations O'dell Award for Best Paper in *JMR* (5-year lag)

Hauser, John R. and Glen L. Urban (1986), "Value Priority Hypotheses for Consumer Budget Plans," *Journal of Consumer Research*, 12, 4, (March), 446-462.

Eliashberg, Jehoshua and John R. Hauser (1985), "A Measurement Error Approach for Modeling Consumer Risk Preference," *Management Science*, 31, 1, (January), 1-25.

Hauser, John R., and Steven P. Gaskin (1984), "Application of the `DEFENDER' Consumer Model," *Marketing Science*, 3, 4, (Fall), 327-351. Reprinted (in French) in *Recherche et Applications on Marketing*, Vol. 1, April 1986, pp. 59-92.

Urban, Glen L., P. L. Johnson and John R. Hauser (1984), "Testing Competitive Market Structures," *Marketing Science*, 3, 2, (Spring), 83-112.

INFORMS (TIMS) Finalist, Best Article in Marketing Science Literature, 1984.

Hauser, John R. (1984), "Consumer Research to Focus R&D Projects" *Journal of Product Innovation Management*, 1, 2, (January), 70.84.

Hauser, John R., and Steven M. Shugan (1983), "Defensive Marketing Strategy," *Marketing Science*, 2, 4, (Fall), 319-360.

INFORMS (TIMS) Best Article in Marketing Science Literature, 1983.

Cited in 2007 by the INFORMS Society of Marketing Science as one "of the top 20 marketing science articles in the past 25 years.

Republished in 2008 as one of eight "classic" articles in *Marketing Science*.

Hauser, John R., and Kenneth J. Wisniewski (1982), "Application Predictive Test, and Strategy Implications of a Dynamic Model of Consumer Response," *Marketing Science*, 1, 2, (Spring), 143-179.

Hauser, John R., and Kenneth J. Wisniewski (1982), "Dynamic Analysis of Consumer Response to Marketing Strategies," *Management Science*, 28, 5, (May), 455-486.

INFORMS (TIMS) Best Article in Marketing Science Literature, 1982.

Tybout, Alice M. and John R. Hauser (1981), "A Marketing Audit Using a Conceptual Model of Consumer Behavior: Application and Evaluation," *Journal of Marketing*, 45, 3, (Summer), 81-101.

Hauser, John R., and Patricia Simmie (1981), "Profit Maximizing Perceptual Positions: An Integrated Theory for the Selection of Product Features and Price," *Management Science*, 27, 2, (January), 33-56.

One of the 500 most-cited articles in the first 50 years of *Management Science*.

Hauser, John R., Frank S. Koppelman and Alice M. Tybout (1981), "Consumer-Oriented Transportation Service Planning: "Consumer Analysis and Strategies," *Applications of Management Science*, 1, 91-138.

Hauser, John R., and Steven M. Shugan (1980), "Intensity Measures of Consumer Preference," Operation Research, 28, 2, (March-April), 278-320.

Hauser, John R., and Frank S. Koppelman (1979), "Alternative Perceptual Mapping Techniques: Relative Accuracy and Usefulness, *Journal of Marketing Research*, 16, 4, (November), 495-506.

Hauser, John R., and Glen L. Urban (1979), "Assessment of Attribute Importances and Consumer Utility Functions: von Neumann-Morgenstern Theory Applied to Consumer Behavior," *Journal of Consumer Research*, 5, (March), 251-262.

Koppelman, Frank S. and John R. Hauser (1979), "Destination Choice Behavior for Non-Grocery Shopping Trips," *Transportation Research Record*, 673, 157-165.

Hauser, John R. (1978), "Consumer Preference Axioms: Behavioral Postulates for Describing and Predicting Stochastic Choice," *Management Science*, 24, 13, (September), 1331-1341.

Hauser, John R. (1978), "Testing the Accuracy, Usefulness and Significance of Probabilistic Models: An Information Theoretic Approach," *Operations Research*, 26, 3, (May-June), 406-421.

Hauser, John R. and Glen L. Urban (1977), "A Normative Methodology for Modeling Consumer Response to Innovation," *Operations Research*, 25, 4. (July-August), 579-619.

Published Notes and Commentaries

Hauser, John R. (2011), "Consumers and the Recognition Heuristic *In Vivo*," invited commentary, forthcoming, *Judgment and Decision Making*.

Hauser, John R. (2011), "New Developments in Product-Line Optimization," forthcoming the *International Journal on Research in Marketing*. Commentary on papers by Michalek, Ebbes, Adigüzel, Feinberg, and Papalambros, "Enhancing Marketing with Engineering," and Tsafarakis, Marinakis, and Matsatsinis, "Particle Swarm Optimization for Optimal Product Line Design."

Hauser, John R. (2011), "Paul E. Green: An Applications' Guru," in Vithala Rao, Ed., *Paul Green's Legends Volume: Conjoint Analysis Applications*, (Newbury Park, CA: Sage Publications). Forthcoming.

Hauser, John R. (2011), "Perspectives on Paul E. Green," in V. Srinivasan, Ed., *Paul Green's Contributions to Conjoint Analysis – Early Years,* (Newbury Park, CA: Sage Publications). Forthcoming.

Hauser, John R., Glen L. Urban, Guilherme Liberali, and Michael Braun (2009), "Response to Comments on 'Website Morphing,'" *Marketing Science,* 28, 2, (March-April), 227-228.

Hauser, John R. and Steven M. Shugan (2007), "Comments on 'Defensive Marketing Strategy,'" *Marketing Science*, 27, 1, (January-February), 85-87.

Rangaswamy, Arvind , Jim Cochran, Tülin Erdem, John R. Hauser, and Robert J. Meyer (2007), "Editor-in-Chief Search Committee Report: The Digital Future is Here," *Marketing Science*, 27, 1, (January-February), 1-3.

Hauser, John R. (2006), "Twenty-Five Years of Eclectic Growth in Marketing Science," *Marketing Science* (invited commentary), 25, 6, (November-December), 557-558.

Hauser, John R., Greg Allenby, Frederic H. Murphy, Jagmohan Raju, Richard Staelin, and Joel Steckel (2005), "Marketing Science – Growth and Evolution," *Marketing Science*, 24, 1, (Winter), 1-2, invited editorial.

Hauser, John R., Scott Carr, Barbara Kahn, James Hess, and Richard Staelin (2002), "Marketing Science: A Strong Franchise with a Bright Future," *Marketing Science*, 21, 1, (Winter), invited editorial.

Hauser, John R. and Birger Wernerfelt (1988), "Existence and Uniqueness of Price Equilibria in Defender," *Marketing Science*, Vol. 7, No. 1, (Winter), 92-93.

Hauser, John R. (1984), "Price Theory and the Role of Marketing Science," *Journal of Business*, Vol. 57, No. 1, (January), S65-S72.

Hauser, John R. (1980), "Comments on 'Econometric Models of Probabilistic Choice Among Products'," *Journal of Business*, 53, 3, Part 2, (July 1980), S31-S34.

Papers in Edited Volumes and/or Proceedings

Selove, Matthew and John R. Hauser (2010), "How Does Incorporating Price Competition into Market Simulators Affect Product Design Decisions?," *Proceedings of the Sawtooth Software Conference*, Newport Beach, CA, Oct 6-8, 2010.

Hauser, John R. and Glen L. Urban (2009), "Profile of John D. C. Little," in Saul I. Gass and Arjang A. Assad eds. *Profiles in Operations Research,* (New York, NY: Springer).

Ding, Min, Steven Gaskin, and John Hauser (2009), "A Critical Review of Non-compensatory and Compensatory Models of Consideration-Set Decisions," *2009 Sawtooth Software Conference Proceedings*, Delray, FL, March 23-27, 2009, 207-232.

Runner-up, Best Paper at Sawtooth Software Conference, 2009.

Gaskin, Steven, Theodoros Evgeniou, Daniel Bailiff, John Hauser (2007), "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," *Proceedings of the Sawtooth Software Conference* in Santa Rosa, CA, October 17-19, 2007.

Hauser, John R. and Ely Dahan (2010), "New Product Development," in Rajiv Grover, Ed., *Essentials of Marketing Management,* (Englewood Cliffs, NJ: Prentice Hall), forthcoming January 2011.

Toubia, Olivier, Theodoros Evgeniou, and John Hauser (2007), "Optimization-Based and Machine-Learning Methods for Conjoint Analysis: Estimation and Question Design," in Anders Gustafsson, Andreas Herrmann and Frank Huber, Eds, *Conjoint Measurement: Methods and Applications*, 4E, (New York, NY: Springer). 231-258.

Hauser, John R., Ely Dahan, Michael Yee, and James Orlin (2006), ""Must Have" Aspects vs. Tradeoff Aspects in Models of Customer Decisions," *Proceedings of the Sawtooth Software Conference* in Del Ray Beach, FL, March 29-31, 2006

Best Paper at the Sawtooth Software Conference, 2006.

Hauser, John R. and Vithala Rao (2004), "Conjoint Analysis, Related Modeling, and Applications," *Advances in Market Research and Modeling: Progress and Prospects,,* Jerry Wind and Paul Green,

Eds., (Boston, MA: Kluwer Academic Publishers), 141-168.

Dahan, Ely and John R. Hauser (2003), "Product Management: New Product Development and Launching," *Handbook of Marketing*, Barton Weitz and Robin Wensley, Eds, Sage Press, (June), 179-222.

Hauser, John R. (1997), "The Role of Mathematical Models in the Study of Product Development," *Proceedings of the 14th Paul D. Converse Awards Conference*, University of Illinois, Champaign-Urbana, IL, 72-90.

Swanson, Derby A. and John R. Hauser (1995), "The Voice of the Customer: How Can You Be Sure You Know What Customers Really Want?," *Proceedings* of the 1st Pacific Rim Symposium of Quality Function Deployment, MacQuarie University, NSW Australia, February 15-17.

Little, John D. C., Leonard M. Lodish, John R. Hauser, and Glen L. Urban (1993), "Comment on `Marketing Science's Pilgrimage to the Ivory Tower' by Hermann Simon," in *Research Traditions in Marketing*, Gary L. Lilien, Bernard Pras, and Gilles Laurent, eds, (Kluwer), 45-51.

Hauser, John R. (1986), "Theory and Application of Defensive Strategy" in *The Economics of Strategic Planning,* Lacy G. Thomas, ed., (Lexington Books, D. C. Heath & Co.: Lexington, MA), 113-140. Reprinted by the Marketing Science Institute.

Hauser, John R. (1985), "The Coming revolution in Marketing Theory," in R. Russell, ed., *Marketing in an Electronic Age*, (Harvard Business School Press: Boston, MA), 344-363.

Hauser, John R. and Glen L. Urban (1984), "Consumer Durables: Actual Budgets Compared to Value Priority Model - Preliminary Results and Managerial Implications," *Proceedings* of the ESOMAR-Congress, Rome, Italy, (September). (Awarded Best Paper at Conference).

Hauser, John R., John H. Roberts and Glen L. Urban (1983), "Forecasting Sales of a New Consumer Durable: A Prelaunch Modeling and Measurement Methodology," *Advances and Practices of Marketing Science*, Fred S. Zufryden, ed., (The Institute of Management Science: Providence, RI), 115-128.

Hauser, John R., and Glen L. Urban (1982), "Prelaunch Forecasting of New Consumer Durables: Ideas on a Consumer Value-Priority Model," in A. D. Shocker and R. Srivastava, eds., *Analytic Approaches to Product and Market Planning*, Vol. 2, (Marketing Science Institute: Cambridge Massachusetts), 276-296.

Hauser, John R. (1982), "Comments on 'A Survey of Experimental Market Mechanisms for Classical Environments'," *Research in Marketing, Supplement 1: Choice Models for Buyer Behavior*, L. McAlister, ed., (JAI Press: Greenwich, CT), Spring, 49-56.

Hauser, John R. (1981), "Comments on 'Violations of Regularity and the Similarity Hypothesis by Adding Asymmetrically Dominated Alternatives to the Choice Set'," *Proceedings of the Special Conference on Choice Theory*, Joel Huber, ed., (Duke University: Durham, NC), June.

Hauser, John R., and Frank S. Koppelman (1979), "An Empirical Comparison of Techniques to Model Consumer Perceptions and Preferences," in A. D. Shocker, ed., *Analytic Approaches to Product and Marketing Planning*, (Marketing Science Institute: Cambridge, Massachusetts), 216-238.

Tybout, Alice M., John R. Hauser, and Frank S. Koppelman (1977), "Consumer-Oriented Transportation Planning: An Integrated Methodology for Modeling Consumer Perceptions, Preferences and Behavior," *Advances in Consumer Research*, Vol. 5, (Chicago, Illinois), October.

Hauser, John R. and Steven M. Shugan (1977), "Extended Conjoint Analysis with Intensity Measures and Computer Assisted Interviews: Applications to Telecommunications and Travel, " *Advances in Consumer Research*, Vol. 5, (Chicago, Illinois), October.

Hauser, John R. and Frank S. Koppelman (1977), "Designing Transportation Services: A Marketing Approach." *Proceedings of the Transportation Research Forum*, (Atlanta, GA), October, 638-652.

Hauser, John R. and Peter R. Stopher (1976), "Choosing an Objective Function Based on Modeling Consumer Perceptions and Preferences," *Proceedings of the International Conference on Cybernetics and Society*, (Washington, D.C.), November, 26-31.

Magazine Articles

Hauser, John R., Abbie Griffin, and Steve Gaskin (2011), "The House of Quality," *Wiley International Encyclopedia of Marketing*, (Chichester, West Sussex UK: John Wiley & Sons, Ltd.).

Abbie Griffin, Steve Gaskin, Robert Klein, Gerry Katz, and John R. Hauser (2009), "The Voice of the Customer," *Wiley International Encyclopedia of Marketing*, (Chichester, West Sussex UK: John Wiley & Sons, Ltd.).

Hauser, John R. (2002), "Marketing Makes a Difference," *Marketing Management*, (January/February), 11, 1, 46-47.

Hauser, John R. (2000), "Going Overboard on Platforms," *AMS Voices,* 8.

Hauser, John R. (1997), "The Problem with Pinball," *AMS Voices,* 4.

Hauser, John R. (1996), "You Are What You Measure," *AMS Voices*, 1.

Hauser, John R. (1995), "Internal Customers," *Insight*, 4, 1.

Hauser, John R. (1994), "Quality Function Deployment," *Marketing Encyclopedia for the Year 2000*, Jeffrey Heilbrunn, ed., American Marketing Association, Chicago, IL, 60606.

Hauser, John R. (1993), "Are Customer-Satisfaction Programs Profitable?, *Insight*, 3.

Hauser, John R. (1988), "Customer Driven Engineering," *Design News*, (July 18), p. 50.

Hauser, John R. and Robert L. Klein (1988), "Without Good Research, Quality is a Shot in the Dark," *Marketing News*, Vol. 22, No. 1, January 4. Page 1.

Hauser, John R. (1986), "`Defender' Helps Mature Brands Ward off New Foes," *Marketing Educator*, 5, 3, (Fall), 5.

Working Papers

Liberali, Guilherme, Glen L. Urban, and John R. Hauser (2011), " Providing Unbiased Competitive Information to Encourage Trust, Consideration, and Sales: Two Field Experiments," (Cambridge, MA: MIT Sloan School of Management), September, under review at the *International Journal of Research in Marketing*.

Hauser, John R., Glen L. Urban, and Guilherme Liberali (2011), "Website Morphing 2.0: Technical and Implementation Advances Combined with the First Field Experiment of Website Morphing," (Cambridge, MA: MIT Sloan School of Management), July, under review at *Marketing Science*.

Selove, Matthew and John R. Hauser (2011), "The Strategic Importance of Accuracy in Conjoint Design," (Cambridge, MA: MIT Sloan School of Management), July, under review *Marketing Science*.

Hauser, John R., Songting Dong, and Min Ding (2011), " Self-Reflection and Articulated Consumer Preferences," (Cambridge, MA: MIT Sloan School of Management), July, under review *Journal of Product Innovation Management*.

Draft Working Papers

Ding, Min, John R. Hauser, and Lixin Huang (2009), "Sleuthing Game," draft working paper, (Cambridge, MA: MIT Sloan School of Management).

Older Working Papers (Support published papers with additional information)

Braun, Michael, Clarence Lee, Glen L. Urban, and John R. Hauser (2009), "Does Matching Website Characteristics to Cognitive Styles Increase Online Sales?," (Cambridge, MA: MIT Sloan School of Management).

Zettelmeyer, Florian and John R. Hauser (1995), "Metrics to Evaluate R&D Groups: Phase I, Qualitative Interviews," Working Paper, International Center for Research on the Management of Technology, MIT, Cambridge, MA, 02142.

Hauser, John R. (1991), "Comparison of Importance Measurement Methodologies and their Relationship to Consumer Satisfaction," (Cambridge, MA: MIT Sloan School of Management).

Research in Progress

Review of consideration set research. With Don Lehmann.

Review of incentive alignment in marketing research. With Min Ding and Joel Huber.

Genetic Algorithms for Understanding Consumer Preferences with Kamal Malek and Kevin Karty.

Advertising morphing. With Glen Urban and Gui Liberali.

Applications of conjunctive decision rules for managerial strategy in the auto industry. With Glen Urban and Gui Liberali.

Research Reports (not otherwise listed)

Hauser, John R. (1996), "R&D Metrics: An Annotated Bibliography," ICRMOT Working Paper, M.I.T., Cambridge, MA 02142. (June) Also available as a Marketing Science Institute Working Paper (November).

Hauser, John R. and Greg Cirmak (1987), "Consumer Driven Engineering for the CHEK Automobiles," Information Resources, Inc. Report to General Motors, Inc. Details the results of a major study on consumer perceptions and preferences of luxury automobiles. April.

Hauser, John R. (1983), "Critique of Market Studies for Cellular Radio Telephone:. Affidavits before the FCC evaluating market studies, June and September.

Hauser, John R. (1983), "Forecasts of Demand and Cellular Radio Telephone,: Affidavits before

the FCC for five major and nine minor markets. June and April.

Hauser, John R., and J. Bertan (1982), "Auto Show Interviews," Internal Report to Buick Division of General Motors, June.

Hauser, John R., and Kenneth J. Wisniewski (1981), "Monitoring the Implementation of Innovative Transportation Services, Phase I: Final Report," Technical Report to the Urban Mass Transit Administration, Research Grant IL-11-0012, May.

Hauser, John R. and Kenneth J. Wisniewski (1979), "Consumer Analysis for General Travel Destinations," Technical Report, Transportation Center, Northwestern University, March.

Hauser, John R. and Steven M. Shugan (1978), "Designing and Building a Market Research Information System," Technical Report, Transportation Center, Northwestern University, February.

Hauser, John R. (1978), "Forecasting and Influencing the Adoption of Technological Innovations," Technical Report, Transportation Center, Northwestern University, October.

Hauser, John R., Alice M. Tybout and Frank S. Koppelman (1978), "Consumer-Oriented Transportation Services Planning: The Development and Implementation of a Questionnaire to Determine Consumer Wants and Needs," Technical Report, Transportation Center, Northwestern University, October.

Tybout, Alice M., Frank S. Koppelman and John R. Hauser (1977), "Consumer Views of Transportation in Evanston: A Report Based on Focus Group Interviews," Technical Report, Transportation Center, Northwestern University, June.

Koppelman, Frank S., John R. Hauser and Alice M. Tybout (1977), "Preliminary Analysis of Perceptions, Preferences, Beliefs and Usage of Transportation Services for Travel to Downtown Evanston," Technical, Report, Transportation Center, Northwestern University, May.

Hauser, John R. (1977), "Results of the Focus Group Interviews for Shared Ride Auto Transit," Cambridge Systematics Consultant's Report, May.

Hauser, John R. (1976), "Report on the Applicability of Attitudinal research for Improving the Effectiveness of Transportation Demand Models," Position Paper commissioned by Cambridge Systematics, Inc., April.

Wilson, Nigel, R. W. Weissberg and John R. Hauser (1976), "Advanced Dial-a-Ride Algorithms--Final Report," M.I.T. Department of Civil Engineering Technical Report, April.

Hauser, John R., et al. (1974), "The Chemung County Transit Survey." Volunteers in Technical Assistance (a division of VISTA) publication for Chemung County, NY, June. (Includes analysis of transportation options based on the results of the survey designed and implemented by the technical team.)

Hauser, John R. (1974), "A Cost Model for RTS (Rochester, NY) Conventional Bus Routes," M.I.T., Department of Civil Engineering Report, January.

Hauser, John R. (1973), "An Efficient Model for Planning Bus Routes in Communities with Populations Between 20,000 and 250,000," M.I.T., Operations Research Center Working Paper OR-029-993, November.

Research Grants

July 2007 – June 2008	Understanding Non-compensatory Decision Making for Consideration Decisions (under Consortium with MIT Center for eBusiness and General Motors, Inc.
June 2000 – May 2006	Center for Innovation in Product Development, MIT, Initiative Leader, Virtual Customer.
January 2001 – May 2002	eBusiness Center at MIT. Design and Delivery of Online Promotions. (with John Little, Duncan Simester, and Glen Urban).
January 1997 – May 2000	Center for Innovation in Product Development, Engineering Research Center Grant from the National Science Foundation. Research Director. In addition, research grants for non-monetary incentives, procurement metrics, and virtual customer methods.
June 1999 – May 2000	"Metrics Thermostat," International Center for Research on the Management of Technology (Principal Investigator).
June 1999- May 2001	"New Product Metrics at Ford and the US Navy," Center for Innovation in Product Development
June 1999- May 2001	"Lean Sustainment Metrics at the USAF," Lean Sustainment Initiative at MIT
June 1994 - May 1999	"Metrics to Value R&D," International Center for Research on the Management of Technology (Principal Investigator). General topic. Detailed proposals were for various aspects of the problem.
June 1991 - May 1994	"Customer Needs, Customer Satisfaction, Sales, and Profit: Providing the Right Incentives to Engineering and R&D," International Center for Research on the Management of Technology (co-Principal Investigator with Birger Wernerfelt)
January 1990 - June 1992	"Information Acceleration and Preproduction Forecasting of New Autos, Phases I and II." General Motors Electric Vehicle Project. (Associate)
December 1988 - June 1990	"Improved Methodologies to Measure Consumer Needs," Procter & Gamble Company. (Principal Investigator)
September 1981 - December 1985	"Prelaunch Forecasting System for New Consumer Durables and Its Applications to Auto Purchases," General Motors, Buick Division (co-Principal Investigator with Glen L. Urban).
January 1981 - May 1981	"Marketing Approaches in Travel Demand," United Parcel Service Grant (Faculty Advisor).
January 1979 - August 1980	"Monitoring the Implementation of Innovative Public Transportation Services" from University Research Program

	of the Urban Mass Transportation Administration (Principal Investigator).
July 1975 - September 1977	"Consumer-Oriented Transportation Service Planning." from the Program of University Research, U.S. Department of Transportation (Faculty Associate).
September 1977 - January 1978	"Consumer-oriented Transportation Service: Modification and Evaluation" from Program of University Research, USDOT (Faculty Associate).
May 1976 - September 1978	"Enhancement of Communications with a Small Scientific Community Using Slow-Scan Televideo Terminals and Voice-Grade Telephone Lines" from the National Science Foundation (Faculty Associate).
January 1976 - December 1976	"A Method for Assessing Pricing and Structural Changes on Transport Mode Use," U.S. Department of Transportation (Faculty Associate).
September 1976 - June 1977	"Prediction of Urban Recreational Demand" from the National Science Foundation (Faculty Consultant).

