

**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)

WRITTEN DIRECT TESTIMONY OF

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I. Qualification

1. I am a statistician and an economist. I received a Bachelor of Science degree in Statistics and a Bachelor of Arts degree in Business Administration from the University of Dortmund/Germany in 1988. I received a Master of Science degree in Statistics from the University of Dortmund/Germany in 1988, and I received a Master of Arts degree in Economics from the University of California, San Diego in 1992. I also finished Ph.D. requirements (except dissertation) in Economics at the University of California, San Diego. Attached hereto as Appendix A is a true and correct copy of my curriculum vitae.
2. I am currently employed as a Managing Director at the Berkeley Research Group (“BRG”). Prior to joining BRG, I was a Partner at Resolution Economics. I also held Managing Director positions at Alvarez & Marsal, Navigant Consulting, and LECG. I also held partner-level positions at Deloitte & Touche LLP, PricewaterhouseCoopers LLP, and Arthur Andersen LLP. At the three latter firms, I was responsible for the Economic and Statistical Consulting group on the West Coast. Before moving to the United States to attend graduate school, I worked as a statistician for the German Government for three years, from 1986 to 1989.
3. For over 25 years, my work has focused on the application of economic, statistical, and financial models to a variety of areas, such as providing solutions to business problems, supporting complex litigation in a consulting and expert witness role, and conducting economic impact studies in a large variety of industries including, but not limited to, technology, entertainment, healthcare, retail, manufacturing, automotive, energy and utilities, hospitality, and federal, state, and local government.
4. I have extensive experience designing and conducting surveys, as well as statistically analyzing survey results. I have worked in both the litigation context as a consultant and/or designated expert and the non-litigation context as a statistical and economic consultant. My experience includes, among other things, conjoint analysis, observational studies, time and motion studies, and focus groups to measure consumer opinions and behaviors regarding products and services including price setting, discrete choice modelling, purchase processes, product attributes, branding and positioning, market segmentation, and new product research.

5. I have submitted numerous expert reports, been deposed, and testified at trial and hearings. In particular, I have submitted numerous expert and rebuttal reports dealing with surveys and statistical sampling related issues. A list of my deposition and trial testimony is included in my curriculum vitae.
6. All of the facts and circumstances set forth in this Report are known to me personally, and I am prepared to testify to them if called to do so. BRG is compensated for its work on this matter based on an agreed upon hourly billing rate schedule. My hourly billing rate for professional services related to this case is \$650 and the billing rates of BRG staff supporting me on this engagement range from \$150 to \$425. BRG's payment is not contingent upon the outcome of this litigation.

II. Background and Assignment

7. I have been retained by counsel for SoundExchange to design, implement, and statistically analyze a survey of Sirius XM users who subscribe to paid satellite radio packages that contain both music and non-music programming.¹ I understand that the purpose of this survey is to measure the degree to which these subscribers value the music versus non-music content in Sirius XM's programming. The survey also examines subscribers' willingness to accept a hypothetical Sirius XM package that contains only music programming or only non-music programming, and the extent to which they would require discounts for such a hypothetical product. It is my understanding that this Report will be used in proceedings to determine the rate of royalties that Sirius XM will pay to copyright holders for sound recordings played on its service.
8. This Report describes the contents of the survey, the protocol used to implement it, and my findings based on the data collected. A copy of the survey questionnaire with programming instructions is attached as Appendix B; screenshots of the survey as seen by participants is attached as Appendix C.

¹ In this Report, I sometimes refer to this group –Sirius XM users who subscribe to paid satellite radio packages that contain both music and non-music programming – as simply “Sirius XM subscribers.”

9. The remainder of the Report proceeds as follows: Section III lists the documents I reviewed or relied upon in forming my opinions. Section IV presents a summary of my opinions and findings. Section V describes the survey on which this Report is based, with emphasis on the design and implementation. Finally, Section VI includes statistical analysis of the results and summarizes my key findings and conclusions.

III. Documents Reviewed

10. In order to form the opinions expressed in this Report, I have reviewed and/or relied upon the following documents:
 - a. SiriusXM Radio Survey by Edison Research, May 2015 (SX Exhibit 34)
 - b. The sources cited in the footnotes of this Report. These include references to textbooks and research literature in the fields of survey methodology, statistical analysis, and consumer research.
11. The documents above are listed in Appendix D.

IV. Summary of Opinions

12. This Report describes the internet survey of Sirius XM subscribers that I designed and conducted. The survey was administered between October 7 and October 11, 2016. In total, 1,101 respondents completed the survey, and their responses were statistically analyzed. The results are reported in detail below.
13. The survey was properly designed and executed and strictly adhered to scientific principles of survey research to ensure the reliability and validity of the results.
14. Based on the results of this survey and my statistical analysis of the survey results, as well as my education, background, and professional experience, I have formed the following opinions with a high degree of scientific certainty:

- a. When asked to allocate 100 points between music and non-music programming to reflect its importance to their decision to subscribe to satellite radio, respondents allocated 72 points to music programming and 28 points to non-music programming.
- b. When asked to allocate 100 points between each category of programming to reflect its importance in their decision to remain a subscriber to Sirius XM satellite radio (based on personal decision-making experience), respondents allocated 70.6 points for music programming and 29.4 points for non-music programming.
- c. Respondents were asked to allocate 100 points between music and non-music to reflect the percentage of time they typically spend listening to music versus non-music on satellite radio. Their responses enabled me to determine that the median listening time for music programming is 80%, and the median listening time for non-music programming is 20%.²
- d. 70.1% of all survey respondents would no longer subscribe to their current Sirius XM satellite radio package at their current subscription rate if music programming was no longer offered. 32.4% of all survey respondents would no longer subscribe to their current Sirius XM satellite radio package at their current subscription rate if non-music programming was no longer offered.
- e. Respondents were also asked about the minimum level of discount (if any) that would convince them to continue to pay for a Sirius XM radio subscription if music or non-music, respectively, were no longer offered. 42.7% of survey respondents would no longer pay for a subscription if music programming was no longer

² As discussed below, respondents assigned 71.25% of their listening time to music programming and 28.75% to non-music programming. However, because these two figures represent unweighted averages, I calculated the median listening time as indicated by these responses to this question.

The median in a distribution of data points is the value for which 50% of all data points in that distribution are smaller or equal to while the other 50% of all data points in that distribution are greater or equal to that value. In this case, a median of 80% means that 50% of all survey respondents indicated that they listen to music programming 80% or more of their listening time.

Median (rather than mean) is an appropriate measure with regard to this question: because respondents were asked to provide the proportion of their listening time devoted to music, as opposed to actual listening time in hours or minutes, it is not possible to calculate a weighted average that takes into account respondents' actual listening time.

offered, regardless of any amount of discount. 10.0% of survey respondents would no longer pay for a subscription if non-music programming was no longer offered, regardless of any amount of discount.

- f. Among those respondents who said a discount could be offered to convince them to continue to pay for a Sirius XM radio subscription, the mode of the discount required was in the range between 71-80% if music was no longer offered and 21-30% if non-music was no longer offered.

V. Survey Design and Implementation

15. Surveys are a frequently used data collection tool. There is not one authoritative list of required steps for conducting surveys. However, various authors and professional organizations generally agree on several basic elements necessary to properly design and implement surveys, and statistically analyze results, such that reliable and valid conclusions can be drawn and applied to a broader universe.³
16. The survey conducted in this matter followed accepted scientific standards of the profession, including as to design, implementation, and analysis. This included, among other things, adherence to general guidelines regarding choosing and defining the survey population; framing clear, non-leading questions; properly gathering, reporting, and analyzing data using accepted statistical techniques; and using a qualified survey vendor to program, implement, and execute the survey following proper procedures for internet panel surveys. These principles and guidelines are described in the Federal Judicial Center's *Manual for Complex Litigation*, as well as the *Reference Guide on Survey Research*.⁴

³ See, e.g., *Handbook of Survey Research* (Peter V. Marsden & James D. Wright eds., 2d ed., 2010); *Survey Methodology* (Wiley Series in Survey Methodology), Robert M. Groves et al., *Survey Methodology* (Wiley Series in Survey Methodology) (2d ed., Wiley 2009); American Association for Public Opinion Research ("AAPOR") – www.aapor.org; American Statistical Association ("ASA") – www.amstat.org. These are but a few of the excellent resources within the voluminous literature that defines the relevant steps in proper survey research.

⁴ See Federal Judicial Center, *Manual for Complex Litigation*, Fourth Edition, Section 11.493 (2004); Shari Seidman Diamond, *Reference Guide on Survey Research*, in *Reference Manual on Scientific Evidence* 359-423 (3d ed. Federal Judicial Center, 2011). Guidance in these resources was followed in designing and implementing this survey.

17. The remainder of Section V is structured as follows: Subsection 1 discusses the survey design; and Subsection 2 discusses its implementation, including how BRG worked with the survey vendor and, how the survey was balanced demographically.

V.1 Survey Design

18. When properly designed and executed, surveys can yield important data points that are otherwise not available. In the design phase, I undertook the following steps to ensure that the survey complies with the core recommendations for survey methodology set forth in the resources above.⁵

V.1.1 Survey Goal and Purpose

19. First, I identified the goal and purpose of the survey. As described above, the purpose of this survey is to measure the degree to which Sirius XM subscribers value music versus non-music content in the packages to which they subscribe. I understand that this data is being sought in connection with the above-captioned rate-setting proceeding.

V.1.2 Universe Definition

20. Next, I defined the appropriate target population or universe.⁶ The “target population” is that segment of the overall population whose opinions, choices, and preferences are relevant to the issues in the case at hand.

21. In this case, the target population is defined as Sirius XM users who subscribe to paid satellite radio packages that contain both music and non-music programming. The population was limited to adults (18 years of age or older), who live in the United States, and who use a subscription package that includes both music and non-music programming. Members of the target population were required to either pay for the Sirius XM package themselves or live in the same household as the person who pays for it, and were required to use their subscription. Furthermore, individuals who are employed by Sirius XM satellite radio, who are employed in

⁵ See notes 3 and 4 *supra*.

⁶ See Diamond, *Reference Guide on Survey Research*, in *Reference Manual on Scientific Evidence* at 376.

the music industry, or who live in households with someone who is, were excluded from the target population.

V.1.3 Identify Sampling Frame

22. The sampling frame is the source of all sampling units in the population from which the sample is actually drawn. For this study, the sampling frame was the panel maintained by Research Now, a highly experienced and well-established firm with over 6 million online panelists.⁷ Invitations to participate in this study were sent out to a random sample of panelists. The random sample was balanced to be representative of the U.S. population by using demographic variables from the U.S. Census.
23. In a pilot study, individuals were selected from the random sample of panelists until 101 individuals from the target population as defined in Paragraph 21 had been identified. The demographic information of those 101 individuals in the pilot sample was then utilized as balancing weights to select the participants in the main study from a sampling frame of pre-identified Sirius XM users. Invitations to participate in the main study were based on random sample draws of approximately 78,800 pre-identified Sirius XM users. They were distributed in batches to reflect the targeted demographic balancing.

V.1.4 Determine Survey Methodology

24. The survey was conducted as an internet panel survey. Internet-based surveys have increasingly gained popularity and acceptance, can provide reliable results, and can have some advantages over other recruiting methodologies.
25. For instance, studies have found that computer data collection yields higher concurrent validity, less chances of participants framing answers to attempt to please the questioner, and less random measurement error when compared to other types of surveys such as mall intercept studies and telephone surveys. Internet surveys also allow for broader geographic reach than

⁷ See Research Now website, <https://www.researchnow.com/>

face-to-face methods.⁸ Well-executed internet survey research is regularly accepted by courts.⁹

26. Moreover, internet surveys are now a fixture in the corporate world. According to the Global Research Business Network, internet surveys now account for more than a quarter of global market and social research revenues. At an estimated \$10 billion, that is more than telephone and face-to-face surveys combined.¹⁰ In many of the world's top research markets, internet surveys are now the primary means of research.¹¹

27. I have personally worked on numerous consulting projects outside the litigation context where internet surveys were a main data collection tool and were used for corporate decision-making for critical issues such as pricing, resource expenditures and investment allocation. For example, for a major hospitality company, I performed an internet based survey to assess travellers' preferences about how to combine the rewards programs for the company's hotel segment and its time-share segment. I also performed an internet survey for a software development company seeking to assess consumers' price sensitivity in connection with the creation of new product bundles.

28. The efficacy of this type of survey is often furthered by survey market research firms that operate large internet panels. These firms employ trained professionals who program, administer, and quality control the surveys so as to increase the quality of the results.

29. Advanced statistical methods can be applied to compute model based confidence intervals for well-designed and well-balanced non-probability samples, including internet panel surveys. In 2016, the American Association of Public Opinion Research ("AAPOR") issued a guidance paper on "Reporting Precision for Nonprobability Samples"¹² which details approaches and

⁸ See Diamond, *Reference Guide on Survey Research*, at 401. Additionally, online surveys have advantages in terms of efficiency and cost.

⁹ Bruce Isaacson et al., *Why Online Surveys Can Be a Smart Choice in Intellectual Property Litigation*, 26 IPL Newsletter (2008) (ABA Section of Intellectual Property Law).

¹⁰ See *The Next Frontier for Online Survey Companies: Law Firms*, Fortune, <http://fortune.com/2015/09/16/online-survey-companies-law-firms/> (last visited Oct. 18, 2016).

¹¹ *Id.*

¹² AAPOR Guidance on Reporting Precision for Nonprobability Samples - https://www.aapor.org/getattachment/Education-Resources/For-Researchers/AAPOR_Guidance_Nonprob_Precision_042216.pdf.aspx

reporting guidelines when precision calculations are performed for non-probability samples. I discuss in more detail in Section VI how I applied the re-sampling method known as bootstrapping to obtain precision estimates for the results from my study. The bootstrapping methodology is one of the valid approaches described in the AAPOR guidance.

30. In sum, properly designed and well-executed internet surveys have increasingly gained acceptance and can be used to draw valid statistical inferences about the target population.

V.1.5 Determine Adequate Sample Size

31. The survey included questions that asked respondents to allocate points between categories, as well as questions that gave multiple answer choice categories. In the environment of simple random sampling, a sample size of approximately 1068 allows for the estimation of a multinomial attribute with a 95% confidence interval and a plus or minus 3% margin of error.¹³
32. I determined that a similar sample size would be appropriate here because the ultimate respondents were selected from a randomized sampling frame of all panelists and random draws from a sampling frame of pre-identified Sirius XM users based on email invitations distributed in batches to reflect the targeted demographic balancing of completed surveys.
33. A pilot study sample size of 100 and a main study sample size of 1000 SiriusXM subscribers was therefore targeted.

V.1.6 Develop Questionnaire/Survey Questions

34. The survey consisted of a set of screening questions, followed by a set of main survey questions that were asked only of those respondents who qualified.

¹³ The sample size for a proportion is $n = Z_a^2 * p * (1-p) / (ME^2)$ (see e.g., William Cochran, *Sampling Techniques* 75 (3d ed. 1977)). In the formula n is the sample size, Z_a is the confidence coefficient from the normal distribution where a denotes the desired confidence level, p is the proportion one desires to estimate from the sample, and ME denotes the desired margin of error. For given requirements for Z_a and ME (e.g., 95% confidence and 3% margin of error) the expression $Z_a^2 * p * (1-p) / (ME^2)$ is maximized for $p=0.5$. That means that without the knowledge of p an upper bound for the sample size is needed to estimate a proportion with a given confidence and a given margin of error. Plugging $ME=3\%$ and $Z_\alpha = 1.96$ (which is the coefficient that corresponds to 95% confidence in sufficiently large samples – in smaller samples the value t_α from the t-distribution can be used) results in 1067.1 which is then rounded up to $n=1068$. The farther away the proportion is from 0.5 the smaller the sample size n becomes for a given confidence and margin of error requirement.

35. First, potential respondents were asked about their gender, age, household income, race/ethnicity, and the geographic regions in which they live. Instructions on how to calculate household income were provided. Geographic regions were based on categories used in the Census, and the states that make up each of these regions were listed.
36. Respondents who were less than 18 years old were terminated from the survey. Respondents who live outside of the United States were also terminated.¹⁴
37. Next, the following screening questions were used to identify the target population:
- a. “Do you or a member of your household have a paid subscription to Sirius XM satellite radio?” Answer choices were “Yes/No.” Those who answered “No” were terminated.
 - b. “Do you use your Sirius XM satellite radio subscription?” Answer choices were “Yes/No.” Those who answered “No” were terminated.
 - c. “Are you or a member of your household employed by Sirius XM satellite radio?” Answer choices were “Yes/No/Don’t Know.” Those who answered “Yes” or “Don’t Know” were terminated.
 - d. “Are you or a member of your household employed in the music industry?” Answer choices were “Yes/No/Don’t Know.” Those who answered “Yes” or “Don’t Know” were terminated.
38. Next, the terms music programming and non-music programming were explained:

¹⁴ I did not exclude the limited number of respondents who declined to provide their household income. Only 1.9% of participants preferred not to answer this question. This number is a very small percentage of non-response even compared with statistics from the U.S. Census Bureau about non-response to income related questions. *See, e.g.,* United States Census Bureau, *Survey of Income and Program Participation*, <http://www.census.gov/programs-surveys/sipp/methodology/organizing-principles/nonresponse.html> (last visited Oct. 18, 2016) (discussing the issue of non-response in the Survey of Income and Program Participation (SIPP)); Charles Hokayem et al., U.S. Census Bureau, *A Look at CPS Non-Response and Trends in Poverty* (2012), <https://www.census.gov/library/working-papers/2012/demo/sehsd-wp-2012-21.html> (discussing the issue of non-response in the Current Population Survey (CPS)). Therefore, allowing this small group of respondents to continue to participate did not negatively impact the validity of the results.

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.

39. The question “Are you or a member of your household currently paying for a Sirius XM satellite radio package which includes both music and non-music programming?” with answer choices “Yes/No/Don’t Know” screened out everyone who answered “No” or “Don’t Know”.
40. The next question introduced Sirius XM packages as follows: “*SiriusXM offers different subscription packages containing different mixes of programming. For the following question, we want to ask if you know which package of SiriusXM radio that you subscribe to. If you subscribe to more than one package, please answer with respect to the one that you use the most.*” It then asked: “Which SiriusXM satellite radio package do you subscribe to?” and offered the following answer choices:¹⁵

“Select” (some premium channels)

“All Access” (all premium channels – e.g., Howard Stern, every NFL game, every NASCAR race, etc.)¹⁶

“Mostly Music”

“News, Sports & Talk”

Don’t know

Other: _____

41. In several questions that followed, respondents were asked to allocate points between music and non-music. They received the following instruction: “*In several of the following questions you will be asked to allocate 100 points between music and non-music based on several different measures. The total points you allocate must add to 100 points.*” For all questions that required

¹⁵ The first four choices were put in random order for each questionnaire while “Don’t Know” and “Other” were always the last two choices listed.

¹⁶ Descriptions of the “Select” and “All Access” packages were based on descriptions available on Sirius XM’s website. See Sirius XM website, Our Most Popular Packages, <http://www.siriusxm.com/ourmostpopularpackages>.

respondents to allocate points, the survey was programmed so that they were not permitted to move forward unless the points they allocated added up to 100. This safeguarded against arithmetical errors in allocation responses.

42. Respondents were asked: “Were you involved in your household’s decision to subscribe to Sirius XM satellite radio?” Those who answered “yes” were asked to “allocate 100 points between Music programming and Non-Music programming to reflect its importance to YOUR decision to subscribe to satellite radio.” A respondent could not continue unless the two numbers entered added up to 100.
43. Respondents were then asked: “Are you involved in your household’s decision about whether to remain a subscriber to Sirius XM satellite radio?” Those who answered “yes” were then asked to “allocate 100 points between each category of programming to reflect its importance to YOUR decision to remain a subscriber to Sirius XM satellite radio.” A respondent could not continue unless the two numbers entered for Music and Non-Music added up to 100.
44. Respondents were then asked to “allocate 100 points between music and non-music to reflect the time YOU typically spend listening to music versus non-music on satellite radio (i.e., enter the percentage of time you spend listening to either type of programming). This allocation should reflect your own personal listening habits.” A respondent could not continue unless the two numbers entered added up to 100.
45. To avoid potential order bias in this survey,¹⁷ certain answer choices were shown in a different order,¹⁸ chosen at random, to each respondent (e.g., “music” appeared before “non-music” for a randomly chosen half of respondents, and “non-music” appeared before “music” for the other randomly chosen half of respondents).
46. The final set of questions involved hypothetical Sirius XM packages that included only music or only non-music. Respondents were asked: “Would you continue to subscribe to SiriusXM

¹⁷ Choices presented earlier in a list of choices in a questionnaire are disproportionately likely to be selected. This phenomenon is known as order bias. Jon A. Krosnick & Duane F. Alwin, *An evaluation of a cognitive theory of response order effects in survey measurement*, 51 Oxford J. Soc. Sci. Pub. Op. Q. 201-219 (1987).

¹⁸ Typically, variables measured on a nominal scale, i.e., categories that do not have a natural order are randomized to avoid order bias. The answer choices in Question Q13 were 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.

satellite radio at your current subscription rates if music was no longer offered (i.e., if you could only have a non-music package)?” The answer choices were “Yes”, “No”, “Don’t Know.”

47. Respondents were then asked: “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?” The answer choices were discounts in 10% increments (i.e., 1-10%, 11-20%, ... 91-99%), “None – I would not need a discount,” “None – no amount of discount would convince me if music was not offered,” and “Don’t Know”).
48. The questions described in paragraphs 46 and 47 were then asked with regard to non-music content.
49. So that I could test for order bias, respondents were shown these questions in random order: A random selection of half of the respondents were asked about music programming first, whereas the other random half of the respondents were asked about non-music programming first.
50. Finally, I included a question for quality control purposes in which respondents were asked about their willingness to participate in a follow-up to verify their participation in this survey. Ultimately, 10% of the survey respondents who indicated their willingness to participate in a follow-up were later contacted by telephone for verification purposes.

V.1.7 Perform Pilot Study

51. A pilot study is a small scale version of the questionnaire administered to individuals from the same population of interest as the large-scale or main study.
52. I designed and conducted a pilot study with a sample size of 101. The pilot study allowed me to test the questionnaire before proceeding to the main study. As described in greater detail below, the pilot study also enabled me to obtain balancing weights of demographic variables for the main study.

53. Upon analyzing the results of the pilot study, I concluded that no changes to the questionnaire were necessary.

V.2 Survey Implementation

54. For the survey implementation, I engaged Amplitude Research, Inc. (“Amplitude”), a survey firm with expertise in questionnaire design, data collection, and reporting.¹⁹ Amplitude conducts surveys for global, national and regional companies of all sizes, industries, and markets. Approximately 70% of Amplitude’s projects are conducted using online surveys, with the other 30% split evenly between telephone and mail research.

55. Amplitude administered the survey between October 7 and October 11, 2016. During this time period, I had daily phone conversations with Amplitude staff and management about project progress.

56. Participants were recruited from the online panel maintained by Research Now, a highly experienced and well-established firm with over 6 million internet panelists. Research Now maintains a variety of panels in the United States and worldwide,²⁰ and Amplitude has partnered with Research Now on numerous studies using Research Now panels.

57. Amplitude and/or Research Now followed accepted standards in the field of market research regarding the following²¹:

- a. Panelist recruitment consistent with all ESOMAR²² Standards (Research Now);
- b. Demographic balancing;
- c. Use of advanced software and technology;
- d. Use of a proprietary survey completion time tracker;
- e. High quality filtering system to clean respondent data; and

¹⁹ For more information, *see* Amplitude Research website, <http://www.amplituderesearch.com>.

²⁰ *See* Research Now website, <https://www.researchnow.com/>

²¹ *See* Amplitude Research website, <http://www.amplituderesearch.com/>, for detailed descriptions. I further verified through discussions with Amplitude’s CEO and the Project Manager assigned to my survey that the standards mentioned were applied in the implementation of my survey.

²² ESOMAR is a worldwide market research association that had developed professional and ethical standards for researchers. *See* ESOMAR website, Knowledge and Standards, <https://www.esomar.org/knowledge-and-standards.php>.

- f. Data tabulation and recording.
58. The survey was conducted in a “double-blind” fashion. That is, neither the staff at Amplitude/Research Now nor the respondents were aware of the survey sponsor or the ultimate purpose of the survey. The data collection was performed automatically and concurrent with answering the online questionnaire, and an Excel data file was extracted automatically using the raw data, and then cleaned.
59. To ensure that the data generated by the survey were of the highest quality, Amplitude implemented additional quality control measures:
- a. Respondents who indicated that they did not understand or were unwilling to adhere to the survey instructions were screened out of the survey.
 - b. During the survey invitation process, Research Now used a link to the online survey embedded in the email invitation. This link contained an embedded unique identification number to ensure that only invited respondents could answer the survey, and that each respondent could complete the survey one time only.²³
 - c. Survey participation was by email invitation only of double opt-in panelists. Web intercepts were not used.
 - d. The survey included a control measure used to evaluate the extent to which respondents were involved in completing the survey. As a control, Amplitude included survey administration tools which included review of each respondent’s survey completion time,²⁴ review of text field responses, straight-line testing, and other filtering techniques that result in superior data and higher quality feedback.
 - e. Survey participation was validated via a follow-up phone survey of 10% of survey respondents.

²³ The survey had to be completed in one session, and the same login information could not be used more than once.

²⁴ Survey timers were used to time how long it took each respondent to complete the survey after beginning. Participants who did not meet the timing requirements were removed.

60. Respondents who qualified and completed the survey were awarded \$1.50 in e-Rewards Currency. These kinds of small incentives are common in survey research and do not influence the reliability of the survey.

V.2.1 Pilot Study

61. To identify demographic balancing for the target population of Sirius XM subscribers in the main study, and to test the questionnaire, a pilot study was conducted.

62. The pilot study was conducted on the first day of the survey implementation (October 7, 2016). 101 surveys were completed in this phase.

63. Survey invitations were distributed by email to a random sample of the 6 million people in the general population of the Research Now internet panel. The random sample was balanced consistent with U.S. Census data on age, gender, race, household income, and geographic region.²⁵ Email invitations were distributed in batches and adjusted as needed to reflect appropriate demographic balancing targets based on survey starts. The demographic adjustments were made based on known profiles of the survey panelists. Further, all respondents were screened on the questionnaire using the study specific qualifying criteria consistent with the U.S. Census data.

V.2.2 Demographic Balancing and Main Study

64. The main study was conducted between October 7 and October 11, 2016. The main study achieved 1000 completes and used the same questionnaire as the pilot study.

65. The main study drew from a pool of approximately 78,800 pre-identified Sirius XM users within the Research Now population. Sirius XM subscribers were directly targeted using random sample pulls from the known profiles of the web panelists. Email invitations were distributed in batches to reflect the targeted demographic balancing of survey completes.

²⁵ See United States Census Bureau, Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties, and Puerto Rico Commonwealth and Municipios: April 1, 2010 to July 1, 2015, available at <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk> (last visited Oct. 18, 2016).

66. The demographics of the 101 completed pilot surveys were used to establish the demographic balancing sub-quotas for survey completes for the main study.