Invited Lectures (Outside the Sloan School)

Wharton School, University of Pennsylvania, April 2009, “Website Morphing”

Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition, Summer Institute on Bounded Rationality in Psychology and Economics, August 2006, “Greedoid-Based Non-Compensatory
Consider-then-Choice Inference.”

Northwestern University, Evanston, IL, April 2006, “Greedoid-based Non-compensatory Inference.”

University of Michigan, Seminar Series, October 2004, “Table Stakes: Non-compensatory Consideration-then-Choice Inference.”

Management Roundtable Special Conference on “Taking the Voice of the Customer to the Next Level,” Boston, MA October 2004, “The Virtual Customer.”

Marketing Science Institute Research Generation Conference, Atlanta, GA, May 2004, “New Products/Innovation,” (with Gerry Tellis).

Marketing Science Institute Conference on Emerging Approaches for Successful Innovation, Chicago, IL, May 2003, "'Listening-In' to Find Unmet Customer Needs and Solutions."

University of California at Los Angeles, "Polyhedral CBC (and other fun stuff), February 2003

New York University, "Polyhedral Methods," March 2003.

Industrial Liaison Program – Research Directors' Conference, April 2002, "The Virtual Customer."

University of Maryland, "Polyhedral Methods for Conjoint Analysis," March 2002.

Marketing Science Institute Trustees Meeting on Marketing Outside the Silo, Boston, MA, April

2002, "Challenges and Visions for Marketing's Role in Product Development Processes."

Managing Corporate Innovation -- ILP Symposium celebrating ten years of Management of Technology Research at MIT. "Dealing with the Virtual Customer: Fast Web-based Customer Input." April 2001

Epoch Foundation, Cambridge, MA, October 2000, "The Virtual Customer."

Yale University Research Seminar in Marketing, New Haven, CN, March 2000, "Metrics Thermostat."

Analysis Group Economics Seminar, Boston, MA, December 1999, "The Use of Marketing Research in Litigation." Also New York, NY, March 2000 and Washington, D. C., March 2002.

Boston Chapter of the Society for Concurrent Engineering, Waltham, MA, October 1999, "Metrics Thermostat."

University of Michigan DuPont Distinguished Speakers' Series, Ann Arbor, MI, March 1998, "New Product Metrics."

Kirin Brewery Co. Limited, Tokyo, JAPAN, December 1998, "You Are What You Measure!" and "Scientific Studies of the Voice of the Customer."

NEC Corporation, Tokyo, JAPA, December 1998, "Scientific Studies of the Voice of the Customer."

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Stanford University, Stanford, CA, December 1996, "Metrics to Value R,D&E"

University of California at Los Angeles, Los Angeles, CA, February 1997, "Research, Development, and Engineering Metrics"

Duke University, Durham, NC, "Internal Customers and Internal Suppliers," Nov. 1995.

University of Minnesota, Minneapolis, MN, "Voice of the Customer," "Internal Customers and Captive Suppliers," May 1995.

Winter Retreat, University of Florida, Gainesville, FL, "Internal Customers and Captive Suppliers," December 1993.

Product Development Association - Boston, "Design and Marketing of New Products II: Advances in Product Development Management over the Last 13 Years," May 1993.

3M, Minneapolis, MN, "Incentives to Encourage a Long-term Perspective and a Customer Focus," Workshop on "Towards a World-class Research, Development, and Engineering Organization," November 1992.

Baxter Health Care, Orange County, CA, "The Voice of the Customer," August 1992.

TIMS College on the Practice of Management Science (*New Directions in Management Science*), Cambridge, MA: "The Voice of the Customer," October 1991.

IBM, Inc., Boca Raton, FL: "Voice of the Customer for Performance Graphics," May 1991.

Kirin Brewery Company, Ltd. Tokyo, JAPAN: "New Product Development" and "Customer Satisfaction and Customer Needs," April 1991.

American Iron and Steel Institute, Detroit, MI: "Satisfying the Customer -- Technical Issues," February 1991.

Warner Lambert, Inc., Mountain Laurel, PA: "Communication Among R&D and Marketing," October 1990.

Digital Equipment Corporation, Maynard, MA: "Voice of the Customer," May 1990.

Life Insurance Marketing and Research Association, Inc.: 31st Research Planning Conference, Boston, MA, "The House of Quality." June 1989.

University of Illinois: "Customer Driven Engineering." April, 1988.

Marketing Science Institute and IBM Thornwood Educational Facility: Quality through Customer Driven Engineering." April, 1988.

Harvard Business School: "Customer Driven Engineering: Integrating Marketing and Engineering." February, 1988.

Vanderbilt University: "Competitive Price and Advertising Strategies" and "Customer Driven Engineering." October, 1988.

Columbia University: "Price, Positioning, and Advertising Games: To Equilibrate of Not, Does it Pay to be Smart?" May, 1987.

New York Marketing Modelers' Club: "Would You Really Rather Have a Buick?: Prelaunch Forecasting of New Automobiles," May 1987.

M.I.T. Applied Economics: "Competitive Product Selection and Advertising Models." April, 1987.

Northwestern University: "Agendas and Consumer Choice," August, 1986.

AMA Faculty Consortium on Marketing Strategy at the University Tennessee, Knoxville. "Defender: Analyses for Competitive Strategy," July, 1986.

Ohio State University: "Defensive and Competitive Strategy." May, 1986.

Boston University: "Research in Competitive Strategy." November, 1985.

Midwest Electronics Association, Minneapolis, MN: "New Products for High-Tech Firms." October, 1985.

University of Pennsylvania: "Agendas and Consumer Choice," August, 1985.

Herstein Institute, Vienna Austria: "Competitive Strategy," May, 1985.

Cadbury-Schweppes, Birmingham, England: "New Product Development and Defensive Strategy." May, 1985.

Rhone-Poulenc and Aluminum Pechiney, Paris, France: "New Product Development." April, 1985.

University of Michigan: "Defensive and Competitive Strategy." February, 1985.

Marketing Science Institute Special Mini-Conference: "Defensive Marketing Strategies for Consumer Firms." September 1983.

University of Chicago, Graduate School of Business, Chicago, IL. "Agendas and Consumer Choice," May 1984.

European Institute for Business Administration (INSEAD), Fontainebleau, FRANCE. "Agendas and Consumer Choice," June 1984.

University of Connecticut. "Defensive Marketing: Theory, Measurement, and Models," April, 1983.

University of Osaka, JAPAN "Defensive Marketing: Theory, Measurement, and Models," August, 1983.

Kao Soap, Ltd., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Johnson & Johnson, K. K., Tokyo, JAPAN: "Defensive Marketing," August, 1983.

Analog Devices, Inc., Norwood, MA. "New Product Development," May, 1982.

University of Rochester Research Seminar, "Prelaunch Forecasting of New Consumer Durables," April 1982.

Frito-Lay R & D Laboratory, Dallas, TX, "Marketing and R & D for New Products," October 1981.

University of California at Los Angels Research Seminar, "Defensive Marketing Strategies," July, 1981.

Purdue University Research Seminar, "Product Realization," October 1979.

Stanford University Research Seminar, "Product Realization," October 1979.

Elrick and Lavidge, Inc., Chicago, Illinois, "Product Realization," October 1979.

Booz, Allen and Hamilton, Inc., Chicago, Illinois, "New Service Planning for Hospitals," April 1979.

Cornell University Research Seminar, "Intensity Measures of Consumer Preference," February 1979.

University of Rochester Research Seminar, "Product Realization: Synthesis of Marketing and Economic Theory," December 1978.

Region VI Center of Health Planning, New Orleans, LA, "Finding the Linkage Through Marketing,: August 1978.

Nebraska Hospital Association, Kearney, NE, "Hospital Marketing Surveys," May 1978.

Executive Development Group, Waterloo Management Education Centre, Toronto, Ontario, Canada, "Designing New Industrial Products," February 1978.

Academic Update, Xavier University Graduate Program in Hospital and Health Administration,

Cincinnati, OH, "Designing Hospital Services: A Marketing Approach," October 1977.

The Hospital Marketing Workshop, Ireland Educational Corporation, Chicago, Illinois, "Analyzing the Hospital Markets," January 1977 and May 1977.

Association for College Unions - International, 1976 Fall Conference in Green Bay, WI, Keynote Speech - "Designing Successful Services: A Marketing Approach," October 1976.

University of Chicago, Graduate School of Business, Research Seminar, "Testing Probabilistic Models," April 1976.

Council for the Advancement and Support of Education, Conference on Marketing Alumni Program, New York, NY, Keynote Speech, February 1976.

Presentations at Professional Meetings (No published proceedings, some co-presented or presented by co-author[s])

New England Marketing Conference, Cambridge, MA, October 28, 2011. Gui Liberali, Glen L. Urban and John R. Hauser, " Providing Unbiased Competitive Information to Encourage Trust, Consideration, and Sales: Two Field Experiments."

Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT, May 12-14, 2011. John R. Hauser and Matthew Selove*, "The Strategic Importance of Accuracy in the Relative Quality of Conjoint Analysis."

INFORMS Marketing Science Conference, Cologne, Germany, June 2010 (*indicates primary presenter if not me)

- Liberali, Guilherme*, John R. Hauser, and Glen L. Urban, "Optimal Time-to-Morph and Cognitive Costs of Morphing."
- Liberali, Guilherme, Glen L. Urban, and John R. Hauser, "Do Competitive Test Drives and Product Brochures Improve Sales?"
- Urban, Glen L.*, Jong Moon Kim, Erin MacDonald, John R. Hauser and Daria Dzyabura, "Developing Consideration Rules for Durable Goods Markets."

2010 Advanced Research Techniques Forum, San Francisco, CA, June 6-9, 2010, "Unstructured Direct Elicitation of Non-compensatory and Compensatory Decision Rules," with Min Ding, Songting Dong*, Daria Dzyabura (listed as Silinskaia), Zhilin Yang, Chenting Su, and Steven Gaskin.

2009 AMA Sheth Foundation Doctoral Consortium, J. Mack Robinson College of Business, Georgia State University, June 2009. E-Commerce and Digital Marketing Topics.

INFORMS Marketing Science Conference, Ann Arbor, MI, June 2009 (* indicates primary presenter if not me)

- "An Empirical Test of Incentive-Compatible Direct Elicitation of Heuristic Decision Rules for Consideration and Choice," with Min Ding, Songting Dong, Daria Dzyabura, Zhilin Yang, Chenting Su, and Steven Gaskin
- "Adaptive Profile Evaluation to Identify Heuristic Decision Rules in "Large" and Challenging Experimental Designs," with Daria Dzyabura (formerly Silinskaia)* and Glen L. Urban..
- "Morphing Websites in the Presence of Switching Costs," with Guilherme Liberali* and Glen L. Urban.
- "Continuous-Time Markov-Process with Misclassification: Modeling and Application to Auto Marketing," with Glen L. Urban* and Guilherme Liberali.
- "An Incentive-Aligned Sleuthing Game For Survey Research," with Min Ding*
- "Would You Consider a Buick Even if It Were #1 in JD Power?" with Erin MacDonald* and

Glen Urban
- "Cognitive Simplicity and Consideration Sets," with Rene Befurt*, Daria Dzyabura, Olivier Toubia, and Theodoros Evgeniou
- "John D. C. Little, a Pioneer in Marketing Science (Festschrift paper)," with Glen L. Urban

INFORMS Marketing Science Conference, Vancouver, B.C., June 2008 (* indicates primary presenter if not me)
- "Cognitive Styles and Website Design," with Michael Braun, Glen L. Urban, and Clarence Lee.
- Modeling Cognitive Complexity to Predict Consideration Sets," with Daria Dzyabura (formerly Silinskaia)*, Theodoros Evgeniou, Olivier Toubia, and Rene Befurt.
- "Morphing Websites to Match Individual Cognitive Styles," with Michael Braun*, Glen L. Urban, and Guilherme Liberali

Sawtooth Software Conference, Delray, FL, March 2009, "A Critical Review of Non-compensatory and Compensatory Models of Consideration-Set Decisions," with Min Ding and Steven Gaskin

AMA Doctoral Consortium, Robert J. Trulaske, Sr. College of Business, University of Missouri, June 2007, "Looking Ahead: Directions for Scholarly Research in Marketing" and "Building Teaching Effectiveness: Stimulating Student Interest."

Sawtooth Software Conference, Santa Rosa, CA, October 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, Daniel Bailiff.

AMA Advance Research Technologies Forum, Sante Fe, New Mexico, June 2007, "Two-Stage Models: Identifying Non-Compensatory Heuristics for the Consideration Set then Adaptive Polyhedral Methods Within the Consideration Set," with Steven Gaskin, Theodoros Evgeniou, and Daniel Bailiff.

AMA Doctoral Consortium, W. P. Carey School of Business, Arizona State University, May 2007, "Consideration
The New Battlefield in Product Development."

Agent-based Models of Market Dynamics and Consumer Behaviour, University of Surrey, Guildford, UK, January 2006, "Co-opetition for the Diffusion of Resistant Innovations: A Case Study in the Global Wine Industry using an Agent-based Model." with Rosanna Garcia. Also presented at the American Marketing Association's Advanced Research Techniques (ART) Forum in June 2006 at Monterrey CA.

AMA Doctoral Consortium, University of Maryland, College Park, MD, July 2006, "Creating Value: Products and Brands."

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, "A Truth-telling Sleuthing Game for Survey Research," with Min Ding.

Marketing Science Conference, University of Pittsburgh, Pittsburgh, PA, June 2006, On Managerially Efficient Experimental Designs,: with Olivier Toubia.

Sawtooth Software Conference on Conjoint Analysis, Delray Beach, FL, March 2006, "Must Have" Aspects vs. Tradeoff Aspects in Models of Customer Decisions," with Michael Yee, James Orlin, Ely Dahan.

AMA Doctoral Consortium, University of Connecticut, Storrs CT, June 2005, "The Virtual

Customer."

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Direct, Nonparametric Product Optimization Using Interactive Genetic Algorithms," with Kamal Malek and Kevin Karty.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Non-Deterministic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Application to the Diffusion of the New Wine Cork," with Olivier Toubia and Rosanna Garcia.

Marketing Science Conference, Emory, Atlanta, GA, June 2005, "Greedoid-Based Non-compensatory Two-Stage Consideration-then-Choice Inference," with Michael Yee, Jim Orlin, and Ely Dahan.

Marketing Science Doctoral Consortium, Rotterdam, The Netherlands, June 2004, "Research that Has Impact."

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "Improving Choice-Based Polyhedral Methods by Taking Response Error into Account," with Olivier Toubia.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "The Dream Versus Reality of CRM," with Glen L. Urban, Eric Bradlow, and, Mahesh Kumar.

Marketing Science Conference, Rotterdam, The Netherlands, June 2004, "Non-compensatory Consideration-then-Choice Adaptive Conjoint Analysis," with Michael Yee and James Orlin.

AMA Doctoral Consortium, Texas A&M University, College Station, TX, June 2004, "Virtual Customer Initiative."

AMA Advanced Research Techniques Forum, June 2004, "Conjoint Adaptive Ranking Database System (CARDS)," with Ely Dahan, James Orlin, and Michael Yee.

AMA Doctoral Consortium, University of Minnesota, Minneapolis, MN, June 2003, "The Review Process."

Marketing Science Doctoral Consortium, University of Maryland, June 2003, "Roots of Marketing Science Thought," with John Little.

Marketing Science Conference, University of Maryland, June 12-15, 2003, "Individual-level Adaptation of Choice-Based Conjoint Questions: More Efficient Questions and More Accurate Estimation," (with Olivier Toubia and Duncan Simester).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Configurators, Utility Balance, and Managerial Use," (with Duncan Simester and Olivier Toubia).

Marketing Science Doctoral Consortium, University of Alberta, Canada, "Helping Managers Structure and Make Decisions," June 27, 2002. (Founding Consortium).

Marketing Science Conference, University of Alberta, Canada, June 28, 2002, "Adaptive Choice-Based Conjoint Analysis with Polyhedral Methods," (with Duncan Simester and Olivier Toubia*).

Advances in Marketing Research and Modeling: The Academic and Industry Impact of Paul E. Green, Wharton, Philadelphia, PA, May 2002, "New Methods of Data Collection and Estimation Using Polyhedral Estimation Techniques."

Production and Operations Management Society (POMS) Conference 2002 - High Tech POM, San Francisco, CA, April 2002, "The Virtual Customer," (with Ely Dahan*).

Product Development Association (PDMA) International Research Conference, Santa Clara, CA, October 2001, "The Virtual Customer," (with Ely Dahan*).

New England Marketing Conference, Cambridge, MA, September 2002, "Fast Polyhedral Adaptive Conjoint Estimation," (with Ely Dahan, Duncan Simester, and Olivier Toubia).

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Empirical Test of Web-based Conjoint Analysis Including ACA, Efficient Fixed Designs, Polyhedral Methods, and Hybrid Methods," (with Ely Dahan, Duncan Simester, and Olivier Toubia*)

Marketing Science Conference, Wiesbaden, Germany, July 2001, "Evaluation of Fast Polyhedral Adaptive Conjoint Estimation," (with Duncan Simester and Olivier Toubia).

The 12th Annual Advanced Research Techniques Forum, Amelia Island, Florida, June 2001, "The Virtual Customer: Communication, Conceptualization, and Computation," (with Ely Dahan*).

AMA Doctoral Consortium, University of Miami, June 2001, "Role of Technology in Marketing."

Marketing Science Conference, UCLA, June 2000, "Applications of the Metrics Thermostat."

Marketing Science Conference, UCLA, June 2000, "The Virtual Customer." (with Ely Dahan and Duncan Simester).

Marketing Science Institute Marketing Metrics Workshop, Washington, D.C. October 1999, "Metrics for New Product Development: Making Agency Theory Practical," Plenary Speaker.

Marketing Science Conference, Syracuse, NY, May 1999, “Balancing Customer Input, Speed to Market, and Reduced Cost in New Product Development: What is the Most Profitable Strategy”

ICRMOT Conference on Technology Alliances and New Product Development: A Cross-cultural Perspective, Mishima, JAPAN, December 1998, “You Are What You Measure!”

AMA Doctoral Consortium, Athens, Georgia, August 1998, “Quantitative Advances in Marketing Models.”

AMA Winter Educators’ Conference, Austin, TX, February 1998 (Plenary Speaker), “New Challenges in the Marketing-Product Development Interface.”

AMA Doctoral Consortium, Cincinnati OH, August 1997, "Working with Industry."

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Marketing Science Institute Conference on Interfunctional Interfaces: The Management of Corporate Fault Zones, Palo Alto, CA, December 1996, “Multi-Stage Modeling of R&D/Marketing Interfaces in New Product Development.”

Marketing Science Conference, Berkeley CA, March 1997, “Cultivating Technological Managers for Customer Expertise.”

Envisioning the Future on Internet Marketing: Research and Strategy Implications, M.I.T., September 1996, “Agents and Intermediaries: Roles, Trust, and Value.”

"Can R&D be Evaluated on Market-Driven Criteria?," (with Florian Zettelmeyer). Marketing Science Conference, University of Florida, Gainesville, March 1996

"Information Acceleration," (with Glen Urban, William Qualls, Bruce Weinberg, Jon Bohlmann, and Roberta Chicos). Wharton Conference on Innovation in Product Development, Philadelphia, PA, May 1995.

"Metrics by Which Managers Evaluate R&D Groups," (with Florian Zettelmeyer). Association of Consumer Research, Boston, MA, October 1994.

"Satisfying the Internal Customer," (with Birger Wernerfelt and Duncan Simester) Marketing Science Conference, University of Arizona, Tucson, AZ, March 1994.

"Customer-Satisfaction Based Incentive Systems," AMA Educator's Conference, Boston, MA, August 1993.

"Marketing in the 1990s: Emerging Issues," AMA Doctoral Consortium, University of Illinois, August 1993.

"Quality Function Deployment and the Voice of the Customer," Pharmaceutical Management Science Association, Phoenix AZ, May 1993.

"In a World of Active Time-constrained Customers, How Can a Firm be the Great Communicator," (with Birger Wernerfelt), Marketing Science Conference, Washington University, St. Louis, MO, March 1993.

"Customer Needs, Customer Satisfaction, Sales, and Profit," (with Birger Wernerfelt, Ronit Bodner, and Duncan Simester), ORSA/TIMS Joint National Conference, San Francisco, CA, November 1992.

"Customer Satisfaction and Employee Rewards," (with Birger Wernerfelt, Ronit Bodner, and Duncan Semester), Marketing Science Conference, London, England, June 1992.

"Information Acceleration and Preproduction Forecasting of Electric Autos," (with Glen L. Urban and Bruce Weinberg), Marketing Science Conference, London, England, June 1992.

"The Voice of the Customer and Customer Satisfaction," ORSA/TIMS Joint National Meeting, Anaheim, CA, October 1991.

"Modeling Marketing Phenomena," AMA Doctoral Consortium, University of Southern Calif. August 1991.

"Relationship of Satisfaction to Customer Needs and to Market Share," 1st Congress on Customer Satisfaction and Market-Driven Quality, American Marketing Association, Orlando FL, May 1991.

"Time Flies When You're Having Fun: How Consumers Allocate Their Time When Evaluating Products" (with Bruce Weinberg, Glen Urban, and Miguel Villas-Boas), Marketing Science Conference, Wilmington, DL, March 1991.

"Information Acceleration and Preproduction Forecasting of New Autos," (with Glen Urban, and Bruce Weinberg), Marketing Science Conference, Wilmington, DL, March 1991.

"Beyond Quality Function Deployment," ORSA/TIMS Joint National Meeting, Philadelphia, PA October 1990. (Conference-wide Tutorial)

"Competitive Marketing Strategies," Operations Research 1990 (Osterreichische Gesellschaft fur Operations Research), Vienna, Austria, August 1990. (Invited Speaker)

"New Product Development: A Quantitative Analysis of Interfunctional Communication" (with Abbie Griffin), Marketing Science Conference, Urbana, IL, March 1990.

"Integrated Product Development: New Methodological Developments" (with Abbie Griffin), Marketing Science Conference, Durham, N.C., March 1989.

"Customer Driven Engineering" (with Gregory Cirmak and Robert Klein), ORSA/TIMS Joint National Meeting, Washington, D.C., April 1988.

"Competitive Advertising and Pricing in Duopolies" (with Birger Wernerfelt), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Driven Engineering" (with Abbie Griffin), Marketing Science Conference, Seattle, Washington, March 1988.

"Customer Needs," Visions of Design Practices for the Future, Newton, MA, October 1987.

"Effective Strategies in Oligopoly" (with Peter Fader), ORSA/TIMS Joint National Meeting, Miami Beach, Florida, November 1986.

"Competitive Strategy Contest: Result and Analysis" (with Peter Fader), Marketing Science Conference, Dallas, TX, March 1986.

"The PC As a Tool to Teach Complex Marketing Science Concepts," Marketing Science Conference, Dallas, TX, March 1986.

"The Coming Revolution in Marketing Theory," Plenary Speaker, European Marketing Conference, Bielefeld, West Germany. April 1985.

"Defensive Strategy" Confer. on Economics of the Firm, Universite de Paris X, Nanterre, France, April 1985.

"Competitive Marketing Strategies" Marketing Science Conference, Nashville, Tennessee, March 1985.

"Developing New Product Management: Past Progress, Current Efforts, Current Needs" (Panel) Marketing Science Conference, Nashville, Tennessee, March 1985.

"Testing Competitive Marketing Structures: Theory and Applications" (with Glen Urban) ORSA/TIMS Joint National Meeting, Dallas, TX November 1984.

"Competitive Strategy," ORSA/TIMS Joint National Meeting, Dallas, Texas, November 1984.

"Forecasting Automobile Sales: An Application of a Value Priority Algorithm," (with Glen Urban), John Roberts and John Dabels), TIMS XXVI International Meeting, Copenhagen, Denmark, June 1984.

"Consumer Durables: The Actual Consumer Budgets Compared to the Value Priority Model," (with Glen Urban), Marketing Science Conference, Chicago, Illinois, March 1984.

"Defensive Strategy Models: Application and Predictive Text," (with Steven Gaskin, and Karl Irons) ORSA/TIMS Joint National Meeting, Orlando, Florida, November 1983.

"New Product Research: Focus on Defensive strategies," Roundtable Program, ORSA/TIMS Joint National Meeting, Orlando, FL, November 1983.

"Intensity of Preference," (with Steven Shugan) ORSA/TIMS Joint National meeting, San Diego, CA, October 1982.

"Measurement Error Theories for von Neumann-Morgenstern Utility Functions," (with Jehoshua Eliashberg) ORSA/TIMS Joint National Meeting, San Diego, CA, October 1982.

"Consumer Preference Models: Axioms and Statistics," ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Economic Models of Consumer Behavior," (panel discussion), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Defensive Marketing Strategies, Part II," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Houston, Texas, October 1981.

"Agendas and Choice Probabilities," (with Amos Tversky), Association of Consumer Research, St. Louis, Missouri, October 1981, and Special Conference on Choice Theory, Durham, North Carolina , June 1981.

"Strategic Response to Competitive New Products," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Toronto, Ontario, Canada, May 1981.

"Applications of a Dynamic Semi-Markov Model of Consumer Choice," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Colorado Springs, Colorado, November 1980.

"Models of Consumer Behavior," (panel discussion), ORSA/TIMS joint National Meetings, Colorado Springs, Colorado, November 1980.

"Dynamic Semi-Markov Models of Consumer Behavior," (with Ken Wisniewski) TIMS International Conference on Marketing, Paris, June 1980.

"Profit Maximizing Perceptual Positioning," (with Patricia Simmie) TIMS International Conference on Marketing, Paris, June 1980.

"An Error Theory for von Neumann-Morgenstern Utility Assessment," (with Jehoshua Eliashberg), ORSA/TIMS Joint National Meeting, Washington, D.C., May 1980.

"Defender: Defensive Strategies Against New Products" (with Steven Shugan), ORSA/TIMS Second Special Interest Conference on Marketing Measurement and Analysis, Austin, Texas, March 1980.

"Adaptive Control of New Product Launches," (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, Milwaukee, Wisconsin, October 1979.

"The Value of Up-front Research in New Products," (with Glen Urban), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Methods for Computing Probabilities of Choice," (with Steven Shugan), TIMS International Meeting, Honolulu, Hawaii, June 1979.

"Forecasting and Improving the Adoption of New High Technology Products," (with Pat Lyon), ORSA/TIMS Joint National Meeting, New Orleans, Louisiana, May 1979.

"A Methodology for Product Realization: Multi-method Procedures," (with Patricia Simmie), ORSA/TIMS Joint National Meeting, Los Angeles, California, November 1978.

"Searching for Marketing Segments" (with Ken Wisniewski), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"P.A.R.I.S.: An Interactive Market Research System," (with Steven Shugan), ORSA/TIMS Joint National Meeting, New York, New York, May 1978.

"Extended Conjoint Analysis," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Consumer Preference Functions: Theory, Measurement, Estimation , and Application," (with Steven Shugan), ORSA/TIMS Joint National Meeting, Atlanta, Georgia, November 1977.

"Measuring Consumer Preferences for Health Care Plans," (with Glen Urban), ORSA/TIMS Joint National Meeting, San Francisco, California, May 1977.

"Improved Transportation Design with Consumer Response Models: An AMTRAK Example" (with Frank Koppelman), ORSA/TIMS Joint National Meeting, Miami, Florida, November 1976.

"A Comparison of Statistical and Direct Multiattribute Utility Assessment Procedures," (with Glen Urban), ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1985.

"Measuring Consumer Preferences: An Axiomization for Describing Choice," ORSA/TIMS Joint National Meeting, Las Vegas, Nevada, November 1975.

"Modeling Consumer Response to Innovations," (1) Milwaukee Chapter of ORSA/TIMS, November 1985; (2) Chicago Chapter of ORSA/TIMS, December 1975.

"Modeling Decisions of Choice Among Finite Alternatives: Applications to Marketing and to Transportation Demand Theory," ORSA/TIMS Joint National Meeting, San Juan, Puerto, Rico, October 1974.

"An Efficient Model for Planning Bus Routes in Medium Sized Communities," ORSA/TIMS Joint National Meeting, San Diego, CA, November 1973.

Professional Affiliations

The Institute for Operations Research and Management Science

American Marketing Association

Product Development and Management Association, Certified New Product Development Professional

Association for Consumer Research

Professional Services

Secretary, INFORMS Society of Marketing (January 2002 – December 2005). Founding Officer.

Advisory Council, INFORMS College of Marketing (1994 - 2002)

Council of The Institute of Management Sciences (1987 - 1989)

Associate Editor for Marketing, *Management Science*, (1980 - 1981)

Department Editor for Marketing, *Management Science*, (1982 - 1988)

Editor-in-Chief, *Marketing Science*, (1989 - 1994)

Editorial Advisory Board, *Sloan Management Review* (2000-2002).

Associate Editor, *Journal of Marketing Research* (April 2006 – June 2009). First time in journal history that Area Editors have been appointed.

Senior Advisory Board, *Journal of Marketing Research* (July 2009 on). First time such an advisory board was formed.

Editorial Boards, *Marketing Science*, (1980 – 1988, Editor 1989-1995, 2003- 2008, including acting Area Editor), *Journal of Product Innovation Management* (1997 - present), *Journal of Marketing* (2005- present, outstanding reviewer 2006), *European Management Journal* (advisory, 1998 - 2002), *International Journal for Research in Marketing* (2007 – present).

Reviewer: *Advances in Consumer Research, Applications in Management Science, European Journal of Research in Marketing, Journal of the Academy of Marketing Science,* Journal *of Consumer Research, Journal of Marketing, Journal of Marketing Research, Journal of Mathematical Psychology, Journal of Product Innovation Management, Management Science, Marketing Science, Operations Research, Review of Marketing, Sloan Management Review, Transportation Research Record, Transportation Science,* AMA Dissertation Prize, AMA Educators' Conference, American Institute of Decision Sciences Dissertation Prize, Nicholson Dissertation Prize, Marketing Science Institute Dissertation Award, Product Development Management Association Dissertation Prize, Prentice-Hall Books, National Science Foundation.

Conference Chairman: Conference Chair, Profitable Customer-Driven Organizations: Developing the Blueprint, Management Roundtable, May 1994.

Segment Chairman: Yale School of Management, Center for Customer Insight, The Customer Insights Conference, New Haven, CT. May 12-14, 2011. New Product Innovations.

Non-traditional Models of Consumer Preference and Choice, Adaptive Preference and Estimation, Optimizing Product Design and Customer Targeting, Obtaining Information From or About Consumers (Atlanta, GA, 2005, co-chair four sessions)

TIMS International Meeting, Copenhagen, Denmark, June 1984 (two sessions).

TIMS College of Marketing, Houston, Texas, October 1981 (twelve sessions).

TIMS College of Marketing, Milwaukee, Wisconsin, October 1979 (five sessions).

American Marketing Association Educator's Conference, Chicago, Illinois, August 1978, (three sessions).

INFORMS Marketing Science Conference, Atlanta GA, June 2005 (four sessions)

Session Chairman: *INFORMS (Previously named ORSA or TIMS)*

Virtual Customer Initiative (Rotterdam, The Netherlands, 2004)

New Approaches to Mapping (University of Maryland, 2003)

The Virtual Customer (University of Alberta, Canada 2002)

The Virtual Customer (Wiesbaden, Germany 2001)

Building Competitive Advantage Through Product Quality and R&D (Gainesville, FL 1996)

Customer Satisfaction and Its Role in Global Competition (San Francisco, CA 1992)

Competitive R&D (Washington, D.C., April 1988)

Competitive Marketing Strategy, (St. Louis, Michigan, November 1987)

Competition in Multiattributed Spaces (Atlanta, Georgia, November 1985).

Marketing: Consumer Measurement (Copenhagen, Denmark, June 1984)

Marketing: Dynamic Structures (Copenhagen, Denmark, June 1984)

Product Policy (Orlando, Florida, November 1983)

Product Policy (San Diego, California, October 1982)

New Product Introduction and Defense in Competitive Environments, (Detroit, Michigan, April 1982)

New Product and Product Policy Models, (Houston, Texas, October 1981)

New Product Models (Toronto, Ontario, Canada, May 1981)

Models of Consumer Behavior (Colorado Springs, Colorado, November 1980)

New Product Realization and Selection (Los Angeles, California, November 1978).

Session Chairman: *Association of Consumer Research*

Mathematical Theories of Consumer Behavior (St. Louis, Missouri, October 1981)

Committee Memberships

Editor Selection Committee, *Marketing Science*, INFORMS College of Marketing, 2001 (chair), 2004 (chair), 2007.

Editor Selection Committee, *Journal of Marketing Research,* American Marketing Association, 1999.

Conference Steering Committee, Duke Invitational Symposium on Choice Modeling and Behavior, June 1993.

Editor Selection Committee, *Management Science,* TIMS.

Founding Committee for *Marketing Science*, TIMS College of Marketing, (1979 - 1982).

Management Science Roundtable, TIMS, (1982 - 1988)

Marketing Strategy Steering Committee, Marketing Science Institute, (1983 - 1984).

Organizing Committee for Conference on Economics of the Firm, April 1985, Universite de Paris X Nanterre.

Organizing Committee for 1985 Conference in Bielefeld, West Germany, European Marketing Academy.

Publications Committee (1980 - 1982), Operations Society of America.

Scientific Committee for 1986 Conference in Helsinki, Finland.

Student Affairs Committee (1978 - 1979), Operations Society of America.

*Litigation Consulting (on behalf of, *deposition testimony, †court, commission, or arbitration testimony)*

Alcatel-Lucent USA Inc. v. Amazon.com, Inc. et al. (Patent Infringement)* †

Allergan, Inc. Engagement. (Off-label Prescriptions),

American Express Travel Related Services, Inc. v. Visa USA, Inc., et. al.* (Evaluation of marketing research).

American Multi-Cinema, Inc. v. American Movie Classics Company, Inc., et. al. (Confusion),

Amway v. Procter & Gamble (Damages)*,

Atlantic Recording Corporation, et. al. v. XM Satellite Radio, Inc. (Copyright infringement).

Axcan Scandipharm, Inc. V. Global Pharmaceuticals And Impax Laboratories, Inc. (False Advertising).

Berlex v. Biogen, Inc. (Damages)*,

Blue Mountain Arts, Susan Polis Schutz, and Stephen Schutz v. Hallmark Card, Inc. (Trade Dress),

James And Lisa Camenson, et al.; v. Milgard Manufacturing Inc., et. al. (Class action)

Comm-Tract Corp. v. Northern Telecom, Inc. (Advice only),

Computer Aid, Inc. v. Hewlett Packard (damages)*,

Creative Laboratories, Inc. v. Apple Computer, Inc. (Intellectual Property),

CTC Communications Corporation v. Bell Atlantic Corporation (Damages),

Curt Schlesinger and Peter Lore, on behalf themselves and the Certified Class, Plaintiffs, v. Ticketmaster* (Class action, false advertising, confusion)

Dayna Craft, et al. v. Philip Morris Companies, Inc. and Philip Morris Inc. (Class Action).*

EPD v. Curtis (Product Confusion)†,

Stephen S. Gallagher, et. al. v. State Farm Mutual Automobile Insurance Company, et al. (Class Action)

Geico v. Google and Overture Services (Yahoo), Inc. (Trademark Infringement),

Gillette v. S. C. Johnson (Patent Infringement),

Heublein vs. Seagrams and Gallo (Liability),

Hewlett-Packard, Inc. v. Factory Mutual Insurance Company (Insurance Coverage)*

Intel v. Advanced Micro Devices (Damages)*,

J. B. D. L. Corp. d/b/a, Beckett Apothecary v. Wyeth-Ayerst Laboratories, Inc. and American Home Products Corporation, (Class Action),

Jerry Jacobs, et. al. v. Osmose Inc., et. al. (Class Action)*,

Jay Kordich, et. al. v. Salton Maxim Housewares, Inc., et. al. (Trademark)†,

In RE J.P. Morgan Chase Cash Balance Litigation (Class Action),*

Lending Tree, Inc. v. The Gator Corporation (Intellectual Property),

Lotus v. Borland (Damages)*,

Louis Vuitton Malletier, S. A. v. Hyundai Motor America (Trademark Infringement)*,

Marvin Lumber and Cedar Company v. PPG Industries, Inc., et. al. (Survey Design),

MasterCard International, Inc. v. First National Bank of Omaha (Product Confusion)*,

Mayo Foundation v. Mayo Health Facilities (Product Confusion)†,

Mead Johnson Nutritionals v. unnamed party (False Advertising),

Merck & Co. (Lanham Act Advice)

In Re Microsoft Corporation Antitrust Litigation (Multi-district Litigation)*,

Pacific Bell Telephone Company in New Regulatory Framework Review of Customer Satisfaction before the California Public Utility Commission†,

Luciano F. Paone v. Microsoft Corporation (Patent Infringement)*.

Pfizer Consumer Healthcare (Lanham Act Advice)

Playtex v. Procter & Gamble (Claims Substantiation)*†

Procter & Gamble v. Amway (Liability and Damages)*†,

Procter & Gamble v. Haugan, et. al. (Liability and Damages)†,

Putnum Fund Trustees, (Investment Fraud, advice on market research)

Ram Broadcasting, Inc. (Cellular Telephone Filings),

RealPlayer, Inc. v. Microsoft Corporation (Anti-trust)

Roberts et. al. v. Enterprise Rent-a-Car Company of Boston, Inc.,

The Republic of Columbia v. Diageo North America, et al. (Anti-trust).

St. Clair Intellectual Property Consultants, Inc. v. Research in Motion, Ltd. and General Imaging Co. (Patent infringement)

Barbara Schwab, et. al. v. Philip Morris, USA (Class Action)*

SoundExhange, Inc. vs. Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.: In the Matter of Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Radio Services*,†

State of Colorado, et. al. v. Warner Chilcott Holdings Company III, Ltd., et. al. (Anti-trust)*

State of Florida and Plaintiff States Antitrust Litigation for Disposable Contact Lenses (Survey

Analysis)†,

Stipic, et. al. v. Behr Process Corporation and Masco International (Class Action)*,

Straumann Company v. Lifecore Biomedical, Inc. (Product Confusion)*,

Sun Microsystems, Inc. v. Microsoft Corporation (Anti-trust),

Tivo, Inc. v. Echostar Communications Corporation, et. al*.

Tropicana Products, Inc. v. Vero Beach Groves, Inc. (Lanham Act)†,

Wal-Mart Stores, Inc (and other retailers) v. Mastercard International, Inc. (Liability and Damages, Anti-trust)*,

We Media, Inc. v. We: Women's Entertainment, LLC. (Product Confusion)*.

Marketing, Marketing Research, and Product Development Consulting

American Home Foods, Inc.; American Airlines; American Hospital Supply Corporation; Analog Devices, Inc; Andersen Consulting, Inc. (Accenture), Applied Marketing Science, Inc.; A.T.&T.; Avon; Barton-Aschmann Associates; Baxter Cardiovascular Group, Booz Allen Hamilton, Inc., Cambridge Systematics, Inc.; Colgate-Palmolive; Costello Associates, Inc.; Economics' Laboratories, Inc.; Elrick and Lavidge, Inc.; Evanston Hospital; Evanston, Illinois and Schaumburg, Illinois (Transportation Planning); Fidelity Investments; French's Inc., G.D. Searle, Inc.; General Foods, Inc.; General Motors, Inc., Buick Division, Chevrolet Division, Marketing and Product Planning; Gillette; IBM, Inc.; Information Resources, Inc.; Intel, Inc., Johnson & Johnson; Kodak; Macromedia, Inc., Management Decision Systems, Inc.; M/A/R/C, Inc.; Merck, Inc., Navistar International, Inc.; Pacific Gas and Electric Company, Pepsi-Cola, Inc.; Polaroid; Procter & Gamble Company; Product Genesis, Inc.; RAM Broadcasting, Inc.; Regional Transportation Authority; Richardson-Vicks, Inc.; Southern Company Services, Inc.; Time-Life Books; Volunteers in Technical Assistance, and Wyeth-Ayerst Laboratories, Inc. Co-founder, principal, and board member, Applied Marketing Science, Inc., Advisory Board, Affinnova, Inc.

M.I.T. or MIT Sloan Committee Work

Committee on the Undergraduate Program, 2003 – 2005.

MIT Sloan Committee on Educational Technology, 2004 – 2006.

Center for Innovation in Product Development

Leader, Virtual Customer Initiative, 2000 - 2006

Research Director, 1997 – 2000

Center for Transportation Studies, 1981 - 1982.

Master of Science in Transportation Committee.

Committee to Investigate Sloan-Logo Research Notes (MIT Sloan, chair), 2001-2002.

Associated Faculty Committee to Review the Organizational Learning Center (MIT Sloan), 1995.

Dean's Consultation Committee (MIT Sloan), 2008-2009.

Dean Search Committee (MIT Sloan), 1993

Building Committee for the E51 Expansion, MIT Sloan, 1992, Ad Hoc

Organization Committee for the New MIT Sloan Building, E62, (2007- 2009)

Executive Educational Programs Committee (MIT Sloan), 1983 – 1985, 1998-1999, 2007

Faculty Admissions Committee, 2004-2009

Faculty Council (MIT Sloan), 1999

International Center on Research for the Management of Technology (MIT Sloan)

- Co-Director, (1993 - 2000).
- Joint Steering Committee (1990 - 1993).

Management Science Area, MIT Sloan School of Management

- Area Head, (2005- 2009)
- Chairman of Subcommittee on Peer Group Comparisons, (1981 - 1982)
- Committee on Management Science Curriculum Redesign, (1982 - 1983)
- Marketing Group Head (1986, 1988 – 2003, 2010-2011)

Management of Technology Program Committee (MIT Sloan), 2001- 2003

Master's Program Committee, MIT Sloan, (1980 – 1987, 2007 – 2011))

- Chairman: Subcommittee On Placement, (1981 - 1982).
- Core Curriculum Reassessment Committee (1991-1992)
- Core Curriculum Implementation Committee (1992-1994)
- Subcommittee on Admissions, Special Consideration, (2007 – 2009).
- Subcommittee on the Management Science Core, (1982 - 1983).
- Subcommittee on Entrepreneurship and Innovation Evaluation (Chair, 2008).
- Subcommittee on Tracks (2008-2009)
  - Ad hoc committee to develop a Marketing, Operations and Strategy Track (2011).
- Subcommittee on Strategy Curriculum (2009)
- Subcommittee on Course Ratings (2011)

Operations Research Center

Admissions Committee, (1981 - 1982).

Associated Faculty (1980 – present)

Operations Research Committee (2001- 2003)

President's Committee (1984).

Personnel and Policy Committee, MIT Sloan (Executive Committee, 2005 – 2009)

Chair of ad hoc committees for reappointment, promotion, and tenure (1983 - present)

Member of ad hoc committees for reappointment, promotion, and tenure (1981 - present)

Symposium Director, Marketing Center, MIT Sloan School, M.I.T., (1981 - 1982).

Zannetos Dissertation Award Committee, MIT Sloan, (1981-82, 1996-97, chair 1997-1998).

M.I.T. Subjects Taught (often multiple sections)

15.810, Marketing Management (Core)	Spring 1990, 1991, 1992, 1993, 1994, 1995, 1997, 1998, 1999, 2001, 2004, 2005. 2006. Fall 1999, 2006, 2007, 2008, 2011.
	(Teaching awards listed on page 2 of vita.)
15.812, Marketing Management (UG)	Fall 1981, 1982, 1984, 1985, 1986. Spring 1981, 1984, 2006.
15.813, Marketing Management in Public Sector	Fall 1980.
15.814, Marketing Mgmt (Mgmt of Technology)	Fall 1988, 1993, 1999, 2001.
15.820, Advanced Marketing Management	Spring 1990
15.828, New Product Development	Spring 1981, 1982, 1989; Fall 1982, 1984; 1985.
15.838, Ph.D. Seminar (Various Topics)	Spring 1986, 1997, 2002, 2006, 2011.
15.839, Marketing and Statistics Workshop	Spring 1982; Fall 1982, 1984.
15.TH4. Thesis Project on Competitive Strategy	Spring 1985, 1986.

Summer Session, ILP, and External Executive

A.T.&T Course on New Product Development, 1986.

European Institute for Business Administration (INSEAD) European Marketing Programme, 1985.

Greater Boston Area Executive Program, 1982, 1983.

M.I.T. Civil Engineering, Demand Theory, 1980, 1981, and 1982.

M.I.T. ILP, Marketing Strategy and Models in the Information age, 1983.

M.I.T., Management of R&D, 1989, 1990, 1991, 1992, 1993, 1994. 1995, 1996, 1997, 1998, 1999.

M.I.T. Marketing Science Symposium, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988.

M.I.T./M.I.P. Executive Program, 1992.