67. The following Charts 1-5 show the distribution for six main Census demographic and socio-economic variables in the pilot sample compared to the sample for the main study. These charts highlight how the balancing was applied:

Chart 1: Gender Distribution – Probe Sample and Main Sample

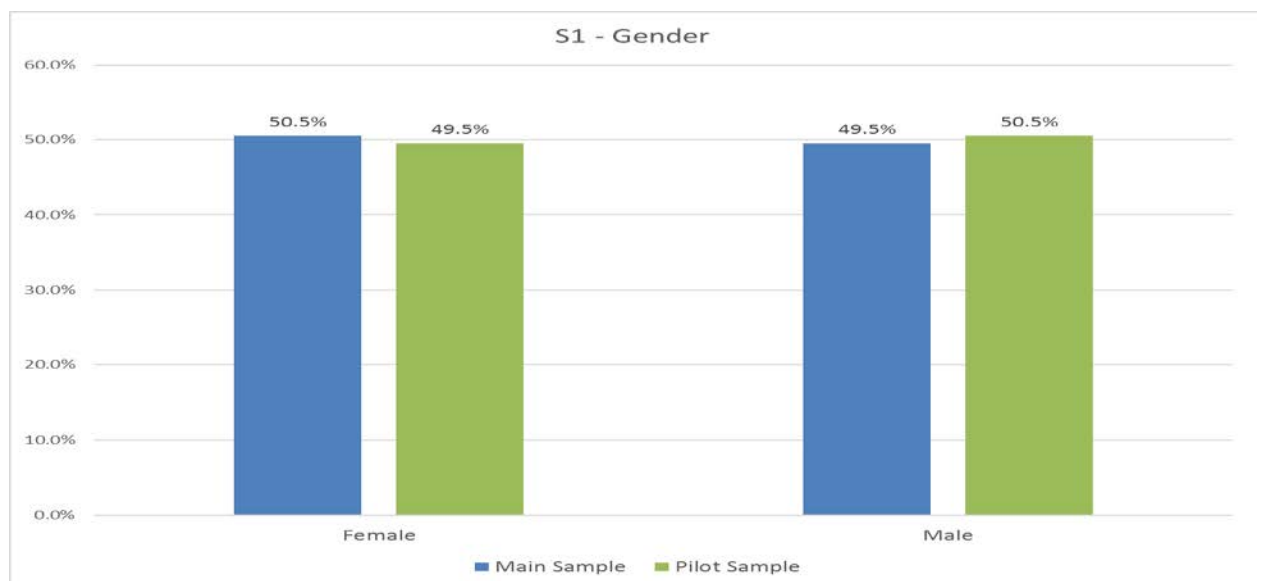


Chart 2: Age Distribution – Probe Sample and Main Sample

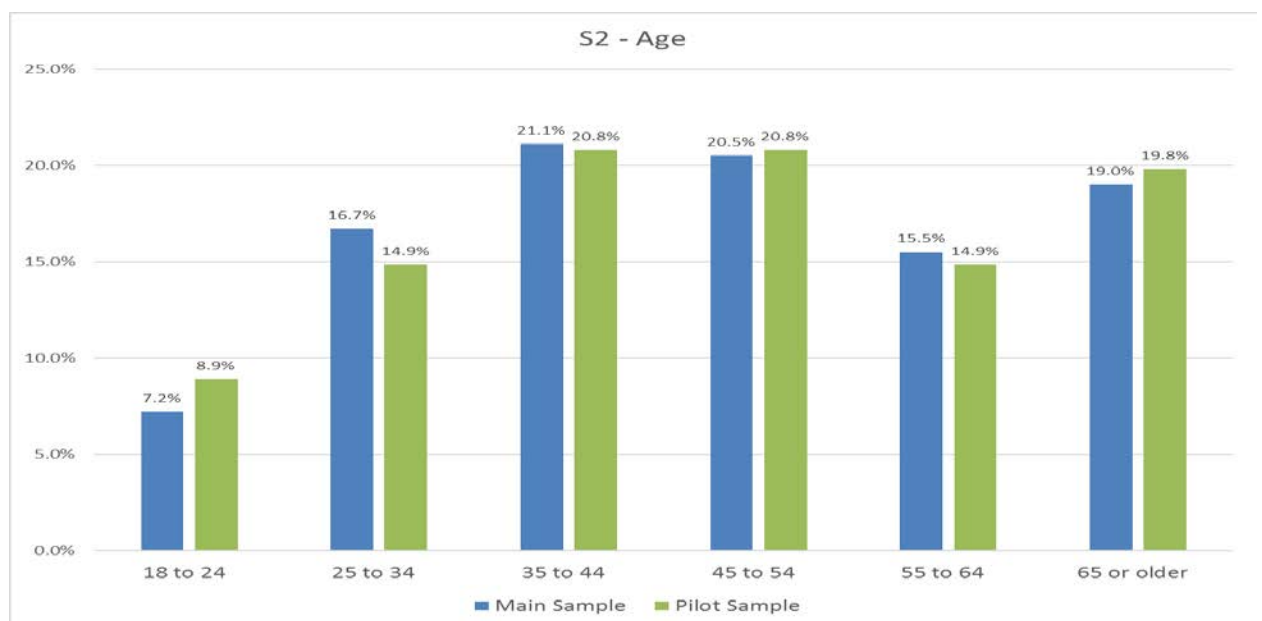


Chart 3: Household Income Distribution – Probe Sample and Main Sample

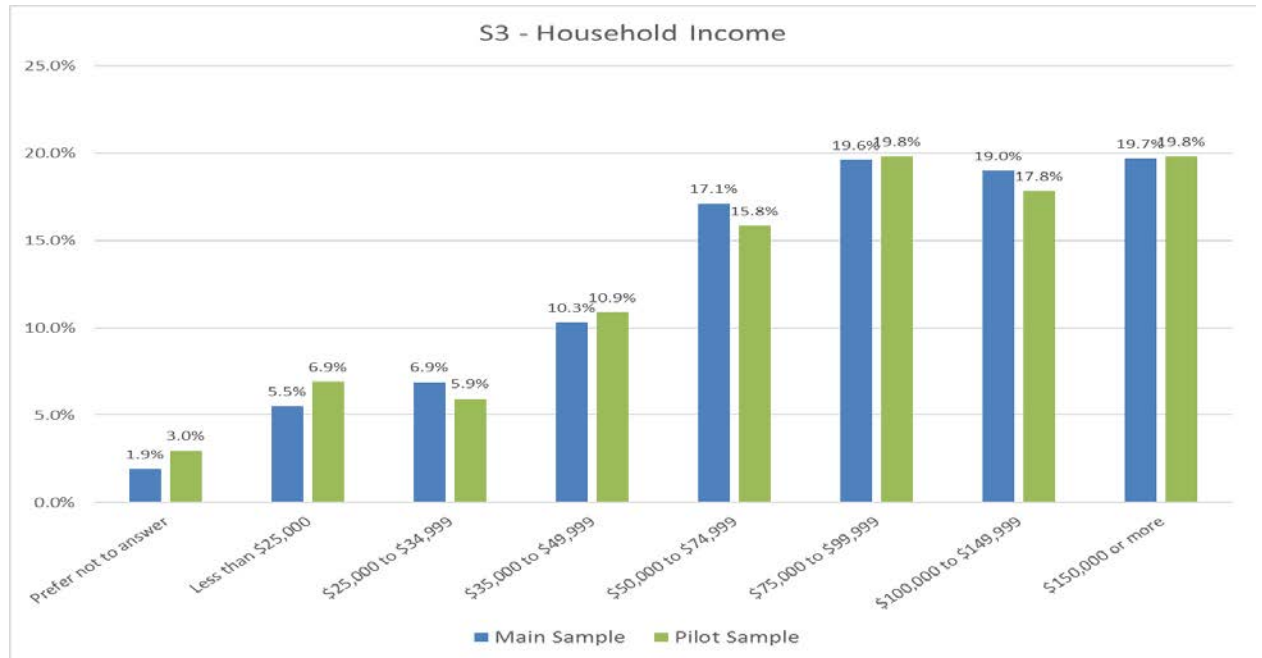


Chart 4: Distribution by Census Region– Probe Sample and Main Sample

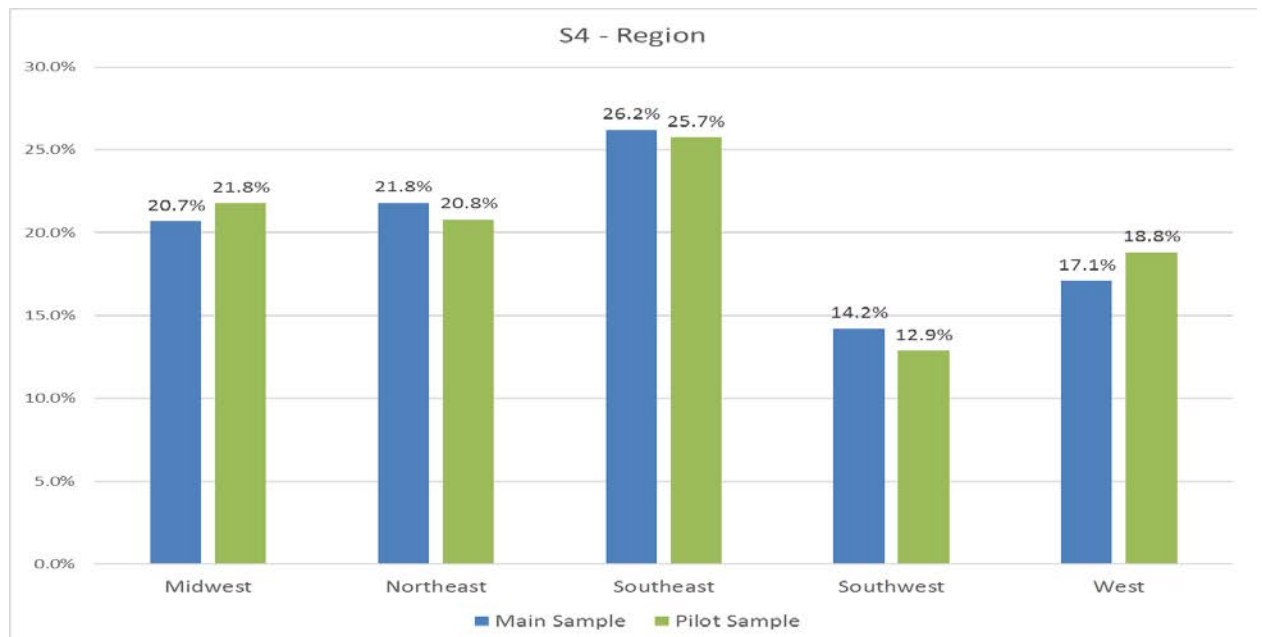
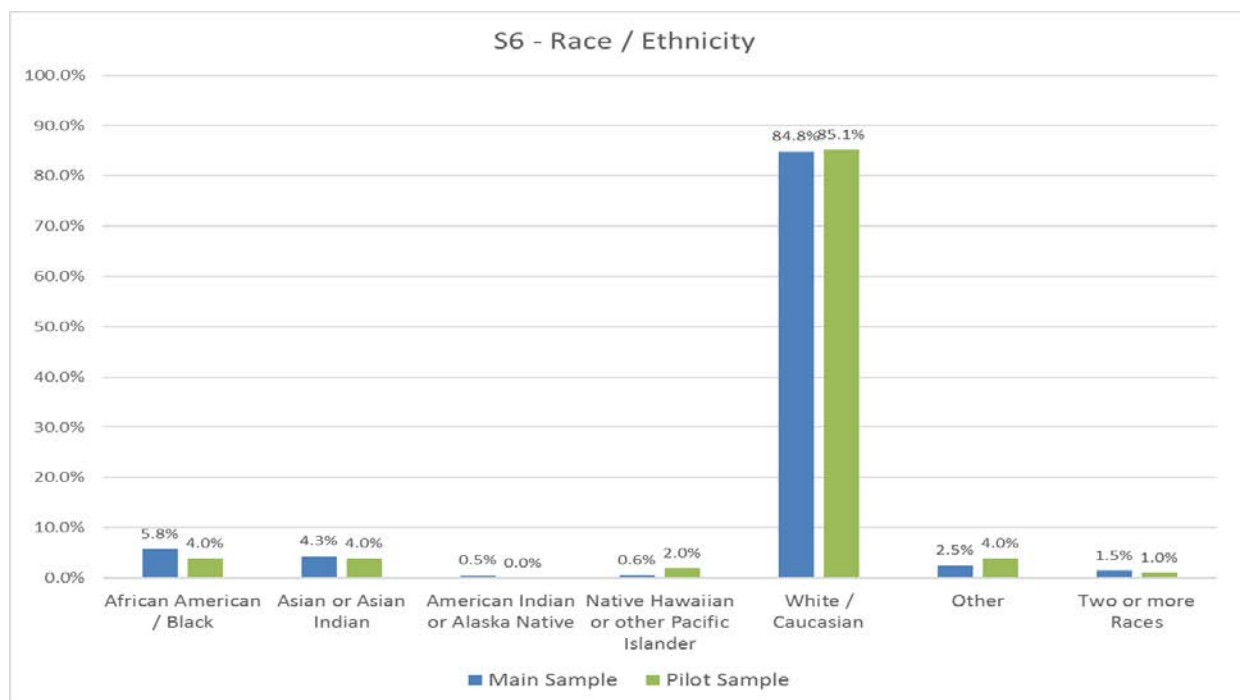


Chart 5: Distribution by Race/Ethnicity– Probe Sample and Main Sample



68. During the work on my survey, counsel for SoundExchange made me aware of a survey conducted by Edison Research in 2015 for SiriusXM, titled “SiriusXM Radio Survey.” The Edison Research survey was conducted as a mixed-mode survey using landlines, cell phones, and the internet. The sample size was 1,460 participants, 77% of whom were named Sirius XM account holders.
69. The Edison Research study reported summary demographic statistics for the sample participants that strongly resemble the demographic distribution I had obtained from the random selection of participants from the Research Now panel and the subsequent weight balancing. I performed descriptive statistical analyses including but not limited to median comparison, category-by-category percentile comparisons, and 3% margin of error band comparisons. These analyses led me to conclude that the demographics of the underlying target population between my survey and the Edison Research study were not statistically significantly different from each other. The results of my statistical analyses of the demographics across the two studies is attached hereto as Appendix E.

VI. Statistical Analysis, Key Findings and Conclusions

70. In this section, I summarize the key findings of my survey. The raw data from the survey, all charts and tabulations, and all statistical calculations referenced in this Report are attached hereto as Appendix F.

VI.1 Allocation Questions

71. Question 8 (Decision to Subscribe): When asked to allocate 100 points between music and non-music programming to reflect its importance to their decision to subscribe to satellite radio, respondents allocated 72 points to music programming and 28 points to non-music programming.

72. Question 10 (Decision to Remain a Subscriber): When asked to allocate 100 points between each category of programming to reflect its importance in their decision to remain a subscriber to Sirius XM satellite radio (based on personal decision making experience), respondents allocated 70.6 points for music programming and 29.4 points for non-music programming.

73. Question 11 (Time Spent Listening): When asked to allocate 100 points between music and non-music to reflect the percentage of time they typically spend listening to music versus non-music on satellite radio, respondents assigned 71.25% of their listening time to music programming and 28.75% to non-music programming. Because these two figures represent unweighted averages, I also calculated the median listening time as indicated by the responses to this question. I found that the median listening time for music programming is 80%, and the median listening time for non-music programming is 20%.

74. As described above, the order of the answer choices for the questions above was randomly assigned to the survey participants. Based on a random selection, half of the participants saw music listed first and the other half saw non-music listed first. Table 1 summarizes the results of two-sample-t-tests²⁶, which I performed to assess whether the results of these three survey

²⁶ See Robert Witte & John Witte, *Statistics* 286-333 (9th ed. 2010), for a detailed discussion of two sample t-tests.

questions are dependent on whether the respondents saw music or non-music answer choices first.

Table 1: Results of Two-Sample-t-Tests for Questions 8, 10, 11

2 Sample T-Test of the Mean: Percentage Allocation Questions Q8, Q10, Q11 (Welch's t-test)							
Survey Question	Bucket Allocation	Test Variable	Mean	N	Sample Variance	t-value	p-value
Q8	Music programming	First Asked: Music	72.03	486	651.4527	0.042955	0.97
		First Asked: Non-Music	71.96	458	608.1166		
	Non-Music programming	First Asked: Music	27.97	486	651.4527	-0.04296	0.97
		First Asked: Non-Music	28.04	458	608.1166		
Q10	Music programming	First Asked: Music	70.87	501	783.3961	0.304254	0.76
		First Asked: Non-Music	70.34	474	701.6314		
	Non-Music programming	First Asked: Music	29.13	501	783.3961	-0.30425	0.76
		First Asked: Non-Music	29.66	474	701.6314		
*Q11	Music programming	First Asked: Music	80.00				
		First Asked: Non-Music	80.00				
	Non-Music programming	First Asked: Music	20.00				
		First Asked: Non-Music	20.00				

** The estimate for Q11 is the median of the distribution. This is the appropriate measure because the actual listening time of individual respondents is not known.*

75. These tests did not provide any evidence that there was a significant difference in the answers based on the order of the answer choices as can be seen in the p-values of 0.97 and 0.76, respectively.²⁷

VI.2 Questions about Cancellation and Pricing

76. Question 12 asked:

- a. 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)?
 - o Yes

²⁷ p-values measure the likelihood that an observed difference is due to chance. p-values are between 0 and 1. Small p-values are interpreted as evidence that observed differences are not due to chance. Those differences are called statistically significant. The most frequently used significance levels in statistical testing are 5% which corresponds to p-values of 0.05 or smaller and 1% which corresponds to p-values of 0.01 or smaller. If the p-values are large (i.e., larger than a specified significant level) then the observed differences are not statistically significant.

- No
 - Don't know,
- b. Would you continue to subscribe to SiriusXM satellite radio at your current subscription rates if non-music was no longer offered (i.e., if you could only have a music package)?
- Yes
 - No
 - Don't know,

77. In response, 70.1% of all survey respondents said they would no longer subscribe to Sirius XM satellite radio at their current subscription rates if music programming was no longer offered. 32.4% of all survey respondents said they would no longer subscribe to Sirius XM satellite radio at their current subscription rates if non-music programming was no longer offered.

78. As described above, the order of these questions was randomly assigned to the survey participants. Based on a random selection, half of the participants saw the music programming question first, and the other random half saw the non-music programming question first. Table 2 summarizes the results of further statistical significance tests I performed to assess if the order of questions 12A and B impacted the results of the survey.

Table 2: Results of Two-Sample-t-Tests for Question 12

2 Sample T-Test for Proportions Q12A vs. Q12B									
Bucket Selection	Order of Music v. Non-Music Question	Test Variable	Proportions	N	p-hat	q-hat	std.error	t-value	p-value
Don't know	All respondents regardless of order	Music	0.105	105	0.112438	0.887563	0.042297	-0.33099	0.74
		Non-Music	0.119	119					
No	All respondents regardless of order	Music	0.701	701	0.581831	0.418169	0.033136	11.37723	0.00***
		Non-Music	0.324	324					
No	Music N/A asked first	Music	0.6905222437	357	0.578322	0.421678	0.044346	7.283966	0.00***
		Non-Music	0.3675048356	190					
No	Non-Music N/A asked first	Music	0.7122153209	344	0.590331	0.409669	0.050078	8.682113	0.00***
		Non-Music	0.2774327122	134					
Yes	All respondents regardless of order	Music	0.194	194	0.463229	0.536771	0.04157	-8.73218	0.00***
		Non-Music	0.557	557					
Yes	Music N/A asked first	Music	0.2108317215	109	0.427847	0.572153	0.056237	-5.43427	0.00***
		Non-Music	0.5164410058	267					
Yes	Non-Music N/A asked first	Music	0.1759834369	85	0.50421	0.49579	0.061668	-6.88248	0.00***
		Non-Music	0.6004140787	290					

*** $p < 0.01$, Proportions significantly different at 99%

** $p < 0.05$, Proportions significantly different at 95%

* $p < 0.10$, Proportions significantly different at 90%

79. For these questions, respondents were given the options “Yes,” “No,” and “Don’t know.” The results in Table 2 show that the proportion of “Don’t know” answers are not significantly different from each other when the questions were asked in different order (p-value of 0.74).

80. The “Yes” and “No” answers show the same results at levels independent of the order of the questions, as well.

81. The results for the “Yes” and “No” answers to Questions 12A and 12B are significant in excess of 1% (the p-value is smaller than 0.01): The proportion of subscribers who would not continue to subscribe at their current rate if music was no longer offered is statistically significantly larger than the proportion of subscribers who would not continue to subscribe at their current rate if non-music was no longer offered.

82. Lastly, Question 13A/B asked respondents to select the minimum level of discount (if any) that could be offered to convince them to still pay for a Sirius XM satellite radio subscription

if music programming was no longer offered, and the minimum level of discount (if any) that could be offered to convince them to still pay for a Sirius XM satellite radio subscription if non-music programming was no longer offered.

83. I analyzed the responses to these questions to identify the most frequent responses with regard to music and non-music programming. Table 3 summarizes the results of this analysis:

Table 3: Frequency Distribution of Discount Categories

<i>Discount Offered: Music Programming No Longer Offered</i>		<i>Discount Offered: Non-Music Programming No Longer Offered</i>	
None – no amount of discount...	42.7%	21% - 30%	15.4%
51% - 60%	8.3%	None – I wouldn't need a discount...	12.2%
71% - 80%	8.3%	41% - 50%	11.0%
41% - 50%	7.1%	11% - 20%	10.2%
81% - 90%	6.3%	51% - 60%	10.2%
91% - 99%	4.9%	None – no amount of discount...	10.0%
21% - 30%	4.8%	31% - 40%	7.8%
61% - 70%	4.3%	71% - 80%	5.1%
31% - 40%	4.2%	61% - 70%	4.5%
11% - 20%	2.6%	1% - 10%	4.4%
Don't know	2.6%	Don't know	3.7%
None – I wouldn't need a discount...	2.2%	91% - 99%	3.0%
1% - 10%	1.7%	81% - 90%	2.5%

84. As Table 3 shows, 42.7% of respondents would no longer subscribe to their current package if music programming was no longer offered (regardless of any discount). By contrast, 10.0% of respondents would no longer subscribe to their current package if non-music programming was no longer offered.

85. Among those survey respondents who would continue their subscription at a discount, the median discount required for a hypothetical package in which music programming was no longer available was in the range between 51-60%. With regard to a hypothetical package in which non-music programming was no longer available, the median discount requested was in the range between 31-40%.

86. When music programming would no longer be offered, the single largest category of responses (42.7%) is that “None – no amount of discount would convince me if option was not offered.”

The single largest category of responses when non-music programming would no longer be offered is a discount between 21% and 30%.

87. It is further noteworthy, that:

- a. The discount categories of 51-60% and 71-80% are the most frequently mentioned discounts when music is no longer offered while the most frequently mentioned discount when non-music is no longer offered is 21-30%. Together, these data indicate that subscribers demand substantially larger discounts to continue their subscription when music is no longer offered.
- b. The number of subscribers who would continue their subscription without a discount when non-music programming was no longer offered is over 5.5 times larger than the number of subscribers who would continue their subscription without a discount when music programming was no longer offered (12.2% is .54 times 22%).

VI.3 Precision Computations

88. The foregoing results are the point estimates derived from the survey results.

89. The survey I conducted is used an internet panel. However, the identification of the sample frame, the selection process of participants from the sample frame, and utilizing demographic information as balancing weights makes the resulting sample a representative selection from the target population.

90. As stated above, I adhered to the previously cited AAPOR Guidance on Reporting Precision for Nonprobability Samples.²⁸ I also followed the format of reporting the results of my precision computations as suggested in the AAPOR Guidance:²⁹
91. I applied what is known as a “bootstrap” approach. To estimate the precision of the estimates from this survey and construct 99%, 95%, and 90% approximations to confidence intervals, I created 1000 samples of size 500, size 750, and size 1000 from the combined results in the pilot study and the main study. The bootstrap approach I applied assumed that the survey results came from a simple random sample selected from the sampling frame for the target population.³⁰
92. For the results for each of the survey questions Q8, Q10, Q11, Q12, and Q13, I resampled 1000 random draws for three different sample sizes ($n=500$, $n=750$, $n=1000$) from the survey results. In other words, I randomly selected one thousand samples of size 500, one thousand samples of size 750, and one thousand samples of size 1000 from the survey results. I then computed the proportion estimators for the answer categories in Q8, Q10, Q11, Q12, and Q13. Each sample yields a different estimator. In the next step I tabulated all the results from all the re-sampling steps and I determined the following percentiles for the distribution of each proportion estimator: 0.5th, 2.5th, 5th, 25th, 50th, 75th, 95th, 97.5th, and 99.5th.
93. The n -th percentile of a distribution was defined as the value in that distribution for which $n\%$ of all data points in that distribution are smaller than or equal to that value. Based on this definition, the percentiles can be used to calculate approximate confidence intervals in the following way: The 2.5th percentile is the value in the distribution for which 2.5% of all data

²⁸ American Association for Public Opinion Research, AAPOR Guidance on Reporting Precision for Nonprobability Samples, Page 1 (discussing a number of approaches that survey researchers use to estimate precision with nonprobability samples), https://www.aapor.org/getattachment/Education-Resources/For-Researchers/AAPOR_Guidance_Nonprob_Precision_042216.pdf.aspx.

²⁹ AAPOR Guidance at Pages 2 and 3.

³⁰ The target population is defined as Sirius XM users who subscribe to paid satellite radio packages that contain both music and non-music programming. The population was limited to adults (18 years of age or older), who live in the United States, and who use a subscription package that includes both music and non-music programming. Members of the target population were required to either pay for the Sirius XM package themselves or live in the same household as the person who pays for it, and were required to have used their subscription. Furthermore, individuals who are employed by Sirius XM satellite radio in particular or who are employed in the music industry in general or individuals who live in households where a member of the household is employed by Sirius XM satellite radio or in the music industry were excluded from the target population.

points are smaller than or equal to and the 97.5th percentile is the value in the distribution for which 97.5% of all data points are smaller than or equal to.

94. By definition, in every distribution 95% of all data points from that distribution fall between the 2.5th and the 97.5th percentile which makes the 2.5th percentile comparable to the lower bound of a 95% confidence interval and the 97.5th percentile comparable to the upper bound of a 95% confidence interval. Similarly, 99% of all data points from that distribution fall between the 0.5th and the 99.5th percentile which makes the 0.5th percentile comparable to the lower bound of a 99% confidence interval and the 99.5th percentile comparable to the upper bound of a 99% confidence interval. And, in every distribution 90% of all data points from that distribution fall between the 5th and the 95th percentile, which makes the 5th percentile comparable to the lower bound of a 90% confidence interval and the 95th percentile comparable to the upper bound of a 90% confidence interval.

The following Table 4 displays the results for Questions Q8 and Q10.

Table 4: Results from Bootstrapping

Percentiles of the Proportion Estimator												
		Percentiles	PE	0.5%	2.5%	5.0%	25.0%	50.0%	75.0%	95.0%	97.5%	99.5%
N=500	Q8	Musi c	78	69.0	69.8	70.1	71.2	72.0	72.8	73.9	74.3	74.8
1000	Q8	Non- Musi c	22	25.2	25.7	26.1	27.2	28.0	28.8	29.9	30.2	31.0
Random	Q10	Musi c	70. 6	67.1	68.0	68.5	69.7	70.5	71.3	72.3	72.7	73.4
	Q10	Non- Musi c	29. 4	26.6	27.3	27.7	28.7	29.5	30.3	31.5	32.0	32.9
N=750	Q8	Musi c	78	69.7	70.2	70.4	71.4	72.0	72.6	73.6	73.8	74.5
1000	Q8	Non- Musi c	22	25.5	26.2	26.4	27.4	28.0	28.6	29.6	29.8	30.3
Random	Q10	Musi c	70. 6	68.1	68.6	68.9	69.7	70.4	71.1	72.1	72.4	73.1
	Q10	Non- Musi c	29. 4	26.9	27.6	27.9	28.9	29.6	30.3	31.1	31.4	31.9
N=1000	Q8	Musi c	78	70.2	70.5	70.7	71.5	72.0	72.5	73.2	73.5	73.9
1000	Q8	Non- Musi c	22	26.1	26.5	26.8	27.5	28.0	28.5	29.3	29.5	29.8
Random	Q10	Musi c	70. 6	68.1	68.8	69.1	69.9	70.4	70.9	71.8	71.9	72.5
	Q10	Non- Musi c	29. 4	27.5	28.1	28.2	29.1	29.6	30.1	30.9	31.2	31.9
		PE	Proportion estimator from Survey									
			Lower and upper bound of an approximate 90% confidence interval									
			Lower and upper bound of an approximate 95% confidence interval									
			Lower and upper bound of an approximate 99% confidence interval									

95. The results from the bootstrapping approach to determine approximate confidence intervals for the proportion estimator presented in Table 4 indicate that the approximate 99% confidence interval for the proportion estimator (which is 72% based on the survey results) for the importance of music programming in the decision to subscribe has a lower bound of 69% and

upper bound of 74.8% for a sample size of 500. When the sample size increases, the width of the approximate confidence interval decreases: for a sample size of 1000 the lower bound of an approximate 99% confidence interval is 70.2% and the upper bound is 73.9%. When the confidence requirements are lower, the width of the approximate confidence interval also decreases: For example, for a sample size of 1000 the lower bound of an approximate 95% confidence interval is 70.5% and the upper bound is 73.5%.³¹

96. The detailed results from the bootstrapping methodology to calculate approximate confidence intervals for the proportion estimators for Questions Q11, Q12, and Q13 are attached to this Report as Appendix G.
97. Based on the foregoing, I have formed the opinions described herein with a high degree of scientific certainty.

³¹ In comparison, under the assumption that the survey is derived from a simple random sample the lower bound of a 95% confidence interval for the 72% proportion estimator can be calculated as 69.3% and the upper bound of a 95% confidence interval for the 72% proportion estimator can be calculated as 74.7%.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: 10-18-2016



Stefan Boedeker

APPENDIX A

STEFAN BOEDEKER

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Education

- BS in Statistics,
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- BA in Business Administration,
University of Dortmund, Germany
- MS in Statistics
University of Dortmund, Germany
- MA in Economics
University of California, San Diego
- ABD in Economics
University of California, San Diego

Professional Associations

- Member of the American Economic Association (AEA)
- Member of the American Statistical Association (ASA)
- Member of the Econometric Society
- Member of the Mathematical Association of America (MAA)
- Member of the American Association for Public Opinion Research (AAPOR)
- Member of the Market Research Association (MRA)
- In 2001 Stefan was a member of an AICPA task force dealing with Corporate Integrity Agreements (CIA). Stefan was responsible for issues related to statistical methodology utilized in CIA's.

Background

Stefan is a Managing Director at Berkeley Research Group where he focuses on the application of economic, statistical, and financial models to a variety of areas such as solutions to business issues, complex litigation cases, and economic impact studies. He has extensive experience applying economic and statistical theories and methodologies to a wide variety of cases where But-for-scenarios have to be developed based on probabilistic methods and where statistical predictive modeling has to be applied to assess liability and damages.

Stefan has applied these techniques in business disputes, single-plaintiff cases, multi-plaintiff cases, and class action proceedings in the areas of class certification, liability assessment, developing damages scenarios, and post settlement or judgment distributions.

Professional and Business Experience

Representative Engagements

Survey Sampling

Stefan has extensive experience in designing, conducting, and statistically analyzing surveys. He has applied his expertise in both, the business consulting sector as in litigation proceedings in a wide variety of industries. Stefan's work also often incorporates the review and evaluation of surveys designed, conducted, and analyzed by other consultants and experts. In this capacity Stefan has frequently been asked to assess what can and what cannot be concluded from survey data.

- » In a class action alleging misleading advertisement about coupon redemption policies, Stefan analyzed transactional coupon redemption data and conducted a consumer survey about the perceived meaning of the advertising regarding the coupon redemption policies
- » In a case involving the meaning of certain endorsement labels on sporting equipment, Stefan analyzed a consumer survey about the recognition and perceived meaning of such labels.
- » In a case where a celebrity chef look-alike was used in a commercial, Stefan conducted a survey to assess the extent of consumers' confusion and the potential impact on product sales.
- » In a case of advertising slogans for an alcoholic beverage, Stefan conducted a survey to assess whether consumers assumed that the products advertised were from a particular brewery.
- » In a post-acquisition study for a large instant breakfast producer, Stefan conducted surveys to assess the value of the acquired brand name and the advantages of keeping that name for certain product lines.
- » In a dispute between two golf club manufacturers over advertising claims for their drivers, Stefan performed statistical analyses of test data and a consumer survey to assess the impact of the advertising on the propensity to buy a particular driver.
- » For a large consumer products company, Stefan combined statistical modeling of transactional purchase data with consumer surveys to assess the price premiums that consumers were willing to pay for certain national brands over local brands and non-branded products.
- » Stefan designed, conducted and implemented consumer surveys about coupon redemption rates, frequency and volume of coupon usage, and the perceived value of coupons in class action settlements.
- » Stefan designed and analyzed a survey in a dispute about the perception of customer mis-information concerning the rating process of video and computer games.
- » For a large casino operator Stefan designed, conducted, and analyzed surveys about consumer visit frequency and gambling habits to develop a "comp" system.
- » Stefan analyzed guest data to analyze the effectiveness of a frequent traveler program as well as group discount pricing. Based on a survey of frequent travelers and utilizing data mining tools Stefan developed predictive models for customer acquisition, retention, and attrition. Stefan also specified share of wallet models. The study resulted in price setting recommendations and a restructuring of the yield management system.
- » Stefan designed a survey of used car dealers to assess the impact of optional equipment and general condition on the value of used automobiles for insurance valuation purposes.
- » In a consumer class action alleging economic losses to the class caused by defective window regulators Stefan designed, conducted, and analyzed a survey used to segment the customer base and identify different levels of economic loss.
- » For one of the largest school districts in the country Stefan designed, conducted and statistically analyzed a survey of school administrators, teaching personnel, students, and parents about the attitude towards a new recycling program prior to its implementation.

- » For a large school district Stefan designed, conducted and statistically analyzed a survey about the acceptance of a recycling program across school administrators, teaching personnel, students, and parents after its implementation. The answers of the survey were cross validated by actually observing and analyzing the recycling behavior on a sample of school yards.
- » In several environmental disputes Stefan designed, conducted and statistically analyzed surveys assessing the willingness to pay among users and non-users of natural resources for cleanup costs related to pollution.
- » In a dispute over alleged underfunding of special education in public schools funding Stefan designed, conducted, and statistically analyzed a survey among school district administrators about allocation of public funds.
- » In a variety of instances for clients across multiple industries Stefan designed, conducted, and statistically analyzed data from customer surveys to assess a qualitative ranking of the importance of goods and services offered and to measure the performance relative to the customers' perception of importance.
- » For the San Diego County Bar Association, Task Force on Diversity in the Profession, Stefan performed a statistical analysis of questionnaires on diversity regarding aspects of race, gender, age, and disability.
- » On numerous occasions Stefan has been retained to critically analyze other experts' surveys and opine on design, implementation, statistical analysis of data obtained from the surveys, and interpretations and conclusions drawn based on the results.
- » For a large insurance company, Stefan utilized statistical sampling methodology to estimate the potential exposure in a lawsuit alleging the unlawfulness of certain liability waivers in automobile insurance.
- » In numerous wage and hour litigation cases Stefan designed, conducted, and statistically analyzed surveys in junction with observational studies to gain information about how store managers, assistant managers, and/or other salaried employees in supervisory functions allocate their time worked across managerial and non-managerial activities.
 - Including, but not limited to large department stores, electronics retailer, large big box retailer, women's special clothing retailer, women's shoe retailer, sporting goods stores, amusement park industry, restaurant industry, high tech, etc.
- » In numerous wage and hour litigation cases Stefan designed, conducted, and statistically analyzed surveys in junction with observational studies to gain information about the implementation of and compliance of meal and rest break policies.
 - Including, but not limited to large department stores, electronics retailer, large big box retailer, women's special clothing retailer, women's shoe retailer, sporting goods stores, amusement park industry, restaurant industry, high tech, etc.

Non-Litigation

- » For large grocery store chains, Stefan analyzed the effectiveness of a frequent shopper card program utilizing data mining techniques. He also analyzed customer data to facilitate the introduction of one-to-one marketing tools.
- » For a grocery store chain, Stefan utilized econometric elasticity models to recommend pricing strategies for in-store promotions.
- » For a grocery store chain, Stefan developed customer segmentation models to design segment specific marketing campaigns.
- » For the American Film Marketing Association, Stefan performed an economic impact study of the influence of the independent film producers and distributors on the U.S. economy in general, and the California economy in particular.
- » For a large entertainment client, Stefan developed statistical models to predict the return of video cassettes and DVDs.
- » For several clients in the retail industry, Stefan developed statistical models to estimate the liability of unredeemed gift certificates.
- » For a client in the restaurant business, Stefan developed statistical models to quantify the dollar amount of outstanding unredeemed gift certificates.
- » For a major hotel chain, Stefan developed statistical models to forecast the redemption of frequent traveler program points for tax purposes.
- » For a high profile e-commerce company, Stefan's team produced an interactive Business decision tool to forecast company growth and profitability. The interactive model allows the client, through the choice of a few fundamental inputs, to measure the simultaneous impact on all cost and revenue dimensions of the company, including real estate and equity participation.
- » For the Nevada Resort Association, Stefan quantified the economic impact of the gaming industry with special emphasis on the accelerated population growth in greater Las Vegas.
- » For the Los Angeles Unified School District, Stefan performed an economic study about the impact of different recycling programs.
- » For the Los Angeles County Department of Health Services, Stefan conducted a time and motion study to determine the time required to complete specific Medi-Cal eligibility and provider forms.
- » For the Arizona Tax Research Association, Stefan developed economic models to quantify the revenue impact of a proposed change of taxation in the construction sector in Arizona.
- » For a hotel property management company, Stefan analyzed customer data, and used data mining methods to develop predictive models for customer acquisition, retention, and attrition.

- » For a project analyzing the extent of competition in the market segments of a pipeline company, Stefan estimated regression and Tobit-models to determine optimal bidding behavior for gas storage demand. He prepared testimony given in filings before the Federal Energy Regulatory Commission (FERC).
- » For a hotel property management company, Stefan developed a demand driven yield management system.
- » For a company providing self-storage space, Stefan developed a demand driven price-setting strategy utilizing own- and cross-price elasticity regression models.
- » For a high-tech start-up with a unique service offering of new products, Stefan recommended product-pricing scenarios.
- » For a large international conglomerate, Stefan developed customized data mining techniques for the implementation within a customer knowledge management system.
- » For a large law firm, Stefan performed a comprehensive statistical analysis of Los Angeles superior court jury verdicts over the last decade. The project tested the hypothesis of systematic bias in particular courthouses with respect to plaintiff-win probability, length of trial, length of deliberation, and dollar amounts awarded.

Depositions & Testimony

Depositions

1. MRO Communications, Inc vs. American Telephone and Telegraph Company, United States District Court District of Nevada, Case. No. -5-95-903-PMP, Deposition Testimony, September 26, 1996
2. Yolanda Aiello Harris, individually and on behalf of all others similarly situated; Jennifer Hopkins, individually and on behalf of others similarly situated; Shannon L. Bradley, individually and on behalf of others similarly situated, Plaintiffs, vs. CB Richard Ellis, Inc., a California corporation; CB Commercial INC., a California corporation; Defendants, Superior Court of California, County of San Diego, Case No. GIC 745044, Deposition Testimony, January 05, 2001.
3. State of Tennessee, ex rel., Douglas Sizemore, Petitioner vs. Xantus Healthplan of Tennessee, Inc., Chancery Court of Davidson County, Tennessee at Nashville, Case No 99-917-II, Deposition Testimony, October 11, 2001.
4. Howard Wright, Inc., a California corporation doing business as AppleOne Employment Services, Plaintiffs, vs. Olsen Staffing Services, Inc., a Delaware Corporation, Dagny Smith, an individual, Vicky Riechers, an individual, and Linda Shiftman, an individual, Defendants, Superior Court of the State of California for the County of Los Angeles, Case No. BC 200657, Deposition Testimony, December 7, 2001.
5. Sacred Heart Medical Center, et al., Plaintiffs, -vs- Department of Social and Health Services, and Dennis Braddock, the Secretary of the Department of Social and Health Services, Defendants, Superior Court of the State of Washington in and for the County of Thurston, No. 00-2-01898-1, Deposition Testimony, January 23, 2003.

6. Patrick Bjorkquist individually and on behalf of all others similarly situated, Plaintiff, vs. Farmers Insurance Company of Washington, Defendant, in the Superior Court of the State of Washington for King County, Case No.: 02-2-11684-1 SEA, Deposition Testimony, November 3, 2003.
7. Diversified Property, a general partnership, Dora Saikhon Family Trust, and Nancy Saikhon Borrelli, an individual, Plaintiffs vs. Manufacturers Life Insurance (U.S.A.), a Michigan corporation, erroneously sued as Manufacturers Life Insurance Company, Inc., Defendants in the Superior Court of California, County of San Diego, Case No.: GIC 815128, Deposition Testimony on July 21, 2004.
8. Alan Powers, Plaintiff, vs. Laramar Group et al., Defendants in the United States District Court, Northern District of California, No. C-02-3755 SBA, Deposition Testimony on August 27, 2004.
9. Group Anesthesia Services, A Medical Group, Inc., Claimant, vs. American Medical Partners of North Carolina, Inc., etc., et al., Respondents, JAMS Arbitration, Reference No. 1100040919, Deposition Testimony on February 9, 2005.
10. Group Anesthesia Services, A Medical Group, Inc., Claimant, vs. American Medical Partners of North Carolina, Inc., etc., et al., Respondents, JAMS Arbitration, Reference No. 1100040919, Deposition Testimony on March 11, 2005.
11. Fujitsu v. Cirrus Logic et al., United States District Court, Northern District of California, San Jose Division, Case No. 02CV01627. Deposition Testimony on April 21 and 22, 2005.
12. Goldman et al. v. RadioShack Corporation, United States District Court, Eastern District of Pennsylvania, Case No. 03 CV 0032, Deposition Testimony on May 18, 2005.
13. Perez et al. v. RadioShack Corporation, United States District Court, Northern District of Illinois, Eastern Division, Case No. 02-CV-7884, Deposition Testimony on December 13, 2005.
14. United States of America ex rel. A. Scott Pogue v. American Healthcorp Inc., Diabetes Treatment Centers of America Inc., et al., United States District Court, Middle District of Tennessee at Nashville, Civil No. 3-94-0515, Deposition Testimony on May 12, 2006.
15. School Districts' Alliance v. State of Washington, United States District Court, Eastern District of Thurston, Case No. 04-2-02000-7, Deposition Testimony on July 20, 2006.
16. Boca Raton Community Hospital, Inc., a Florida not-for-profit corporation d/b/a Boca Raton Community Hospital, on behalf of itself and on behalf of Class of all others similarly situated v. Tenet Healthcare Corp., a Nevada Corporation, United States District Court, Southern District of Florida, Miami Division, Case No. 05-80183-CIV-SEITZ/MCALILEY, Deposition Testimony on July 25, 2006.
17. Boca Raton Community Hospital, Inc., a Florida not-for-profit corporation d/b/a Boca Raton Community Hospital, on behalf of itself and on behalf of Class of all others similarly situated v. Tenet Healthcare Corp., a Nevada Corporation, United States District Court, Southern District of Florida, Miami Division, Case No. 05-80183-CIV-SEITZ/MCALILEY, Deposition Testimony on October 13, 2006.
18. Louise Ogborn v. McDonald's Corporation et al., Commonwealth of Kentucky 55th Judicial District, Bullitt County Circuit Court, Case No. 04-CI-00769, Deposition Testimony on October 19, 2006.

19. Elise Davis v. Kohl's Department Stores, Inc. consolidated with Rosie Grindstaff v. Kohl's Department Stores, Inc., Superior Court of the State of California for County of Los Angeles Central District, Case No. BC 327426 (lead case) consolidated with Case No. BC 341954, Deposition Testimony on April 25, 2007.
20. Norman Utley, et al., v. MCI, Inc., MCI Worldcom Communications, Inc., and MCI Network Services, Inc., formerly known as MCI Worldcom Network Services, Inc., United States District Court, Northern District of Texas, Dallas Division, Civil Action No. 3:05 - CV- 0046 - K, Deposition Testimony on May 30, 2007.
21. Ramon Moreno and Ernesto Morailo, on behalf of themselves and all others similarly situated v. Guerrero Mexican Food Products Inc., a division of Gruma Corporation; and Gruma Corporation, a Nevada Corporation, United States District Court, Central District of California, Case No. CV05-773RSWL(PLAx), Deposition Testimony on August 10, 2007.
22. Darensburg et al. v. Metropolitan Transportation Commission, U.S. District Court, Northern District of California, Case No. C-05-1597-EDL, Deposition Testimony on March 18, 2008.
23. In Re: King Pharmaceuticals, INC, Derivative Litigation, Lead Case No: BOO19077(M), The Chancery Court, Sullivan County at Bristol, Tennessee, Deposition Testimony on April 4, 2008.
24. P. Ansley et al. v. Lewis Homes of California, a California General Partnership, et al., Superior Court of the State of California, For the County of Solano, Case No. FCS02445, Deposition Testimony on April 10, 2008.
25. Personnel Plus v. Ashish Wahi et al., Superior Court of the State of California, County of Orange, Case No. 07CC08363, Deposition Testimony on August 13, 2008.
26. First Capitol Consulting Inc. v. LVX, Inc. et al., Superior Court of the State of California for the County of Los Angeles, Case No. BC378202, Deposition Testimony on October 27, 2008.
27. R. Molina et al. v. Lexmark International, Inc., Superior Court of the State of California for the County of Los Angeles, Case No. BC339177, Deposition Testimony on November 19, 2008.
28. In re National Century Financial Enterprises, Inc. Investment Litigation, No. 2:03-MD-1565-JLG-MRA (S.D.Ohio), Deposition Testimony on January 22, 2009.
29. New York City Employees' Retirement System, et al. v. Bank One, N.A., et al., Case No. 03-cv-09973 (LAK) (S.D.N.Y.), Deposition Testimony on January 22, 2009.
30. Dole Fresh Fruit International, Ltd, Hyundai Precision America, Inc., JAMS Arbitration, ADRS Case #05-1138-RTA, Deposition Testimony on December 21, 2009.
31. D. Berry, L. Hedges et al. v. Volkswagen of America, Inc., in The Circuit Court of Jackson County, Missouri, at Independence, No. 0516-CV01171 Division 2, Deposition Testimony on February 18, 2010.
32. D. Aberle et al. v. Davidson Builders, Inc., et al., Superior Court of the State of California, County of Orange, Case No.: 37-2008-00083718-CU-CD-CTL, Deposition Testimony on March 24, 2010.
33. Urga, et al. v. Redlands Community Hospital, Superior Court of the State of California, County of San Bernardino, Case No. SCVSS 123769, Deposition Testimony on May 17, 2010.

34. Oberschlake, et al v. St. Joseph Hospital of Orange, et al, Superior Court of the State of California, County of Orange, Case No. 05CC00301, Deposition Testimony on August 12, 2010.
35. J. Morrison v. The Vons Companies, Inc., Superior Court of State of California, County of San Diego, Case No. 37-2009-00081026-CU-BT-CTL, Deposition Testimony on December 7, 2010
36. R. Pate, et al. v. Children's Hospital of Orange County, Superior Court of California, County of Orange, Case No. 05CC00303, Deposition Testimony on April 13, 2011.
37. M. St. Croix, et al. v. Cedar Fair, L.P., et al., Superior Court of California, County of Orange, Case No. 30-2008-0214500, Deposition Testimony on August 22, 2011.
38. Steven Domalewski, a minor v. Hillerich and Bradsby Co., et al., Superior Court of New Jersey, Passaic County, Docket No.: PAS-L-2119-08, Deposition Testimony on January 5, 2012.
39. Cathleen McDonough, et al., v. Horizon Blue Cross/Blue Shield of New Jersey, United States District Court, District of New Jersey, Civil Action No. 09-cv-00571-(SRC) (PC), Deposition Testimony on January 10, 2012.
40. Daniel Ordonez, et al., v. Radio Shack, United States District Court, Central District of California, Case No. CV 10-07060 CAS (JCGx), Deposition Testimony on October 24, 2012.
41. Ameritox, Ltd., v. Millennium Laboratories, Inc., United States District Court, Middle District of Florida, Case No. 8:11-cv-00775-SCB-TBM, Deposition Testimony on December 20, 2013.
42. United States of America, ex rel. Glenda Martin v. Life Care Centers of America, Inc., United States District Court Eastern District of Tennessee at Chattanooga, Civ. Action No. 1:08-CV-251, Deposition Testimony on January 15, 2014.
43. United States of America, ex rel. Tammie Taylor v. Life Care Centers of America, Inc., United States District Court Eastern District of Tennessee at Chattanooga, Civ. Action No. 1:12-CV-64, Deposition Testimony on January 15, 2014.
44. Darren Smith, et al., v. Panera Bread Company, Superior Court of California, County of San Diego, Case No. 37-201-00084077 CU-BT-CTL, Deposition Testimony on April 30, 2014.
45. Joseph Hummel et al., v. Castle Principles, LLC et al., Superior Court of California, County of Santa Clara, Case No. 112CV223170, Deposition Testimony on June 19, 2014.
46. Sherman Way Oil, Inc. (Bijan Pouldar), American Pacific Enterprises Group (Sherwin Louie), Bahman Kohanteb, Hamid Kalhor , Claimants, Vs. Circle K Stores, Inc., Respondent, Alternative Dispute Resolution Case No's 13-7103-DSC through 13-7106-DSC, Deposition Testimony on September 25, 2014.
47. In re: ExxonMobil Oil Corporation, et al., Southern California Bulk Sale Litigation, Case No. CV12-04689-PA (VBKx), Deposition Testimony on September 25, 2014.
48. Oracle Wage and Hour Cases, Raghunandam Matam et al., v. Oracle Corporation, Superior Court of California, County of Alameda, No. RG-09480164, Deposition Testimony, October 21, 2014.

49. G. Taylor et al. v. Shippers Transport Express, Inc., et al., United States District Court, Central District of California, Case No.: CV13-02092-BRO (PLAx), Deposition Testimony on October 24, 2014.
50. Denise Mays et al. v. Children's Hospital of Los Angeles, Superior Court of California, County of Los Angeles, Case No. BC477830, Deposition Testimony on March 17, 2015.
51. Direct General Insurance Company v. Indian Harbor Insurance Company et al., United States District Court, Southern District of Florida, Miami Division, Case No. 14-20050-CIV-Cooke/Torres, Deposition Testimony on March 27, 2015.
52. Dennis Dickman v. Gerdau Reinforcing Steel, et al., Superior Court of California, County of San Bernardino, Case No. CIV-DS-1406231, Deposition Testimony on July 7, 2015.
53. Fred Devries, et al. v. Morgan Stanley & Co. LLC, et al., United States District Court, Southern District of Florida, Case No. 9:12-cv-81223-KAM, Deposition Testimony on July 31, 2015.
54. Dennis Dickman v. Gerdau Reinforcing Steel, et al., Superior Court of California, County of San Bernardino, Case No. CIV-DS-1406231, Deposition Testimony on September 11, 2015
55. Leah Davis, and Amy Krajec, et al. v. St. Jude Hospital, Superior Court of California, County of Orange, Case No. 30-2012-00602596-CU-OE-CXC, Deposition Testimony on January 19, 2016.
56. In re MyFord Touch Consumer Litigation, Whalen, et al. vs. Ford Motor Company, United States District Court Northern District of California San Francisco Division, Case No. 13-cv-3072-EMC, Deposition Testimony on February 23, 2016.
57. United States of America, ex rel. Glenda Martin v. Life Care Centers of America, Inc., United States District court Eastern District of Tennessee at Chattanooga, Civ. Action No. 1:08-CV-251 & United States of America, ex rel. Tammie Taylor v. Life Care Centers of America, Inc., United States District court Eastern District of Tennessee at Chattanooga, Civ. Action No. 1:12-CV-64, Deposition Testimony on March 4, 2016.
58. The United States of America and the State of Florida ex rel. Angela Ruckh v. CMC II LLC, United States District court for the Middle District of Florida Tampa Division, Civil Action No. 8:11 CV 1303 SDM-TBM, Deposition Testimony on March 16, 2016.
59. Michael Bozsik v. Livingston International Inc., Ontario Superior Court of Justice, Court File No. 5270/14, sworn testimony at Cross Examination on May 12, 2016.
60. Bertha Sanchez, et al. v. St. Mary Medical Center, et al., Superior Court of the State of California for the County of San Bernardino, Case No. CIVDS 1304898, Deposition Testimony on July 13, 2016.
61. Christian Juarez, et al v. Dignity Health, a California corporation, et al., Superior Court of the State of California, County of Los Angeles, Central Civil West District, Case No. BC550950, Deposition Testimony on August 15, 2016.
62. In Re Dial Complete Marketing and Sales Practices Litigation, United States District Court, District of New Hampshire, Case No. 11-md-2263-SM (MDL Docket No. 2263), Deposition Testimony on August 30, 2016.

63. In Re: Myford Touch Consumer Litigation, United States District Court, Northern District of California, San Francisco Division, Case No. 13-cv-3072-EMC, Deposition Testimony on September 16, 2016.

Testimony

1. State of Tennessee, ex rel., Douglas Sizemore, Petitioner vs. Xantus Healthplan of Tennessee, Inc., Chancery Court of Davidson County, Tennessee at Nashville, Case No 99-917-II, Trial Testimony, October 16, 2001.
2. State of Tennessee, ex rel., Douglas Sizemore, Petitioner vs. Xantus Healthplan of Tennessee, Inc., Chancery Court of Davidson County, Tennessee at Nashville, Case No 99-917-II, Rebuttal Testimony, October 26, 2001.
3. Howard Wright, Inc., a California corporation doing business as AppleOne Employment Services, Plaintiffs, vs. Olsen Staffing Services, Inc., a Delaware Corporation, Dagney Smith, an individual, Vicky Riechers, an individual, and Linda Shiftman, an individual, Defendants, Superior Court of the State of California for the County of Los Angeles, Case No. BC 200657, Trial Testimony, March 4, 2002.
4. Columbia/HCA Healthcare Corporation - Billing Practices Litigation, United States District Court, Middle District of Tennessee, Nashville Division, Case No. 3-98-MDL-1227 on June 28, 2002.
5. Sacred Heart Medical Center, et al., Plaintiffs v. Department of Social and Health Services, and Dennis Braddock, the Secretary of the Department of Social and Health Services, Defendants, Superior Court of the State of Washington in and for the County of Thurston, No. 00-2-01898-1, Testimony in Liability Trial, April 14, 2003.
6. Diversified Property, a general partnership, Dora Saikhon Family Trust, and Nancy Saikhon Borrelli, an individual, Plaintiffs v. Manufacturers Life Insurance (U.S.A.), a Michigan corporation, erroneously sued as Manufacturers Life Insurance Company, Inc., Defendants in the Superior Court of California, County of San Diego, Case No.: GIC 815128, Trial Testimony on October 25, 2004.
7. Bridgestone/Firestone North American Tire v. Sompo Japan Ins. Co. of America, United States District Court for the Middle District of Tennessee Nashville Division Civil Action NO. 3-02-1117, March 7, 2005
8. Group Anesthesia Services, A Medical Group, Inc., Claimant, vs. American Medical Partners of North Carolina, Inc., etc., et al., Respondents, JAMS Arbitration, Reference No. 1100040919, Arbitration Testimony on March 23, 2005.
9. Goldman et al. v. RadioShack Corporation, United States District Court, Eastern District of Pennsylvania, Case No. 03 CV 0032, Testimony in Liability Trial, on June 28, 29, 2005.
10. Goldman et al. v. RadioShack Corporation, United States District Court, Eastern District of Pennsylvania, Case No. 03 CV 0032, Rebuttal Testimony in Liability Trial, on July 5, 2005.
11. Mauna Loa Vacation Ownership LLP v. Accelerated Assets, LLP. United States District Court, District of Arizona, Case No. CIV 03-0846 PCT DGC. Trial Testimony, on February 22, 2006.

12. School Districts' Alliance v. State of Washington, United States District Court, Eastern District of Thurston, Case No. 04-2-02000-7, Trial Testimony on November 13, 2006.
13. In the Matter of Premier Medical Group, PC, Appellant – Department of Health and Human Services, Office of Medicare Hearings and Appeals, Southern Field Office, ALJ Appeal No. 1-221579701, Medicare Appeal No. 1-18761858, Provider No. 3706654, AR No. 9406352171039, Judge Zaring Robertson, US Administrative Law Judge, Testimony on April 1, 2008.
14. Darensburg et al. v. Metropolitan Transportation Commission, U.S. District Court, Northern District of California, Case No. C-05-1597-EDL, Trial Testimony on October 9, 2008.
15. R. Molina et al. v. Lexmark International, Inc., Superior Court of the State of California for the County of Los Angeles, Case No. BC339177, Trial Testimony on October 22 and 26, 2009.
16. Dole Fresh Fruit International, Ltd, Hyundai Precision America, Inc., ADRS Case #05-1138-RTA, Trial Testimony on February 19, 2010.
17. In the matter of University of Tennessee Cancer Institute, ALJ Appeal No. 1-446 575 318, Office of Medicare Hearings & Appeals, Judge Z. Robertson, US Administrative Law Judge, Testimony on April 20, 2010.
18. Urga, et al. v. Redlands Community Hospital, Superior Court of the State of California, County of San Bernardino, Case No. SCVSS 123769, Trial Testimony on July 20, 2010.
19. Marine Engineers' Beneficial Association v. Department of Transportation, Ferries Division Federal Mediation & Conciliation Service Cause No. 110105-52404-6 AGO Matter No. 10499471, July 19, 2011.
20. Richard Robinson v. County of Los Angeles, et al., United States District Court of California, Central District, Case No. CV06-2409 GAF (VBKx), Trial Testimony on December 1, 2011.
21. In the matter of American Home Patient, ALJ Hearing, Appeal No. 1-982137828, Office of Medicare Hearings & Appeals, Miami Office Southern Field Division, Testimony on October 29, 2012.
22. In the matter of American Home Patient, ALJ Hearing, Appeal No. 1-924297238, Office of Medicare Hearings & Appeals, Irvine Office Western Field Division, Hearing Testimony on February 28, 2013.
23. TaylorMade Golf Company Challenge to Callaway Golf Company's Final Response, National Advertising Division, New York, Testimony on March 13, 2013.
24. United States of America, ex rel. Tammie Taylor v. Life Care Centers of America, Inc., United States District Court Eastern District of Tennessee at Chattanooga, Civ. Action No. 1:12-CV-64, Testimony on May 13 and 14, 2014.
25. United States of America v. Houshang Pavehzadeh, United States District Court for the Central District of California, Case No. 0973 2:13CR00320, Trial Testimony on May 19, 2014.
26. Sherman Way Oil, Inc. (Bijan Pouldar), American Pacific Enterprises Group (Sherwin Louie), Bahman Kohanteb, Hamid Kalhor , Claimants, Vs. Circle K Stores, Inc., Respondent, Alternative Dispute Resolution Case No's 13-7103-DSC through 13-7106-DSC, Arbitration Testimony on October 10, 2014.