M.I.T. New Product Development, 1997.

Pedagogical Developments.

In 1990 and 1991, Prof. John D. C. Little and I redesigned the core curriculum in Marketing Management and taught the course to the entire Master's class. As structured the course builds upon the strengths of M.I.T. (international, strong disciplinary base, functional integration, and information technology) and combines case studies, problem assignments, and lectures in an eighteen-session course.

In the 1991-1992 I was part of a committee of six faculty members that redesigned the core curriculum at the Sloan School. I supervised the voice-of-the-customer analyses of students and recruiters and encouraged the committee to design a program that these customers would find exciting. The new core was implemented in the 1993-1994 academic year. Student satisfaction increased significantly.

Teaching Notes

Note on Defensive Marketing Strategy (2005, for 15.810, Marketing Management)

Note on Product Development (2005, for 15.810, Marketing Management)

Note on the Voice of the Customer (2005, for 15.810, Marketing Management)

Note on Consumer Behavior (2005, for 15.810, Marketing Management)

Note on Life Cycle Diffusion Models (2005, for 15.810, Marketing Management)

Note on Engineering Product Design (2006, for 15.810, Marketing Management)

Note on Conjoint Analysis (2007, for 15.810, Marketing Management)

M.I.T. Thesis Supervision

(a) *Sloan School of Management, Master's Theses*

Hafiz Adamjee (joint with John Scaife), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). This product was subsequently commercialized and was a finalist for the *New Media* Invision 1994 Multimedia award at COMDEX/Spring '94.

Ramay Akras, "Competitive Strategy in the Marketing of Small DDP Computers: an Analysis of Emerging Price and Product Position Patterns," - (1986).

Frederic Amerson, "Strategic Marketing Simulation: Improvements to the Enterprise Integrating Exercise," - (1989).

Andrivet, Sébastien (Sloan Fellows Program), “Customer research, customer-driven design, and business strategy in Massively Multiplayer Online Games,” – (2007)

Andrew Anagnos (joint with Karen Van Kirk), "A Framework for Analyzing Quality in the News Media," - (1991)

Allen Aerni, "Measurement of Customer Satisfaction," - (1994).

Joel Berez, "An Investigation of Decision Hierarchies" - (1981).

Harel Beit-on, "Competitive Strategy for Small Business Jet Aircraft," - (1985).

Willy Biberstein (SDM Program), "Framework for Customer Interaction Throughout the Automotive Product Development Process," (February 2002).

Andre Borschberg (joint with Webb Elkins), "Defensive Marketing Strategy: Its Application to a financial Decision Support System" - Reader (1983).

Philippe Bosquet, "European Airline Deregulation: Defining Air France's Strategy for the 1990's," - Reader (1989)

Jill A. Christians, (joint with Cheryl M. Duckworth), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Poh-Kian Chua (MOT Program), "R,D&E Metrics: Shaping the Outcomes of Your R,D&E Investment," – (1998).

Leslie K. Cooper, "The Structure of Recruiter Needs at the Sloan School of Management: A Quantitative Assessment," - (1992).

Teruyuki Daino (Sloan Fellows Program), "How a Leading Company Can Overcome a Competitive Challenge: A Case Study of Anheuser-Busch Company." – (1998).

Laura E. Donohue, "Software Product Development: An Application of the Integration of R&D and Marketing via Quality Function Deployment" - (1990)

Cheryl M. Duckworth (joint with Jill A. Christians), "Expectations and Customer Satisfaction: A Market Research Study for Plimoth Plantation," Reader (1994).

Webb Elkins (joint with Andre Borschberg), "Defensive Marketing Strategy: Its Application to a Financial Decision Support System" - Reader (1983).

Rasheed El-Moslimany (LFM Program), "Getting Value from the Value Chain: Comfort Choice," Co-Advisor. (June 2002)

Julio Faura (MOT Program), "Contribution to Web-based Conjoint Analysis for Market Research," (2000).

Richard Feldman, "Decision Support Systems for Forecasting Communications in the Home," - Reader (1985).

Anders T. Fornander, "The Continuing Operating System Battle in the Personal Computer Industry," - Reader (1994).

Carl Frank (MOT Program), "Metrics Thermostat for Strategic Priorities in Military System Acquisition Projects," (2000).

Mihaela Fulga, "Competitive Pricing and Positioning Strategies in the Dating Service Market," -

(1986).

Steven P. Gaskin, "Defender: Test and Application of a Defensive Marketing Model" - (1986). 1st Place, Brooks Award.

Peter N. Goettler, "A Pre-market Forecasting Model of New Consumer Durables: Development and Application," - Reader (1986).

Patti N. Goldberger, "Competitive Strategy in the Market for Running Shoes," - (1985).

Akhil Gupta, "The Personal Computer Industry: Economic and Market Influences on Product Positioning Strategies," - (1986).

Michael Halloran (joint with Marc Silver), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Carla Heaton, "Competitive Strategy in the Facsimile Market," - (1985).

Judith Hee, "Determining Manufacturer's Coupon Strategies" - Reader (1981).

Jonathan E. Higginson, “Understanding Dependencies in Research and Development at the Charles Stark Draper Laboratory.” - (1997).

Scott D. Hill, "Correlation of Core Competencies with Market-Driven or Self-Guided Research," - (1995).

Dan Isaacs, "Competitive Pricing and Positioning Strategies in the Imported Beer Marketing," - (1986).

Francois Jacques, "Marketing Strategies in Innovative Industries: The Case of Package/Document Delivery Services," - Co-Advisor (1985).

Lawrence Kahn, "Competitive Positioning: A Study of Recruiter's and Employer's Perceptions of the Sloan School of Management" - (1982). Honorable mention Brooke's Thesis Prize.

D. Darcy Kay, "Competitive Strategy for Anti-arthritic Drugs" - (1985).

Young Joo Kim (MOT Program), “R&D Management Applications of The Dynamic Metrics Framework” – (1998)

Sidney A. Kriger, "The Effect of Quality Function Deployment on Communications of the New Product Development Teams," - (1989)

Yasuke Kume, "New Marketing Strategy of Telecommunications in Japan" - Reader (1981).

Elvind Lange, "Measuring Market Response to Marketing Mix Variables Using Dynamic Modeling and Its Implications for Brand Strategy" - Reader (1981).

Stephen P. Langhans, "Defensive Marketing Strategy: A Consumer Semi-Durable Case Example" - (1983).

In-Kyu Lee, "Evaluating System for the Upstream Center of R&D for being Market-Oriented in a Consumer Electronics Company," - (1995).

Michael Leslie (joint with Joel Wachtler), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Kit Mee Lim, "Competitive Strategy among Companies Offering Credit Cards," - Reader (1985).

James A. Lutz, "Competitive Marketing Strategy in the CAD Marketplace," - (1985).

Larry D. Lyons, "Forecasting the Impact of Competitive Entries on Sales of a New Consumer Durable" - Reader (1984).

Arpita Majundar (SDM Program), "Strategic Metrics for Product Development at Ford Motor Company," - (2000).

Catherine E. Manion, "A Survey of Customer Satisfaction Incentive Systems for Salespersons," - (1993).

Maureen E. Matamoros, "Information Overload," – Reader (1986).

Meghan McArdle (LFM Program), "Internet-based Rapid Customer Feedback for Design Feature Tradeoff Analysis," – co-Advisor (2000)

Fernando Motta, "Competitive Strategy Among Panamanian Banks," - (1985).

Neil Novich, "Price and Promotion Analysis Using Scanner Data" - Reader (1981).

Kenji Nozaki, "Marketing and Technology Strategy for the Japanese Architectural Design Company," - (1989).

Seiji Nozawa, “Voice of the Customer Analysis in the Japanese Beer Market.” - (1997).

Minho Park (MOT Program), “R&D Matrix at LG Electronics.” - (1997)

Stephen Pearse, "Production and Sales Forecasting: A Case Study and Analysis" - Reader (1982).

Ning P. Peng, "An Exploration of the Impact and Success of Customer Satisfaction Programs," - (1994).

Homer Pien (MOT Program), “Competitive Advantage through Successful Management of R&D.” - (1997)

Susan B. Poulin, "Defensive Strategy in the Automatic Test Equipment Industry" (1984).

Jill W. Roberts, "MBA Recruiters' Needs: Voice of the Customer Analysis," - (1992).

Lisa Gayle Ross, "A Voice of the Customer Analysis of M.B.A. Schools: The Student Segment," - (1992). Lisa was a runner-up for the George Hay Brown Marketing Scholar of the Year in 1992.

Tamaki Sano, “Strategy for Kirin as a Global Brand” – (2009) Sloan Fellow.

John Scaife (joint with Hafiz Adamjee), "The Face of the Customer: The Use of Multimedia in Quality Function Deployment," - (1993). See award listed under Adamjee.

Paul E. Schoidtz, "Advertising, Price, and Positioning Equilibria," - (1986).

Hongmei Shang, "A Simulation Analysis of Optimal Task Assignment for Growing Managers from R&D Labs," – (February 2000).

Rosemarie Shield, "Competitive Pricing and Positioning Strategies in the Chromatographic Instruments Market," - , (1986).

Jon Silver (joint with John C. Thompson, Jr.), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Prize, Brooks Award.

Marc Silver (joint with Michael Halloran), "Defensive Marketing Strategy: Empirical Applications" - (1983).

Lisa Silverman, "An Application of New Product Growth Modeling to Automobile Introductions" - (1982).

Sheryl Sligh, "An Assessment of the Analog Modem Market," - (1991).

Jamie Smith, "Industrial Buying Process of Pension Funds for Real Estate," - (1982).

Yoshihito Takahashi (MOT), "Analysis of Strategy in an Ethical Drug Industry," – Reader (2000).

Genevieve Tchang, "A Methodology for Planning and Evaluating External Relations at Business Schools" - Reader (1982).

John C. Thompson, Jr. (joint with Jon Silver), "Beta-binomial Analysis of Customer Needs -- Channels for Personal Computers," - (1991). 1st Place, Brooks Award.

V. Mullin Traynor, "The Dissemination and Adoption of New Technology: Control Data's Computer-Based Training System, Plato, and the Electric Utilities" - (1982).

Karen Van Kirk (joint with Andrew Anagnos), "A Framework for Analyzing Quality in the News Media," - (1991)

Joel Wachtler (joint with Michael Leslie), "A Methodology for Making International Marketing Mix Decisions," - Reader (1985).

Tamao Watanabe, "Customer Analysis of the U.S. Cardiovascular Drug Market: Focusing on Physician's Drug Choice" - (1991)

Stephen L. Weise, "Expert Decision Support Systems for Marketing Management," – Reader (1986).

Nancy Werner, "Competitive Price and Positioning in the Integrated Office Automation Systems Market" - (1986).

Julie Wherry, “Pre-Test Marketing: Its Current State in the Consumer Goods Industry and Its Effect on Determining a Networked Good.” - (2006).

Ali Yalcin, "The Potentials and Limitations of Customer Satisfaction Indices in Captive Customer-Supplier Environments," - (1995)

Sandra Yie, "The Core Curriculum at Sloan: Establishing a Hierarchy of Needs," - (1992).

Judy Young, "Responsive Marketing Strategy at AT&T" - (1982).

(b) *Aeronautics S.M. Theses*

Keith Russell (LSI), "Reengineering Metrics Systems for Aircraft Sustainment Teams: A Metrics Thermostat for Use in Strategic Priority Management," (February 2001).

(c) *Electrical Engineering, S.B. and M.Eng. Theses*

Chan, Christine W. Y. (M. Eng), "Measuring Non-Monetary Incentives Using Conjoint Analysis," Co-Advisor (1999).

Emily Hui (M.Eng.), "Application of Polyhedral Conjoint Analysis to the Design of Sloan's Executive Education Programs." June 2003.

Brian T. Miller (S. B.), "A Verification of Price Equilibria Based on Non-Zero Conjectural Variation," (1986).

(d) *Mechanical Engineering, Master's Theses*

Burt D. LaFountain, "An Empirical Exploration of Metrics for Product Development Teams" – (1999)

Tina Savage, "The Virtual Customer: A Distributed Methodology for Linking Product Design and Customer Preferences." Co-Advisor (1998).

(e) *Operations Research Center, Master's Theses*

Jeffrey Moffit (ORC), " Applying the Metrics Thermostat to Naval Acquisitions for Improving the Total Ownership Cost – Effectiveness of New Systems," (2001)

Olivier Toubia (ORC), "Interior-point Methods Applied to Internet Conjoint Analysis," (February 2001), Co-Advisor.

(f) *Urban Studies, Master's Theses*

Marijoan Bull, "Affirmative Fair Housing Marketing" - Committee Member (1982).

Barry Cosgrove, "Marketing Analysis for the Brockton Area Transportation Authority" – Committee Member (1981).

(g) *Sloan School of Management, Ph.D. Theses*

Makoto Abe, "A Marketing Mix Model Developed from Single Source Data: A Semiparametric Approach." Committee member (August 1991). Abe is on the faculty at the University of Tokyo.

Daria Dzyabura, "Essays on Machine Learning in Marketing (tentative title)," Chairman (expected June 2012).

Peter Fader, "Effective Strategies in Oligopolies," Chairman (February 1987). Sloan School of Management, Zannetos Prize, 1st Place. Fader is on the faculty at the University of Pennsylvania.

Fred Feinberg, "Pulsing Policies for Aggregate Advertising Models" Committee Member (August 1988). Feinberg is on the faculty of the University of Michigan.

Dave Godes, " Friend or Foe?: The Relationship Between Learning and Incentives and two additional essays in marketing," (June 2000), Committee Member. Primary advisor on listed essay. Zannetos Prize, 1st Place. Godes is on the faculty of the University of Maryland.

Abbie Griffin, "Functionally Integrated New Product Development: Improving the Product Development Process Through Linking Marketing and Technology Development," Chairman. (June 1989). Griffin is on the faculty at the University of Utah and was editor of *Journal of Product Innovation Management* from 1997-2003 Frank Bass Dissertation Award (INFORMS).

Gurumurthy Kalyanaram, "Empirical Modeling of the Dynamics of the Order of Entry Effect on Market Share, Trial Penetration and Repeat Purchases for Frequently Purchased Consumer Goods," Committee Member (March 1989). G. K. was on the faculty at the University of Texas, Dallas.

Eriko Kitazawa, "Customer Satisfaction at Japanese Utility Franchises," Committee Member (1996).

John H. Roberts, "A Multiattributed Utility Diffusion Model: Theory and Application to the Prelaunch Forecasting of Autos". Committee Member (February 1984). Roberts is on the faculty at the London Business School.

Matt Selove, "The Strategic Importance of Accuracy in Conjoint Design," Committee Member (June 2010). Selove is on the faculty at the University of Southern California. John Howard Dissertation Award (AMA), 2010.

Duncan I. Simester, "Analytical Essays on Marketing," Committee Member, (June 1993). Sloan School of Management, Zannetos Prize, Honorable Mention. Simester is on the faculty of M.I.T.

Olivier Toubia, "New Approaches to Idea Generation and Consumer Input in the Product Development Process," (June 2004). Toubia is on the faculty of Columbia University. Frank M. Bass Dissertation Award (INFORMS), 2005, John Howard Dissertation Award (AMA), 2005.

Miguel Villas-Boas, "On Promotions and Advertising Policies: A Strategic Approach." Committee member (February 1991). Villas-Boas is on the faculty at the University of California, Berkeley.

Bruce Weinberg, "An Information-Acceleration-Based Methodology for Developing Preproduction Forecasts for Durable Goods: Design, Development, and Initial Validation." Committee Member. (August 1992). Weinberg was on the faculty at Boston University.

Florian Zettelmeyer, "Three Essays on Strategic and Organizational Uses of Information in Marketing." Committee Member. Zettelmeyer is on the faculty of Northwestern University.

(h) *Civil Engineering, Ph.D. Thesis*

Karla Karash (Ph.D.), "An Application of the Lens Model in Measuring Retail Attractiveness and the Effects of Transportation Programs" - Committee Member (August 1983). Karash was at the MBTA.

(i) *Mechanical Engineering, Ph.D. Thesis*

Javier Gonzalez-Zugasti (Mechanical Engineering, Ph.D.), "Models for Product Family Design and Selection," (June 2000), Committee Member.

(j) *Operations Research Center, Ph.D. Thesis*

Yee, Michael (Operations Research, Ph.D.), "Inferring Non-Compensatory Choice Heuristics," (June 2006), Co-Advisor. Yee is at MIT's Lincoln Laboratories.

Northwestern University Ph.D. Thesis Supervision (1975 - 1980 Academic Years)

Steven M. Shugan, "A Descriptive Stochastic Preference Theory and Dynamic Optimization: Applications Toward Predicting Consumer Choice' Chairman (September 1977). Shugan is on the faculty at the University of Florida and current editor of *Marketing Science*.

Patricia Simmie, "Product Realization: Theory, Models, and Application" - Chairman (June 1979), American Marketing Association Dissertation Prize, Honorable Mention. Simmie was at York University.

Ken J. Wisniewski, "A Semi-Markov Theory of Consumer Response: New Theoretical Properties, Simulation Testing, and Empirical Application" Chairman (June 1981). American Marketing Association Dissertation Prize, First Place. Wisniewski was on the University of Chicago.

Appendix B

Testimony

John R. Hauser

Expert Testimony (2006-2011)

Luciano F. Paone v. Microsoft Corporation, Case No. CV-07-2973, United States District Court, Eastern District of New York. Deposition Testimony, September 23, 2011.

Alcatel Lucent, Inc. v. Amazon.Com, Inc., et al., Civil Docket No. 6:09-CV-422. United States District Court For The Eastern District Of Texas Tyler Division, Deposition testimony, June 3, 2011, Trial testimony, October 13, 2011.

Louis Vuitton Malletier v. Hyundai Motor America, Case Number 10-CIV-1611-PKC, United States District Court, Southern District of New York. Deposition testimony, May 6, 2011.

Curt Schlesinger, et al. v. Ticketmaster, Case No. BC30456, Superior Court of the State of California for the County of Los Angeles. Deposition testimony, November 19, 2010.

St. Claire Intellectual Property Consultants, Inc. v. Research In Motion LTD., et al., Research In Motion Corporation, Civil Action No. 08-371-JJF-LPS, United States District Court for the District of Delaware. Deposition testimony, February 26, 2010.

Dayna Craft, et al. v. Philip Morris Companies, Inc. and Philip Morris Inc., Case No. 002-00406-02, Division No. 6, Missouri Circuit Court, Twenty-Second Judicial Circuit (City of St. Louis). Deposition testimony, November 11-12, 2009.

Playtex Products, Inc. v. The Procter & Gamble Company, Case No. 08 Civ. 1532 (WHP). Deposition testimony, February 25, 2009. Trial testimony, March 19, 2009.

In RE J.P. Morgan Chase Cash Balance Litigation, Master File No. 06. Div. 0732 (HB), United States District Court, Southern District of New York. Deposition testimony, December 10, 2008.

American Express Travel Related Services Company, Inc. v. Visa U.S.A., Inc., et al., No. 04 CV08967 (BSJ) (DFE), *Discover Financial Services, LLC v. Visa U.S.A., Inc., et al.*, No. 04 CV 97844 (BSJ) (DFE), United States District Court, Southern District of New York. Deposition testimony, November 9 and 10, 2007.

In the Matter of Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Radio Services, Docket No. 2006-1 CRB DSTRA, Before the Copyright Royalty Judges, Librarian of Congress. Deposition testimony, August 11, 2007. Trial testimony, August 21, 2007.

Hewlett-Packard Company v. Factory Mutual Insurance Company, Case No. 04-CV-02791 (TPG) : (ECFCASE), United States District Court, Southern District Of New York. Deposition testimony, June 28, 2007.

The Procter & Gamble Company, et al. vs. Randy L. Haugen, et al., Case No. 1:95-CV-0094W (DKW), United States District of Utah, Northern Division. Trial testimony, March 9 and 12, 2007.

State of Colorado, et al. v. Warner Chilcott Holdings Company III, LTD., et al., Civil Action No. 1:05CV02182 (CKK), United States District Court for the District of Columbia. Deposition testimony, January 19, 2007.

Barbara Schwab, et al. v. Philip Morris USA, Inc., Case No. CV-04-1945 (JBW) (SMG), United States District Court for the Eastern District of New York. Deposition testimony, March 23, March 24, May 18, and August 21, 2006.

Appendix C

Documents Relied Upon

DOCUMENTS RELIED UPON

A. Academic Articles and Books

1. Dahan, Ely, and John R. Hauser, "The Virtual Customer," *Journal of Product Innovation Management*, 19, 2002, pp. 332-353.
2. Gabriel M. Gelb and Betsy D. Gelb, "Internet Surveys for Trademark Litigation: Ready or Not, Here They Come," *The Trademark Reporter*, 97, 5, September-October, 2007, p. 1073.
3. Glen L. Urban and John R. Hauser, *Design and Marketing of New Products*, (Englewood Cliffs, NJ; Prentice-Hall, Inc.), 1980.
4. Goodman, Leo A., "On the exact variance of products," *Journal of the American Statistical Association*, December 1960, 708-713.
5. Griffin, Abbie and John R. Hauser, "The Voice of the Customer," *Marketing Science*, Vol. 12, No. 1, Winter 1993, pp. 1-27.
6. Hauser, John R., Olivier Toubia, Theodoros Evgeniou, Rene Befurt, and Daria Dzyabura, "Disjunctions of Conjunctions, Cognitive Simplicity and Consideration Sets," *Journal of Marketing Research*, Vol. 47, June 2010, pp. 485-496.
7. Sawyer, Alan G., "Demand Artifacts in Laboratory Experiments in Consumer Research," *Journal of Consumer Research*, 1, 4, March 1975, pp. 20-30.
8. Shrimp, Terence A., Eva M. Hyatt, and David J. Snyder, "A Critical Appraisal of Demand Artifacts in Consumer Research," *Journal of Consumer Research*, 18, 3, December 1991, pp. 273-283.
9. Smith, D.M., N. Schwarz, T.R. Roberts, and P.A. Ubel, "Why are you calling me? How study introductions change response patterns," *Quality of Life Research*, 15, 2006, pp. 621-630.
10. Robert H. Thornburg, Trademark Surveys: Development of Computer-Based Survey Methods, *4 J. Marshall Rev. Intell. Prop. L. 91* (2005).

11. Toubia, Olivier, Duncan I. Simester, John R. Hauser, and Ely Dahan, "Fast Polyhedral Adaptive Conjoint Estimation," *Marketing Science*, 22, 3, Summer 2003, 273-303.
12. Toubia, Olivier, John Hauser and Rosanna Garcia, "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application," *Marketing Science*, Vol. 26, No. 5, September-October, 2007, pp. 596-610.
13. Urban, Glen L., and John R. Hauser, "'Listening-In' to Find and Explore New Combinations of Customer Needs," *Journal of Marketing*, Vol. 68, No. 2, April 2004, pp. 72-87.