27. AdvanceMed Audit of Altercare of Wadsworth, Medicare Appeal, Medicare Appeal No. 1-912446681, Testimony in Administrative Law Judge Hearing on February 19, 2015.

Publications

Boedeker, Stefan and Goetz Trenkler (2001) - "A Comparison of the Ridge and Iteration Estimator" - in: Econometric Studies: A Festschrift in Honour of Joachim Frohn (ed. by Ralph Friedmann, Lothar Knueppel, and Helmut Luetkepohl), New Brunswick

Professional and Business History

- » Berkeley Research Group, 2010 - Present, Managing Director
- » Resolution Economics, 2008-2010, Partner
- » Alvarez & Marsal, 2007-2008, Managing Director
- » LECG LLC, 2005-2007, Director
- » Navigant Consulting Inc., 2004-2005, Managing Director in Litigation and Investigation Practice
- » Deloitte & Touche LLP, 2003 - 2004, Leader of the Economic and Statistical Consulting Practice in the West Region
- » PricewaterhouseCoopers LLP, 2002 – 2003, Leader of the Litigation Consulting Group in Los Angeles, Leader of the Economic and Statistical Consulting Practice in the West Region
- » Andersen LLP, 1992- 2002 – Partner (since 2000), last position held: Director of Economic and Statistical Consulting practice in the Pacific Region
- » University of California, San Diego, 1989-1991 – Teaching Assistant, Department of Economics
- » German Government, 1986-1989 – Economic Research Assistant

APPENDIX B

WELCOME, AND THANK YOU FOR PARTICIPATING IN THIS IMPORTANT RESEARCH SURVEY.

S1:

Are you:

- ☐ Male
- ☐ Female

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S2:

Which of the following categories includes your age?

- ☐ Under 18 [END SURVEY]
- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or older

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S3.

The next question is about the total income of YOUR HOUSEHOLD for last year – for the 12 months of 2015. Please include your income PLUS the income of all members living in your household (including cohabiting partners and armed forces members living at home). Please count income BEFORE TAXES and from all sources (such as wages, salaries, tips, net income from a business, interest, dividends, child support, alimony, Social Security, public assistance, pensions, and retirement benefits). What was your total HOUSEHOLD income for the 12 months of 2015?

- ☐ Less than \$25,000
- ☐ \$25,000 to \$34,999
- ☐ \$35,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$149,999
- ☐ \$150,000 or more
- ☐ Prefer not to answer

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S4:

In which of the following regions of the U.S. do you live?

- ☐ Midwest - IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
- ☐ Northeast - CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT

- ☐ Southeast - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
- ☐ Southwest - AZ, NM, OK, TX
- ☐ West - AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY
- ☐ None of the above **[END SURVEY]**

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S5:

Are you of Hispanic, Latino, or Spanish origin?

- ☐ Yes
- ☐ No

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S6:

What is your race? (Select all that apply.)

- ☐ African American / Black
- ☐ American Indian or Alaska Native
- ☐ Asian or Asian Indian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ White / Caucasian
- ☐ Other: _____

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Q1:

Do you or a member of your household have a paid subscription to Sirius XM satellite radio?

- ☐ Yes
- ☐ No **[END SURVEY]**

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Q2:

Do you use your Sirius XM satellite radio subscription?

- ☐ Yes
- ☐ No **[END SURVEY]**

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Q3:

Are you or a member of your household employed by Sirius XM satellite radio?

- ☐ Yes **[END SURVEY]**
- ☐ No
- ☐ Don't know **[END SURVEY]**

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Q4:

Are you or a member of your household employed in the music industry?

- ☐ Yes [END SURVEY]
- ☐ No
- ☐ Don't know [END SURVEY]

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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.

Q5:

Are you or a member of your household currently paying for a Sirius XM satellite radio package which includes both music and non-music programming?

- ☐ Yes
- ☐ No [END SURVEY]
- ☐ Don't know [END SURVEY]

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SiriusXM offers different subscription packages containing different mixes of programming. For the following question, we want to ask if you know which package of SiriusXM radio that you subscribe to. If you subscribe to more than one package, please answer with respect to the one that you use the most

[Note to Programmer: Randomize the order of the first four choices but always put "Don't Know" and "Other" last.]

Q6:

Which SiriusXM satellite radio package do you subscribe to?

- ☐ "Select" (some premium channels)
- ☐ "All Access" (all premium channels – e.g., Howard Stern, every NFL game, every NASCAR race, etc.)
- ☐ "Mostly Music"
- ☐ "News, Sports & Talk"
- ☐ Don't know
- ☐ Other: _____

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Q7:

Were you involved in your household's decision to subscribe to Sirius XM satellite radio?

- ☐ Yes
- ☐ No **[SKIP NEXT QUESTION]**

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In several of the following questions you will be asked to allocate 100 points between music and non-music based on several different measures. The total points you allocate must add to 100 points.

Q8:

Please allocate 100 points between Music and Non-Music programming to reflect its importance to YOUR decision to subscribe to satellite radio.

[Note to Programmer: Randomly select music or non-music as first choice with equal selection probability]

- ☐ Music
- ☐ Non-Music

[Note to Programmer: Show total points given after first choice is made; then show total after second choice is made; do not let participant continue if total does not add up to 100]

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Q9:

Are you involved in your household's decision about whether to remain a subscriber to Sirius XM satellite radio?

- ☐ Yes
- ☐ No **[SKIP NEXT QUESTION]**

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Q10:

Please allocate 100 points between each category of programming to reflect its importance in YOUR decision to remain a subscriber to Sirius XM satellite radio. This allocation should reflect your own personal decision making experience.

[Note to Programmer: Randomly select music or non-music as first choice with equal selection probability]

- Music
- Non-Music

[Note to Programmer: Show total points given after first choice is made; then show total after second choice is made; do not let participant continue if total does not add up to 100]

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Q11:

Please allocate 100 points between music and non-music to reflect the time YOU typically spend listening to music versus non-music on satellite radio (i.e., enter the percentage of time you spend listening to either type of programming). This allocation should reflect your own personal listening habits.

[Note to Programmer: Randomly select music or non-music as first choice with equal selection probability]

- Music
- Non-Music

[Note to Programmer: Show total points given after first choice is made; then show total after second choice is made; do not let participant continue if total does not add up to 100]

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[Note to Programmer: Randomize the order of questions 12A and 12B – a randomly selected half of participants will see Q12A first and the other half will see Q12B first. The randomly selected half who will see Q12A first will continue with Q13A]]

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
- Don't know

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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 **(Only shows if "Yes" selected in previous question.)**
- ☐ None – no amount of discount would convince me if music was not offered
- ☐ Don't know

-----PAGE BREAK-----

Q12B:

Would you continue to subscribe to SiriusXM satellite radio at your current subscription rates if non-music programming was no longer offered (i.e., if you could only have a non-music package)?

- ☐ Yes
- ☐ No
- ☐ Don't know

-----PAGE BREAK-----

Q13B:

If non-music programming 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 **(Only shows if "Yes" selected in previous question.)**
- ☐ None – no amount of discount would convince me if music was not offered
- ☐ Don't know

-----PAGE BREAK-----

Q14:

After the results of this survey are analyzed, would you be willing to answer some follow-up questions by telephone if needed that will take approximately 3 minutes? If "yes", you might be contacted via e-mail to ask for a telephone number and times that would be convenient for you. If you are contacted and participate in a brief interview by telephone, you will receive \$25 in e-Rewards currency as a token of appreciation for your time.

- ☐ Yes
- ☐ No

-----PAGE BREAK-----

That completes our survey. Thank you very much for your time and input!

APPENDIX C

Amplitude Research, Inc.

Welcome, and thank you for participating in this important research survey.

Are you:

- ☐ Male
- ☐ Female

Completed:

Amplitude Research, Inc.

Which of the following categories includes your age?

- ☐ Under 18
- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or older

Completed:

Amplitude Research, Inc.

The next question is about the total income of YOUR HOUSEHOLD for last year – for the 12 months of 2015. Please include your income PLUS the income of all members living in your household (including cohabiting partners and armed forces members living at home). Please count income BEFORE TAXES and from all sources (such as wages, salaries, tips, net income from a business, interest, dividends, child support, alimony, Social Security, public assistance, pensions, and retirement benefits). What was your total HOUSEHOLD income for the 12 months of 2015?

- ☐ Less than \$25,000
- ☐ \$25,000 to \$34,999
- ☐ \$35,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$149,999
- ☐ \$150,000 or more
- ☐ Prefer not to answer

Completed:

Amplitude Research, Inc.

In which of the following regions of the U.S. do you live?

- ☐ Midwest - IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
- ☐ Northeast - CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT
- ☐ Southeast - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
- ☐ Southwest - AZ, NM, OK, TX
- ☐ West - AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY
- ☐ None of the above

Completed:

Amplitude Research, Inc.

In which of the following regions of the U.S. do you live?

- ☐ Midwest - IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
- ☐ Northeast - CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT
- ☐ Southeast - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
- ☐ Southwest - AZ, NM, OK, TX
- ☐ West - AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY
- ☐ None of the above

Completed:

Amplitude Research, Inc.

Are you of Hispanic, Latino, or Spanish origin?

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

What is your race? (Select all that apply.)

- ☐ African American / Black
- ☐ American Indian or Alaska Native
- ☐ Asian or Asian Indian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ White / Caucasian
- ☐ Other

Completed:

Amplitude Research, Inc.

Do you or a member of your household have a paid subscription to SiriusXM satellite radio?

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

Do you use your SiriusXM satellite radio subscription?

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

Are you or a member of your household employed by SiriusXM satellite radio?

- ☐ Yes
- ☐ No
- ☐ Don't know

Completed:

Amplitude Research, Inc.

Are you or a member of your household employed in the music industry?

- ☐ Yes
- ☐ No
- ☐ Don't know

Completed:

Amplitude Research, Inc.

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.

Are you or a member of your household currently paying for a SiriusXM satellite radio package which includes both music and non-music programming?

- ☐ Yes
- ☐ No
- ☐ Don't know

Completed:

Amplitude Research, Inc.

SiriusXM offers different subscription packages containing different mixes of programming. For the following question, we want to ask if you know which package of SiriusXM radio that you subscribe to. If you subscribe to more than one package, please answer with respect to the one that you use the most.

Which SiriusXM satellite radio package do you subscribe to?

- ☐ "Select" (some premium channels)
- ☐ "All Access" (all premium channels – e.g., Howard Stern, every NFL game, every NASCAR race, etc.)
- ☐ "Mostly Music"
- ☐ "News, Sports & Talk"
- ☐ Don't know
- ☐ Other

Completed:

Amplitude Research, Inc.

Were you involved in your household's decision to subscribe to SiriusXM satellite radio?

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

In several of the following questions you will be asked to allocate 100 points between music and non-music based on several different measures. The total points you allocate must add to 100 points.

Please allocate 100 points between Music and Non-Music programming to reflect its importance to YOUR decision to subscribe to satellite radio.

Non-Music

Music

Total

Completed:

Amplitude Research, Inc.

Are you involved in your household's decision about whether to remain a subscriber to SiriusXM satellite radio?

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

Please allocate 100 points between each category of programming to reflect its importance in YOUR decision to remain a subscriber to SiriusXM satellite radio. This allocation should reflect your own personal decision making experience.

Non-Music

Music

Total

Completed:

Amplitude Research, Inc.

Please allocate 100 points between music and non-music to reflect the time YOU typically spend listening to music versus non-music on satellite radio (i.e., enter the percentage of time you spend listening to either type of programming). This allocation should reflect your own personal listening habits.

Music

Non-Music

Total

Completed:

Amplitude Research, Inc.

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
- ☐ Don't know

Completed:

Amplitude Research, Inc.

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 – no amount of discount would convince me if music was not offered
- ☐ Don't know

Completed:

Amplitude Research, Inc.

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

Completed:

Amplitude Research, Inc.

Would you continue to subscribe to SiriusXM 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)?

- ☐ Yes
- ☐ No
- ☐ Don't know

Completed:

Amplitude Research, Inc.

If non-music was not offered (i.e., you could only select a 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 - no amount of discount would convince me if non-music was not offered
- ☐ Don't know

Completed:

Amplitude Research, Inc.

After the results of this survey are analyzed, would you be willing to answer some follow-up questions by telephone if needed that will take approximately 3 minutes? If "yes", you might be contacted via e-mail to ask for a telephone number and times that would be convenient for you. If you are contacted and participate in a brief interview by telephone, you will receive \$25 in e-Rewards currency as a token of appreciation for your time.

- ☐ Yes
- ☐ No

Completed:

Amplitude Research, Inc.

That completes our survey. Thank you very much for your time and input!

Completed:

APPENDIX D

Materials Relied On

American Association for Public Opinion Research website, www.aapor.org

American Association for Public Opinion Research, AAPOR Guidance on Reporting Precision for Nonprobability Samples - https://www.aapor.org/getattachment/Education-Resources/For-Researchers/AAPOR_Guidance_Nonprob_Precision_042216.pdf.aspx

American Statistical Association website, www.amstat.org

Amplitude Research website, <http://www.amplituderesearch.com>.

William Cochran, *Sampling Techniques* 75 (3d ed. 1977)

Shari Seidman Diamond, *Reference Guide on Survey Research*, in *Reference Manual on Scientific Evidence* 359-423 (3d ed. Federal Judicial Center, 2011)

The Next Frontier for Online Survey Companies: Law Firms, Fortune, <http://fortune.com/2015/09/16/online-survey-companies-law-firms/> (last visited Oct. 18, 2016)

Bruce Isaacson et al., *Why Online Surveys Can Be a Smart Choice in Intellectual Property Litigation*, 26 IPL Newsletter (2008) (ABA Section of Intellectual Property Law)

Jon A. Krosnick & Duane F. Alwin, *An evaluation of a cognitive theory of response order effects in survey measurement*, 51 Oxford J. Soc. Sci. Pub. Op. Q. 201-219 (1987)

Research Now website, <https://www.researchnow.com/>

SiriusXM Radio Survey by Edison Research, May 2015 (SXR_DIR_00023538 – SXR_DIR_00026610) (SX Exhibit 34)

Sirius XM website, Our Most Popular Packages, <http://www.siriusxm.com/ourmostpopularpackages>

Robert M. Groves et al., *Survey Methodology* (Wiley Series in Survey Methodology) (2d ed., Wiley 2009)

United States Census Bureau, Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties, and Puerto Rico Commonwealth and Municipios: April 1, 2010 to July 1, 2015, available at <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk> (last visited Oct. 18, 2016)

U.S. Census Bureau, *Survey of Income and Program Participation*,
<http://www.census.gov/programs-surveys/sipp/methodology/organizing-principles/nonresponse.html> (last visited Oct. 18, 2016)

Charles Hokayem et al., U.S. Census Bureau, *A Look at CPS Non-Response and Trends in Poverty* (2012), <https://www.census.gov/library/working-papers/2012/demo/sehsd-wp-2012-21.html>

Robert Witte & John Witte, *Statistics* 286-333 (9th ed. 2010)

Handbook of Survey Research (Peter V. Marsden & James D. Wright eds., 2d ed., 2010)

APPENDICES E-G

Produced in Native Format

Exhibit Sponsored by Stefan Boedeker

Exhibit No.	Description	Designation*
SX Ex. 034	[Redacted]	Restricted

*Exhibits designated Restricted are omitted from this public version in their entirety.

**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)

WRITTEN DIRECT TESTIMONY OF

Ravi Dhar

**George Rogers Clark Professor of Management
Yale School of Management**

October, 2016

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I. QUALIFICATIONS

1. My name is Ravi Dhar. I am the George Rogers Clark Professor of Management and Marketing at the Yale School of Management, and the Director of the Yale Center for Customer Insights at the School of Management at Yale University in New Haven, Connecticut. I also have an affiliated appointment as a Professor of Psychology at the Department of Psychology at Yale University and serve on the editorial board of leading consumer research journals, such as *Journal of Consumer Psychology*, *Journal of Consumer Research*, *Journal of Marketing*, and *Marketing Letters*. I am the past Associate Editor of *Journal of Marketing Research*, the past Area Editor of *Marketing Science*, and the past Associate Editor of *Journal of Consumer Research*.
2. I hold a Ph.D. and M.S. in Business Administration from the University of California at Berkeley. My doctoral dissertation ("Consumer Preference for a No-Choice Option") was focused in the area of consumer decision-making. I have published more than sixty papers in journals, proceedings, and as book chapters, including in the leading marketing, psychology, and management journals, including among others, the *Harvard Business Review*, *Journal of Behavioral Decision Making*, *Journal of Business*, *Journal of Consumer Psychology*, *Journal of Consumer Research*, *Journal of Marketing Research*, *Journal of Personality and Social Psychology*, *Management Science*, *Marketing Science*, *Organizational Behavior and Human Decision Processes*, and *Sloan Management Review*.
3. Several of my publications were also considered for research awards such as the Paul E. Green Award ("The Effect of Forced Choice on Choice," Finalist in 2004) and the William O'Dell Award ("Consumer Choice Between Hedonic and Utilitarian Goods," Winner in 2005; "Making Complementary Choices in Consumption Episodes: Highlighting Versus Balancing," Finalist in 2004; "The Effect of Forced Choice on Choice," Finalist in 2008; "Preference Fluency in Choice," Finalist in 2012). The William O'Dell Award is presented to the *Journal of Marketing Research* article that has made the most significant, long-term contribution to marketing theory, methodology, and/or practice. The Paul E. Green Award is presented to the *Journal of Marketing*

Research article that shows or demonstrates the most potential to contribute significantly to the practice of marketing research and research in marketing. I have been awarded the 2012 Distinguished Scientific Contribution Award from the Society of Consumer Psychologists, which is given annually to honor a scholar who has made significant and lasting contributions in the field of consumer psychology. A detailed listing of my educational background and publications is set forth in the curriculum vitae, which is attached as Appendix A.

4. My fields of expertise are consumer and customer behavior, consumer psychology, branding, marketing management, marketing strategy, survey methodology and evaluation. In my work as a marketing professor and as a consultant to major corporations, I have conducted, supervised, and/or evaluated more than 250 surveys, as well as analyzed questions relating to different aspects of consumer behavior. Most of my research focuses on consumers' decision making—the manner in which consumers acquire and process information when forming product perception and preferences, the effect of product attributes and information presentation on consumer purchase and consumption decisions, and the effect of different marketing mix activities (such as promotions and advertising) on consumer buying decisions.
5. My teaching responsibilities at Yale University's School of Management include two doctoral courses that examine advanced research topics in the area of consumer behavior, judgment, and decision-making. I teach or have taught several different courses for graduate students who are enrolled in the MBA program or the Executive MBA program at Yale: Consumer Behavior, E-Business and Marketing, Marketing Strategy, Marketing Management, Marketing of Financial Services, and Strategic Marketing Leadership. I have given seminars to mid-level and senior-level executives in more than a dozen countries in North and South America, Asia, and Europe. I have also worked as a consultant or adviser to companies on marketing-related issues in different types of industries (*e.g.*, consumer products, high technology, health, and financial services).

6. I have served as an expert witness on marketing research issues in a variety of litigation matters. A list of cases in which I have testified as an expert, at trial or at deposition in the preceding four or more years is attached as Appendix B.
7. I am being compensated for my work on this case at \$795 per hour. My compensation is not contingent upon the conclusions I reach or on the outcome of this matter.
8. In forming my opinion, I reviewed materials provided to me by counsel as well as other materials, listed in Appendix C, academic research on the principles of consumer information processing and decision making, the survey results discussed below, and the other documents discussed in this report. In addition, I relied on my education, training, and experience, on general principles of marketing research and survey research, as well as consumer information processing and decision-making.
9. I reserve the right to supplement my testimony and this report in response to any further information provided by the parties, and/or in light of additional documents or testimony brought forth through the ongoing discovery in this proceeding, at the hearing, or otherwise, which may be brought to my attention after the date of my signature below.

II. BACKGROUND AND PURPOSE OF THE REPORT

10. I understand that this proceeding will determine the royalties that Sirius XM will pay to copyright holders for the right to publicly perform sound recordings on its service.¹ I have been asked by Counsel for SoundExchange, Inc. ("SoundExchange") to conduct a survey to measure the preferences of subscribers to certain music services who would choose to cancel their subscriptions at a given price. The survey measures whether the subscribers would instead prefer to subscribe to another music

¹ I am aware that rates will also be set in this proceeding for the "preexisting subscription services" or "PSS," which are among the services providing music channels included in an existing cable or satellite TV subscription. Such services were included among certain of the potential survey responses described below, but my analysis does not otherwise address the PSS.

subscription service. Specifically, Sirius XM subscribers surveyed were current paid subscribers to the Sirius Select package² and current users of a free trial subscription to Sirius XM (typically available with certain new or used car purchases).³

11. In addition to examining these behaviors for Sirius XM Satellite Radio subscribers, I was also asked to examine similar preferences of subscribers who would choose to cancel their subscription to certain music streaming services. Specifically, these services include the following categories of music streaming services, represented by the most popular brand(s) within the category.
 - a. Paid subscriptions to certain On-Demand music streaming services (Spotify and Apple that represent approximately 12 million paid On-Demand music streaming subscriptions);⁴
 - b. Paid subscriptions to certain Not On-Demand music streaming services (Pandora One with almost four million paid subscribers);⁵
12. I was also asked to measure preferences of consumers who use certain free, ad-supported music streaming services. The survey measures whether those users would subscribe to a corresponding subscription music service at a given price. Specifically, these services include the following music streaming services, represented by the most popular brand that offers a free, ad-supported account.

² My analysis of paid Sirius XM subscribers was limited only to those respondents subscribing to the Sirius Select package, which I understand is one of the most popular subscription packages.

³ Purchasers and lessees of new cars or trucks with satellite radio-enabled radios generally receive trial subscriptions of between three and twelve months. See Sirius XM Holdings, Inc., Form 10-K filed with the Securities and Exchange Commission for the Period Ending December 31, 2015, p. 22, 40.

⁴ Cowen & Co. estimate that Spotify and Apple Music have approximately 8 and 4 million paid subscribers respectively in the U.S., approximately 75% of the 16 million subscriptions to On-Demand music streaming services. Patrick Seitz, "Streaming Music Leader Spotify Challenged by Apple, Amazon, Pandora," *Investor's Business Daily*, June 29, 2016, accessed October 17, 2016, <http://www.investors.com/news/technology/click/streaming-music-leader-spotify-challenged-by-apple-amazon-pandora/?ven=YahooCP&src=AURLLED&ven=yahoo>.

⁵ *Pandora 2016 Annual Report for the Fiscal Year Ended December 31, 2015*, at p. 46, accessed October 17, 2016, <http://investor.pandora.com/phoenix.zhtml?c=227956&p=proxy>.

- a. Free, ad-supported users of the On-Demand music streaming service Spotify were asked about whether they would subscribe to Spotify Premium at various price points. (Free-ad-supported Spotify represents approximately 24 million users in the U.S.)⁶
 - b. Free, ad-supported users of the Not On-Demand music streaming service Pandora were asked about whether they would subscribe to Pandora One at certain prices. (Free, ad-supported Pandora represents over 80 million unique monthly users.)⁷
13. In this context, I conducted a survey to determine who would continue or cancel their subscription to Sirius XM or one of the music streaming services at price levels that varied by approximately ten, twenty, or thirty percent from the standard price of a service that they reported to use.⁸ Respondents who indicated that they would cancel their service at a given price were asked whether they would instead subscribe to a different subscription music service.⁹
14. This report presents the details of the survey that I supervised and the conclusions I have reached based on the data collected.

⁶ Spotify is the only major On-Demand music streaming service that offers a free, ad-supported tier. As noted in Footnote 4, Spotify is reported to have approximately 8 million paid subscribers in the U.S. Spotify has approximately three times as many free, ad-supported users as paying subscribers worldwide. Applying this ratio applies to the U.S., implies Spotify has approximately 24 million free, ad-supported users in the U.S.

⁷ *Pandora 2016 Annual Report for the Fiscal Year Ended December 31, 2015*, at p. 46, accessed October 17, 2016, <http://investor.pandora.com/phoenix.zhtml?c=227956&p=proxy>.

⁸ The survey I designed, which asked respondents whether they would continue subscribing to a given service at alternative price points, uses a common method of ascertaining respondents' willingness to pay for a product or service. See, e.g., Robert J. Dolan and John T. Gourville, "Principles of Pricing," Harvard Business School Case 9-506-021, April 3, 2009.

⁹ Respondents were screened for qualification as a current user for each one of the Sirius XM and music streaming services, but only asked about a single service in the main survey. Respondents who were asked about their subscriptions to a music streaming service (Apple Music, Spotify Premium, or Pandora One) were told to assume that all music streaming services in that category had the same monthly subscription price when providing their preferences for switching among subscription music services.

15. The design, execution and analysis of the survey followed accepted scientific standards of my profession and were consistent with the principles for survey research discussed in the Federal Judicial Center's Manual for Complex Litigation (4th, Section 11.493)¹⁰, as well as guidelines set forth in the *Reference Guide on Survey Research*.¹¹ To illustrate:
- a. The survey population was properly chosen and defined;
 - b. The sample chosen was representative of that population;
 - c. The questions asked were clear and not leading;
 - d. The data gathered were accurately reported;
 - e. The data were analyzed in accordance with accepted statistical principles;
 - f. The process was conducted to ensure objectivity;
 - g. The survey was conducted by qualified people following proper interview procedures.
16. In the remainder of this report, I describe the protocol used to implement the survey and present my findings. Section III presents a summary of my opinions and findings in this matter. Section IV describes the survey methodology used to determine (i) the preferences of subscribers of Sirius XM and the other music streaming services for those who would choose to cancel their subscriptions at a given price and (ii) the preferences for subscribing to another music subscription service among those who would choose to cancel their subscriptions at a given price. Section IV also describes the methodology used to determine the preferences of users of the free, ad-supported music streaming services for subscribing to the corresponding ad-free music subscription music service at a given price.¹² Section V describes how the survey

¹⁰ Federal Judicial Center, Manual for Complex Litigation, Fourth Edition, Section 11.493.

¹¹ See, e.g., many of the recommendations in Shari Seidman Diamond "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 359-423.

¹² By corresponding ad-free music service, I mean that respondents who used the free, ad-supported version of Spotify were asked about whether they would subscribe to Spotify Premium at various price points, and respondents who used the free, ad-supported version of

population and the survey sample were chosen and defined. Section VI sets forth the screening criteria used to qualify respondents for participation in the study. In Section VII, I discuss the survey rollout, and in Section VIII, I describe the key survey questions. Finally, Section IX presents my findings on respondents' preferences for switching to another music service for subscribers who would choose to cancel a given music service subscription.

III. SUMMARY OF OPINIONS

17. Based on the results of the study I conducted, and my education, background, professional experience, analysis, and review of relevant materials in this case, it is my opinion that the survey results described below and related empirical conclusions concerning the preferences of subscribers to certain music services who would choose to cancel their subscriptions at a given price and whether they would instead subscribe to another music subscription service are supported with a high degree of scientific certainty. It is also my opinion with a high degree of scientific certainty that the survey reliably measures the preferences of users of free, ad-supported music streaming services for subscribing to a subscription music service at a given price.
18. An Internet survey was conducted under my direction between September 14 and September 22, 2016 to measure (i) the preferences of subscribers who would choose to cancel their subscriptions at a given price; (ii) the preferences for subscribing to another music subscription service among those who would choose to cancel their subscriptions at a given price; and (iii) the preferences of users of free, ad-supported music streaming services, and whether they would subscribe to a corresponding subscription music service at a given price.
19. The survey was carefully designed and executed, adhering to scientific principles of survey research to ensure reliability and validity of the results. In total, 2,602

Pandora were asked about whether they would subscribe to Pandora One at various price points.

respondents completed the survey and their responses were analyzed and are reported below.

20. The survey results demonstrate that 76% of Sirius XM Sirius Select subscribers would cancel their subscriptions to Sirius XM at various prices between \$11.49 and \$20.49 per month. Of the 76% who would cancel their subscription to Sirius XM Select at any of the price levels examined, the data show that 22% of Sirius XM Select subscribers would switch to a paid On-Demand music streaming subscription, and 11% would switch to a paid Not-On-Demand music streaming subscription.¹³
21. The survey results also demonstrate that 44% of subscribers to the On-Demand music streaming services Apple Music and Spotify Premium would cancel their subscriptions at various prices between \$6.99 and \$12.99 per month. Of the 44% who would cancel their subscription to the On-Demand music streaming services Apple Music and Spotify Premium at any of the price levels examined, the data show that 14% would switch to Sirius XM and 19% would switch to a Not-On-Demand music streaming service.
22. Likewise, 51% of subscribers to the Not-On-Demand music streaming service Pandora One would cancel their subscriptions at various prices between \$3.49 and \$6.49 per month. Of the 51% who would cancel their subscription to Pandora One at any of the price levels examined, the data show that 10% would switch to Sirius XM and 16% would switch to an On-Demand music streaming service.
23. Among users of free, ad-supported music streaming services, 38% indicated that they would subscribe to a subscription music service if the price was discounted between 10% and 30% below the standard price for the subscription. 51% of those respondents would not subscribe to a subscription music service if the price was discounted between 10% and 30% below the standard price for a subscription.

¹³ The results reported here are unweighted figures. In Section IX, I report figures using alternative weighting methods.

IV. SURVEY METHODOLOGY

24. In implementing the survey, I was assisted by the Brattle Group, an economic consulting firm, and the Target Research Group, a marketing research company with extensive experience in conducting surveys.¹⁴ Both the Brattle Group and Target Research Group worked under my direction to implement the online survey, including the management and coordination of the data collection, and to conduct the empirical analysis supporting my opinions in this report. Their compensation is not contingent upon the conclusions I reach nor on the outcome of this matter.
25. To ensure objectivity, it is standard practice to conduct research in a double-blind manner (i.e., both the interviewer and the respondent are blind to the sponsor of the survey and its purpose).¹⁵ The survey replicated double-blind conditions. The survey questionnaire did not provide any information on the sponsor of the survey or about its underlying purpose. The full sequence of survey questions is presented in Appendix D, with screenshots of the programmed survey presented in Appendix E.
26. The survey questions were tested to ensure that respondents understood and could respond accurately to the questions.
27. Respondents were instructed, "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" (underline in original).
28. In addition, the survey used quasi-filters (i.e., explicitly included the response option of "Don't know/unsure"), which substantially decreases any potential concern that the respondent will feel pressure to provide an answer when they are unsure.¹⁶

¹⁴ The survey was programmed and hosted by CarbonView Research (<http://www.carbonview.com>) under my direction and the guidance of the Brattle Group and the Target Research Group.

¹⁵ Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 410-411.

¹⁶ Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 390.

29. Respondents were also given an option to choose “Other” when the options provided might not include their specific response to a question. Those who chose “Other” were asked to specify an answer to the question in a free-response text box. There were relatively few such responses; all such responses were included verbatim and were reviewed by the Brattle Group and by me personally.
30. When presenting respondents with a set of options in a closed-ended question, it is generally good practice, depending on the types of options, to randomize the answer options in order to control for possible order effects.¹⁷ Accordingly, I randomized response options so that different respondents saw the options in different orders, where it was appropriate. There are standard exceptions to the randomization 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.
31. The survey has two parts: a screening questionnaire, and a set of main survey questions. Respondents were screened for qualification as a current user for each one of the services of interest (Sirius XM Sirius Select or trial subscription; Apple Music; Spotify; or Pandora), but only asked about a single service in the main survey.¹⁸ As is best practice, respondents who qualified for more than one service were randomly assigned to a set of questions in the main survey about just one of their services.

V. SURVEY POPULATION

32. One of the first steps in ensuring that the survey results are meaningful is the selection of the appropriate target population or universe.¹⁹ The universe is that segment of the population whose beliefs and opinions are relevant to the issues in the case. The survey universe for this study is defined as U.S. adults (18 years of age or older) who

¹⁷ Shari Seidman Diamond, “Reference Guide on Survey Research,” *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 395-396.

¹⁸ Specific screening questions are outlined in Section VI: Screening Criteria.

¹⁹ Shari Seidman Diamond, “Reference Guide on Survey Research,” *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 376.

have Sirius XM Satellite Radio or who use certain On-Demand or certain Not-On-Demand music streaming services.²⁰ For users of paid subscriptions to Satellite Radio, an On-Demand service or Not-On-Demand service, only primary decision makers (those who made a decision by themselves or played a major role in the decision) were included as part of the respondent population.²¹

33. In order to survey relevant individuals, I designed an Internet survey that screened potential respondents to determine if they were members of the appropriate population. The sampling frame for any survey (i.e., the source from which the sample is actually drawn) should closely approximate the underlying population. An Internet-based survey offers this capability and many other advantages over different recruiting methodologies, such as broad geographic reach to areas of the U.S. where recruiting via malls or other face-to-face methods would not be feasible.²² Internet surveys also allow respondents to review instructions or a list of alternatives, as I discuss below. At present, 88.5% of U.S. households have Internet access;²³ by contrast, 52% of households have a landline phone. Moreover, Internet surveys are a

²⁰ The On-Demand music streaming services were Apple Music, Spotify Premium, and the ad-supported version of Spotify; the Not-On-Demand music streaming services were Pandora One and the ad-supported version of Pandora. Respondents who had more than one category of service, (e.g., Satellite Radio and Apple Music) qualified for the survey and later were randomly placed into a cell and asked about only one service.

²¹ As discussed in Paragraph 43, I also screened out respondents who work for certain employers or in certain industries.

²² See, e.g., Shari Seidman Diamond, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011, p. 401; Gelb, G., and Gelb, B., "Internet Surveys for Trademark Litigation: Ready or Not, Here They Come," *The Trademark Reporter*. Vol. 97, 2007; Isaacson B., et al., "Why Online Surveys Can Be A Smart Choice in Intellectual Property Litigation," *IPL Newsletter* (ABA Section of Intellectual Property Law) Vol. 26, No. 3, 2008; Poret, H., "A Comparative Empirical Analysis of Online versus Mail and Phone Methodologies for Trademark Surveys," *The Trademark Reporter*. Vol. 100, 2010; Simonson, A., "Online Interviewing for Use in Lanham Act Litigation," *Intellectual Property Strategist* Vol. 14, 2007.

²³ <http://www.internetlivestats.com/internet-users-by-country/> (accessed October 14, 2016).

widely accepted form of market research.²⁴ Courts have accepted the findings of Internet surveys in a broad range of cases, including surveys that I have personally designed for a number of different cases.²⁵

34. In my experience, a properly designed Internet survey is representative of the target population and can be used to draw valid statistical inferences of the target population. In this case, the target population in this survey included respondents who are users of Internet-based services, making an Internet survey a natural venue.
35. 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. For this study, participants were recruited from the panel maintained by Survey Sampling, Inc. ("SSI"), a highly experienced and well-established firm that maintains a variety of panels with over six million panelists in the United States and 11.5 million panelists worldwide.²⁶ To draw statistical inferences for a target population, I ensured the representativeness of the survey population by "click-balancing" the inbound sample (i.e., targeting a representative sample from the market research panel based on the distribution of individuals by validated demographics) to the U.S. Census data. The demographic variables used for balancing were gender, age, and Census region, and the resulting survey population was within 3% of the U.S. Census.²⁷
36. During the survey invitation process, SSI included a link to the online survey. This link contained an embedded identification number to ensure that only invited

²⁴ Blumberg, Stephen J., and Luke, Julian V. "Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, July–December 2015," National Center for Health Statistics, May 2016, p. 2.

²⁵ See Appendix B for some recent examples.

²⁶ <https://www.surveysampling.com/knowledge-center/panels-respondent-experience/>, last accessed: September 27, 2016.

²⁷ U.S. Census Bureau, "Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015," Population Division, June 2016, accessed October 17, 2016, <https://www.census.gov/popest/data/state/asrh/2015/SC-EST2015-AGESEX-CIV.html>.

respondents could answer the survey, that each respondent could only complete the survey once, and that only one member per household could complete the survey.

37. Respondents who qualified and completed the survey were provided with a reward valued between \$1 and \$2. In my experience, such honoraria are common in survey research and do not influence the accuracy of the responses.

VI. SCREENING CRITERIA

38. At the beginning of the survey, respondents were screened to determine whether they qualified for any of the following services:
- a. Paid subscription to Sirius XM's Sirius Select service and have made the decision themselves or who played a major role in deciding whether to subscribe to Sirius Select;
 - b. Current trial subscription to Sirius XM;
 - c. Paid subscription to the On-Demand music streaming service Apple Music and have made the decision themselves or who played a major role in deciding whether to subscribe to Apple Music;
 - d. Paid subscription to the On-Demand music streaming Service Spotify Premium and have made the decision themselves or who played a major role in deciding whether to subscribe to Spotify Premium;
 - e. User of the free, ad-supported version of the On-Demand music streaming service Spotify;
 - f. Paid subscription to the Not-On-Demand music streaming service Pandora One and have made the decision themselves or who played a major role in deciding whether to subscribe to Pandora One;
 - g. User of the free, ad-supported version of the Not-On-Demand music streaming service Pandora.

Respondents who reported using one or more of the services were selected to answer questions about one of the services used.²⁸

39. As noted above, respondents who had a paid subscription to one of the qualifying services were separately asked about their role in the decision to take a subscription for each music service (Sirius XM's Sirius Select, Apple Music, Spotify Premium, or Pandora One) (Q53 and Q55). Respondents were allowed to continue the survey and answer additional questions about a particular service only if they made the decision themselves, or if they played a major role in deciding whether to subscribe to that particular service (Q53 and Q55).
40. After respondents read a brief, standard introduction about how to navigate the survey, assuring them of confidentiality, and instructing them not to guess when answering questions, respondents were prompted with a CAPTCHA challenge to ensure that their responses were not computer-generated.²⁹
41. After completing the CAPTCHA challenge, respondents were asked for their gender (Q30) and age (Q35). Answers to these questions were used to validate that the respondent who was invited to the survey was indeed the person taking the survey. Survey responses were mapped to panel data and any respondent with a data conflict on these questions was terminated from the survey.

²⁸ Respondents were screened for all the services they could potentially qualify for. After the initial screening, each respondent was randomly assigned to only one of the qualifying music service cells.

²⁹ 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, "CAPTCHA: Telling Humans and Computers Apart Automatically," <http://www.captcha.net>, visited on September 28, 2016.

42. Respondents were then queried as to the type of electronic devices they were using to complete the survey, allowing only those with desktop, laptop, or tablet computers to continue (Q40).³⁰
43. Respondents were then asked a standard industry exclusion question (Q50), screening out any respondents who indicated that they, or other members of their household, were employed by a Market Research Company or Public Relations Agency, for a Satellite Radio company, Streaming Music company, for Apple, Google or Amazon, or for a company that creates music such as a Recording Studio, Record Company, or a Music Publisher. Respondents who indicated that they, or a member of their household worked for one of those types of firms were terminated from the survey.
44. Next, in screening question Q51, respondents were asked about the music services they currently have, including all subscriptions—free, trial or introductory, or paid. Only those respondents indicating that they used Satellite Radio (Sirius XM) or a Music Streaming Service (*e.g.*, Apple Music, Spotify or Pandora) were allowed to continue.
45. Respondents were screened about the types of Sirius XM services or Music Streaming Services they currently had. Respondents were screened for all the services for which they could potentially qualify. After the initial screening, each respondent was randomly assigned to only one of the qualifying music service cells: Sirius XM (Sirius Select) or Sirius XM free trial, or one of the other five categories of music streaming services (paid subscription to Spotify or Apple Music, use of free, ad-supported Spotify, subscription to Pandora One, use of free, ad-supported Pandora).³¹

³⁰ Respondents taking the survey on a smartphone, or on any other mobile device besides a desktop, laptop or tablet computer, were informed, "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." Respondents were not permitted to take the survey with a smartphone because respondents may have needed to access information through a pop-up window, which would not display well on smartphones.

³¹ In the survey 1,413 respondents qualified for multiple cells. For example, 41% of respondents indicated having a paid subscription to Sirius Select also indicated having a paid subscription to at least one On-Demand streaming music service (Apple Music or Spotify Premium) or to Pandora One. [REDACTED]

46. The next screening question (Q52) was only presented to respondents who responded that they currently have some type of Sirius XM subscription. They were asked if their Sirius XM subscription was a paid subscription, part of package from DISH network, or a free Trial Period subscription.³² Trial subscribers qualified to potentially be asked about a Sirius XM Trial subscription in the main survey. Paid Subscribers were asked two additional screening questions, to specify the specific subscription package (Q52.2), and indicate their involvement in the decision to purchase Sirius XM (Q53). Sirius XM subscribers with the "Select" package, who made the decision themselves or who played a major role in deciding whether to subscribe to Sirius XM, qualified to potentially be asked about a paid Sirius XM "Select" package subscription in the main survey.³³
47. Respondents who reported currently using a music streaming service were asked the next screening question (Q54). They were asked to identify which of the following streaming music services they currently have:
- a. Paid subscription to Apple Music
 - b. Paid subscription to Spotify Premium
 - c. Free, ad-supported version of Spotify
 - d. Paid subscription to Pandora One
 - e. Free, ad-supported version of Pandora
 - f. A music streaming service not listed above (those who chose this option were asked to identify the service)

³² Those who only had Sirius XM as part of a bundled DISH package were not eligible to be asked about Sirius XM in the main questionnaire.

³³ I included only subscribers to the Sirius XM Sirius Select package, which I understand is one of the most popular subscription packages.

48. Respondents who reported being users of the free, ad-supported versions of Spotify and/or Pandora qualified to potentially be asked about that service in the main survey. Paid Subscribers to Apple Music and/or Spotify Premium were asked an additional screening question to indicate their role in the decision to purchase a subscription to Apple Music and/or Spotify (Q55). Those who made the decision themselves or who played a major role in deciding whether to subscribe to that particular service qualified to potentially be asked about a paid subscription to Apple Music or Spotify Premium in the main survey.³⁴ As noted above, respondents who qualified for more than one service were randomly assigned to a set of questions in the main survey about just one of their services.
49. Lastly, as a quality control measure, respondents were asked to confirm that they understood and agreed to the following instructions before being assigned to a track of questions about a specific service in the main questionnaire (Q140).
- 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.

Only those respondents who answered affirmatively that they understood and agreed were allowed to proceed to the main survey.

³⁴ A total of 48 respondents indicated that they currently had both paid and ad-supported account to Spotify (21 respondents), to Pandora (24 respondents), or both (3 respondents), without qualifying for another cell (*e.g.*, a subscription to Apple Music). These respondents were terminated from the survey.

VII. SURVEY ROLLOUT

50. The survey was conducted from September 14 through September 22, 2016. To ensure that the survey operated properly, I extensively tested the links, skip logic, randomization of cell assignment and response options, and screening questions. The Brattle Group, at my direction, also performed extensive testing on these features of the survey.
51. A total of 15,904 potential respondents who are representative of the general population responded to an invitation to take the survey and began the survey's screener. Those entering the survey had a personally encoded link that established survey security, ensuring that respondents could not take the survey multiple times. Appendix F provides screening statistics including the reasons that potential respondents were terminated from the survey.
52. Ultimately, 2,602 qualified respondents completed the survey. Of these, I removed 86 respondents who completed the survey in what I judged to be too little time or too much time.³⁵ The remaining 2,516 respondents constituted the final sample, and were asked about one of the services they reported using. Table 1 shows the number of respondents who were asked about each service.

³⁵ Specifically, I removed five respondents who completed the survey in less than one minute and 81 respondents who took more than 20 minutes to complete the survey. The results are similar if I include only 95% of the respondents, removing the 2.5% who took the greatest amount of time to complete the survey and the 2.5% who took the least amount of time to complete the survey.

Table 1: Survey Respondents by Service

Sirius XM Select	509
Sirius XM Trial	503
On-Demand Paid (Apple Music and Spotify Premium)	504
Not On-Demand Paid (Pandora One)	499
On-Demand and Not On-Demand Free (Pandora and Spotify)	501
Total Respondents	2,516

VIII. KEY SURVEY QUESTIONS

53. Respondents who qualified for the survey were asked a series of questions about one of the services they used. The specific set of questions for each service is outlined below.

A. SIRIUS XM SIRIUS SELECT SUBSCRIBERS

54. Sirius XM paid subscribers to the Select package started the main questionnaire by being introduced to definitions of music services (Q200), and were asked to confirm that they understood the descriptions of all three of these services (Q201). The exact text read by the respondent is as follows (bold in original):

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.**

Only those who answered affirmatively proceeded to be asked the next set of questions.

55. Respondents were then informed that “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 the **longest**.” And then told “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**” (Q202, bold and underline in original).
56. Next, respondents were asked a set of up to seven questions about whether they would continue their current subscription to Sirius XM at certain monthly subscription prices (Q203-Q203.6). These monthly prices started at thirty percent below the standard subscription \$15.99 price of the Sirius Select Package, and increased in increments of approximately 10%, as outlined in Table 2.

Table 2: Prices Offered to Sirius XM Subscribers

Sirius XM (Select Package)		
Question	Relative to Standard Price	Monthly Price
Q203	30% below standard price	\$11.49
Q203.1	20% below standard price	\$12.99
Q203.2	10% below standard price	\$14.49
Q203.3	standard price	\$15.99
Q203.4	10% above standard price	\$17.49
Q203.5	20% above standard price	\$18.99
Q203.6	30% above standard price	\$20.49

57. Specifically, they were asked in Q203 “If right now you were to be charged **\$11.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you ...? Continue to subscribe to Sirius XM Satellite Radio, Cancel your subscription to

Sirius XM Satellite Radio, or Don't know/unsure" (bold in original).³⁶ Respondents who answered they would continue to subscribe or chose the "Don't know/unsure" option were asked Q203.1, a parallel question with a monthly price of \$12.99, and so forth, until they chose the "Cancel your subscription" option, or until they were asked Q203.6, whether they would continue to subscribe to Sirius XM if the subscription price were \$20.49 per month.

58. For the price level at which a respondent selected "Cancel your subscription" option, a respondent was then asked, "You mentioned that you would cancel your subscription to **Sirius XM** if you were charged [PRICE AT WHICH THE RESPONDENT CHOSE TO CANCEL THE SERVICE] 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." The response options were randomized and included the following: "Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **\$9.99** per month", "Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month", "No, I would not subscribe to a paid music service in place of **Sirius XM**", and "Don't know/unsure" (Q210, bold and underline in original).³⁷
59. Those who said they would not subscribe to a paid music service in place of Sirius XM were asked "You mentioned that you would not subscribe 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**?" (Q210.1, bold and underline in original).³⁸ Their options included the selection of all that apply from the following: "I would purchase CDs

³⁶ The order of the Continue and Cancel options were randomized across respondents. Half of the respondents always saw "continue" first, and half always saw "cancel" first.

³⁷ When answering this question, respondents could click on a link that said "**Click here if you want to review the music services definitions**" (bold in original).

³⁸ Respondents who said they would subscribe to an On-Demand service, or a Not-On-Demand service (as well as those who said they were unsure or did not know) were thanked for their time and completed the survey.

and/or music downloads”, “I would listen to free music”, “Other (Please specify—you will not be constrained by the size of the box).”

60. Lastly, those who said they would listen to free music were asked “How would you listen to free music instead of Sirius XM Satellite Radio” (Q210.2), and asked to pick all that apply from the following answer options, which were presented in randomized order.

- 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)
- Free On-Demand music video sites with ads (*e.g.*, YouTube)
- Music channels included in an existing cable or satellite TV subscription (*e.g.*, Music Choice)³⁹
- AM/FM radio or AM/FM HD radio
- Music obtained through Peer-to-Peer file sharing or free download sites
- Borrow CDs, vinyl or tapes from friends or a library
- Continue listening to the music collection I already own
- Other (Please specify—you will not be constrained by the size of the box) _____
- Don’t know/unsure

B. SIRIUS XM FREE TRIAL PERIOD SUBSCRIBERS

61. Free Trial Period Sirius XM subscribers started the main questionnaire by being asked how long they have had their Trial Period subscriptions to Sirius XM Satellite Radio (Q500.1). Respondents who reported having a trial subscription for over 12 months were terminated from the survey.⁴⁰

³⁹ Services like Music Choice were included among the free music options both here and below, even though one might view the service as paid for as a small part of the respondent’s cable or satellite television subscription payment, because these services could be accessed by the respondent for no incremental charge.

⁴⁰ As noted in Footnote 3, the length of time of trial subscriptions ranged from three to 12 months.

62. Respondents were then introduced to definitions of music services (Q500.2), and were asked to confirm that they understood the descriptions of all three of these services (Q501). The exact text read by the respondent is as follows (bold in original):

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.**

Only those who answered affirmatively proceeded to be asked the next set of questions.

63. Respondents were then informed that "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" (Q502, bold in original).
64. Next, respondents were asked a set of up to seven questions about whether they would convert their Sirius XM subscription at certain monthly subscription prices when their trial period ends (Q503 through Q503.6). These monthly prices started at

thirty percent below the standard price for a Select package subscription, and increased in 10% increments, as outlined in Table 3.

Table 3: Prices Offered to Sirius XM Trial Subscribers

Sirius XM (Select Package)		
Question	Relative to Standard Price	Monthly Price
Q503	30% below standard price	\$11.49
Q503.1	20% below standard price	\$12.99
Q503.2	10% below standard price	\$14.49
Q503.3	standard price	\$15.99
Q503.4	10% above standard price	\$17.49
Q503.5	20% above standard price	\$18.99
Q503.6	30% above standard price	\$20.49

65. Specifically, they were asked in Q503 “At the end of your trial period, if you were offered a subscription to **Sirius XM Satellite Radio** at the price of \$11.49 per month, would you or would you not subscribe to the service” (bold in original). Answer options included: “Yes, I would subscribe to the service,” “No, I would not subscribe to the service”, or “Don’t know/unsure” (underline in original).⁴¹ Respondents who answered they would subscribe or chose the “Don’t know/unsure” option were asked the next in the series of questions, and continued to be asked Q503.1, a parallel question with a monthly price of \$12.99, and so forth until they chose the “No, I would not subscribe” option or until they were asked Q503.6, whether they would subscribe to Sirius XM if the subscription price were \$20.49 per month.
66. For the price level at which a respondent selected “No, I would not subscribe” option, a respondent was then asked, “You mentioned that you would not subscribe to **Sirius XM** at the end of your trial period if you were charged [PRICE AT WHICH THE RESPONDENT CHOSE NOT TO SUBSCRIBE] 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

⁴¹ The order of the Continue and Cancel options were randomized across respondents. Half of the respondents always saw “continue” first, and half always saw “cancel” first.

subscription, and would not include a music service that you currently subscribe to” (Q510, bold and underline in original). The response options were randomized and included the following: “Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **\$9.99** per month”, “Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month”, “No, I would not subscribe to a paid music service in place of **Sirius XM** when my trial period ends”, and “Don’t know/unsure” (Q510, bold and underline in original).⁴²

67. Those respondents who said they would not subscribe to a paid music service in place of their **Trial Period** subscription were asked “You mentioned that you would not subscribe 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**?” (Q510.1, bold and underline in original).⁴³ Their response options were randomized and included the selection of all that apply from the following: “I would purchase CDs and/or music downloads”, “I would listen to free music”, “Other (Please specify—you will not be constrained by the size of the box)”, “None of the Above”, and “Don’t know/unsure”.
68. Lastly, those who said they would listen to free music were asked “How would you listen to free music instead of paying for a subscription to **Sirius XM Satellite Radio**?” (Q510.2, bold in original), and asked to pick all that apply from the following answer options, which were presented in randomized order.
- 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)
 - Free On-Demand music video sites with ads (*e.g.*, YouTube)

⁴² When answering this question, respondents who wanted to see the definitions of the services again could click on a link that said “**Click here if you want to review the music services definitions**” (bold in original).

⁴³ Respondents who said that they would subscribe to an On-Demand service, or a Not-On-Demand service (as well as those who said they were unsure or did not know) were thanked for their time and completed the survey.

- Music channels included in an existing cable or satellite TV subscription (*e.g.*, Music Choice)
- AM/FM radio or AM/FM HD radio
- Music obtained through Peer-to-Peer file sharing or free download sites
- Borrow CDs, vinyl or tapes from friends or a library
- Continue listening to the music collection I already own
- Other (Please specify—you will not be constrained by the size of the box) _____
- Don't know/unsure

C. PAID ON-DEMAND MUSIC STREAMING SERVICE SUBSCRIBERS

69. Subscribers to paid subscriptions to On-Demand music streaming services (specifically, Apple Music or Spotify Premium) started the main questionnaire by being introduced to definitions of music services (Q300), and were asked to confirm that they understood the descriptions of all three of these services (Q301). The exact text read by the respondent is as follows (bold in original):

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.**

Only those who answered affirmatively proceeded and be asked the next set of questions.

70. Respondents were then informed that “The next few questions will be about your **[Apply Music or Spotify Premium]** streaming service subscription,” (bold in original) and told “You will be presented with several different monthly prices for a subscription to **[Apply Music or Spotify Premium]**. This amount may be higher or lower than the amount you currently pay for your subscription to **[Apply Music or Spotify Premium]**” (Q302, bold in original).
71. Next, respondents were asked a set of up to seven questions about whether they would continue their current subscription to Apple Music or Spotify Premium at certain monthly subscription prices (Q303 through Q303.6). These monthly prices started at thirty percent below the standard price for the subscription, and increased in 10% increments, as outlined in Table 4.

Table 4: Prices Offered to On-Demand Music Streaming Services

Apple Music/Spotify Premium		
Question	Relative to Standard Price	Monthly Price
Q303	30% below standard price	\$6.99
Q303.1	20% below standard price	\$7.99
Q303.2	10% below standard price	\$8.99
Q303.3	standard price	\$9.99
Q303.4	10% above standard price	\$10.99
Q303.5	20% above standard price	\$11.99
Q303.6	30% above standard price	\$12.99

72. Specifically, they were asked in Q303 “If right now you were to be charged \$6.99 per month for the same **[Apple Music or Spotify Premium]** subscription you currently have, and you knew that all other On-Demand music streaming service subscriptions were also \$6.99 per month, would you ...? Continue to subscribe to **[Apple Music or Spotify Premium]**, Cancel your subscription to **[Apple Music or Spotify Premium]**, or

Don't know/unsure" (bold and underline in original).⁴⁴ Respondents who answered they would continue to subscribe or chose the "Don't know/unsure" option were asked Q303.1, a parallel question with a monthly price of \$7.99, and so forth, until they chose the "Cancel your subscription" option, or until they were asked Q303.6, whether they would continue to subscribe to that service if the subscription price were \$12.99 per month.

73. For the price level at which a respondent selected "Cancel your subscription" option, a respondent was then asked, "You mentioned that you would cancel your subscription to [Apple Music or Spotify Premium] if you were charged [PRICE AT WHICH THE RESPONDENT CHOSE TO CANCEL THE SERVICE] per month, and you knew that all other **On-Demand** music streaming services were also [PRICE AT WHICH THE RESPONDENT CHOSE TO CANCEL THE SERVICE] per month. Keeping in mind all other music services you subscribe to, would you or would you not subscribe to a paid music services in place of [Apple Music or Spotify Premium]? This would only include a new subscription, and would not include a music service that you currently subscribe to" (Q310, bold and underline in original). The response options included the following: "Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month", "Yes, I would subscribe to **Sirius XM** satellite radio at **\$15.99** per month", "No, I would not subscribe to a paid music service in place of [Apple Music or Spotify Premium]", and "Don't know/unsure" (Q310, bold in original).⁴⁵
74. Those who said they would not subscribe to a paid music service in place of [Apple Music or Spotify Premium] were asked "You mentioned that you would not subscribe to a paid music service in place of [Apple Music or Spotify Premium]. What else, if anything, would you do instead of paying for a subscription to [Apple Music or Spotify

⁴⁴ The order of the Continue and Cancel options were randomized across respondents. Half of the respondents always saw "continue" first, and half always saw "cancel" first.