B. Other Publications

1. Diamond, Shari S., "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Third Edition, Federal Judicial Center, 2011.

C. Websites

1. CAPTCHA: Telling Humans and Computers Apart Automatically," CAPTCHA, http://www.captcha.net/, visited on October 5, 2011.
2. "Charles Coolidge Parlin - Marketing Research Award," American Marketing Association, http://www.marketingpower.com/Calendar/Pages/CharlesCoolidgeParlinAward.aspx, visited on April 19, 2011.
3. e-Rewards, Inc. Announces Agreement to Acquire Peanut Labs," Research Now, September 27, 2010, http://www.researchnow.com/en-US/PressAndEvents/News/2010/10/Peanut%20Labs%20Aquisition.aspx, visited on October 5, 2011.
4. "The Paul D. Converse Awards," American Marketing Association, http://www.marketingpower.com/Community/ARC/Pages/Career/Awards/Converse.aspx, visited on March 28, 2011.
5. "Previous Recipients," 16th Paul D. Converse Marketing Symposium, http://business.illinois.edu/converse/previous.htm, visited on April 20, 2011.

6. "2009 Charles Coolidge Parlin Marketing Research Award," American Marketing Association, January 14, 2009, http://www.marketingpower.com/ResourceLibrary/Pages/MarketingThoughtLeaders/MarketingThoughtLeaders11409/Parlin_Marketing_Research_Award.aspx, visited on April 14, 2011.
7. http://www.ams-inc.com.
8. www.bernett.com.
9. http://www.internetworldstats.com/stats14.htm , visited on 10/6/2010.
10. http://www.researchnow.com/en-gb/Panels/PanelQuality/ResearchIntegrity.aspx, visited on November 2, 2011.

D. Expert Reports

1. Expert Report of John R. Hauser, 2007.

E. Other Documents

1. Email from Laurence N. Gold at Inside Research, 10/15/10.
2. Final Determination of Rates and Terms in the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, 1/10/08.
3. Sirius XM Consolidated – Package Report, November 23, 2010, sheet "Consolidated Plan Detail."

Appendix D

Survey Instrument
(Screen Shots and Microsoft Word Version)

Intro 1

Thank you for agreeing to participate in this study.

All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. If you don't know an answer or don't have an answer to a particular question, please choose "Don't know/Unsure."

Please press the ">>" button at the bottom of the page to begin. DO NOT USE the "back" and "forward" buttons on your browser.

>>

0% 25% 50% 75% 100%

SCREENING QUESTIONS

S0.



click here for different image

Please enter the code exactly as it appears in the image above, and then click ">>" to continue.

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0% 25% 50% 75% 100%

S1.

In which state do you currently reside?

(Select One)

Please select your answer

>>

0% 25% 50% 75% 100%

S3.

What is your gender?

(Select One)

- ○ Male
- ○ Female

>>

0% 25% 50% 75% 100%

S4.

Which of these groups includes your age?

(Select One)

- ○ Under 18 years of age
- ○ 18 – 24
- ○ 25 – 34
- ○ 35 – 49
- ○ 50 – 64
- ○ 65 or older
- ○ Refused

>>

0% 25% 50% 75% 100%

S5.

What type of electronic device are you using to complete this survey?

(Select One)

- ○ Laptop computer
- ○ Tablet computer (e.g., iPad)
- ○ iPhone
- ○ Desktop computer
- ○ Blackberry
- ○ Other mobile or electronic device

>>

0% 25% 50% 75% 100%

S6.

Are you, or are any members of your household, employed in any of the following industries?

(Select All That Apply)

- ☐ A music recording studio or owner of copyrighted music
- ☐ A market research firm or public relations (PR) agency
- ☐ An internet service provider
- ☐ A satellite radio company
- ☐ An insurance company
- ○ None of these

>>

0% 25% 50% 75% 100%

S7.

To which of these services, if any, does your household currently subscribe?

(Select All That Apply)

- ☐ Cable TV
- ☐ Broadband (high-speed) Internet
- ☐ Satellite TV
- ☐ Satellite radio
- ○ Don't Know / Unsure
- ○ None of these

>>

0% 25% 50% 75% 100%

S8.

Which of the following best describes your role in making decisions about your satellite radio subscription(s)?

(Select One)

- ○ You make the decision yourself
- ○ You play a substantial role in the decision
- ○ You play a minor role in the decision
- ○ You are not involved in the decision
- ○ Don't Know/Unsure

>>

0% 25% 50% 75% 100%

S9.

Which of the following type(s) of satellite radio subscriptions does your household currently have?

(Select All That Apply)

- ☐ A trial subscription (e.g., available with the purchase of some new cars) directly from SiriusXM, Sirius, or XM
- ☐ A paid subscription directly from SiriusXM, Sirius, or XM
- ☐ SiriusXM, Sirius, or XM as part of a package from a third party (such as through DirecTV, DiSH Network or AOL)
- ○ Don't Know/Unsure

>>

0% 25% 50% 75% 100%

S9A.

How many paid satellite subscriptions from SiriusXM, Sirius, or XM do you currently have?

(Select One)

- ○ One
- ○ More than one
- ○ Don't know/Unsure

>>

0% 25% 50% 75% 100%

Please think about the paid subscription you have had the longest. This subscription will be referred to as your ***primary*** subscription in the following questions.

>>

0% 25% 50% 75% 100%

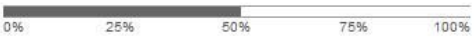
S10.

What type of satellite radio receiver(s) do you or others in your household listen to for your primary satellite radio subscription?

(Select All That Apply)

- ☐ A computer (i.e., listen to SiriusXM, Sirius, or XM radio over the Internet)
- ☐ A receiver for use around your home, car, or boat or a portable satellite receiver unit that can be used anywhere
- ☐ A cell phone (i.e., listen to SiriusXM, Sirius, or XM radio over the Internet)
- ○ Don't Know /Unsure

>>



S11.

Is your primary satellite radio subscription XM or Sirius?

(Select One)

- ○ Sirius
- ○ XM
- ○ Don't Know/Unsure

>>

0% 25% 50% 75% 100%

S12.

Does your primary satellite radio subscription include a range of programming channels (e.g., music, sports, talk and entertainment, comedy, news, traffic, and weather), or just a limited subset of channels (e.g., sports and talk only, family-friendly only, mostly music only), or do you not know?

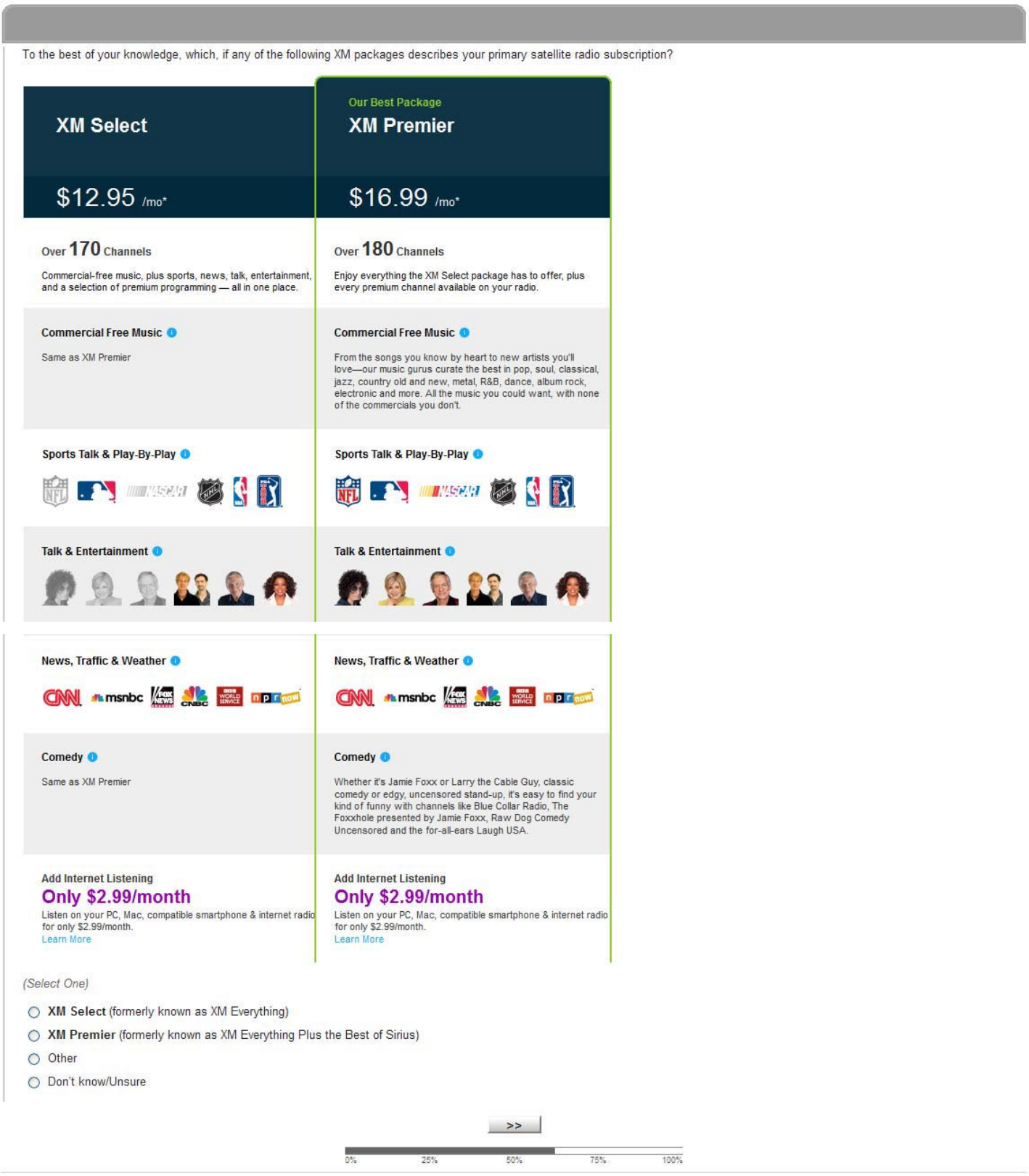
(Select One)

- ○ A subset of channels only (e.g., sports and talk only, family-friendly only, mostly music only)
- ○ A range of programming channels (e.g., music, sports, traffic, weather, talk, entertainment, and comedy)
- ○ Don't Know/Unsure

>>

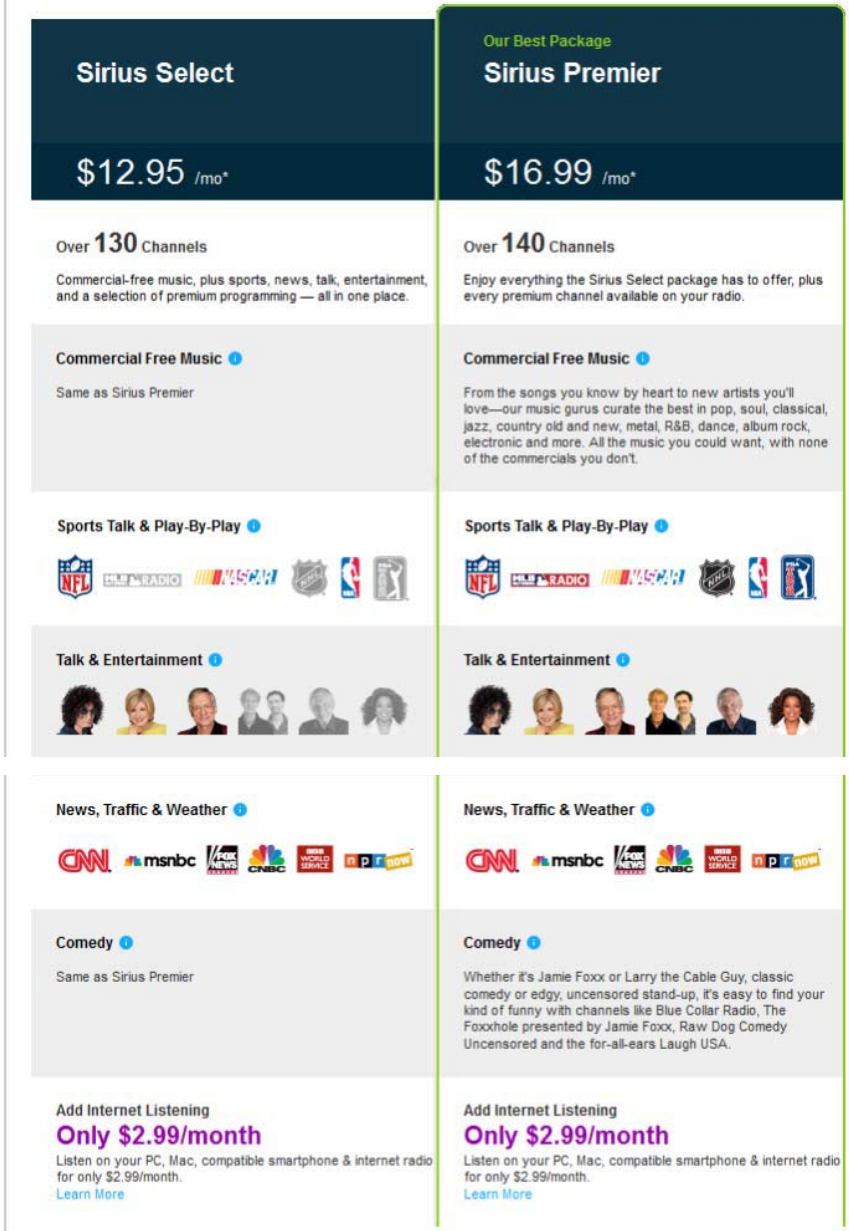
0% 25% 50% 75% 100%

S13A.


To the best of your knowledge, which, if any of the following XM packages describes your primary satellite radio subscription?
XM Select
$12.95 /mo*
Our Best Package
XM Premier
$16.99 /mo*
Over 170 Channels
Commercial-free music, plus sports, news, talk, entertainment, and a selection of premium programming — all in one place.
Over 180 Channels
Enjoy everything the XM Select package has to offer, plus every premium channel available on your radio.
Commercial Free Music
Same as XM Premier
Commercial Free Music
From the songs you know by heart to new artists you'll love—our music gurus curate the best in pop, soul, classical, jazz, country old and new, metal, R&B, dance, album rock, electronic and more. All the music you could want, with none of the commercials you don't.
Sports Talk & Play-By-Play
Sports Talk & Play-By-Play
Talk & Entertainment
Talk & Entertainment
News, Traffic & Weather
News, Traffic & Weather
Comedy
Same as XM Premier
Comedy
Whether it's Jamie Foxx or Larry the Cable Guy, classic comedy or edgy, uncensored stand-up, it's easy to find your kind of funny with channels like Blue Collar Radio, The Foxxhole presented by Jamie Foxx, Raw Dog Comedy Uncensored and the for-all-ears Laugh USA.
Add Internet Listening
Only $2.99/month
Listen on your PC, Mac, compatible smartphone & internet radio for only $2.99/month.
Learn More
Add Internet Listening
Only $2.99/month
Listen on your PC, Mac, compatible smartphone & internet radio for only $2.99/month.
Learn More
(Select One)
XM Select (formerly known as XM Everything)
XM Premier (formerly known as XM Everything Plus the Best of Sirius)
Other
Don't know/Unsure
>>
0%
25%
50%
75%
100%

S13B.

To the best of your knowledge, which, if any of the following Sirius packages describes your primary satellite radio subscription?



(Select One)

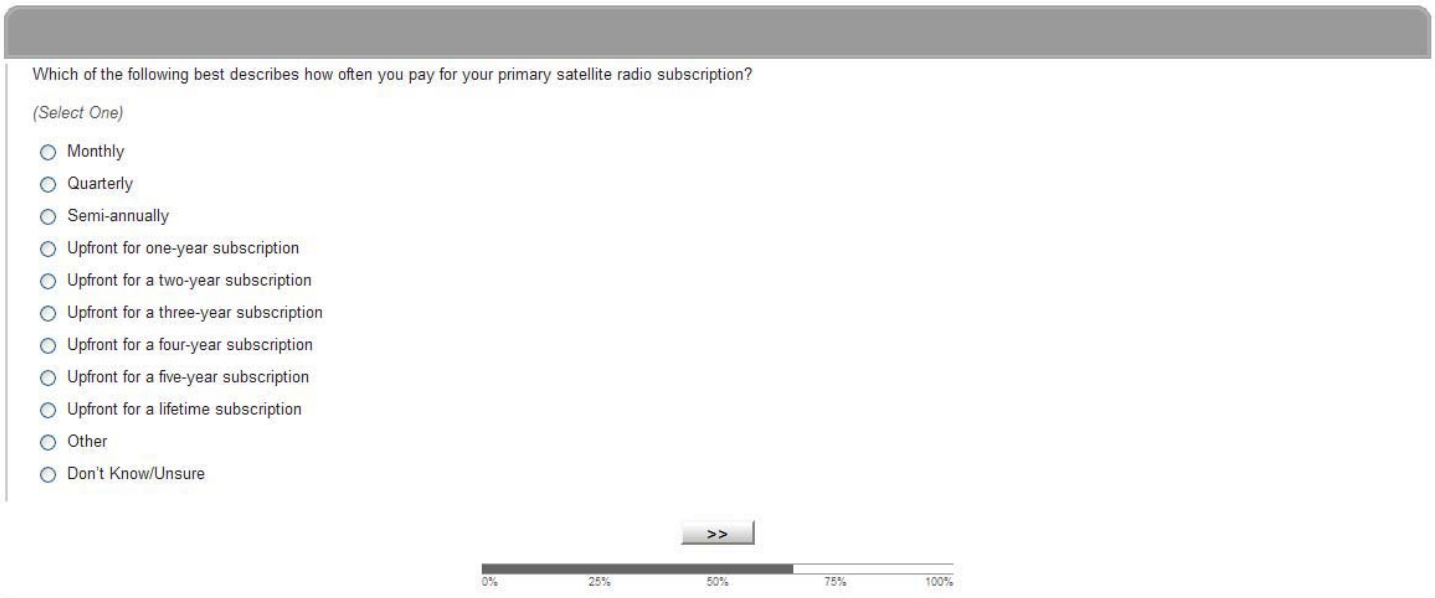
- ○ **Sirius Select** (formerly known as Sirius Everything)
- ○ **Sirius Premier** (formerly known as Sirius Everything Plus the Best of XM)
- ○ Other
- ○ Don't know/Unsure

>>

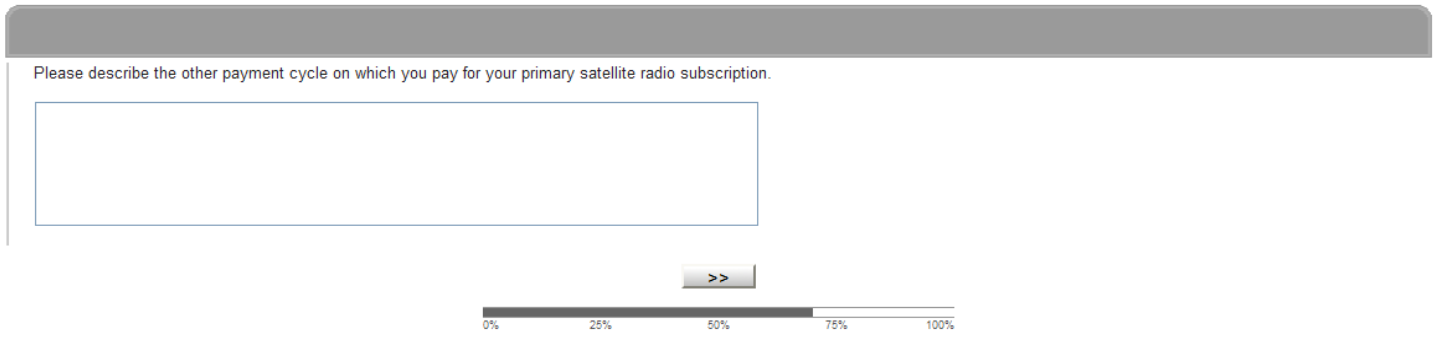
0% 25% 50% 75% 100%

MAIN QUESTIONNAIRE - PRICING SECTION

Q1.



Q2.



Q3.

The standard price for your primary **Sirius Premier** (formerly known as Sirius Everything Plus the Best of XM) satellite radio subscription on a monthly basis is **$16.99 per month**. This price does not include any taxes, promotional discounts, multiple receiver discounts, fees, or add-on services such as Internet listening.

Are you currently paying the standard price of **$16.99 per month** for your primary satellite radio subscription, or are you on a special promotional price that lowers the cost of your subscription for a limited period of time (e.g., introductory promotion or a "win your business back" promotion)?

(Select One)

- ○ Promotional price
- ○ Standard price
- ○ Don't Know/Unsure

>>

Q4.

Please describe the promotional pricing offer and amount, if possible.

>>

Q5.

Would you be willing to pay the standard price of $16.99 per month for your current Sirius package when the promotional period ends or would you cancel your subscription when the promotional period ends?

(Select One)

- ○ No, I would cancel my subscription when the promotional period ends
- ○ Yes, I would continue to subscribe and pay the standard price
- ○ Don't Know/Unsure

>>

Q6.

You just indicated that you would cancel your satellite radio service if the price were $16.99 per month. What is the most you would be willing to pay ***monthly*** for your primary satellite radio subscription before deciding it was too expensive; in other words, if the price was any higher you would cancel your subscription?

(Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents.)

$ [ ] per month

☐ Don't Know/Unsure

>>

Q7.

Next, you will be asked a series of seven (7) questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s).

When giving your answers, please think only about your primary subscription for satellite radio that you listen to over the satellite radio receiver. Do not consider any satellite radio programming that you listen to over the Internet on a computer or on a cell phone.

>>

Q7a

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels ***AND***
There was no sports coverage available, not even your favorite teams ***AND***
There were as many commercials as on AM or FM Radio ***AND***
You couldn't listen to the same stations everywhere

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7b

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to

Please assume that all other aspects of satellite radio would remain the same.

You might decide that you are still willing to pay $10.00 per month, you might decide that you are willing to pay less than $10.00 per month, or you may choose to no longer pay for this satellite radio subscription. Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents. If you would no longer be willing to pay for this satellite radio subscription, please enter '0.00."

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7c

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels ***AND***
There was no sports coverage available, not even your favorite teams ***AND***
There were as many commercials as on AM or FM Radio

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7d

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7e

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels ***AND***
There was no sports coverage available, not even your favorite teams ***AND***
There were as many commercials as on AM or FM Radio ***AND***
You couldn't listen to the same stations everywhere ***AND***
There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7f

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels ***AND***
There was no sports coverage available, not even your favorite teams

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q7g

How much would you pay per month for satellite radio if...

Sound quality was only equal to that of standard FM radio you can listen to ***AND***
There was no music available, not even your favorite channels ***AND***
There was no sports coverage available, not even your favorite teams ***AND***
There were as many commercials as on AM or FM Radio ***AND***
You couldn't listen to the same stations everywhere ***AND***
There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts ***AND***
There were no news, weather or traffic reports available

Please assume that all other aspects of satellite radio would remain the same.

Instead of $10.00 per month, I would pay $ [ ] per month.

>>

Q8.

Now let's go back to thinking about your package that exists today (disregarding the questions when you were asked to state a price if aspects of satellite radio service were missing).

You indicated earlier that you currently pay the standard price of $16.99 per month for your current Sirius package.

What is the most you would be willing to pay ***monthly*** for your primary satellite radio subscription before deciding it was too expensive; in other words, if the price was any higher you would cancel your subscription?

Your answer can be the same as what you are currently paying or higher.

(Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents.)

$ [ ] per month

☐ Don't Know/Unsure

>>

MAIN QUESTIONNAIRE - IMPORTANCE SECTION

Now, think about the music that can be found on satellite radio. After a song has been written, it can be recorded many times, by the same artist or different artists. Some examples include classical music being recorded and released long after it was originally composed, popular artists releasing cover versions of previously recorded songs, and technology advances making it possible to re-release music with improved sound quality.

Once again, when giving your answers to the following questions, please think only of satellite radio that you listen to over the satellite receiver. Do not consider any satellite radio programming that you listen to over the Internet on a computer or on a cell phone.

>>

Q9.

Please allocate 100 percentage points based on the relative importance of each statement below regarding your decision to subscribe to satellite radio. Make sure the total adds up to 100%. If you don't know or are unsure, please check the box.

(Enter whole numbers only – do not use decimal points or other punctuation.)

I can listen to music that was recorded and released (not necessarily composed/written) before 1970 ____

I can listen to music that was recorded and released (not necessarily composed/written) from 1970 through today ____

= 0

☐ Don't Know/Unsure

>>

MAIN QUESTIONNAIRE – GENRE SECTION

Q10.

Which of the following music genres do you or members of your household listen to regularly on a satellite radio receiver, as opposed to listening to satellite radio over the Internet on a computer or on a cell phone?

(Select All That Apply)

- ☐ Country
- ☐ Classical
- ☐ Hip-Hop/R&B
- ☐ Christian
- ☐ Rock
- ☐ Jazz/Standards
- ☐ Dance/Electronic
- ☐ Pop
- ○ None of these

>>

Q11.

Please allocate 100 percentage points according to how important it is to have each of the following genres of music available to you on satellite radio, even if personally, you don't currently listen to it. Make sure the total adds up to 100%.

(Enter whole numbers only – do not use decimal points or other punctuation.)

Country	
Classical	
Hip-Hop/R&B	
Christian	
Rock	
Jazz/Standards	
Dance/Electronic	
Pop	
=	0

>>

Q12.

And finally, how many online surveys, including this one, have you completed in the past 3 months with Research Now (also known as e-Rewards) and any other survey panel provider?

(Select One)

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10
- ○ More than 10

>>

Q13.

Please indicate your best estimate of how many surveys, including this one, you have completed in the past 3 months with Research Now (also known as e-Rewards) and any other survey panel provider?

>>

Broadcast Survey- FINAL – 09.15.11- (Market Price/Subscribers)

Thank you for agreeing to participate in this study.

All of your answers will remain strictly confidential. No one will attempt to sell you anything as a result of participating in this study. If you don't know an answer or don't have an answer to a particular question, please choose "Don't know/Unsure."

Please press the >> button at the bottom of the page to begin. DO NOT USE the "back" and "forward" buttons on your browser.

SCREENING QUESTIONS

S0. **[INSERT CAPTCHA]**

Please enter the code exactly as it appears in the image above, and then click ">>" to continue.

S1. In which state do you currently reside? (Select One) **[DROP DOWN MENU OF 50 STATES + DC. INCLUDE A TERMINATING OPTION FOR "State/Region not listed"]**

S2. **[HIDDEN VARIABLE FOR REGION. DETERMINE US CENSUS REGION BASED ON STATE SELECTED IN S1.]**

S3. What is your gender? (Select One)

Male	1	**[CONTINUE]**
Female	2	**[CONTINUE]**

S4. Which of these groups includes your age? (Select One)

Under 18 years of age	1	**[TERMINATE]**
18 – 24	2	**[CONTINUE]**
25 – 34	3	
35 – 49	4	
50 – 64	5	
65 or older	6	
Refused	7	**[TERMINATE]**

[TERMINATE IF SELF-REPORTED GENDER (S3) and AGE (S4) DO NOT MATCH PARAMETERS PASSED TO THE SURVEY BY PANEL PROVIDER]

[NOTE: GENDER, REGION, and AGE BRACKETS WILL BE CLICK BALANCED TO U.S. CENSUS STATS.]

S5. What type of electronic device are you using to complete this survey? (Select One) **[RANDOMIZE LIST]**

Desktop computer	1	**[CONTINUE]**
Laptop computer	2	
Tablet computer (e.g., iPad)	3	
iPhone	4	**[TERMINATE]**
Blackberry	5	
Other mobile or electronic device **[ANCHOR]**	6	

S6. Are you, or are any members of your household, employed in any of the following industries? (Select All That Apply) **[RANDOMIZE]**

A satellite radio company	1	**[TERMINATE]**
A music recording studio or owner of copyrighted music	2	
A market research firm or public relations (PR) agency	3	**[CONTINUE]**
An internet service provider	4	
An insurance company	5	
None of these **[EXCLUSIVE - DESELECT OTHERS] [ANCHOR]**	6	

S7. To which of these services, if any, does your household currently subscribe? (Select All That Apply) **[RANDOMIZE LIST EXCEPT FOR NONE/DK/UNSURE]**

Satellite radio	1	**[CONTINUE]**
Satellite TV	2	**[TERMINATE UNLESS '1' IS SELECTED]**
Broadband (high-speed) Internet	3	
Cable TV	4	
Don't Know / Unsure **[EXCLUSIVE]**	5	
None of these **[EXCLUSIVE]**	6	

S8. Which of the following best describes your role in making decisions about your satellite radio subscription(s)? (Select One) **[ROTATE TOP TO BOTTOM /BOTTOM TO TOP]**

You make the decision yourself	1	**[CONTINUE]**
You play a substantial role in the decision	2	
You play a minor role in the decision	3	**[TERMINATE]**
You are not involved in the decision	4	
Don't Know/Unsure **[ANCHOR]**	5	

S9. Which of the following type(s) of satellite radio subscriptions does your household currently have? (Select All That Apply) **[RANDOMIZE]**

A paid subscription directly from SiriusXM, Sirius, or XM	1	**[CONTINUE]**
A trial subscription (e.g., available with the purchase of some new cars) directly from SiriusXM, Sirius, or XM	2	**[TERMINATE UNLESS '1' IS SELECTED]**
SiriusXM, Sirius, or XM as part of a package from a third party (such as through DirecTV, DiSH Network or AOL)	3	
Don't Know/Unsure **[DESELECT OTHERS] [ANCHOR]**	4	**[TERMINATE]**

S9A. How many paid satellite subscriptions from SiriusXM, Sirius, or XM do you currently have? (Select One)

One	1	**[SKIP TO S10]**
More than one	2	**[CONTINUE TO INTRO BELOW]**
Don't know/Unsure	3	**[CONTINUE TO INTRO BELOW]**

Please think about the paid subscription you have had the longest. This subscription will be referred to as your ***primary*** subscription in the following questions.

S10. What type of satellite radio receiver(s) do you or others in your household listen to for your [FILL "primary" if S9A = 2, 3] satellite radio subscription? (Select All That Apply) **[RANDOMIZE]**

A receiver for use around your home, car, or boat or a portable satellite receiver unit that can be used anywhere	1	**[CONTINUE]**
A computer (i.e., listen to SiriusXM, Sirius, or XM radio over the Internet)	2	**[TERMINATE UNLESS '1' IS SELECTED]**
A cell phone (i.e., listen to SiriusXM, Sirius, or XM radio over the Internet)	3	
Don't Know /Unsure **[DESELECT OTHERS][ANCHOR]**	4	**[TERMINATE]**

S11. Is your [FILL "primary" if S9A = 2, 3] satellite radio subscription XM or Sirius? (Select One) **[ROTATE XM AND SIRIUS]**

XM	1	**[CONTINUE- USE THIS TO FILL IMAGE FOR S13A]**
Sirius	2	**[CONTINUE- USE THIS TO FILL IMAGE FOR S13B]**
Don't Know/Unsure	3	**[TERMINATE]**

S12. Does your [FILL "primary" if S9A= 2, 3] satellite radio subscription include a range of programming channels (e.g., music, sports, talk and entertainment, comedy, news, traffic, and weather), or just a limited subset of channels (e.g., sports and talk only, family-friendly only, mostly music only), or do you not know? (Select One) **[RANDOMIZE]**

A range of programming channels (e.g., music, sports, traffic, weather, talk, entertainment, and comedy)	1	**[CONTINUE TO S13A IF S11=1, SKIP TO S13B IF S11=2]**
A subset of channels only (e.g., sports and talk only, family-friendly only, mostly music only)	2	**[TERMINATE]**
Don't Know/Unsure **[ANCHOR]**	3	**[TERMINATE]**

S13A. To the best of your knowledge, which, if any of the following XM packages describes your [FILL "primary" if S9A= 2, 3] satellite radio subscription? (Select One) **[RANDOMIZE FORWARD OR REVERSE ORDER OF 1-2. ORDER OF IMAGES SHOULD MATCH THE ORDER OF OPTIONS.]**



XM Premier (formerly known as XM Everything Plus the Best of Sirius)	1	**[CONTINUE]**
XM Select (formerly known as XM Everything)	2	
Other **[ANCHOR]**	3	**[TERMINATE]**
Don't Know/Unsure **[ANCHOR]**	4	**[TERMINATE]**

S13B. To the best of your knowledge, which, if any of the following Sirius packages describes your [FILL "primary" if S9A= 2, 3] satellite radio subscription? (Select One) **[RANDOMIZE FORWARD OR REVERSE ORDER OF 1-2. ORDER OF IMAGES SHOULD MATCH THE ORDER OF OPTIONS.]**



Sirius Premier (formerly known as Sirius Everything Plus the Best of XM)	1	**[CONTINUE]**
Sirius Select (formerly known as Sirius Everything)	2	
Other **[ANCHOR]**	3	**[TERMINATE]**
Don't Know/Unsure **[ANCHOR]**	4	**[TERMINATE]**

MAIN QUESTIONNAIRE - PRICING SECTION

Q1. Which of the following best describes how often you pay for your [FILL "primary" if S9A= 2, 3] satellite radio subscription? (Select One)

Monthly	1	[SKIP TO Q3]
Quarterly	2	
Semi-annually	3	[TERMINATE]
Upfront for one-year subscription	4	[SKIP TO Q3]
Upfront for a two-year subscription	5	
Upfront for a three-year subscription	6	
Upfront for a four-year subscription	7	[TERMINATE]
Upfront for a five-year subscription	8	
Upfront for a lifetime subscription	9	
Other	10	[CONTINUE]
Don't Know/Unsure	11	[TERMINATE]

Q2. Please describe the other payment cycle on which you pay for your [FILL "primary" if S9A= 2, 3] satellite radio subscription. [OPEN END]

[CAPTURE RESPONSE THEN TERMINATE]

Q3. The standard price for your **[FILL "primary" if S9A= 2, 3] [INSERT ANSWER FROM EITHER S13A OR S13B]** satellite radio subscription on **[FILL "a" for Monthly and Quarterly OR "an" for Upfront] [INSERT FILL FROM Q1]** basis is **[FILL WITH ANCHOR FROM CHART BASED ON ANSWER TO Q1].** This price does not include any taxes, promotional discounts, multiple receiver discounts, fees, or add-on services such as Internet listening.

ANCHOR PRICE	
SELECT	**1 Receiver**
Monthly	**$12.95 per month**
Quarterly	$38.85, which is **$12.95 per month**
Upfront for one-year subscription	$142.45, which is a discounted price of **$11.87 per month**
Upfront for a two-year subscription	$271.95, which is a discounted price of **$11.33 per month**
Upfront for a three-year subscription	$401.45, which is a discounted price of **$11.15 per month**
PREMIER	**1 Receiver**
Monthly	**$16.99 per month**
Quarterly	$50.97, which is **$16.99 per month**
Upfront for one-year subscription	$186.89, which is a discounted price of **$15.57 per month**
Upfront for a two-year subscription	$356.79, which is a discounted price of **$14.87 per month**
Upfront for a three-year subscription	$526.69, which is a discounted price of **$14.63 per month**

Are you currently paying the standard price of **[FILL FROM ANCHOR PRICE GIVING BOTH PRICE AND MONTHLY PRICE BASED ON ANSWER TO Q1]** for your **[FILL "primary" IF S9A=2, 3]** satellite radio subscription, or are you on a special promotional price that lowers the cost of your subscription for a limited period of time (e.g., introductory promotion or a "win your business back" promotion)? (Select One) **[RANDOMIZE]**

Standard price	1	**[SKIP TO Q7]**
Promotional price	2	**[CONTINUE]**
Don't Know/Unsure **[ANCHOR]**	3	**[SKIP TO Q5]**

Q4. Please describe the promotional pricing offer and amount, if possible. **[OPEN END]**

Q5. Would you be willing to pay the standard price of **[MONTHLY ANCHOR PRICE]** per month for your current **[FILL IF S11=1** "XM"**, IF S11=2** "Sirius"**]** package **[FILL** "when the promotional period ends" **ONLY IF Q3=2]** or would you cancel your subscription **[FILL** "when the promotional period ends" **ONLY IF Q3=2]**? (Select One) **[RANDOMIZE]**

Yes, I would continue to subscribe and pay the standard price	1	**[SKIP TO Q7]**
No, I would cancel my subscription **[FILL** "when the promotional period ends" **ONLY IF Q3=2]**	2	**[CONTINUE]**
Don't Know/Unsure **[ANCHOR]**	3	**[TERMINATE]**

Q6. You just indicated that you would cancel your satellite radio service if the price were **[MONTLY ANCHOR PRICE]**. What is the most you would be willing to pay ***monthly*** for your **[FILL "primary" if S9A= 2, 3]** satellite radio subscription before deciding it was too expensive; in other words, if the price was any higher you would cancel your subscription? *(Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents.)* **[OPEN END] [ALLOW FOR 4 DIGITS. DO NOT ALLOW A RESPONSE OF ZERO (00.00)] [MUST BE < THAN STANDARD MONTHLY AMOUNT PROVIDED IN ANCHOR]**

$ ___ ___ . ___ ___ per month **[NEW ANCHOR FOR Q7 SEQUENCE]**

❑ Don't Know/Unsure **[TERMINATE]**

Q7.

Next, you will be asked a series of seven (7) questions about how much you would be willing to pay for satellite radio under a number of different conditions. These conditions will build upon each other, with each question including all the conditions of the previous question(s).

When giving your answers, please think only about your **[FILL "primary" if S9A= 2, 3]** subscription for satellite radio that you listen to over the satellite radio receiver. Do not consider any satellite radio programming that you listen to over the Internet on a computer or on a cell phone.

[RANDOMIZE THE ORDER IN WHICH CONDITIONS BUILD, INCLUDING NO MUSIC]
[RECORD ORDER OF CONDITIONS]
[Q7a-Q7g SHOULD BE SHOWN ON SEPARATE SCREENS]
[HAVE MOST RECENTLY ADDED CONDITION APPEAR IN BOLD]
[SHOW PRICING FROM PREVIOUS CONDITION] Error message should read: 'Response must be less than or equal to [INSERT PRICE FROM PREVIOUS CONDITION].' AND/OR 'Please enter as a dollar amount - response must include exactly two decimal places (e.g., 12.50, 11.00, 0.00).'
[IF ANY Q7a-Q7f=0, CONTINUE TO Q8 OR SKIP TO Q9 IF Q5=2 or 3]
[MONTHLY ANCHOR PRICE COMES FROM Q3 UNLESS REPSONDENT HAS ANSWERED Q6 IN WHICH CASE FILL FROM Q6]

Q7a: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere

Please assume that all other aspects of satellite radio would remain the same.

FOR FIRST IN THE SERIES, ADD 'You might decide that you are still willing to pay **[FILL MONTHLY ANCHOR PRICE]** per month, you might decide that you are willing to pay less than **[FILL MONTHLY ANCHOR PRICE]** per month, or you may choose to no longer pay for this satellite radio subscription. Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents. If you would no longer be willing to pay for this satellite radio subscription, please enter '0.00.'

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7b: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7c: How much would you pay **per month** for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to AND

There were as many commercials as on AM or FM Radio

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7d: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to AND

There were as many commercials as on AM or FM Radio AND

There was no music available, not even your favorite channels

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7e: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to AND

There were as many commercials as on AM or FM Radio AND

There was no music available, not even your favorite channels AND

There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7f: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to AND

There were as many commercials as on AM or FM Radio AND

There was no music available, not even your favorite channels AND

There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts AND

There was no sports coverage available, not even your favorite teams

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q7g: How much would you pay per month for satellite radio if …

You couldn't listen to the same stations everywhere AND

Sound quality was only equal to that of standard FM radio you can listen to AND

There were as many commercials as on AM or FM Radio AND

There was no music available, not even your favorite channels AND

There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts AND

There was no sports coverage available, not even your favorite teams AND

There were no news, weather or traffic reports available

Please assume that all other aspects of satellite radio would remain the same.

Instead of **[INCLUDE INITIAL MONTHLY ANCHOR PRICE IF ASKED FIRST, OR PREVIOUS ANSWER IN THE SERIES]** per month, I would pay $ _ _._ _ per month. **[OPEN END: $ AMOUNT MUST BE EQUAL or LESS THAN PREVIOUS PRICE]**

Q8. **[ASK ONLY IF Q3=1 OR Q5=1]** Now let's go back to thinking about your package that exists today (disregarding the questions when you were asked to state a price if aspects of satellite radio service were missing).

You indicated earlier that **you [FILL 'currently' IF Q3=1] [FILL 'would be willing to' IF Q3=2 AND Q5=1]** pay the standard price of **[MONTHLY ANCHOR PRICE]** per month for your current **[FILL IF S11=1** "XM"**, IF S11=2** "Sirius"**]** package.

What is the most you would be willing to pay ***monthly*** for your **[FILL "primary" if S9A= 2, 3]** satellite radio subscription before deciding it was too expensive; in other words, if the price was any higher you would cancel your subscription?

[SPLIT THIS SENTENCE OUT FROM THE PREVIOUS PARAGRAPH]

Your answer can be the same as what you are currently paying or higher. *(Please enter a dollar amount - response must contain the dollar amount followed by a decimal point and then cents.)* **[OPEN END] [ALLOW FOR 4 DIGITS] [MUST BE > or = TO AMOUNT PROVIDED IN ANCHOR]**

$ ___ ___ . ___ ___ per month

❑ Don't Know/Unsure

MAIN QUESTIONNAIRE - IMPORTANCE SECTION [ASK ALL]

Now, think about the music that can be found on satellite radio. After a song has been written, it can be recorded many times, by the same artist or different artists. Some examples include classical music being recorded and released long after it was originally composed, popular artists releasing cover versions of previously recorded songs, and technology advances making it possible to re-release music with improved sound quality.

Once again, when giving your answers to the following questions, please think only of satellite radio that you listen to over the satellite receiver. Do not consider any satellite radio programming that you listen to over the Internet on a computer or on a cell phone.

Q9. Please allocate 100 percentage points based on the relative importance of each statement below regarding your decision to subscribe to satellite radio. Make sure the total adds up to 100%. If you don't know or are unsure, please check the box. (Enter whole numbers only – do not use decimal points or other punctuation.) **[ROTATE] [WHOLE NUMBERS BETWEEN 0 and 100, MUST=100%] [ERROR MESSAGE: THE TOTAL MUST EQUAL 100%]**

	SCORE
I can listen to music that was recorded and released (not necessarily composed/written) from 1970 through today	
I can listen to music that was recorded and released (not necessarily composed/written) before 1970	
❑ Don't Know/Unsure	

MAIN QUESTIONNAIRE – GENRE SECTION

Q10. Which of the following music genres do you or members of your household listen to regularly on a satellite radio receiver, as opposed to listening to satellite radio over the Internet on a computer or on a cell phone? (Select All That Apply) **[RANDOMIZE ORDER]**

Pop	1	**[CONTINUE]**
Rock	2	
Hip-Hop/R&B	3	
Dance/Electronic	4	
Country	5	
Christian	6	
Jazz/Standards	7	
Classical	8	
None of these	9	**[SKIP TO Q12]**

Q11. Please allocate 100 percentage points according to how important it is to have each of the following genres of music available to you on satellite radio, even if personally, you don't currently listen to it. Make sure the total adds up to 100%. (Enter whole numbers only – do not use decimal points or other punctuation.) **[RETAIN ORDER FROM Q10 – ELIMINATE OTHER] [WHOLE NUMBERS BETWEEN 0 and 100, MUST=100%] [ERROR MESSAGE: 'The total must equal 100%']**

Pop	
Rock	
Hip-Hop/R&B	
Dance/Electronic	
Country	
Christian	
Jazz/Standards	
Classical	

Q12. And finally, how many online surveys, including this one, have you completed in the past 3 months with Research Now (also known as e-Rewards) and any other survey panel provider? (Select One)

1	1	**[SKIP TO END]**
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	
More than 10	11	**[CONTINUE]**

Q13. Please indicate your best estimate of how many surveys, including this one, you have completed in the past 3 months with Research Now (also known as e-Rewards) and any other survey panel provider? **[NUMERIC INPUT. FORCE A RESPONSE GREATER THAN 10.]**

Those are all of the questions we have for you today. Thank you very much for participating in this study and have a great day.

Appendix E

Invitation to Participate in the Survey

SURVEY INVITATION

Email Subject:
Get Rewarded for Your Time - Study about Consumers

Email Body:
Dear <%First%>,

Based on your e-Rewards(R) profile, you are invited to earn e-Rewards Currency for participating in a research survey. If you qualify and complete the survey:

Full reward amount: $2.50 in e-Rewards Currency

Full survey length: approximately 10 minutes

To complete the survey and earn e-Rewards Currency, simply click the link below, or copy the URL into your browser:

Error! Hyperlink reference not valid.>

We encourage you to respond quickly -- this e-Rewards invitation will be available only until a predetermined number of responses have been received. Please Note: you will only receive e-Rewards credit for taking the survey once.

Continue to check your inbox and your Member home page for future opportunities to earn e-Rewards Currency.