⁴⁵ When answering this question, respondents could click on a link that said "**Click here if you want to review the music services definitions**" (bold in original).

Premium]?” (Q310.1, bold and underline in original.)⁴⁶ Their options included the selection of all that apply from the following: “I would purchase CDs and/or music downloads”, “I would listen to free music”, “Other (Please specify—you will not be constrained by the size of the box)”, “None of the Above”, and “Don’t know/unsure”.

75. Lastly, those who said they would listen to free music were asked “How would you listen to free music instead of **[Apple Music or Spotify Premium]**” (Q310.2, bold in original) and asked to pick all that apply from the following answer options, which were presented in randomized order.

- 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)
- Free On-Demand music video sites with ads (*e.g.*, YouTube)
- Music channels included in an existing cable or satellite TV subscription (*e.g.*, Music Choice)
- AM/FM radio or AM/FM HD radio
- Music obtained through Peer-to-Peer file sharing or free download sites
- Borrow CDs, vinyl or tapes from friends or a library
- Continue listening to the music collection I already own
- Other (Please specify—you will not be constrained by the size of the box) _____
- Don’t know/unsure

D. **PAID NOT ON-DEMAND MUSIC STREAMING SERVICE SUBSCRIBERS**

76. Respondents who were paid subscriptions to Not-On-Demand music streaming services (specifically, Pandora One) started the main questionnaire by being introduced to definitions of music services (Q400), and were asked to confirm that

⁴⁶ Respondents who said they would subscribe to an On-Demand service, or a Not-On-Demand service (as well as those who said they were unsure or did not know) were thanked for their time and completed the survey.

they understood the descriptions of all three of these services (Q401). The exact text read by the respondent is as follows (bold in original):

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.**

Only those who answered affirmatively proceeded to be asked the next set of questions.

77. Respondents were then informed that "The next few questions will be about your **Pandora One** streaming service subscription." And then told "You will be presented with several different monthly prices for a subscription to **Pandora One**. **This amount may be higher or lower than the amount you currently pay for your subscription to Pandora One**" (Q402, bold in original).
78. Next, respondents were asked a set of up to seven questions about whether they would continue their current subscription to **Pandora One** at certain monthly subscription prices (Q403 through Q403.6, bold in original). These monthly prices

started at thirty percent below the standard price for the subscription, and increased in 10% increments, as outlined in Table 5.

Table 5: Prices Offered to Not-On-Demand Music Streaming Services

Pandora One		
Question	Relative to Standard Price	Monthly Price
Q403	30% below standard price	\$3.49
Q403.1	20% below standard price	\$3.99
Q403.2	10% below standard price	\$4.49
Q403.3	standard price	\$4.99
Q403.4	10% above standard price	\$5.49
Q403.5	20% above standard price	\$5.99
Q403.6	30% above standard price	\$6.49

79. Specifically, they were asked in Q403 “If right now you were to be charged \$3.49 per month for the same **Pandora One** subscription you currently have, and you knew that all other **Not-On-Demand** music streaming service subscriptions were also \$3.49 per month, would you ...? Continue to subscribe to **Pandora One**, Cancel your subscription to **Pandora One**, or Don’t know/unsure” (bold and underline in original).⁴⁷ Respondents who answered they would continue to subscribe or chose the “Don’t know/unsure” option were asked Q403.1, a parallel question with a monthly price of \$3.99, and so forth until they chose the “Cancel your subscription” option, or until they were asked Q403.6, whether they would continue to subscribe to Pandora One if the subscription price were \$6.49 per month.
80. For the price level at which a respondent selected “Cancel your subscription” option, a respondent was then asked, “You mentioned that you would cancel your subscription to **Pandora One** if you were charged [PRICE AT WHICH THE RESPONDENT CHOSE TO CANCEL THE SERVICE] per month, and you knew that all other **Not-On-Demand** music streaming services subscriptions were also [PRICE AT WHICH THE RESPONDENT CHOSE TO CANCEL THE SERVICE] per month. Keeping in mind all other

⁴⁷ The order of the Continue and Cancel options were randomized across respondents. Half of the respondents always saw “continue” first, and half always saw ‘cancel’ first.

music services you subscribe to, would you or would you not subscribe to a paid music service in place of **Pandora One**? This would only include a new subscription, and would not include a music service that you currently subscribe to” (Q410, bold and underline in original). The response options included the following: “Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **\$9.99** per month”, “Yes, I would subscribe to **Sirius XM** satellite radio at **\$15.99** per month”, “No, I would not subscribe to a paid music service in place of **Pandora One**”, and “Don’t know/unsure” (Q410, bold and underline in original).⁴⁸

81. Those who said they would not subscribe to a paid music service in place of Pandora One were asked “You mentioned that you would not subscribe to a paid music service in place of **Pandora One**. What else, if anything, would you do instead of paying for a subscription to **Pandora One**” (Q410.1, bold and underline in original).⁴⁹ Their options included the selection of all that apply from the following: “I would purchase CDs and/or music downloads”, “I would listen to free music”, “Other (Please specify—you will not be constrained by the size of the box)”, “None of the Above”, and “Don’t know/unsure”.
82. Lastly, those who said they would listen to free music were asked “How would you listen to free music instead of **Pandora One**” (Q410.2, bold in original), and asked to pick all that apply from the following answer options, which were presented in randomized order.
 - 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)
 - Free On-Demand music video sites with ads (*e.g.*, YouTube)

⁴⁸ When answering this question, respondents could click on a link that said “**Click here if you want to review the music services definitions**” (bold in original).

⁴⁹ Respondents who said they would subscribe to an On-Demand service, or a Not-On-Demand service (as well as those who said they were unsure or did not know) were then thanked for their time and completed the survey.

- Music channels included in an existing cable or satellite TV subscription (*e.g.*, Music Choice)
- AM/FM radio or AM/FM HD radio
- Music obtained through Peer-to-Peer file sharing or free download sites
- Borrow CDs, vinyl or tapes from friends or a library
- Continue listening to the music collection I already own
- Other (Please specify—you will not be constrained by the size of the box) _____
- Don't know/unsure

**E. FREE AD-SUPPORTED USERS OF ON-DEMAND OR NOT ON DEMAND
MUSIC STREAMING SERVICES (SPOTIFY/PANDORA)**

83. Respondents who reported using free, ad-supported music streaming services (Pandora and Spotify) started the main questionnaire by being screened on time spent listening to the service each week (600.1). Respondents who listened for less than an hour per week were not included in the survey as “users” of the service because they may have signed up for an account at some point in the past, but were not likely to be current and/or active users of the service.
84. Respondents using the free version of Pandora were then told that “The next few questions will be about what interest, if any, you may have in purchasing a paid subscription to **Pandora**. A paid subscription to **Pandora** would allow you to listen to music **ad-free, with more skips, and with fewer timeouts**. You will be presented with several different monthly prices for a paid subscription to **Pandora**” (Q603, bold in original).⁵⁰
85. Respondents were then instructed that “The next few questions will be about what interest, if any, you may have in purchasing a paid subscription to **Spotify**. A paid

⁵⁰ Respondents who indicated that they had both a paid subscription to Pandora One and a free Pandora account were not asked questions about Pandora. Only 5% of respondents that completed the survey indicated that they had both free and paid Pandora.

subscription to **Spotify** would allow you to listen to music **ad-free, with unlimited skips, offline, with high quality audio, and to play any track**. You will be presented with several different monthly prices for a paid subscription to **Spotify**” (Q603, bold in original).⁵¹

86. Next, respondents were asked a set of up to three questions about their willingness to subscribe to a paid subscription to **[Pandora or Spotify]** at certain monthly prices (Q603.1 through Q603.3, bold in original). These monthly prices started at ten percent below the standard price for the subscription, and decreased in 10% increments, as outlined in Table 6.

Table 6: Prices Offered to Free Ad Supported Music Streaming Services

Question	Relative to Standard Price	Amount
	Pandora	
Q603.1	10% below standard price	\$4.49
Q603.2	20% below standard price	\$3.99
Q603.3	30% below standard price	\$3.49
	Spotify	
Q603.1	10% below standard price	\$8.99
Q603.2	20% below standard price	\$7.99
Q603.3	30% below standard price	\$6.99

87. Specifically, they were asked in Q603.1 “If right now you were offered a paid subscription to **[Spotify or Pandora]** at **[INSERT “Monthly price with 10% discount” FROM CHART]**, would you or would you not subscribe to the service” (bold in original).⁵² Respondents who answered they would not subscribe, or chose the “Don’t know/unsure” option were asked Q603.2, a parallel question with a monthly price 20% below the standard price for the subscription; respondents who still answered they would not subscribe, or chose the “Don’t know/unsure” option were asked

⁵¹ Respondents who indicated that they had both a paid subscription to Spotify Premium and a free Spotify account were not asked questions about Spotify. Only 5.7 percent of respondents that completed the survey indicated that they had both free and paid Spotify.

⁵² The order of the Subscribe and Not Subscribe options were randomized across respondents. Half of the respondents always saw “subscribe” first and half always say “not subscribe” first.

Q603.3 a parallel question with a monthly price 30% below the standard price for the subscription. Respondents who answered that they would subscribe at any price offered were thanked for their time and completed the survey.

IX. SURVEY RESULTS

88. In this section, I summarize the key findings of my survey. The findings report (i) the prices as which various consumers would choose to cancel their music service subscriptions and (ii) their preference to subscribe to another music service for those who would choose to cancel a given music service subscription.
89. In addition to reporting the number (or percentage) of respondents who responded to the questions in the survey, to ensure accurate representation of the U.S. adult population, the survey responses were also weighted by these three variables: age, gender, and Census region. Applying these weights did not affect my conclusions. A description of the weighting methods and the weighted survey responses are presented in Appendix G.
90. A bootstrapping procedure was used to estimate the precision of, and create a confidence interval around, each one of the reported survey results.⁵³ A set of 1,000 independent “resamples” were generated by randomly selecting respondents with replacement from the original, full-sample of survey respondents. Sampling weights were adjusted by age, gender, and Census region for the resampling. The variation in these 1,000 weighted estimates derived from each of the 1,000 “resamples” forms the basis of the standard error calculations for results reported below.⁵⁴

⁵³ This approach follows the recommendations of the American Association for Public Opinion Research. The text follows closely American Association for Public Opinion Research, “AAPOR Guidance on Reporting Precision for Nonprobability Samples,” 2016, p. 1-2.

⁵⁴ As noted by the American Association for Public Opinion Research, the confidence interval assumes that the weighted estimates are approximately unbiased, which is based on the assertion that any differences between the survey sample and the target population on key survey outcomes are corrected by the sampling weight. See American Association for Public

A. SIRIUS XM SIRIUS SELECT SUBSCRIBERS

91. Of the 509 paid subscribers to Sirius XM Select, 388 (76% of the sample) indicated that they would cancel their Sirius XM subscription at various price points between \$11.49 and \$20.49 per month. 92 respondents (18% of the sample) indicated that they would continue their subscription to Sirius XM Sirius Select at a price of \$20.49 per month. The remaining 29 respondents (6% of the sample) did not report a preference. The distribution of responses is shown in Table 7.⁵⁵

Table 7: Sirius XM Sirius Select Subscribers

Price	Number of Respondents	Continue	Cancel
\$ 11.49	509	390	82
\$ 12.99	427	343	43
\$ 14.49	384	259	71
\$ 15.99	313	209	50
\$ 17.49	263	140	80
\$ 18.99	183	122	24
\$ 20.49	159	92	38

Opinion Research, "AAPOR Guidance on Reporting Precision for Nonprobability Samples," 2016 p. 2.

⁵⁵ I note that 196 respondents (39%) indicated that they would cancel their subscription to Sirius XM when the price was below the \$15.99 standard price of Sirius Select. This result is consistent with the marketplace practice of offering discounts to subscribers from the "sticker price" for a number of reasons, including to subscribers who purchase longer-term subscription plans, subscribers who have multiple subscriptions, and for customer acquisition and customer retention. [REDACTED]

92. Of the 388 respondents who indicated that they would cancel their Sirius XM subscription, 110 (22% of the sample) indicated that they would instead switch to an On-Demand music streaming service, while 54 (11% of the sample) indicated that they would instead switch to a Not-On-Demand music streaming service. The distribution of responses for this set of respondents is presented in Table 8.

Table 8: Sirius XM Sirius Select Subscribers Switching to On-Demand and Not-On-Demand

Price	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Not-On-Demand
\$11.49	82	17	11
\$12.99	43	11	7
\$14.49	71	25	10
\$15.99	50	22	8
\$17.49	80	17	8
\$18.99	24	5	5
\$20.49	38	13	5

93. The estimated proportion of the Sirius XM Sirius Select subscribers who indicated that they would cancel their Sirius XM subscription, and instead switch to an On-Demand music streaming service, is between 21.6% and 22.2% when survey responses are weighted using alternative weighting methods. Similarly, the estimated proportion of those who indicated they would cancel their Sirius XM subscription and instead switch to a Not-On-Demand music streaming service is between 10.3% and 10.7% when survey responses are weighted using alternative methods. Table 9 presents estimated proportions and their respective 95% confidence intervals.

Table 9: Sirius XM Sirius Select Subscribers Switching to On-Demand and Not-On-Demand Music Streaming Services – Estimated Proportions and Confidence Intervals

	Baseline	95% CI	Weighted	95% CI	Raked	95% CI	Bootstrap	95% CI
Cancel	76.2%	72.5% - 79.9%	77.0%	73.3% - 80.7%	76.3%	72.7% - 80.0%	76.9%	73.2% - 80.5%
Cancel and Switch To On-Demand	21.6%	18.0% - 25.2%	22.1%	18.5% - 25.8%	21.8%	18.3% - 25.4%	22.2%	18.7% - 25.7%
Cancel and Switch To Not-On-Demand	10.6%	7.9% - 13.3%	10.4%	7.7% - 13.0%	10.7%	8.0% - 13.4%	10.3%	7.6% - 12.9%

B. SIRIUS XM TRIAL SUBSCRIBERS

94. Of the 503 respondents who reported having a trial subscription to Sirius XM, 379 (75% of the sample) indicated that they would not purchase a paid subscription to Sirius XM at various price points between \$11.49 and \$20.49 per month. 108 respondents (21% of the sample) indicated that they would purchase a paid subscription to Sirius XM at a price of \$20.49 per month. The remaining 16 respondents (3% of the sample) did not report a preference.⁵⁶ The distribution of responses for Sirius XM Trial Subscriber sample is presented in Table 10.

Table 10: Sirius XM Trial Subscribers

Price	Number of Respondents	Subscribe	Not Subscribe
\$ 11.49	503	280	151
\$ 12.99	352	246	42
\$ 14.49	310	184	85
\$ 15.99	225	165	40
\$ 17.49	185	135	27
\$ 18.99	158	122	18
\$ 20.49	140	108	16

⁵⁶ [REDACTED]

95. Of the 379 respondents who indicated that they would not purchase a subscription to Sirius XM, 87 (17% of the sample) indicated that they would instead subscribe to an On-Demand music streaming service, while 53 (11%) indicated that they would instead subscribe to a Not-On-Demand music streaming service. The distribution of responses for this set of respondents is presented in Table 11.

Table 11: Sirius XM Trial Subscribers Switching to On-Demand and Not-On-Demand

Price	Not Subscribe	Not Subscribe and Switch to On-Demand	Not Subscribe and Switch to Not-On-Demand
\$11.49	151	7	15
\$12.99	42	6	7
\$14.49	85	30	9
\$15.99	40	18	8
\$17.49	27	11	7
\$18.99	18	8	5
\$20.49	16	7	2

96. The estimated proportion of the Sirius XM Trial Subscribers who indicated that they would not purchase a subscription to Sirius XM, and instead switch to an On-Demand music streaming service is between 17.3% and 18.5% when survey responses are weighted using alternative weighting methods. Similarly, the estimated proportion of those who indicated they would not purchase a subscription to Sirius XM, and instead switch to a Not-On-Demand music streaming service, is between 10.5% and 11.1% when survey responses are weighted using alternative methods. Table 12 presents estimated proportions and their respective 95% confidence intervals.

Table 12: Sirius XM Trial Subscribers Switching to On-Demand and Not-On-Demand Music Streaming Services – Estimated Proportions and Confidence Intervals

	Baseline	95% CI	Weighted	95% CI	Raked	95% CI	Bootstrap	95% CI
Cancel	75.3%	71.6% - 79.1%	76.2%	72.5% - 79.9%	75.1%	70.6% - 79.6%	75.9%	72.1% - 79.7%
Cancel and Switch To On-Demand	17.3%	14.0% - 20.6%	18.3%	14.9% - 21.6%	17.7%	14.4% - 21.0%	18.5%	15.0% - 22.0%
Cancel and Switch To Not-On-Demand	10.5%	7.9% - 13.2%	10.6%	7.9% - 13.3%	10.6%	7.9% - 13.3%	11.1%	8.3% - 13.9%

C. ON-DEMAND PAID SUBSCRIBERS (APPLE MUSIC AND SPOTIFY PREMIUM)

97. Of the 504 respondents who reported being paid subscribers to On-Demand music services, 246 (49% of the sample) indicated that they would cancel their On-Demand music service subscription at various price points between \$6.99 and \$12.99 per month. 221 respondents (44% of the sample) indicated that they would continue their subscription to their On-Demand music service at a price of \$12.99 per month. The remaining 37 respondents (7% of the sample) did not report a preference. The distribution of responses is shown in Table 13.⁵⁷

Table 13: On-Demand Paid Subscribers (Apple Music and Spotify Premium)

Price	Number of Respondents	Continue	Cancel
\$ 6.99	504	474	20
\$ 7.99	484	432	29
\$ 8.99	455	385	33
\$ 9.99	422	358	31
\$ 10.99	391	274	67
\$ 11.99	324	245	37
\$ 12.99	287	221	29

98. Of the 246 respondents who indicated that they would cancel their On-Demand subscription, 95 (19% of the sample) indicated that they would instead switch to a

⁵⁷ I analyzed the responses of Apple Music subscribers and Spotify subscribers separately. Their responses to questions related to canceling their subscriptions and to questions about whether they would switch to another subscription service were similar across the two services.

Not-On-Demand music streaming service, while 69 (14% of the sample) indicated that they would instead switch to a Sirius XM paid subscription. The distribution of responses for On-Demand Paid Subscriber sample is presented in Table 14.

Table 14: On-Demand Paid Switching to Not-On-Demand and Sirius XM

Price	Cancel	Cancel and Switch to Not-On-Demand	Cancel and Switch to Sirius XM
\$6.99	20	6	11
\$7.99	29	12	7
\$8.99	33	12	11
\$9.99	31	9	13
\$10.99	67	28	12
\$11.99	37	18	7
\$12.99	29	10	8

99. The estimated proportion of respondents who reported being paid subscribers to On-Demand music services and indicated that they would cancel their On-Demand music service subscription, and instead switch to a Not-On-Demand music streaming service, is between 18.8% and 18.9% when survey responses are weighted using alternative weighting methods. Similarly, the estimated proportion of those who indicated they would cancel their On-Demand music streaming service and instead switch to Sirius XM is between 13.3% and 13.7% when survey responses are weighted using alternative methods. Table 15 presents estimated proportions and their respective 95% confidence intervals.

Table 15: On-Demand Subscribers Switching to Not-On-Demand Music Streaming Services and Sirius XM – Estimated Proportions and Confidence Intervals

	Baseline	95% CI	Weighted	95% CI	Raked	95% CI	Bootstrap	95% CI
Cancel	48.8%	44.4% - 53.2%	49.6%	45.3% - 54.0%	48.7%	44.4% - 53.0%	49.8%	45.3% - 54.2%
Cancel and Switch To Not-On-Demand	18.8%	15.4% - 22.3%	18.9%	15.5% - 22.3%	18.9%	15.5% - 22.2%	18.8%	15.3% - 22.3%
Cancel and Switch To Sirius XM	13.7%	10.7% - 16.7%	13.4%	10.4% - 16.3%	13.6%	10.7% - 16.6%	13.3%	10.3% - 16.3%

D. NOT-ON-DEMAND PAID SUBSCRIBERS (PANDORA ONE)

100. Of the 499 respondents who reported being paid subscribers to the Not-On-Demand music service Pandora One, 209 respondents (42% of the sample) indicated that they would cancel their Not-On-Demand music service subscription at various price points between \$3.49 and \$6.49 per month 254 respondents (51% of the sample) indicated that they would continue their subscription to Pandora One at a price of \$6.49 per month. The remaining 36 respondents (7% of the sample) did not report a preference. The distribution is shown in Table 16.

Table 16: Not-On-Demand Paid Subscribers (Pandora One)

Price	Number of Respondents	Continue	Cancel
\$ 3.49	499	461	22
\$ 3.99	477	446	18
\$ 4.49	459	382	42
\$ 4.99	417	362	21
\$ 5.49	396	303	50
\$ 5.99	346	296	21
\$ 6.49	325	254	35

101. Of the 209 respondents who indicated that they would cancel their Not-On-Demand subscription, 80 (16% of the sample) indicated that they would instead switch to an On-Demand music streaming service, and 49 (10% of the sample) indicated that they would switch instead to a Sirius XM paid subscription. The distribution of responses for On-Demand Paid Subscriber sample is presented in Table 17.

Table 17: Not-On-Demand Paid Switching to On-Demand and Sirius XM

Price	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Sirius XM
\$3.49	22	6	9
\$3.99	18	6	4
\$4.49	42	16	10
\$4.99	21	14	3
\$5.49	50	16	7
\$5.99	21	6	5
\$6.49	35	16	11

102. The estimated proportion of respondents who reported being paid subscribers to the Not-On-Demand music streaming service Pandora One and indicated that they would cancel their Not-On-Demand music streaming service subscription, and instead switch to an On-Demand music streaming service subscription, is between 16.0% and 16.6% when survey responses are weighted using alternative weighting methods. Similarly, the estimated proportion of those who indicated they would cancel their Not-On-Demand music streaming service subscription and instead switch to Sirius XM is between 9.4% and 9.9% when survey responses are weighted using alternative methods. Table 18 presents estimated proportions and their respective 95% confidence intervals.

Table 18: Not-On-Demand Subscribers Switching to On-Demand Music Streaming Services and Sirius XM – Estimated Proportions and Confidence Intervals

	Baseline	95% CI	Weighted	95% CI	Raked	95% CI	Bootstrap	95% CI
Cancel	41.9%	37.6% - 46.2%	42.6%	38.2% - 46.9%	41.8%	37.6% - 46.1%	42.4%	38.1% - 46.8%
Cancel and Switch To On-Demand	16.0%	12.8% - 19.3%	16.4%	13.1% - 19.6%	16.1%	12.9% - 19.3%	16.6%	13.2% - 20.0%
Cancel and Switch To Sirius XM	9.8%	7.2% - 12.4%	9.9%	7.3% - 12.5%	9.9%	7.3% - 12.4%	9.4%	6.9% - 12.0%

E. SUBSCRIBERS TO FREE ON-DEMAND OR NOT ON-DEMAND MUSIC SERVICES (SPOTIFY OR PANDORA)

103. Of the 501 respondents who reported being users of free, ad-supported On-Demand or Not-On-Demand music services, 190 (38% of the sample) indicated that they would purchase a paid subscription if the price was discounted between 10% and 30% below the standard price for the subscription. Of the remaining 311 respondents, 257 (51% of the sample) indicated that they would not purchase a paid subscription if the price was discounted between 10% and 30%. The remaining 54 respondents (11% of the sample) did not report a preference. The distribution of responses for On-Demand or Not-On-Demand Free Subscriber sample is presented in Table 19.

Table 19: On-Demand/Not-On-Demand Free Subscribers

Percent Discount	Number of Respondents	Subscribe	Continue with Free
10%	501	154	285
20%	347	25	268
30%	322	11	257

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date:

10/18/16

Ravi Dhar

Ravi Dhar

Appendix A: Curriculum Vitae of Ravi Dhar

March 2016

RAVI DHAR

Yale School of Management
 165 Whitney Avenue
 Yale University
 New Haven, CT 06520
 (203) 432-5947

Employment

George Rogers Clark Professor of Management	2005 - Present
Professor of Psychology (<i>joint appointment</i>)	2003 – Present
Director, Yale Center for Customer Insights	2004 – Present
Professor of Marketing,	2000 – Present
Associate Professor of Marketing,	1997 - 2000
Assistant Professor of Marketing	1992 - 1997
Yale School of Management	

Other Appointments

Visiting Faculty, HEC Paris	Summer 1996
Visiting Associate Professor, Stanford University	Spring 1998
Visiting Professor, Erasmus University	Summer 2000, 2001
Visiting Professor, New York University	Spring 2005, Spring 2010

Education

Haas School of Business, UC Berkeley	1988-1992
Ph. D. (Business Administration)	1992
M.S. (Business Administration)	1990
Indian Institute of Management	1987
M.B.A.	
Indian Institute of Technology	1985
B.Technology	

Academic Honors and Fellowships

Distinguished Alumnus Award, Indian Institute of Management, 2013
 Distinguished Scientific Contribution Award, SCP, 2012
 Yale SOM Alumni Association Teaching Award, 2012
 Finalist, O'Dell Award, 2012
 Finalist, O'Dell Award, 2008
 Winner, O'Dell Award, 2005
 Finalist, O'Dell Award, 2004
 Finalist, Paul Green Award, 2004
 AMA Consortium Faculty Fellow, 2003- 2009, 2010, 2012, 2013

INFORMS Doctoral Consortium Faculty – Multiple Years
ACR Doctoral Consortium Faculty – Multiple Years
John A. Howard Doctoral Dissertation Award (Honorable Mention), 1993
AMA Doctoral Consortium Fellow, 1991

Research Interests

Consumer Behavior	Marketing Strategy
Judgment and Decision Making	Branding
E-Commerce	Behavioral Finance

Teaching Interests

Marketing Management	Consumer Behavior
Marketing Strategy	Behavioral Decision Theory
Financial Services	E-Commerce Marketing

Professional Affiliation (Member)

American Marketing Association
Association for Consumer Research
Society of Judgment and Decision Making

Professional Activities

Editorial Board, *Journal of Consumer Research*, 1997 – Present, Past Associate Editor
Journal of Consumer Psychology, 1997 – 2002, 2005 – Present
Journal of Marketing Research, 2001 – Present, Associate Editor
Journal of Marketing, 2005 - Present
Marketing Letters, 2000 - Present
Marketing Science, 2002- 2011, Past Area Editor

Occasional Reviewer, *Marketing, Management, Psychology Journals, NSF, etc.*

Publications in Journals

Approximate Number of Citations in Google Scholar: 10,000+

1. Proximity of Snacks to Beverages Increases Food Consumption in the Workplace: A Field Study (with E. Baskin, M. Gorlin, Z. Chance, N. Novemsky, K. Huskey, M. Hatzis), *Appetite*, *forthcoming*.
2. “Mental Representation Changes the Evaluation of Green Product Benefits,” (with Kelly Goldsmith and George Newman), *Nature Climate Change*, *forthcoming*.