We value your time,
The e-Rewards Team

Appendix F

Screening Statistics

SCREENING STATISTICS

Full Screening Data		
Complete	354	26%
Self-terminated	42	3%
Failed to validate on age or gender	88	6%
Screen: age younger than 18 or refused	1	0%
Screen: taking survey on inappropriate electronic device	83	6%
Screen: works for satellite radio firm, a music recording studio, or holds a music copyright	3	0%
Screen: not a current satellite radio subscriber	296	22%
Screen: not an influential decision maker	98	7%
Screen: only trial or 3rd-party subscription	87	6%
Screen: only computer or cell-phone receiver or don't know	74	5%
Screen: only subscribe to a subset of channels	34	3%
Screen: don't know which is the satellite radio provider	12	1%
Screen: don't know if subscribe to Premier or Select level	80	6%
Screen: Failure to correctly input Captcha	5	0%
Q1: Payment cycle is atypical	52	4%
Q2: Other payment cycle	1	0%
Q5: Not sure re: reservation price/promo	39	3%
Q6: Not sure re: reservation price/non-promo	9	1%
	1358	

Survey Participation Rates		
Qualified and Included	**348**	**26.0%**
Qualified and Excluded, due to:	**6**	**0.4%**
Straight-lining	*6*	*0.4%*
Disqualified due to:	**962**	**70.5%**
Non subscriber	*296*	*21.7%*
Other screener	*578*	*42.4%*
Age/gender not validated	*88*	*6.5%*
Self-terminated, at:	**42**	**3.1%**
Screeners	*36*	*2.6%*
Survey	*6*	*0.4%*
Total Survey Participants	1358	
Total Survey Invitations	13222	

Appendix G

Willingness to Pay for Music Programming on Satellite Radio

WILLINGNESS TO PAY FOR SATELLITE RADIO

Willingness to Pay for Music Programming on Satellite Radio (Base: 348)

Order	Ubiquity of Station Availability	Premium Sound Quality	Freedom from Commercials	Current Levels of Music	Current Levels of Talk/Comedy	Current Levels of Sports	Current Levels of News Weather and Traffic
First	$7.01	$3.63	$7.83	$10.37	$5.20	$3.75	$3.16
Last	$0.05	$0.02	$0.02	$0.51	$0.06	$0.02	$0.00
Overall	$1.97	$1.20	$2.46	$3.24	$1.46	$1.11	$1.03

Conditions in the Questionnaire Corresponding to Satellite Radio Features:
You couldn't listen to the same stations everywhere
Sound quality was only equal to that of standard FM radio you can listen to
There were as many commercials as on AM or FM Radio
There was no music available, not even your favorite channels
There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts
There was no sports coverage available, not even your favorite teams
There were no news, weather or traffic reports available

Appendix H

Confidence Intervals

CONFIDENCE INTERVALS

Willingness to Pay for Music Programming on Satellite Radio (Base: 348)

	95% Confidence Interval	
Ubiquity of Station Availability	1.59	2.36
Premium Sound Quality	0.89	1.50
Freedom from Commercials	2.04	2.87
Current Levels of Music	2.75	3.74
Current Levels of Talk/Comedy	1.13	1.79
Current Levels of Sports	0.82	1.40
Current Levels of News, Weather and Traffic	0.78	1.28

Conditions in the Questionnaire Corresponding to Satellite Radio Features:
You couldn't listen to the same stations everywhere
Sound quality was only equal to that of standard FM radio you can listen to
There were as many commercials as on AM or FM Radio
There was no music available, not even your favorite channels
There weren't any non-music entertainment-talk or comedy shows available, even those with your favorite hosts
There was no sports coverage available, not even your favorite teams
There were no news, weather or traffic reports available

Relative Importance of Post-1970 Music (Base: 339)

	95% Confidence Interval	
Music Recorded and Released from 1970 Through Today	62.15%	67.95%

UNITED STATES COPYRIGHT ROYALTY JUDGES

Washington, D.C.

In the Matter of:	)	
Determination of Rates and Terms	)	Volume VI
Preexisting Subscription	)	
Services and Satellite Digital	)	Pgs 1587-1834
Audio Radio Services.	)	Pgs 1849-1864

Washington, D.C.

Tuesday, June 12, 2012

The following pages constitute the proceedings held in the above-captioned matter, held at the Library of Congress, Madison Building, 101 Independence Avenue, Southeast, Washington, D.C., before Matthew P. Spoutz, Court Reporter, of Capital Reporting Company, a Notary Public in and for the District of Columbia, beginning at 9:30 A.M.

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JUDGE STANLEY C. WISNIEWSKI

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JOHN HAUSER, PH.D.

was called as a witness, and having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. SINGER:

Q Good morning, Dr. Hauser.

A Good morning.

Q By whom are you currently employed?

A I'm employed by MIT, the Massachusetts Institute of Technology.

Q And what is your current position at MIT?

A I am the professor of marketing.

CHIEF JUDGE BARNETT: And, Professor Hauser, before we go too much further, would you state your full name and spell your name for the record, please.

THE WITNESS: My full name is John R. Hauser. J-O-H-N, H-A-U-S-E-R.

CHIEF JUDGE BARNETT: Thank you.

JUDGE WISNIEWSKI: And, Dr. Hauser, how did you come to be associated with Japanese beer?

THE WITNESS: Well, I think the Kirin Company gave MIT a whole bunch of money and --

JUDGE WISNIEWSKI: The usual way then?

THE WITNESS: Actually they are also a pharmaceutical company and soft drinks and tea.

BY MS. SINGER:

Q Dr. Hauser, how long have you been a professor of marketing at MIT?

A I've been at MIT since 1980.

Q I have placed before you what has been identified as SiriusXM Direct Trial Exhibit 24.

Do you see that?

A Yes, I do.

Q And do you recognize Exhibit 24 as your corrected written direct testimony in this proceeding?

A Yes, I do.

Q And is that your signature on the last page of the testimony on page 32?

A Yes.

MS. SINGER: At this time we would like to move into evidence SiriusXM Direct Trial Exhibit 24.

MR. HANDZO: No objection.

MR. CUNNIFF: No objection, Your Honor.

CHIEF JUDGE BARNETT: Exhibit 24 is

admitted.

(SiriusXM Trial Exhibit Number 24 was received into evidence.)

BY MS. SINGER:

Q Dr. Hauser, if you would take a look, please, at Appendix A. Appendix A is your CV that was current as of October 2011; is that correct?

A That's correct.

Q Dr. Hauser, have you previously been qualified as an expert in marketing, market research, and survey design in any Copyright Royalty Board proceeding?

A Yes, I have, in the previous proceedings in 2007.

MS. SINGER: Your Honors, in light of the fact that Dr. Hauser has previously qualified as an expert and in the interest of time, rather than going through the 43 pages of his CV, I'd would like to offer him as an expert in marketing, market research, and survey design.

MR. HANDZO: No objection.

MR. CUNNIFF: No objection.

CHIEF JUDGE BARNETT: Dr. Hauser is so qualified.

BY MS. SINGER:

Q Dr. Hauser, let's turn to the book of demonstratives that you should also have in front of you, and if you look at page 2, would you please tell us what was your assignment in this case?

A Yes. I was asked to conduct an Internet survey to examine the value that current subscribers to satellite radio place on music, other programming, and non-programming features of satellite radio.

In addition, I was asked to parse the value of music for music recorded before and after February 15, 1977.

Q And what did you do to carry out that assignment?

A I carried out an Internet survey.

Q At a very general level, what did your survey results demonstrate?

A Well, at a very general level, it indicated that respondents were willing to pay $3.24 for all types of music currently played on SiriusXM. In

addition, this parses to $2.11 for music from 1970 through today.

Q Have you conducted any similar surveys for any other Copyright Royalty Board proceedings?

A Yes, I did, in 2007.

Q And what were the results of your 2007 survey as compared to this survey?

A The results were really quite similar. In fact, they're not statistically different than what we obtained previously even though some of the methodologies differ in some minor ways.

Q If you would turn to the third slide, please. Can you please describe your approach for parsing the market price of satellite radio among these various features?

A Yes, I can. This is a conceptual diagram and what it indicates is that we first asked people their willingness to pay for a form of satellite radio. In this case it's satellite radio as it currently is: Full availability of stations, sound quality better than FM radio, no commercials, music programming, as well as the other types of programming

on the radio.

We then take away one or more features. In this case we take away music programming and again asked for the willingness to pay.

So in this case if this was the question for an individual, their valuation would be the willingness to pay before the feature was taken away minus the willingness to pay after the feature was gone -- was taken away.

Now, there's a complexity here that's very important and that is that these seven features interact. For example, music and no commercials, music and music quality. So the order on which we take features away matters.

For example, if we take music programming away first, people are going to give us a fairly high value because then you have an XMSirius radio station without music.

On the other hand, if we take away, say, all the other features away first, then you're reduced to something that's not all that different than FM and the residual value of music is very little. So you

get one number if you take it away first, one number if you take it away last.

So in order to get the interactions correctly, what we do is we take away these features in a random order. So initially it's possible to have all possible ordering of these seven really matters, whether music is first, second, third, fourth, fifth, sixth or seventh. So the final value of music is then averaged over all respondents and averaged in a way that it accounts for these interactions among the features.

Q Let's take a look at how that worked in practice. If you could turn to slide 4, please.

What were the basic steps in your survey?

A This, again, is a conceptual diagram. First we qualify the respondents. For example, they have to --

Q Well, let's go through the steps and then we'll go through...

A Okay. So we first qualify respondents, then we determine the current price, then we ask the willingness to pay for features, and then finally we

parse it before and after 1970.

Q So how did you qualify the respondents?

A Well, there's a series of questions in the survey that determined, for example, whether or not they're a SiriusXM customer, what type of service they have, whether or not they're the major decision-maker in the process, that type of -- set of questions so that they're a relevant population.

Q And if we take look at slide 5, we see S8, which stands for screener question eight, correct?

A Yes. These are some of the types of questions. There are others. But this gives an example, for example, where respondents are asked to identify whether or not they are either the decision-maker or they play a substantial role in decision-making.

And as you can see, if they played a minor role or they weren't involved in decisions or if they weren't sure about this, then they were terminated.

In addition, it's very important to use what are known as quasi-filters -- that's a complicated word in the market research industry. It basically

means that we allow them to have answers such as "don't know" or "unsure" to a question. So we really want to avoid guessing for any of these questions.

Q You said the next step was that you determined the current price.

How did you go about doing that?

A Yes. Well, I was asked to parse the market price, and in this case if you turn now to slide 6, they were asked a series of questions. For example, they were shown the various forms of both XM services and Sirius services, asked to identify the service they have. They were also asked whether or not they paid by the month, they paid by the quarter, they paid by the year or they have a lifetime subscription.

And what we then did is from that, by, say, knowing which service they had and the way in which they were paying, even if they were paying the full price, we were able to compute a monthly price so we can have everybody on the same basis so we are comparing apples to apples and oranges to oranges.

Q In determining that price did you include fees and taxes and various other charges?

A No. We found that when consumers thought about this price, they thought about the overall price without the extra fees, without taxes, and we told them that that was the price they should be thinking about.

Q And there has been some testimony earlier in this proceeding about free introductory subscriptions or new car buyers who receive SiriusXM kind of service for an introductory period.

Did you include in your survey population people who weren't paying anything for their subscription?

A No. The survey is limited to people who are actually paying for the service. A few of those pay slightly less than the current price, and we determined that.

Q So your sample, since it didn't include people who weren't paying, may actually be slightly different than the actual market retail price if the average market retail price were calculated including people who weren't actually paying?

A That's right. My sample only includes

people paying, and, hence, the average price will be a little bit above the market price.

Q Now, how does this survey measure a consumer's willingness to pay for a specific feature of satellite radio?

A Well, if we now turn to Exhibit 7, or page 7 of the exhibit, this is an example question --

CHIEF JUDGE BARNETT: Before we go to Exhibit 7, or page 7. On page 6, was this survey conducted subsequent to the merger of Sirius and XM?

THE WITNESS: Yes, it was.

CHIEF JUDGE BARNETT: So buyers of new vehicles had a receiver in the vehicle that was called SiriusXM. So how were they expected to know whether they had Sirius or XM?

THE WITNESS: At the actual time when the survey was conducted in September of 2011 this covered what the currently available options were.

CHIEF JUDGE BARNETT: Well, I purchased a car in August of 2011 and it had a satellite radio in it. It says "XM" on the button, but I've always referred to it as SiriusXM because that's what I hear

coming out of the box.

THE WITNESS: That's right.

CHIEF JUDGE BARNETT: So I wouldn't know unless I'm supposed to rely on Nissan to tell me that it's XM and not Sirius.

THE WITNESS: That's possible. In which case if you didn't know, you would answer "don't know" and there would be a quasi-filter.

CHIEF JUDGE BARNETT: Okay. All right. Thank you.

THE WITNESS: All right.

CHIEF JUDGE BARNETT: Go ahead.

BY MS. SINGER:

Q Dr. Hauser, still looking at page 6 of the demonstrative, is it your understanding that, even though there was a merger, that consumers were still able to purchase one package or another in September of 2011?

A Yes, during September of 2011.

Q So let's go back to the question. How does your survey measure a consumer's willingness to pay for a specific feature?

A Well, now, again, if we turn to page 7 -- I'd like to point out that the survey was done on the Internet and we actually have screen shots in evidence. So this is a typed version, but this gives one of the many rotations.

In this case three options are taken away first. You couldn't listen to the same stations everywhere, sound quality was only equal to standard FM radio, there were as many commercials as on AM and FM radio and then there was no music available. So we would have asked this question before and after music being taken away. And for this particular respondent we would get the number by subtracting the two willingness to pay.

Now, to show you that this builds, on page 8 we are continuing to build that question and then finally at the end you can see that we take away in this case there were no news, weather, or traffic reports available. So in some cases music would have been taken away last, in some cases it would have been taken away first. In fact, all the orders were a priority equally likely.

Q And in the actual survey a consumer would have seen this question seven times with one additional feature each time the question was presented?

A That's right, each consumer would have the features taken away one at a time, and that allows us to actually compute the willingness to pay for each of the features.

Q How did you choose these seven factors?

A Well, primarily these are roughly equivalent to the seven features that I testified about in 2007. We did talk to a few consumers to make sure the wording was updated, you know, the world has changed a little bit, and we did pre-test the survey.

But overall I believe it's a fairly complete set of questions -- set of features, but very similar to the prior survey.

Q Did you do anything to confirm that your survey included that these seven features were the most important seven features?

A Well, in addition to the pre-tests, it would actually look at what would be the residual value.

The amount that's left after the seven features are taken away is really very small.

For example, in 95 percent of the people the residual value is less than 25 cents relative to the $12.95, and, you know, the average is actually much less than that. So even if we did leave a few features out, they don't have a lot of residual value.

Q Now, how did you calculate the $3.24 number?

A Well, if we turn now to page 9, and I think this sort of indicates again if you take away music first, you do get a large number. In this case, out of roughly $12.95, music is worth about $10.37. And if you take it away last, the service has been degraded to a point the music now is worth only about 51 cents. That is not a lot to be taken away later.

If you now look at an average over all respondents of how they answered to each of these questions -- now, remember the questions were A priority randomized -- then if you average across those respondents, you get $3.24. And that takes into account the fact that these features interact.

Q You mentioned that the second part of your

assignment was to parse the value of music before and after 1970.

Why did you do that?

A Well, my understanding is that the music rights at issue in this case are for music recorded on or after February 15th, 1972. However, when talking to consumers, they tend to think in decades, so it is a very natural question to ask it before and after 1970.

This, of course, would favor SoundExchange a little bit in that we include those two extra years in the measurement for the parsing.

Q And how did you go about parsing the value of music before and after 1970?

A Well, it was actually a very simple question. After a preamble -- and the preamble is in evidence, but we can talk about it -- they were described the situation and then they were asked to allocate a hundred percentage points between music before -- actually they listened to music that was recorded and released, not necessarily composed and written, from 1970 through today versus I can listen

to music that was recorded and released but not necessarily composed and written before 1970. And so they would allocate a hundred percentage points between this. And, of course, there is a quasi-filter here if they didn't feel they could answer the question, they could check "don't know" or "unsure."

Q What were the results of this question number 9, the parsing question?

A Well, now, if we turn to page 11, which is the summary, again, $3.24, the average willingness to pay for music programming, the answer to the parsing question was 65.1 percent averaged across individuals, and if you multiply those together you get an estimate of $2.11.

Q Dr. Hauser, did you do anything to ensure that your survey and the methodology was reliable?

A Yes, I did. I followed as many standard scientific methods as feasible. Here's just a few. For example, the survey was double-blind; we used filters to eliminate respondents who weren't relevant, who didn't have an opinion; we used quasi-filters to avoid guessing. We were basically following standard

scientific procedures to try and make the survey as reliable and valid as possible.

Q Did you use the Internet for your survey I think you mentioned?

A Yes. These days the Internet is really widely used for market research. The Internet has some advantages. It avoids interviewer bias, it sort of creates a blind environment. The courts certainly have accepted the results of Internet surveys.

Indeed, I testified, I think it was in October in Federal Court, on an Internet survey also with the same panel provider, and there's a lot of other cases where Internet surveys have been accepted.

The way this works is there is a panel maintained by companies, large panel companies. In this case we used Research Now, which is a high-quality supplier of respondents.

Research Now, for example, maintains an invitation-only panel of over 3.6 million consumers in the U.S. and over 6 million panelists worldwide. They do roughly about 2,000 projects per month for a variety of clients, and these tend to be the blue-chip

market research companies and consulting firms who are, in turn, working for the top corporations in the world. They have a lot of electronic checks and a lot of human checks to identify fraudulent panels. They do a regular review of member data to validate the identities. Really top corporations use Research Now to make serious decisions about their products and services.

I have used it both in litigation and Applied Marketing Science, which I've worked with, has used it in non-litigation as well, used the panel.

Q And can you just briefly describe the finding sample of respondents from your survey?

A Okay. Yes. Research Now will send out e-mail invitations. People then come to the survey. And in our case 1358 respondents started filling out the survey. A few -- some of these failed to validate on age and gender. Research Now had an age. We had an age. They weren't the same. They failed to validate. Again, a standard procedure. The majority of these were then screened out because they didn't pass the criteria.

For example --

CHIEF JUDGE BARNETT: Professor, what was the gender filter? Why was there a gender filter?

THE WITNESS: Oh. This is to identify -- it's an issue in the market research industry. There are a small number of people who essentially do this to make money and so they're asked initial question -- the question when they join the panel are they male or female and then we also ask them a question are they male or female. And if those two don't match up -- it's a small number, but we terminate them.

CHIEF JUDGE BARNETT: All right. Thank you.

THE WITNESS: I'm not sure that's -- but anyhow most of them are screened out if they are not an influential decision-maker or if they can't answer the satellite radio provider.

And there's a very small number who are called straight-liners; they give the same answer to everything. And we look at those very carefully and in this case we eliminated a small number.

The final sample was 348 respondents. Again, the majority of these were gotten rid of

because they just weren't the respondents we were looking for.

JUDGE ROBERTS: Professor Hauser, I wanted to ask you a couple questions about that 348 number. Looking at page 19 of your testimony in paragraph 45, where you identify that number of 348, and you say that this sample size was adequate.

Could you describe to us what rating system that you were employing to come up with the use of the word "adequate"?

THE WITNESS: Well, as you're aware, there's this issue of a point estimate and then a range about that point estimate. This is what you hear in pollsters, you know, 50 percent plus or minus 2.

What we do provide, again in the appendix, is the point estimate plus the range, the confidence interval of that point estimate, and that's a fairly narrow range. So I felt that that narrow range would be adequate.

JUDGE ROBERTS: Well, I'm curious about the use of the word "adequate," and that is with respect to the 348, if you varied the numbers and you're

sliding up the scale, what is beyond adequate and what is below adequate?

The use of the word to me is just not very precise, that it was adequate. Is it moderately adequate? Is it strongly adequate? Is it so-so adequate? What is it?

THE WITNESS: Well, I think if I had ten respondents, I'd say it wasn't adequate and if I had a million respondents, I'd say more than adequate. 348 is, in survey research, a very acceptable number. The confidence intervals are tight. It's the type of survey -- well, let me give you an example.

There is a methodology in market research called pre-test markets. For example, if Proctor & Gamble is trying to launch a new deodorant or a new laundry detergent, they would show that to consumers ahead of time and then make a forecast, and these forecasts tend to be plus or minus two share points, which is more than enough for Proctor & Gamble to make a decision on launching it.

The sample sizes for those surveys tend to be roughly about 300. So it's a number that is really

quite acceptable. You can get good forecasts. It's a type of number that you would use in a normal course of business.

JUDGE ROBERTS: When you're saying that 348 is adequate, is that "adequate" relative to the number of people that started to fill out the survey, so it's adequate relative to 1,358 people?

THE WITNESS: Well, remember, the 1358 is -- the majority of those are eliminated because they're just not relevant. Okay?

The completion rate, once people fill the survey out, is 97 percent. So that's just something that nature deals us.

We are trying to find SiriusXM subscribers and that's the way we can find those. So 97 percent completion rate is actually a very high number, and we're very pleased with that.

JUDGE ROBERTS: Okay. So actually then the 348 you're saying is adequate to the almost 22 million SiriusXM subscribers, not those that actually attempted to fill out the survey?

THE WITNESS: Yes, that's indeed how

statistical sampling works.

If you're drawing from a population, the standard errors -- the ranges of the estimates are dependent upon a number you draw, not the overall population. And this is how, for example, the Nielsen families, they have about a thousand Nielsen families, can be used to get very accurate estimates of, say, TV programming and who's watching what.

JUDGE ROBERTS: And I noticed that you conducted the survey over a period of four days last September.

THE WITNESS: Yes, that's correct.

JUDGE ROBERTS: Okay. Did you make any adjustments to account for the time of year and the possible impact that might have on, say, for instance, music?

THE WITNESS: This indeed is a snapshot at the time, and that's why when we compare it to the 2007 measures it's amazingly close. So this is -- we're really getting at something that's sort of a valuation of how much they value music, not how much they listen to music at that particular time.

But I agree if we had asked the question "How much music are you listening to," that may or may not have seasonality in it. But I don't think the valuation does have a lot of seasonality. I don't know that for sure, but I do have at least two point estimates that are four years apart and those estimates are quite close.

JUDGE ROBERTS: I'm wondering not just with respect to music, your four days of sampling was in September and you, of course, were asking questions about non-music programming. And I myself being a long-time SiriusXM subscriber, at that time of the year one of the most valued programming to me would be the NFL radio so that I can listen to the New York Giants and Pittsburgh Steeler games. But if you conducted the survey, say, in June, well, that really wouldn't be all that valuable to me since there's no NFL games at that time and I should think I might respond differently and value other programming differently.

THE WITNESS: That's possible, but when we average over a lot of people, hopefully it works out.

The only thing I can really provide as evidence here is we did do this four years apart, a lot of other things varying, and people made roughly on average the same -- actually very -- very closely on average the same judgments.

It also appears that when we were talking to people they felt comfortable with these questions as getting their long-term valuation of music.

JUDGE ROBERTS: All right.

BY MS. SINGER:

Q Dr. Hauser, if you could please take a look at Exhibit H of your testimony, Appendix H.

A Yes.

Q And this page is entitled "Confidence Interval." Can you tell us what a "confidence interval" is?

A Okay. A confidence interval, again, are the ranges you normally hear.

What this says is that we have a 95 percent probability -- a 95 percent confidence that the true point estimate is within this range.

Now, you've all heard of the bell curve,

where it states low and then it peaks. What this says is that most of the -- it's cutting off the ends of the bell curve 2-1/2 percent on either side, so really out in the tails. So it's staying within that range.

Again, most of the density is in the middle of that range. But being very conservative, we used the 95 percent confidence interval.

JUDGE WISNIEWSKI: And that's under the assumption of a normal distribution?

THE WITNESS: Indeed that's under the assumption of a normal distribution, so we're relying on the law as far as numbers.

JUDGE WISNIEWSKI: Thank you.

BY MS. SINGER:

Q And we were talking about the base of 348 people. How do you decide what an adequate sample is statistically to make it a statistically significant result?

A Well, again, it's actually interesting that any sample you can compute a confidence interval for. So even if I had ten people, I would have a confidence interval. Except if I had ten people, the confidence

interval would be really wide, and if I had a million people, the confidence interval would be tight.

In this case we can see that the estimate of music varies from 275 to 374 with 324 being pretty much in the middle, but most of the density really is in the middle, our best estimates.

Q So what does the 95 percent confidence interval level tell you about your base size? Does that give you any confidence that you had enough people in your sample?

A Well, it's in some sense a managerial decision. If you are confident in this confidence interval, knowing most of the density is in the middle, then that would be adequate to make those decisions. Most managers would be comfortable with this level of confidence.

Q And now a final question. Now that we have walked through how you got there, can you please tell us what the results of your survey was looking at slide 15?

A Okay. Just as a summary, on slide 15, the best estimate of the overall willingness to pay for

music, again it's an upper bound estimate, is $3.24.

The best estimate is that 65.1 percent of this is due to music on or before 1970 or beyond and if we multiply those together we get $2.11.

MS. SINGER: I have no further questions.

THE WITNESS: Thank you.

CHIEF JUDGE BARNETT: Cross-examination?

CROSS-EXAMINATION

BY MR. HANDZO:

Q Good morning, Dr. Hauser.

A Good morning.

Q I'm David Handzo. And since this is probably the fourth time I have examined you between trials and depositions, I'm sure you will recall that I represent SoundExchange.

A Yes, I do.

Q Dr. Hauser, in order to have respondents tell you how much they would pay if certain features were removed you needed a starting point, correct?

A Yes, I did.

Q And you referred to that I guess as the anchor price?

A It is the anchor price. It is parsing the market price.

Q And the anchor price that you used was intended to be the price that the consumer was actually paying, correct?

A Yes. My assignment was to parse the market price.

Q Now, I think you may have said on direct that you did not include in your survey subscribers who were not currently paying; is that right?

A Yes, that's what I did say.

Q So you were intending to exclude people who had a promotional deal, for example, or a free trial?

A Yes. I distinguished the two between a promotional deal and a free trial, but the people who have a free trial were not in the sample.

Q And the reason I ask is let me ask you to take a look at your written testimony, at the survey instrument, which I believe is Exhibit D. If you look at the main questionnaire starting with question one --

A Just for clarity, there are screen shots and

then there's the description. I assume you are looking at the description. These are, unfortunately, not page numbered.

Q Yes, I agree it is unfortunate.

A So something that would say main questionnaire pricing section at the top would be Q1.

Q That is what I'm looking at.

A Yes.

Q And I apologize this is cumbersome, but it is the 11th page of this exhibit.

A Yes.

Q Okay. So that would be the part of the questionnaire where you are starting to ask people about what they pay, correct?

A Yes.

Q And you ask them whether they pay a promotional price, correct?

A Are we looking at Q1 now?

Q Look at Q3.

A Okay. Q3. Yes.

Q So you asked them a series of questions -- Q3, Q4, Q5, Q6 -- intended to figure out what people

would pay if they're on a promotion and their promotion ends, right?

A Yes, that's correct, and this is for people who are actually paying something.

Q And for those people who were paying less than the current standard price because they had a promotional deal, you asked them what they would pay when their promotion ended; is that correct?

A Yes, that's correct. There is a small number of those.

Q And for those people you did include them in the survey, correct?

A Yes, I did.

Q And the anchor price you would have had for them was not the price they were actually paying now but, rather, the price they said they will pay once their promotion ends?

A Once their promotion ends is the price they are willing to pay.

Remember, some of these people say they will not pay -- you know, they will not re-purchase it.

Q Right, but I just wanted to make it clear

that what you are including in your survey is not only the price that people are currently paying, it is also the price that people who are on a promotional deal will say they will pay when their promotion ends?

A That's correct. For a small number of people. The way I understand this works, you call up and you want to cancel, and then SiriusXM lowers the price a little bit and then you sign up, and I don't know how much the deal is they get.

Maybe I should be getting it. But...

Q Me too.

A Me too. You have to pretend you are going to cancel and they will give you a lower price.

So the question is how do you handle those. Well, what SiriusXM is hoping is that when a promotion period ends they will go back to paying the $12.95. They may not. So they may not go to $12.95. So rather than using $12.95, a little bit less than that, we actually used how much they would be willing to pay on the assumption that SiriusXM would continue to offer them promotions to retain them.

Q Now, you're aware that SiriusXM this year

instituted a price increase, right?

A I think it was after September.

Q Yeah. Right. In 2012 there was a price increase?

A Right.

Q So after the date of your survey?

A Yes.

Q So you're aware of that, right?

A I'll accept that, yes.

Q Okay. Given that some of these subscribers may now be paying more than they were at the time of your survey, can we simply increase the values in your survey by a proportional amount?

A That is actually not unreasonable.

Q Now, in determining that anchor price, I think you said on direct that you did not include any fees in the price, right?

A Yeah. This is how consumers thought about the price. So being a market researcher, one of the things we try and do is phrase the questions in a form that consumers understand the questions.

Q And the way you went about determining this

anchor price, for example, is you would find out what package people had, whether it is the basic subscription or if it is a premium thing, and you would show them what that price is, right?

A Yes.

Q And then that was the price that you told them to use when they took the rest of the survey, right?

A Well, yes. Actually, basically they tell us what they are paying and we then compute that on a monthly basis. We didn't want someone who is paying for a yearly basis, we didn't want them to have to divide by 12. Again, we pre-tested it. They were comfortable with the set of questions.

Q When you computed the price they were paying, we agreed you did not include fees, right?

A Yes. This can be added after the fact, but, no, we did not include additional fees, nor did we include taxes.

Q And you know that there is a separate music royalty fee imposed by SiriusXM, right?

A Yes, I'm aware of that.

Q And that fee was not included in your anchor price, right?

A That, indeed, is correct.

Q And, in fact, when you constructed your survey you didn't even know what the amount of that fee was, did you?

A If I did know, I've forgotten.

Q When we look at your number valuing music, that is a value that was determined without taking into account the fact that subscribers were paying $1.40 or $1.90 in addition to a music fee, right?

A This is a number that parses the market price they are paying as consumers. They understood this price, yes.

Q So the answer to my question is yes?

A I made no attempt to measure that additional fee, nor did I make an attempt to parse that fee.

I do know consumers see these as extra fees. If you are aware of something called mental accounting, where they put things in separate -- the consumer tends to put numbers in different, essentially, mental accounts, all of those fees tend

to be fees -- fees and taxes.

Q As I understand it, the way you conducted your survey, the respondents were asked to report what they would pay for those SiriusXM services without any one of seven features removed in random order?

A I think that's correctly describing it. What we do is we ask willingness to pay before we remove a feature, willingness to pay after the feature, and we subtract those two numbers.

Q For some number of respondents in your survey they got down to a zero value for the SiriusXM service before they were asked about all seven features, right?

A Yes, that is possible.

Q Are you aware that more than 50 percent of the respondents got down to zero before they were even asked about the value?

A That is certainly possible. That would say we basically got down to something like FM radio.

Q Let's put it this way: Are you aware that 50 percent of the respondents were never even asked the value of music?

A That is not actually -- no, I don't think that is a fair way of describing the questionnaire.

Q Let's make sure I understand how you did this then.

Let's say you had a respondent who was asked to remove certain features of SiriusXM and they got down to a zero value before they were asked to remove the current level of music.

That could happen, right?

A It certainly happens and it is certainly logical. You start taking away commercials -- you start adding commercials, you lower the quality, it is not available. Everywhere you get rid of some of the other features, suddenly they are saying I'm not going to pay anything for this. So that's one of the many orders that can happen.

If that happens, now we take away music, music is not adding anything because they are already paying nothing. So we know the answer, and the answer for that particular thing, music is not adding anything in that particular order.

Remember, what we are doing is randomizing

across all respondents. I think if you like, I have an example using automobiles that illustrates this point and how it applies to the individual.

Q That's okay. I heard the automobile example before.

A Right. But I think it's illustrative because it applies to the individual and it is central here as if we are asking all those questions to a respondent. We can't do that because, you know, we can't ask essentially seven factorial orders. They would rebel.

So statistically and logically it's as if they were rotated across every respondent.

Q I just want to make sure we understand how they worked. Okay?

A Yes.

Q So let's go back to square one. Some number of respondents would have gotten down to a zero value for this service before they were asked how they value music, right?

A That's right. They get to the point where they would not purchase the service at any price --

sorry -- they would not purchase the service and it is no longer any value to them.

Q And you don't know the percentage of respondents who got down to zero before they were asked the question, correct?

A No, I don't.

Q But for respondents that got down to a zero value for the service before they were asked the value of music, in your survey results you valued, all of those people were shown as valuing music at zero, correct?

A We have taken away all the value. There is no value left to parse, so indeed that's the logical answer.

Q Right. And all of those people who were valued and gave, according to you, a value of zero to music because all the value was gone before they got there, they were averaged into the results, correct?

A As well they should be, yes.

Q Are you aware that almost 85 percent of respondents had no value left for this service once you took away music?

A That is certainly possible.

Q By the way, when the survey was run, there was a data file that was prepared that was delivered to an outfit called Cornerstone; is that right?

A Yes, that's correct.

Q And Cornerstone analyzed the results for you?

A Cornerstone analyzed the results.

Q And you got the results from Cornerstone?

A I got the results from Cornerstone.

Q You did not actually review that data file yourself?

A I did not run the -- I think it was the data program. I certainly had a number of checks run. I also had Applied Marketing Science check these over.

You have been provided all these files. If there are any errors in the analysis, they would have been found by now.

Q And you didn't review any individual respondents, right?

A Well, I certainly looked over the data in a general way, but at my direction both Applied

Marketing Science and Cornerstone reviewed all those respondents.

Q And you did not review individual respondents, right?

A I set up the procedures that they followed.

Q So you did not review individual responses, correct?

A They followed my procedures very carefully. I did not program the survey. I did not specifically go in and line by line look at these individual respondents.

Q You didn't look at any of them, did you?

A I looked at the file in general. I did a logical check on these I'm very confident, and I had multiple people check it. That is what I'm relying on.

Q I'm sorry. This isn't a trick question. Did you look at any individual respondents yourself?

A Well, I didn't -- yes and no. I mean I looked over a few, right, just to make sure the data files were correct. After having done that, I then turned that over to the people working at my

direction. So I did not look at each and every respondent myself.

Q Dr. Hauser, I think you said on direct that the features that you are assessing through the survey are features that interact with one another, right?

A Yes, that's correct.

Q So, for example, if we look at your Appendix G, which I think summarizes your results --

A Yes.

Q -- you show values for ubiquity of station availability. The overall is $1.97, right?

A Right. If you take it away first, you lose $7.

Q And premium sound quality you show an overall value of $1.20, right?

A Right, and again you get numbers first, last, and average.

Q Freedom from commercials you show an overall value of 2.46, right?

A That's correct.

Q Now, you would agree with me, would you not, that nobody is going to pay $1.97 plus $1.20 for

premium quality dead silence that's available nationwide?

A Well, remember that, again, this is averaged over all possible orders and some of these people are paying for services that have music, that have comedy, that have sports. So there's going to be some zeroes in there and there's going to be some other numbers.

Q But I want to make sure I'm understanding what your survey is finding here.

We can agree, can't we, nobody is going to successfully offer a satellite service and price it at $1.97 plus $1.20 if what they are offering is nationwide availability of no content but at a very high quality?

A Oh, I think we completely agree. These features interact.

Q So let's turn to the number that you showed for the overall value of current levels of music, which is $3.24, and actually in the column next to that you show freedom of commercials being valued overall at 2.46, right?

A Yes.

Q Now, you are aware the music channels on SiriusXM are commercial free, right?

A Yes.

Q And you are aware SiriusXM has advertising on a number of its non-music channels, correct?

A Yes, that's correct.

Q Now, with respect actually to that $2.46 that you show as the value of freedom from commercials, to some extent that value also reflects the value of music, right?

A Let me just -- could you restate that?

Q Sure. With respect to the $2.46 that you show as the value of freedom from commercials, we can agree, can't we, that that number, to some degree, reflects the value of music as well?

A These features interact just as the value of music reflects freedom from commercials.

Q So, again, we can agree it wouldn't make any sense to have a positive value for commercial-free dead silence?

A We can agree that these features fully interact, and this is why the automobile example is

extremely important to understand why this randomization over orders is very important when you have features that interact.

Q Now, when you asked respondents in your survey to give you a value for current levels of music, in some cases respondents were being asked that before you asked them to remove a value for freedom from commercials, right?

A That's correct.

Q So in that case those respondents probably would have been thinking about the value of music as the value of commercial-free music because you hadn't yet removed the commercial-free aspect, right?

A Well, again, the question is -- it all goes back to the tires on the car. Do you want to attribute 100 percent of the -- very few people would buy a car without tires. Is it fair to attribute $50,000 to tires? No. Because there are a lot of things interacting with these tires.

It's the same thing. What we're trying to do is we're trying to get an estimate how we can parse it given all the interactions that are going on and

what's very important is that we do the randomization over all of these features.

Q I understand that you want to explain the rationale for this, but my question is actually a little more limited. I just want to make sure we understand what these numbers represent. Okay?

So if a respondent was asked to provide a value for current levels of music and they were asked that in a sequence where they hadn't yet been asked to remove freedom from commercials from the equation, it is reasonable to think that when they gave you a value to music they were thinking of it as commercial-free music, right?

A The difference in the willingness to pay was dependent upon not having commercials. So indeed that whole thing, the whole -- both numbers are added -- are moved up because there are no commercials.

You can turn it around the other way and say that the fact there are no commercials adds to -- some of the value you are getting from music due to the fact there is no commercials.

Q And that's where I was going next. Some

respondents would have been asked the value of music after they had already removed the commercial-free aspect of the service, right?

A Yes.

Q So for those respondents, they likely would have been giving you a value of music assuming that there were commercials, right?

A Yes. I think if we just give an example, suppose we just have those two features and for half the people we take away music first and the other half of the people we take away commercials first. So we start at $12.95. In both cases we get to $2.95. So the difference is $10.

So in one half we take away music first we get down to, say, $3.95. So we take $9 for music, $1 for commercial free. The other half of the people we take away commercials first we get down to $3.95. So we have $9 for commercials, $1 for music. We are getting to the same point no matter which order we take those features away. So in that case, because in this case there is asymmetry between commercials and music, it's fair to attribute half of that to

commercials and half of that to music.

So we really shouldn't take any given order and try to interpret that. Because we are trying to measure the effect of these interactions, we should take the randomization over the orders, and that's the thing we should interpret.

Q Let me go with your example. Let's say you are only analyzing this for those two attributes, commercial free and music.

A Right.

Q In the example that you just gave half the people are going to be asked to value music with commercials and half the people are going to be asked to value music without commercials; is that right?

A Right.

Q And then in your results you average those two responses?

A That's right. In one case SiriusXM is bringing 90 percent of the value, in the other case music is bringing 90 percent of the value. So when we averaged the 90 and 10, we get 50 percent.

So I'm trying to say that two things

together, you know, in economic terms, they are complements, and because they're complements having them together is what's really being valued.

I know there are some economists on the panel. This whole issue -- we are trying to measure and parse out the value of complements.

Q Right. To understand your $3.24 number here, that doesn't represent the value of music without commercials, nor does it represent the value of music with commercials; it represents something in-between, correct?

A It is an attempt to recognize that we have interacting complementary features and we're trying to say, you know, who is bringing what to the table, yes.

Q So if we wanted to know the value of music with commercials, we can't just -- let me ask it the other way.

If we want to know the value of commercial-free music on SiriusXM, we can't just add the value of music and the value of freedom from commercials, can we?

A Again, you know, in the simple case, what we

can do is we can say when we add these two together, the value of commercials plus the value of music is the joint value of commercials plus music. It's a joint number.

So then the question -- that adds up to $5.70 if I've done the math right. We are saying that that $5.70, these two things are bringing that together. But in this case music is bringing a little bit more than commercial free.

JUDGE WISNIEWSKI: Well, can you really say that, though, Professor Hauser, because you haven't differentiated between the first feature, the freedom from commercials, as it applies to music and as it applies to, for example, the sports program?

THE WITNESS: You're correct. It's all seven together are complements that add to one another. So you are right.

I think I was using it in the example where there are only two features. But in this case there are all seven features, so -- I hope I pronounce it right -- Judge --

JUDGE WISNIEWSKI: Wisniewski.

THE WITNESS: -- Wisniewski -- I had a student that pronounced it the other way -- Judge Wisniewski is correct, it is all seven features that interact.

BY MS. SINGER:

Q Let me just ask one sort of broader question. If we wanted to know the value of music delivered on a service that is high sound quality, nationwide coverage and no commercials, but doesn't have the non-music content, you don't have an opinion based on this research what that value would be, do you?

A I think you've misstated my testimony. If you want to say we have the service and this service is bringing all these other things to the table and then we add music on top of that, music only adds 51 cents.

On the other hand, if we have all of those things and we take music away, well, we'd lose most of it. We have gone back and forth on this. It's really the interaction and we are trying to parse this interaction when we have complementary items.

Q I understand this all interacts and that's what makes it complicated, so what I'm trying to get at is this:

If we want to know what's the value of the SiriusXM as it currently exists but without non-music content, can I figure that out from these results?

A Let me just repeat what you said so I can answer the question.

Q Sure.

A So you want to say can I figure out what the value of the current SiriusXM radio is without music?

Q No. Without the non-music content.

A What?

Q Without the non-music content.

A Judge Wisniewski is absolutely right. These features interact.

What we are doing is we are parsing. We are parsing. And because we are trying to parse -- let me use another example. There is a word known as "conjunctive," which means you have to have both.

In this case you have an extreme value that there's no value without them, there's a high value

with them. So if there's a high value with them, all I can really say is that there's a high value with the two features.

And what we have here is that we are getting the $12.95 market price when we have all seven features and if we start taking one away -- I mean, for example, if you take away levels of comedy, you lose $5, okay, the levels of talk and comedy or levels of sports you're losing $3.75.

If you notice, the first row adds up to a lot more than $12.95, that is, because they are taken away first. It is different respondents that have taken it away. The row that really matters is when we average over all these possible orders. And so we're really getting at kind of a philosophical issue here, is when you have conjunctive features you really need both of them to make things work or you need all seven things to make things work, how do you try and parse that out, and that's what we are trying to get at.

Q And understanding that all of these features are very interrelated and act together, I take it then we cannot sort of mechanistically take the numbers in

the overall column and simply say well, if you subtract this factor, then the value of the service is $12.95 minus that number?

A Yes. Mechanistically it's very difficult because they interact.

What we can say is that music is bringing $3.24 of the $12.95 to the table in essence.

Q And when you say music is bringing it, to be clear, we're saying music as it's influenced by being commercial free or not being commercial free, as it's influenced by being delivered with high sound quality or not?

A Right. It's how you parse the $12.95 and it's, of course, all music, both before and after 1970, including live and studio recordings, et cetera.

MR. HANDZO: If I may just have one moment, I think I'm done.

JUDGE WISNIEWSKI: While you're doing that, Mr. Handzo, Professor Hauser, on the talk/comedy category there did you consider parsing that out further as between comedy recordings and other talk?

THE WITNESS: Yes. Having more than

seven -- well, maybe one more or so. If I had too many features, my respondents would have rebelled, so I was trying to make some difficult decisions here. I subsequently found that I guess some of the comedy recordings are also at issue in this case, and I also understand that Dr. Noll has made some estimates to try to parse that out. But no, I did not parse it out because I was just trying to be parsimonious with the number of features.

JUDGE WISNIEWSKI: You didn't want to instigate the spirit of 1776 among your respondent group?

THE WITNESS: I'm sorry. What?

JUDGE WISNIEWSKI: You didn't want to resurrect the spirit of 1776 among your respondent group? Or perhaps you were more concerned about the spirit of 1783 in France.

THE WITNESS: A rebellion. Okay. I thought you were talking about the play 1776 and the sound recordings from that. That is why I was a little confused here for a second.

JUDGE WISNIEWSKI: I didn't mean to mislead

you.

MR. HANDZO: That's all I have.

CHIEF JUDGE BARNETT: Mr. Fakler?

MR. FAKLER: Nothing from me.

MS. SINGER: I have no redirect.

CHIEF JUDGE BARNETT: Further questions, Judge?

JUDGE WISNIEWSKI: Yes, perhaps one if I may. It might be easiest if I take you to page 10 of your slide package here, and this is also in your testimony as well. This related to question nine.

Now, is it fair to say, looking at this question that your survey never asked the respondents to assign a relative monetary value to these characteristics, their listening experience, as it did in question seven?

THE WITNESS: That's correct.

JUDGE WISNIEWSKI: Thank you.

CHIEF JUDGE BARNETT: Any follow-up questions then from counsel?

MS. SINGER: No, Your Honor.

CHIEF JUDGE BARNETT: May this witness be

excused?

Thank you, Professor. It's a perfect time for us to take a morning recess and we'll do so.

MR. RICH: Let me state before the recess this concludes the case of SiriusXM.

CHIEF JUDGE BARNETT: Thank you, Mr. Rich.

JUDGE ROBERTS: I'm sorry, Mr. Fakler, who's next?

MR. FAKLER: Mr. Damon Williams.

(Brief recess.)

CHIEF JUDGE BARNETT: Mr. Fakler, you may call your witness.

MR. FAKLER: Thank you, Your Honor. As a second witness, Music Choice calls Mr. Damon Williams.

WHEREUPON,

DAMON WILLIAMS

called as a witness, and having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. FAKLER:

Q Good morning, Mr. Williams. Could you please state your name for the record?