3. "Closer to the Creator: Temporal Contagion Explains The Preference for Earlier Serial Numbers," (with R. Smith and G. Newman), *Journal of Consumer Research*, 2016.
4. "Sophisticated by Design: the Nonconscious Influences of Primed Concepts and Atmospheric Variables on Consumer Preferences," (with T. Andrew Poehlman and John A. Bargh), *Customer Needs and Solutions*, 2015.
5. "Positive Consequences Of Conflict On Decision Making," (with J. Savary, T. Kleiman, and R. Hassin), *Journal of Experimental Psychology: General*, 2015.
6. "The Technological Conundrum: How Rapidly Advancing Technology Can Lead To Commoditization," (with T. Chan and W. Putsis), *Customer Needs and Solutions*, 2015.
7. "When Going Green Backfires: How firm Intentions Shape the Evaluation of Socially Beneficial Product Enhancements," (with G. Newman and M. Gorlin), *Journal of Consumer Research*, 2014.
8. "Why Choosing Healthy Foods Is Hard, and How to Help: Presenting 4P's Framework for Behavior Change," (with Z. Chance and M. Gorlin), *Customer Needs and Solutions*, 2014.
9. "Giving Against the Odds: When Tempting Alternatives Increase Willingness to Donate," (with J. Savary and K. Goldsmith), *Journal of Marketing Research*, 2014.
10. "Authenticity is Contagious: Brand Essence and the Original Source of Production," (with George Newman), *Journal of Marketing Research*, 2014.
11. "A Dual System Framework to Understand Preference Construction Processes in Choice," (with M. Gorlin), *Journal of Consumer Psychology*, 2013.
12. "Refining the dual-process theory of preference construction: A reply to Gawronski, Martin and Sloman, Stanovich, and Wegener and Chien," (with M. Gorlin), *Journal of Consumer Psychology*, 2013.
13. "Negativity Bias and Task Motivation: Testing the Effectiveness of Positively Versus Negatively Framed Incentives," (with K. Goldsmith), *Journal of Experimental Psychology: Applied*, 2013.
14. "Representation and Perceived Similarity: How Abstract Mindset Aids Choice from Large Assortments," (with J. Xu and Z. Jiang), *Journal of Marketing Research*, 2013.
15. "Comparing Apples to Apples or Apples to Oranges: The Role of Mental Representation in Choice Difficulty," (with U. Khan and E. Kim), *Journal of Marketing Research*, 2013.

16. "Adding small differences can increase similarity and choice," (with J. Kim and N. Novemsky), *Psychological Science*, 2013.
17. "When Guilt Begets Pleasure: The Positive Effect of a Negative Emotion," (with K. Goldsmith and E. Kim), *Journal of Marketing Research*, 2012.
18. "Bridging the Gap Between Joint and Individual Decisions: Deconstructing Preferences in Relationships," (with M. Gorlin), *Journal of Consumer Psychology*, 2012.
19. "The Importance of the Context in Brand Extension: How Pictures and Comparisons Shift Consumers' Focus from Fit to Quality," (with T. Meyvis and K. Goldsmith), *Journal of Marketing Research*, 2012.
20. "Self-Signaling and the Costs and Benefits of Temptation in Consumer Choice," (with K. Wertenbroch), *Journal of Marketing Research*, 2012.
21. "Price Framing Effects on Purchase of Hedonic and Utilitarian Bundles," (with U. Khan), *Journal of Marketing Research*, 2010.
22. "Making Products Feel Special: When Metacognitive Difficulty Enhances Evaluation," (with A. Pocheptsova and A. Labroo), *Journal of Marketing Research*, 2010.
23. "Modeling the Under Reporting Bias in Panel Survey Data," (with Sha Yang and Yi Zhao) *Marketing Science*, 2010.
24. "The Effect of Decision Order on Purchase Quantity Decisions," (with I. Simonson and S. M. Nowlis), *Journal of Marketing Research*, 2010.
25. "Tradeoffs and Depletion in Choice," (with N. Novemsky, J. Wang, R. Baumeister), *Journal of Marketing Research*, 2010.
26. "Opportunity Cost Neglect," (with S. Frederick, N. Novemsky, J. Wang, and S. Nowlis), *Journal of Consumer Research*, 2009.
27. "Anticipating Adaptation to Products" (with J. Wang and N. Novemsky), *Journal of Consumer Research*, 2009.
28. "Deciding Without Resources: Psychological Depletion and Choice in Context," (with O. Amir, A. Pocheptsova, and R. Baumeister), *Journal of Marketing Research*, 2009.
29. "Customization Procedures and Customer Preferences," (with A. Valenzuela and F. Zettelmeyer), *Journal of Marketing Research*, 2009.
30. "Beyond Rationality: The Content of Preferences," (with N. Novemsky), *Journal of Consumer Psychology*, 2008.

31. "Of Frog Wines and Frowning Watches: Semantic Priming of Perceptual Features and Brand Evaluation," (with A. Labroo and N. Schwarz), *Journal of Consumer Research*, 2008.
32. "When Thinking Beats Doing: The Role of Optimistic Expectations in Goal-Based Choice," (with A. Fishbach and Y. Zhang), 2007, *Journal of Consumer Research*.
33. "Seeing The Forest Or The Trees: Implications of Construal Level Theory for Consumer Choice," (with E. Kim), *Journal of Consumer Psychology*, 2007
34. "Where There Is a Way, Is There a Will? The Effect of Future Choices on Self-Control" (with U. Khan), *Journal of Experimental Psychology: General*, 2007
35. "Preference Fluency in Choice," (with N. Novemsky, N. Schwarz, and I. Simonson), 2007, *Journal of Marketing Research*.
36. "The Shopping Momentum Effect," (with J. Huber and U. Khan), 2007, *Journal of Marketing Research*.
37. "Institutional Perspectives in Real Estate Investing," (with W. Goetzmann), 2006, *Journal of Portfolio Management*.
38. "Are Rheumatologists' Treatment Decisions Influenced by Patients Age?," (with L. Fraenkel and N. Rabidou)," 2006, *Rheumatology*.
39. "Sub-goals as Substitutes or Complements: The Role of Goal Accessibility," (with A. Fishbach and Y. Zhang), 2006, *Journal of Personality & Social Psychology*.
40. "Up Close and Personal: A Cross Sectional Study of the Disposition Effect" (with N. Zhu), *Management Science*, 2006.
41. "Licensing Effect in Consumer Choice," (with U. Khan), *Journal of Marketing Research*, 2006.
42. "Goals as excuses or guides: The liberating effect of perceived goal progress on choice," (with A. Fishbach), *Journal of Consumer Research*, 2005.
43. "Goal Fulfillment and Goal Targets in Sequential Choice," (with N. Novemsky), *Journal of Consumer Research*, 2005.
44. "Towards extending the Compromise Effect to Complex Buying Contexts," (with Anil Menon and Bryan Maach), *Journal of Marketing Research*, 2004.
45. "To Buy or Not to Buy: Response Mode Effects on Consumer Choice," (with S. Nowlis), *Journal of Marketing Research*, 2004.

46. "Hedging Customers," (with R. Glazer), *Harvard Business Review*, 2003.
47. "The Effect of Forced Choice on Choice," (with I. Simonson), *Journal of Marketing Research*, 2003.
48. "Coping with Ambivalence: The Effect of removing a "fence sitting" option on Consumer Attitude and Preference Judgments (with B. Kahn and S. Nowlis), *Journal of Consumer Research*, 2002.
49. "Consumer Psychology: In Search of Identity," (with Z. Carmon, A. Drolet, S. Nowlis, and I. Simonson), *Annual Review of Psychology*, 2001.
50. "An Empirical Analysis of the Determinants of Category Expenditure," (with W. Putsis), *Journal of Business Research*, 2001.
51. "Trying Hard or Hardly Trying: An Analysis of Context Effects in Choice," (with S. Nowlis and S. Sherman), *Journal of Consumer Psychology*, September 2000.
52. "Consumer Choice between Hedonic and Utilitarian Goods," (with K. Wertenbroch), *Journal of Marketing Research*, February 2000.
53. "Assessing the Competitive Interaction Between Private Labels and National Brands," (with R. Cotterill and W. Putsis), *Journal of Business*, January 2000.
54. "Comparison Effects on Preference Construction," (with S. Nowlis and S. Sherman), *Journal of Consumer Research*, December 1999.
55. "The Effect of Time Pressure on Consumer Choice Deferral," (with S. Nowlis), *Journal of Consumer Research*, March, 1999.
56. "Making complementary choices in consumption episodes: Highlighting Versus Balancing," (with I. Simonson), *Journal of Marketing Research*, February, 1999.
57. "The Many Faces of Competition," (with W. Putsis), *Marketing Letters*, July, 1998.
58. "Consumer Preference for a No-Choice Option," *Journal of Consumer Research*, September, 1997.
59. "Context and Task Effects on Choice Deferral," *Marketing Letters*, January, 1997.
60. "The Effect of Decision Strategy on the Decision to Defer Choice," *Journal of Behavioral Decision Making*, December, 1996.
61. "The Effect of Common and Unique features in Consumer Choice," (with S. J. Sherman), *Journal of Consumer Research*, December, 1996.

62. "Similarity in Context: Cognitive Representation and the Violation of Preference Invariance in Consumer Choice," (with R. Glazer), *Organizational Behavior and Human Decision Processes*, September, 1996.
63. "The Effect of the focus of comparison on consumer preferences," (with I. Simonson), *Journal of Marketing Research*, November, 1992.

Publications in Book Chapters / Managerial Summary

1. "How Google Optimized Office Snacks," (with Zoe Chance, Michelle Hatzis, and Michiel Bakker," *Harvard Business Review*, 2016.
2. "Nudging Individuals Toward Healthier Food Choices with the 4Ps Framework for Behavior Change", (with Chance, Zoë, Michelle Hatzis, and Kim Huskey. in *Behavioral Economics and Public Health*, ed. C. Roberto and I. Kawachi. 2015.
3. "The Power of Customer's Mindset," (with Kelly Goldsmith and Jing Xu), *Sloan Management Review*, 2010.
4. "Giving Consumers License to Enjoy Luxury," (with U. Khan and S. Schmidt), *Sloan Management Review*, 2010.
5. "Brand Permission: A Conceptual and Managerial Framework," (with Tom Meyvis), In *Handbook on Brand and Experience Management*, Bernd H.Schmitt and David L. Rogers (Eds.), Elgar Publishing, Northampton, MA, 2008.
6. "Dynamics of goal-based choice," (with A. Fishbach), In *Handbook of Consumer Psychology*, (eds. C. P. Haugtvedt, P.M. Herr & F. R. Kardes), Erlbaum Press, 2007.
7. "A Behavioral Decision Theoretic Perspective on Hedonic and Utilitarian Choice,"(with U. Khan and K. Wertenbroch) in *Inside Consumption: frontiers of Research on Consumer Motives, Goals, and Desires*, (eds. S. Ratneshwar and David Glen Mick), London: Routledge, 2005.
8. "Customer Relations Online," in *Wiley Next Generation of Business Thinkers*, (ed. Subir Chowdhury), 2004.
9. "Defining Customers' Needs and Values for Marketing Success," in *Inside the Minds: Textbook Marketing*, Aspatore Press, 2003.
10. "The Online Store," (with D. R. Wittink), in *Managing Customer Relationships* (eds. Martha Rogers and Don Peppers), Wiley, 2003.

11. "Choice Deferral," in *The Elgar Companion to Consumer Research and Economic Psychology* (eds. P. Earl and S. Kemp), 1999.

Select Working Papers / Papers Under Review

1. "Ironic Effects of Goal Activation on Choice," (with K. Goldsmith), under first review.
2. "The Effect of Goal Breadth on Consumer Preferences," (with E. Kim), under first review.
3. "Can Investors Multiply and Divide: Investors' response to Stock Splits," (with N. Zhu and Dan Ariely).
4. "Category Expenditure and Promotion: Can Private Labels Expand the Pie," (with W. Putsis), Working Paper.
5. "Mindset over Matter: The Interplay between Goals and Preferences," (with A. Pochepstova), Working Paper.

Conference Proceedings Publications

1. "Constructing preferences: The role of comparisons in consumer judgment and choice," (with S. Zhang), *Proceedings of the Association for Consumer Research*, University of Chicago Press (1999).
2. "Sequential Choices and Uncertain Preferences," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1997).
3. "Causes and Effects of Reference Effects in Choice," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1997).
4. "New Directions in Mental Accounting," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1995).
5. "Decision Difficulty and Uncertain Preferences: Implications for Consumer Choice," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1994).
6. "Behavioral Decision Research: Theory and Applications," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1993).
7. "To Choose Or Not To Choose: This is the Question," *Proceedings of the Association for Consumer Research*, University of Chicago Press (1992).

Invited and Conference Presentations

Invited Academic Presentations (* denotes multiple presentations)

Boston College
Carnegie-Mellon University
Chinese University, Hong Kong
*Columbia University**
*Cornell University**
*Duke University**
Harvard University
Hong Kong University of Science and Technology
*IIPM**
*INSEAD**
Indiana University
Korea University
*London Business School**
*MIT**
National University of Singapore
*New York University**
*Northwestern University**
Ohio State University
Pennsylvania State University
*Stanford University**
Texas A&M University
Tilburg University
Tulane University
University of Alberta
University of British Columbia (planned)
*University of California, Berkeley**
*University of California, Los Angeles**
University of California, San Diego
*University of Chicago**
University of Delaware
University of Colorado
University of Florida
University of Houston
*University of Illinois, Urbana-Champaign**
University of Miami
University of Maryland
University of Massachusetts, Amherst
*University of Michigan**
*University of North Carolina**
*University of Peking**
*University of Pennsylvania**

*University of Rotterdam**
University of Texas, Austin
University of Utah
*University of Toronto**
University of Vienna
*Washington University, St. Louis**

Conference Presentations (Over 150 presentations at conferences, consortiums, keynotes, symposiums, workshops, etc.) Recent presentations include:

Keynote Addresses to Practitioners, Various Events
Choice Symposium
CEO Roundtables, New York and New Haven
CMO Roundtables, Various Organizations
ACR
Informs
Judgment and Decision Making
Behavioral Decision Research in Management
Society of Consumer Psychology

Appendix B: Testimony in Past Four Years

1. Moab Industries, LLC v. Chrysler Group, LLC (Deposition and Trial)
2. In Re: Tropicana Orange Juice Marketing and Sales Practices Litigation (Deposition)
3. FTC v. Amazon.com, Inc. (Deposition)
4. Ericsson, et al. v. TCL Communication Technology Holdings, Ltd., et al. (Deposition)
5. Parallel Network Licensing v. International Business Machines Corporation (Deposition)
6. Select Comfort Corp. v. Tempur Sealy and Mattress Firm Holding Corp. (Deposition)
7. Exxon Mobil Corporation v. FX Networks LLC et al. (Deposition)
8. Playtex Products, LLC v. Munchkin, Inc. (Deposition)
9. Francisco Marty, et al. v. Anheuser-Busch Cos., LLC (Deposition)
10. Smartflash LLC, et al. v. Apple Inc., et al. (Deposition and Trial)
11. Suarez v. Anheuser-Busch Cos., LLC (Deposition)
12. SIMPLEAIR, INC., vs. Google et al. (Deposition and Trial)
13. *Johnathan and Trude Yarger* v. ING Bank, fsb d/b/a/ ING DIRECT (Deposition)
14. Laplant v. The Northwestern Mutual Life Insurance Company (Deposition)
15. MobileMedia Ideas LLC v. HTC Corporation and HTC America, Inc. (Deposition)
16. Johns v. Bayer Corporation and Bayer Healthcare LLC (Deposition)
17. FTC, et al. v. Russell T. Dalbey, et al. (Deposition)
18. Finjan Inc. v. McAfee, Inc., et al (Deposition)
19. Sexy Hair Concepts, LLC v. Conair Corporation (Deposition)
20. In Re: POM Wonderful LLC Marketing and Sales Practices Litigation (Deposition)
21. Paone v. Microsoft Corporation (Deposition)
22. USA v. H&R Block, Inc. (Deposition)
23. Mattel vs. MGA (Deposition)

24. Pandora Jewelers 1995 v. Pandora Jewelry, et al (Deposition)
25. Hansen Beverage Company v. Cytosport, Inc (Deposition)
26. Autodesk, Inc. v. Dassault Systemes SolidWorks Corporation (Deposition)

Appendix C: Materials Reviewed

American Association for Public Opinion Research, "AAPOR Guidance on Reporting Precision for Nonprobability Samples," 2016.

Blumberg, Stephen J., and Luke, Julian V. "Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, July–December 2015," National Center for Health Statistics, May 2016.

CAPTCHA, "CAPTCHA: Telling Humans and Computers Apart Automatically," <http://www.captcha.net>, visited on September 28, 2016.

Diamond, Shari Seidman, "Reference Guide on Survey Research," *Reference Manual on Scientific Evidence*, Third Edition, Federal Judicial Center, 2011.

Dolan, Robert J. and Gourville, John T., "Principles of Pricing," Harvard Business School Case 9-506-021, April 3, 2009.

Federal Judicial Center, Manual for Complex Litigation, Fourth Edition, Section 11.493.

Gelb G. and Gelb, B., "Internet Surveys for Trademark Litigation: Ready or Not, Here They Come," *The Trademark Reporter*, Vol. 97, 2007.

Isaacson, B., et al., "Why Online Surveys Can Be A Smart Choice in Intellectual Property Litigation," *IPL Newsletter* (ABA Section of Intellectual Property Law) Vol. 26, No. 3, 2008.

Odyssey, "Can Improvements Be Made In The Rate Of First-Time Trialers Conversion To Self-Pay," presented to Sirius XM, September 16, 2015.

Pandora, "Pandora 2016 Annual Report for the Fiscal Year Ended December 31, 2015," accessed October 11, 2016, <http://investor.pandora.com/phoenix.zhtml?c=227956&p=proxy>.

Poret, H., "A Comparative Empirical Analysis of Online versus Mail and Phone Methodologies for Trademark Surveys," *The Trademark Reporter*, Vol. 100, 2010.

Seitz, Patrick, "Streaming Music Leader Spotify Challenged by Apple, Amazon, Pandora," *Investor's Business Daily*, June 29, 2016, accessed October 11, 2016, <http://www.investors.com/news/technology/click/streaming-music-leader-spotify-challenged-by-apple-amazon-pandora/?ven=YahooCP&src=AURLLED&ven=yahoo>.

Simson, A., "Online Interviewing for Use in Lanham Act Litigation," *Intellectual Property Strategist*, Vol. 14, 2007.

Sirius XM "2015 Customer Experience Survey Presentation Deck," (SXM_DIR_00023611-SXM_DIR_00023667, at 3614 and 3615).

Sirius XM "2015 Customer Experience Survey Report," (SXM_DIR_00023890-SXM_DIR_00024062)

Sirius XM, "2015 Customer Experience Survey Report," (SXM_DIR_00023726-SXM_DIR_00023889)

Sirius XM, "2015 Results & 2016 Budget," January 26, 2015 (SXM_DIR_00021472-SXM_DIR_00021524).

Sirius XM, "Special Offers for Returning Listeners," accessed October 11, 2016, available at <https://www.siriusxm.com/turnitbackon>.

Sirius XM Holdings, Inc., Form 10-K filed with the Securities and Exchange Commission for the Period Ending December 31, 2015.

Survey Sampling International, LLC, <https://www.surveysampling.com/knowledge-center/panels-respondent-experience/>, Accessed September 27, 2016.

U.S. Census Bureau, "Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015," Population Division, June 2016.

United States Internet Users <http://www.internetlivestats.com/internet-users/us/>, Accessed October 14, 2016.

Appendix D: Survey Questionnaire
#16075 MUSIC SERVICE STUDY

SPECS

CELL 1: **Sirius XM** paid subscribers (max N=500)

CELL 2: **Apple Music** : Interactive music streaming service paid subscribers

Max N=500

CELL 3: **Spotify Premium** : Interactive music streaming service paid subscribers

CELL 4: **Pandora One**: Non-interactive music streaming service paid subscribers (max N=500)

CELL 5: **Free Pandora**:

Max N=500

CELL 6: **Free Spotify**

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 arrow below. **This survey should take between 5 and 7 minutes to complete.**

CAPTCHA SEQUENCE

{PROGRAMMER: PIPE IN ONE RANDOMLY SELECTED WORD FROM LIST. CONFIRM THAT WHAT THE RESPONDENT TYPES IN MATCHES THE PIPED-IN WORD FOR SPELLING AND CASE.}

(QUESTION 15)

So that we can confirm that you are actually a person, please type the following word into the text box below. Please enter it exactly as shown, including upper and lower case letters.

TEXT BOX: _____

{PROGRAMMER: IF THE WORD DOES NOT MATCH ON THE FIRST TRY, ASK Q.20.}

{PIPE IN A DIFFERENT RANDOMLY-SELECTED WORD. CONFIRM THAT WHAT THE RESPONDENT TYPES IN MATCHES THE PIPED-IN WORD FOR SPELLING AND CASE.}

(QUESTION 20)

Please type the following word in the text box below. Please enter it exactly as shown, including upper and lower case letters.

TEXT BOX: _____

{PROGRAMMER: IF THE WORD DOES NOT MATCH, TERMINATE.}

SCREENING SECTION

(QUESTION 25)

In what state do you live?

Please select one answer.

{INSERT DROP DOWN LIST OF 50 STATES}

{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 ***{SKIP TO Q.50}***

- 2: Laptop computer **{SKIP TO Q.50}**
- 3: Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom) **{SKIP TO Q.50}**
- 4: Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One) **{ASK Q.45}**
- 5: Other mobile or electronic device **{ASK Q.45}**

***{IF "SMARTPHONE" (PUNCH 4) OR OTHER MOBILE OR ELECTRONIC DEVICE" (PUNCH 5) SELECTED IN Q.40, PIPE:}
(QUESTION 45)***

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 1-6; 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, SKIP TO Q54}

***{PROGRAMMER: IF CHOICE 3 IS ONLY CHOICE 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 **[TERMINATE]**
- 5: Don't know/unsure **[TERMINATE]**

{PROGRAMMER: ASK Q52 IF OPTION 1 SELECTED IN Q51}
{PROGRAMMER: AFTER ASKING Q52, SKIP TO Q52.1 IF ONLY OPTION 1 SELECTED IN Q52}
(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 package from DISH network
[TERMINATE FROM CELL 1 IF ONLY OPTION CHOSEN IN Q52 AND OPTION #2 NOT CHOSEN IN Q51]
- 3: A free Trial Period subscription to Sirius XM satellite radio (e.g., available with the purchase of some new cars)—**Cell 7 [IF ONLY OPTION CHOSEN, SKIP TO Q54]**
- 4: Don't know/unsure **[TERMINATE FROM CELLS 1 AND 7]**

{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 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}
{TERMINATE IF OPTION 2 ONLY SELECTED IN Q51 AND OPTIONS 6-7
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 CELLS 3 AND 6
AND DO NOT ASK Q55}
{IF OPTIONS 4 AND 5 BOTH CHOSEN, TERMINATE FROM CELLS 4 AND 5
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—Cell 6
- 4: Paid subscription to Pandora One—Cell 4
- 5: Free version of Pandora—Cell 5
- 6: Other (Please specify—you will not be constrained by the size of the box)
_____ [TERMINATE FROM CELLS 2-6]
- 7: Don't know/unsure [TERMINATE FROM CELLS 2-6]

{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 2-4]
- 4: I was not involved in the decision at all [TERMINATE FROM CELLS 2-4]
- 5: Don't know/unsure [TERMINATE FROM CELLS 2-4]

(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.

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}

<u>QUALIFICATIONS FOR EACH CELL:</u>
CELL 1: Sirius XM paid subscribers [PUNCH 1 OR 2 IN Q55 FOR OPTION 1 IN Q52.2]
CELL 2: Apple Music : <u>Interactive</u> music streaming service paid subscribers [PUNCH 1 OR 2 IN Q55 FOR OPTION 1 IN Q54]
CELL 3: Spotify Premium : <u>Interactive</u> music streaming service paid subscribers [PUNCH 1 OR 2 IN Q55 FOR OPTION 2 IN Q54]
CELL 4: Pandora One : <u>Non-interactive</u> music streaming service paid subscribers [PUNCH 1 OR 2 IN Q55 FOR OPTION 4 IN Q54]
CELL 5: Free Pandora : [OPTION 5 SELECTED IN Q54]
CELL 6: Free Spotify [OPTION 3 SELECTED IN Q54]
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 7 CELLS, TERMINATE.

Music Survey

CELL 1: SXM subscribers--ASK Q200 THROUGH Q220

(QUESTION 200)

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.**

(QUESTION 201)

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 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 Q220)**
- 2: Cancel your subscription to Sirius XM Satellite Radio→ **(ASK Q210) {SET SWITCH PRICE=PRICE 7}**
- 3: Don't know/unsure →**(SKIP TO Q220)**

{PROGRAMMER: FIRST ROTATE, THEN GROUP OPTIONS 1 AND 2. THEN ROTATE GROUPED OPTIONS 1 AND 2, AND OPTION 3 IN THE SAME

SEQUENCE AS OTHER “YES – NO” QUESTIONS IN THE SURVEY.**ANCHOR OPTION 4}**

{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 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 →**(SKIP TO Q220)**
- 2: Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month →**(SKIP TO Q220)**
- 3: No, I would not subscribe to a paid music service in place of **Sirius XM**→**(SKIP TO Q210.1)**:
- 4: Don't know/unsure →**(SKIP TO Q220)**

{PROGRAMMER: ROTATE OPTIONS 1 AND 2. ANCHOR OPTIONS 4 AND 5. KEEP OPTIONS 4 AND 5 EXCLUSIVE}

(QUESTION 210.1)

You mentioned that you would not subscribe 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.**

- 1: I would purchase CDs and/or music downloads→**(SKIP TO Q220 IF CHECKED WITHOUT 2)**
- 2: I would listen to free music →**(ASK Q210.2)**
- 3: Other (Please specify—you will not be constrained by the size of the box)

(SKIP TO Q220 IF CHECKED WITHOUT 2)

- 4: None of the Above →**(SKIP TO Q220)**
- 5: Don't know/unsure →**(SKIP TO Q220)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-8. ANCHOR 9 AND 10. KEEP OPTION 10 EXCLUSIVE}

(QUESTION 210.2)

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.**

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 (Please specify—you will not be constrained by the size of the box)
-
10. Don't know/unsure

(QUESTION 220)

Those are all the questions I have. Thank you for your time.

Cells 2 AND 3: ON-DEMAND (INTERACTIVE) SUBSCRIBERS (SPOTIFY PREMIUM OR APPLE MUSIC)--ASK Q300 THROUGH Q320

(QUESTION 300)

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.**

(QUESTION 301)

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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that all other On-Demand music streaming service subscriptions were also [INSERT AMOUNT

CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q303] per month, 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 Q310) {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, and you knew that **all** other **On-Demand** music streaming service subscriptions were also **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q303]** per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **[INSERT SERVICE] →(SKIP TO Q320)**
- 2: Cancel your subscription to **[INSERT SERVICE] → (SKIP TO Q310) {SET SWITCH PRICE=PRICE 7}**
- 3: Don't know/unsure **→(SKIP TO Q320)**

{PROGRAMMER: FIRST ROTATE, THEN GROUP OPTIONS 1 AND 2. THEN ROTATE GROUPED OPTIONS 1 AND 2, AND OPTION 3 IN THE SAME SEQUENCE AS OTHER "YES – NO" QUESTIONS IN THE SURVEY. ANCHOR OPTION 4}

{INSERT link to definitions provided in Q300. It should say, "Click here if you want to review the music services definitions."

(QUESTION 310)

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.**

- 1: Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month **→(SKIP TO Q320)**
- 2: Yes, I would subscribe to **Sirius XM** satellite radio at **\$15.99** per month **→(SKIP TO Q320)**
- 3: No, I would not subscribe to a paid music service in place of **[INSERT SERVICE]→(SKIP TO Q310.1):**
- 4: Don't know/unsure **→(SKIP TO Q320)**

{PROGRAMMER: ROTATE OPTIONS 1 AND 2. ANCHOR OPTIONS 4 AND 5. KEEP OPTIONS 4 AND 5 EXCLUSIVE}

(QUESTION 310.1)

You mentioned that you would not subscribe 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.**

- 1: I would purchase CDs and/or music downloads → **(SKIP TO Q320 IF CHECKED WITHOUT 2)**
- 2: I would listen to free music → **(ASK Q310.2)**
- 3: Other (Please specify—you will not be constrained by the size of the box)

(SKIP TO Q320 IF CHECKED WITHOUT 2)

- 4: None of the Above → **(SKIP TO Q320)**
- 5: Don't know/unsure → **(SKIP TO Q320)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-8. ANCHOR 9 AND 10. KEEP OPTION 10 EXCLUSIVE}

(QUESTION 310.2)

You said that you would listen to free music. How would you listen to free music instead of **(INSERT SERVICE FROM Q302)**? **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 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 (Please specify—you will not be constrained by the size of the box)

-
10. Don't know/unsure

(QUESTION 320)

Those are all the questions I have. Thank you for your time.

**Cell 4: NON-INTERACTIVE SUBSCRIBERS (PANDORA ONE)--ASK Q400
THROUGH Q420**

(QUESTION 400)

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.**

(QUESTION 401)

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 Q402)**
- 2: No, I do not understand the descriptions of all three services → **(TERMINATE)**
- 3: Don't know/unsure → **(TERMINATE)**

(QUESTION 402)

The next few questions will be about your **Pandora One** streaming service subscription. You will be presented with several different monthly prices for a subscription to **Pandora One**. **This amount may be higher or lower than the amount you currently pay for your subscription to Pandora One.**

SERVICE	PRICE	AMOUNT
Pandora One	1	\$3.49
	2	\$3.99
	3	\$4.49
	4	\$4.99
	5	\$5.49
	6	\$5.99
	7	\$6.49

{PROGRAMMER: RANDOMIZE ANSWER CHOICES 1 AND 2. ANCHOR OPTION 3. KEEP THIS ORDER FOR ALL "CONTINUE/CANCEL" QUESTIONS}

(QUESTION 403)

If right now you were to be charged [INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q403] per month for the same Pandora One subscription you currently have, and you knew that all other Not-On-Demand music streaming services subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 1 FROM CHART BEFORE Q403] per month, would you...? Please select one answer.

- 1: Continue to subscribe to Pandora One →(ASK Q403.1)
- 2: Cancel your subscription to Pandora One → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 1}
- 3: Don't know/unsure →(ASK Q403.1)

(QUESTION 403.1)

If right now you were to be charged [INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q403] per month for the same Pandora One subscription you currently have, and you knew that all other Not-On-Demand music streaming services subscriptions were also [INSERT AMOUNT CORRESPONDING TO PRICE 2 FROM CHART BEFORE Q403] per month, would you...? Please select one answer.

- 1: Continue to subscribe to Pandora One →(ASK Q403.2)
- 2: Cancel your subscription to Pandora One → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 2}
- 3: Don't know/unsure →(ASK Q403.2)

(QUESTION 403.2)

If right now you were to be charged [INSERT AMOUNT CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q403] per month for the same Pandora One subscription you currently have, and you knew that all other Not-On-Demand music streaming services subscriptions were also [INSERT AMOUNT

CORRESPONDING TO PRICE 3 FROM CHART BEFORE Q403] per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **Pandora One** →(ASK Q403.3)
- 2: Cancel your subscription to **Pandora One** → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 3}
- 3: Don't know/unsure →(ASK Q403.3)

(QUESTION 403.3)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q403]** per month for the same **Pandora One** subscription you currently have, and you knew that all other **Not-On-Demand** music streaming services subscriptions were also **[INSERT AMOUNT CORRESPONDING TO PRICE 4 FROM CHART BEFORE Q403]** per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **Pandora One** →(ASK Q403.4)
- 2: Cancel your subscription to **Pandora One** → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 4}
- 3: Don't know/unsure →(ASK Q403.4)

(QUESTION 403.4)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q403]** per month for the same **Pandora One** subscription you currently have, and you knew that all other **Not-On-Demand** music streaming services subscriptions were also **[INSERT AMOUNT CORRESPONDING TO PRICE 5 FROM CHART BEFORE Q403]** per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **Pandora One** →(ASK Q403.5)
- 2: Cancel your subscription to **Pandora One** → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 5}
- 3: Don't know/unsure →(ASK Q403.5)

(QUESTION 403.5)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q403]** per month for the same **Pandora One** subscription you currently have, and you knew that all other **Not-On-Demand** music streaming services subscriptions were also **[INSERT AMOUNT CORRESPONDING TO PRICE 6 FROM CHART BEFORE Q403]** per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **Pandora One** →(ASK Q403.6)
- 2: Cancel your subscription to **Pandora One** → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 6}
- 3: Don't know/unsure →(ASK Q403.6)

(QUESTION 403.6)

If right now you were to be charged **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q403]** per month for the same **Pandora One** subscription you currently have, and you knew that all other **Not-On-Demand** music streaming services subscriptions were also **[INSERT AMOUNT CORRESPONDING TO PRICE 7 FROM CHART BEFORE Q403]** per month, would you...? **Please select one answer.**

- 1: Continue to subscribe to **Pandora One** →(SKIP TO Q420)
- 2: Cancel your subscription to **Pandora One** → (SKIP TO Q410) {SET SWITCH PRICE=PRICE 7}
- 3: Don't know/unsure →(SKIP TO Q420)

{PROGRAMMER: FIRST ROTATE, THEN GROUP OPTIONS 1 AND 2. THEN ROTATE GROUPED OPTIONS 1 AND 2, AND OPTION 3 IN THE SAME SEQUENCE AS OTHER "YES – NO" QUESTIONS IN THE SURVEY.

ANCHOR OPTION 4}

{INSERT link to definitions provided in Q400. It should say, "Click here if you want to review the music services definitions."

(QUESTION 410)

You mentioned that you would cancel your subscription to **Pandora One** if you were charged **[INSERT SWITCH PRICE]** per month, and you knew that all other **Not-On-Demand** music streaming services 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 **Pandora One**? 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 →(SKIP TO Q420)
- 2: Yes, I would subscribe to **Sirius XM** satellite radio at **\$15.99** per month →(SKIP TO Q420)
- 3: No, I would not subscribe to a paid music service in place of **Pandora One**→(SKIP TO Q410.1):
- 4: Don't know/unsure →(SKIP TO Q420)

{PROGRAMMER: ROTATE OPTIONS 1 AND 2. ANCHOR OPTIONS 4 AND 5. KEEP OPTIONS 4 AND 5 EXCLUSIVE}

(QUESTION 410.1)

You mentioned that you would not subscribe to a paid music service in place of **Pandora One**. What else, if anything, would you do instead of paying for a subscription to **Pandora One**? **Please select all that apply.**

1: I would purchase CDs and/or music downloads → **(SKIP TO 420 IF CHECKED WITHOUT 2)**

2: I would listen to free music → **(ASK Q410.2)**

3: Other (Please specify—you will not be constrained by the size of the box)

(SKIP TO Q420 IF CHECKED WITHOUT 2)

4: None of the Above → **(SKIP TO Q420)**

5: Don't know/unsure → **(SKIP TO Q420)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-8. ANCHOR 9 AND 10. KEEP OPTION 10 EXCLUSIVE}

(QUESTION 410.2)

You said that you would listen to free music. How would you listen to free music instead of **Pandora One**? **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 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 (Please specify—you will not be constrained by the size of the box) _____
10. Don't know/unsure

(QUESTION 420)

Those are all the questions I have. Thank you for your time.

**CELLS 5 AND 6: FREE AD-SUPPORTED MUSIC STREAMING SERVICE
USERS (PANDORA OR SPOTIFY--ASK Q600 THROUGH Q620)**

(QUESTION 600)

The next few questions will be about your free [INSERT SERVICE] streaming service subscription.

(QUESTION 600.1)

You indicated that you currently use the free version of [INSERT SERVICE] to listen to music. This free version is ad-supported and limits your ability to skip songs.

How often, on average, do you use the free version of [INSERT SERVICE] to listen to music? **Please select one answer.**

- 1: less than an hour a week [TERMINATE]
- 2: 1-5 hours per week
- 3: More than 5 hours per week
- 4: Don't know/unsure

SERVICE	Monthly price with 10% discount	Monthly price with 20% discount	Monthly price with 30% discount	Paid version features
Pandora	\$4.49 per month	\$3.99 per month	\$3.49 per month	ad-free, with more skips, and with fewer timeouts.
Spotify	\$8.99 per month	\$7.99 per month	\$6.99 per month	ad-free, with unlimited skips, offline, with high quality audio, and to play any track.

(QUESTION 603)

The next few questions will be about what interest, if any, you may have in purchasing a paid subscription to [INSERT SERVICE]. A paid subscription to [INSERT SERVICE] would allow you to listen to music [INSERT "Paid Version Features" FROM CHART BEFORE Q603.1]. You will be presented with several different monthly prices for a paid subscription to [INSERT SERVICE].

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}

(QUESTION 603.1)

If right now you were offered a paid subscription to [INSERT SERVICE] at [INSERT "Monthly price with 10% discount" FROM CHART BEFORE Q603], would you or would you not subscribe to the service? **Please select one answer.**

- 1: Yes, I would subscribe to the paid service → (SKIP TO Q620)
- 2: No, I would continue using the free service only → (ASK Q603.2)

3: Don't know/unsure →(ASK Q603.2)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}

(QUESTION 603.2)

If right now you were offered a paid subscription to [INSERT SERVICE] at [INSERT "Monthly price with 20% discount" FROM CHART BEFORE Q603], would you or would you not subscribe to the service? Please select one answer.

1: Yes, I would subscribe to the paid service →(SKIP TO Q620)

2: No, I would continue using the free service only → (ASK Q603.3)

3: Don't know/unsure →(ASK Q603.3)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}

(QUESTION 603.3)

If right now you were offered a paid subscription to [INSERT SERVICE] at [INSERT "Monthly price with 30% discount" FROM CHART BEFORE Q603], would you or would you not subscribe to the service? Please select one answer.

1: Yes, I would subscribe to the paid service →(SKIP TO Q620)

2: No, I would continue using the free service only → (SKIP TO Q620)

3: Don't know/unsure →(SKIP TO Q620)

(QUESTION 620)

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 500.2)

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.**

(QUESTION 501)

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: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "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)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}

(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)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}
(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)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}
(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)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR "YES/NO" QUESTIONS}
(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)

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR “YES/NO” QUESTIONS}
(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)**

{PROGRAMMER: ROTATE ORDER OF OPTIONS 1 AND 2, BASED ON ORDER OF PRIOR “YES/NO” QUESTIONS}
(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 → **(ASK Q520)**
- 2: No, I would not subscribe to the service → **(SKIP TO Q510) {SET SWITCH PRICE=PRICE 7}**
- 3: Don't know/unsure → **(SKIP TO Q520)**

{PROGRAMMER: ROTATE CHOICES 1 AND 2, AND THEN ROTATE 1 AND 2 SEQUENCE WITH 3. ANCHOR 4}

{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, 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.**

- 1: Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **\$9.99** per month → **(SKIP TO Q520)**
- 2: Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month → **(SKIP TO Q520)**
- 3: No, I would not subscribe to a paid music service in place of **Sirius XM** when my trial period ends → **(SKIP TO Q510.1)**
- 4: Don't know/unsure → **(SKIP TO Q520)**

{PROGRAMMER: ROTATE OPTIONS 1 AND 2. ANCHOR OPTIONS 4 AND 5. KEEP OPTIONS 4 AND 5 EXCLUSIVE}

(QUESTION 510.1)

You mentioned that you would not subscribe 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.**

- 1: I would purchase CDs and/or music downloads → **(SKIP TO Q520 IF CHECKED WITHOUT 2)**
- 2: I would listen to free music → **(ASK Q510.2)**
- 3: Other (Please specify—you will not be constrained by the size of the box)

(SKIP TO Q520 IF CHECKED WITHOUT 2)

- 4: None of the Above → **(SKIP TO Q520)**
- 5: Don't know/unsure → **(SKIP TO Q520)**

{PROGRAMMER: RANDOMIZE OPTIONS 1-8. ANCHOR 9 AND 10. KEEP OPTION 10 EXCLUSIVE}

(QUESTION 510.2)

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.**

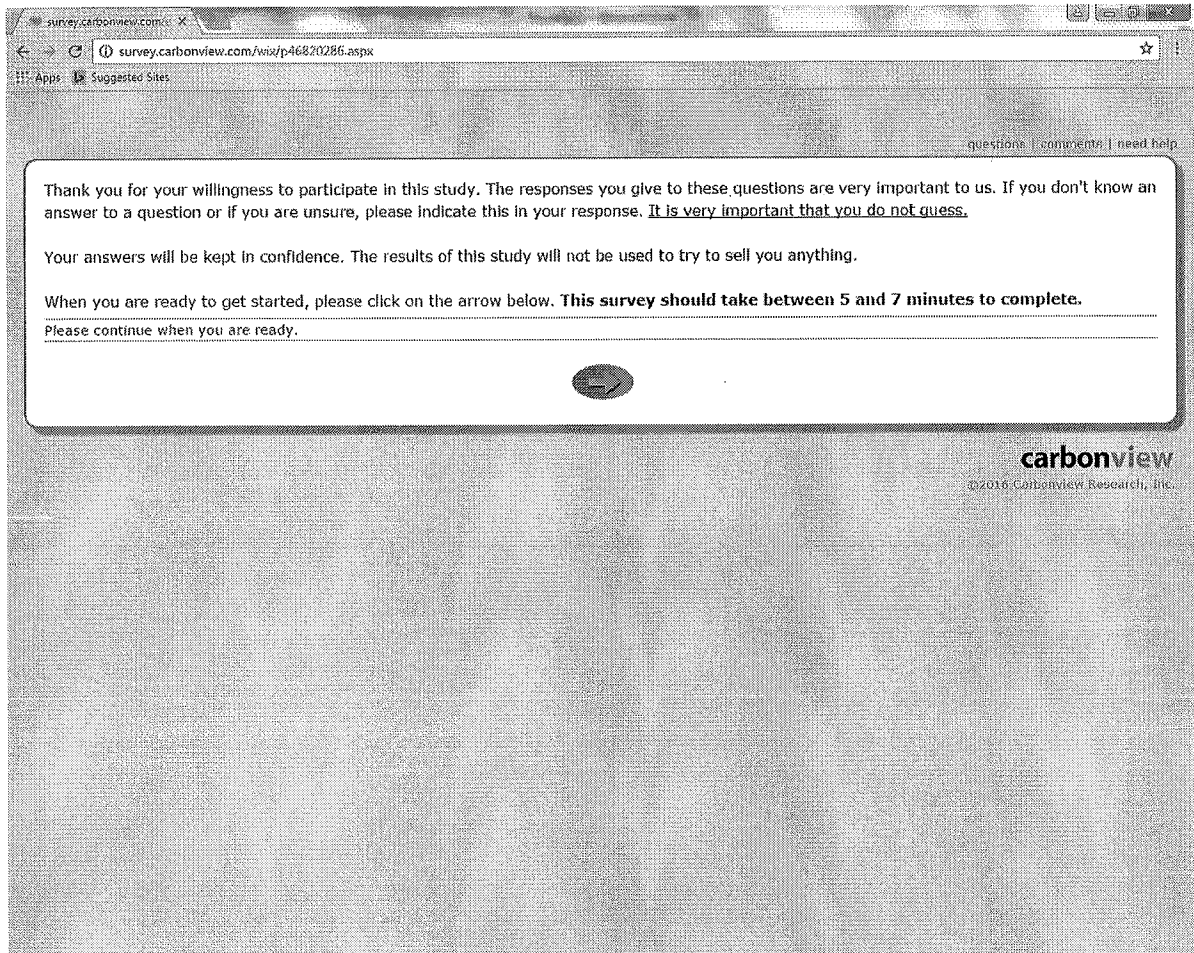
1. Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
 2. Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
 3. Free On-Demand music video sites with ads (e.g., YouTube)
 4. Music channels included in an existing cable or satellite 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 (Please specify—you will not be constrained by the size of the box)
-
10. Don't know/unsure

(QUESTION 520)

Those are all the questions I have. Thank you for your time.

Appendix E: Survey Screenshots

The following screenshots show the sequence of questions a respondent who is asked about a paid subscription to Sirius XM Sirius Select and who would continue to subscribe at all price points between \$11.49 and \$20.49.



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questions | comments | need help

o N N I u B R I

So that we can confirm that you are actually a person, please type the following word into the text box below. Please enter it exactly as shown, including upper and lower case letters.

Please type the code above.

→

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In which state do you live?

Please select one answer.

Please select your answer

Please select your answer

Alabama

Alaska

Arizona

Arkansas

California

Colorado

Connecticut

Delaware

District of Columbia

Florida

Georgia

Hawaii

Idaho

Illinois

Indiana

Iowa

Kansas

Kentucky

Louisiana

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questions | comments | need help

Are you...

Please select one answer.

☐ Male

☐ Female

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Which of the following includes your age?

Please select one answer.

☐ Under 18


☐ 18-34

☐ 35-44

☐ 45-54

☐ 55+

☐ Prefer not to answer



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What type of electronic device are you using to complete this survey?

Please select one answer.

- ☐ Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom)
- ☐ Desktop computer
- ☐ Laptop computer
- ☐ Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One)
- ☐ Other mobile or electronic device

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Do you or does anyone in your household work in any of the following areas?

Please select all that apply.

- ☐ For a company that creates music such as a Recording Studio, Record Company, or a Music Publisher?
- ☐ For a Streaming Music company, such as Pandora or Spotify?
- ☐ For a Market Research Company or Public Relations Agency?
- ☐ For Apple, Google or Amazon?
- ☐ For a Satellite Radio company?
- ☐ For an Internet Service Provider?
- ☐ None of the above

→

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Apps | xtop v1.0 - Extended | Driving Directions f | xtop v1.0 - Extended | New Tab | Wildwood Rentals | Weather, forecasts ad | Design My Own Eng | 18K White Gold Hud

questions | comments | need help

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.

- ☐ Music Streaming Service (e.g., Apple Music, Spotify or Pandora)
- ☐ Satellite Radio (Sirius XM)
- ☐ Broadband Internet (e.g., cable, fiber optic or DSL)
- ☐ None of the above
- ☐ Don't know/unsure

→

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Questions | Comments | Need help?

Which of the following Sirius XM satellite radio subscriptions do you currently have?

Please select all that apply.

- ☐ A paid subscription to Sirius XM satellite radio
- ☐ A subscription to Sirius XM as part of package from DISH network
- ☐ A free trial subscription to Sirius XM satellite radio (e.g., available with the purchase of some new cars)
- ☐ Don't know/unsure

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questions | comments | need help

If you have more than one paid subscription to Sirius XM satellite radio, please answer the following questions based on the one you have the longest.

Please continue when you are ready.

→

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Apps Suggested Sites

questions | comments | need help

Which of the following is your Sirius XM Satellite Radio subscription package?

Select MONTHLY **15⁹⁹**

See OFFER DETAILS below

140+ channels

SELECT Premium Channels

Internet LISTENING

View Select Channel Lineup

140+ Channels

Commercial-Free Music Channels

Howard Stern

Exclusive Artist-Dedicated Music Channels

24/7 Comedy Channels

Every NFL Game

Every NASCAR® Race

All Access MONTHLY **19⁹⁹**

See OFFER DETAILS below

150+ channels

ALL Premium Channels

Internet LISTENING

View All Access Channel Lineup

150+ Channels

Listen Online + On the App

Commercial-Free Music Channels

Howard Stern

Exclusive Artist-Dedicated Music Channels

24/7 Comedy Channels

Every NFL Game

Every NASCAR® Race

MLB®, NBA, and NHL® Games

PGA TOUR® Coverage

Mostly Music MONTHLY **10⁹⁹**

See OFFER DETAILS below

80+ channels

Premium channels

Internet LISTENING ADD-ON

View Mostly Music Channel Lineup

80+ Channels

Listen Online + On the App (add \$4/mo)

Commercial-Free Music Channels

Please select one answer.

☐ Select
☐ All Access
☐ Mostly Music
☐ Other (Please specify-you will not be constrained by the size of the box)

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questions | comments | need help

Who made the decision to get this paid subscription to Sirius XM satellite radio?

Please select one answer.

- ☐ I made the decision myself
- ☐ I played a major role in the decision
- ☐ I played a minor role in the decision
- ☐ I was not involved in the decision at all
- ☐ Don't know/unsure

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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.

☐ I understand and agree to the above instructions

☐ I do not understand or do not agree to the above instructions



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question | comments | need help

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

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App: xtop v1.0 - Extended Driving Directions for xtop v1.0 - Extended New Tab Wildwood Rentals Weather, forecasts Design My Own Eng 18K White Gold Hud

questions | comments | need help

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 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.**

Please continue when you are ready.



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Questions | Comments | Need help?


If right now you were to be charged **\$11.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure



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If right now you were to be charged **\$12.99** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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question: 1 comments | need help

If right now you were to be charged **\$14.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

→

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question | comments | need help

If right now you were to be charged **\$15.99** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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Questions | Comments | Need help?

If right now you were to be charged \$17.49 per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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Questions | Comments | Need help?

If right now you were to be charged **\$18.99** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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If right now you were to be charged **\$20.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

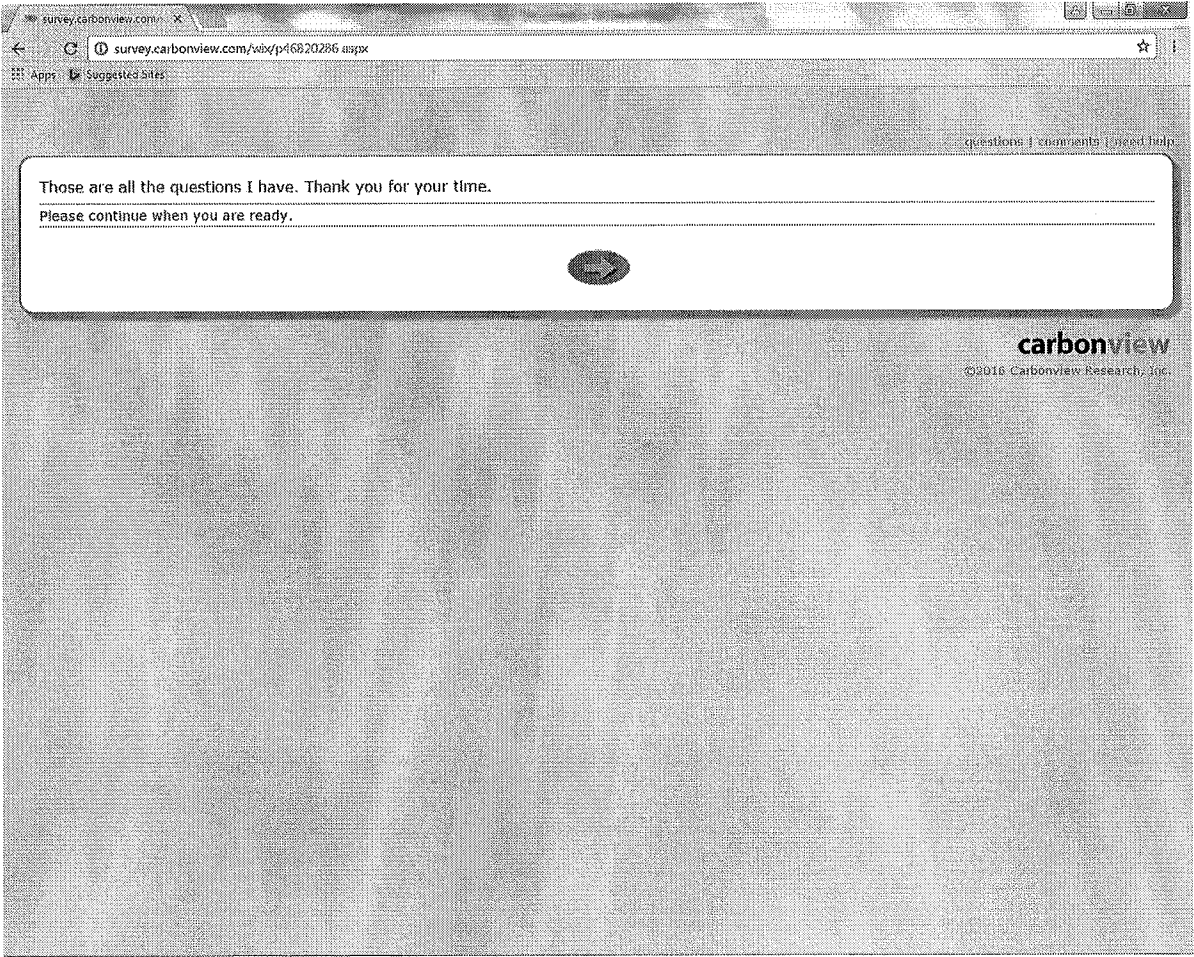
☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

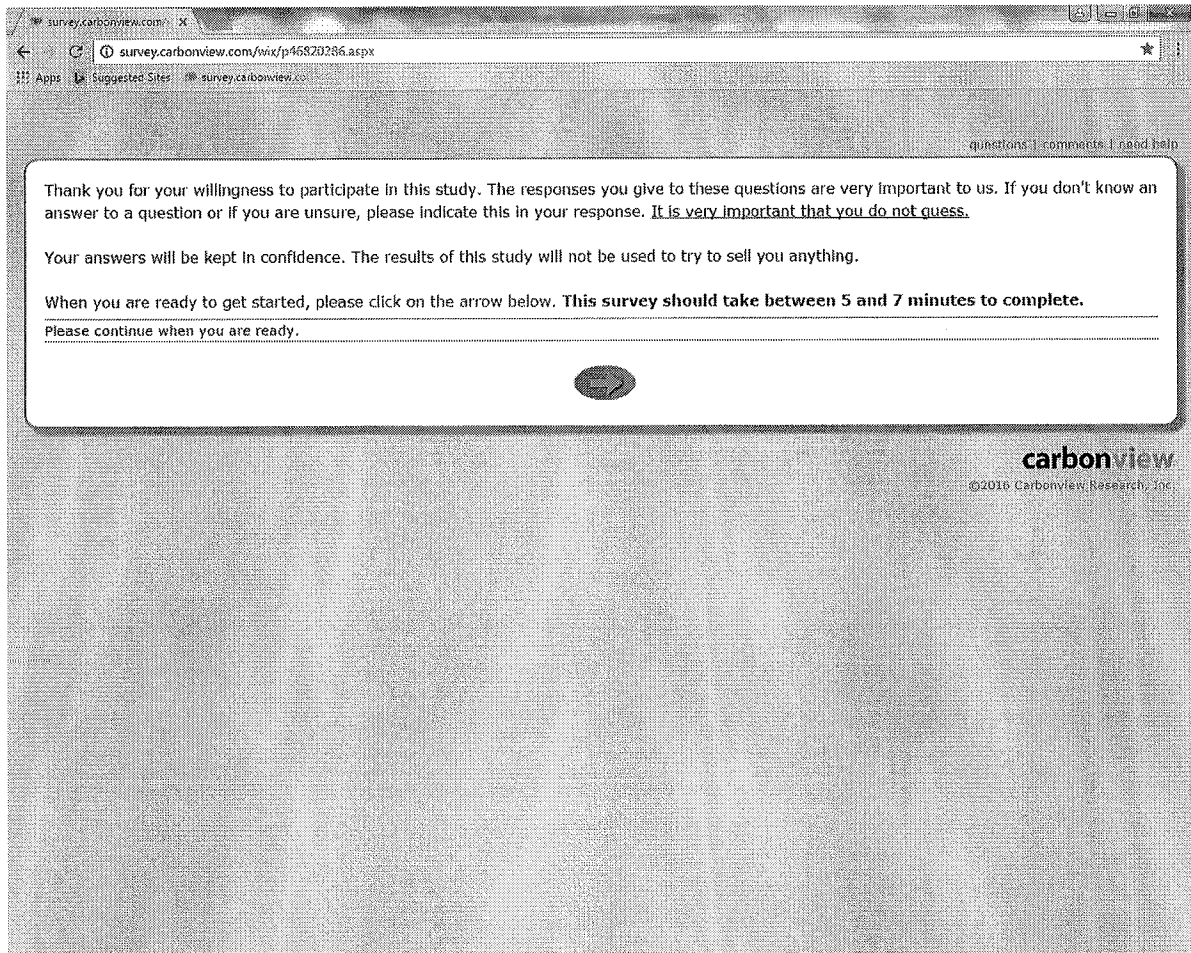
☐ Don't know/unsure

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The following screenshots show the sequence of questions a respondent who is asked about a paid subscription to Sirius XM Sirius Select and who would choose to cancel at \$15.99.



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Questions | Comments | Need help?

8 I 8 c 2 o k v

So that we can confirm that you are actually a person, please type the following word into the text box below. Please enter it exactly as shown, including upper and lower case letters.

Please type the code above.

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In which state do you live?

Please select one answer.

Please select your answer ▼

Please select your answer

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana

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Are you...

Please select one answer.

☐ Male

☐ Female

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questions | comments | need help

Which of the following includes your age?

Please select one answer.

☐ Under 18

☐ 18-34

☐ 35-44

☐ 45-54

☐ 55+

☐ Prefer not to answer

→

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What type of electronic device are you using to complete this survey?

Please select one answer.

- ☐ Laptop computer
- ☐ Desktop computer
- ☐ Tablet computer (e.g., Apple iPad, Kindle Fire, Samsung Galaxy Tab, Motorola Xoom)
- ☐ Smartphone (e.g., Apple iPhone, Samsung Galaxy S4, HTC One)
- ☐ Other mobile or electronic device

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question | comments | need help

Do you or does anyone in your household work in any of the following areas?

Please select all that apply.

- ☐ For Apple, Google or Amazon?
- ☐ For an Internet Service Provider?
- ☐ For a company that creates music such as a Recording Studio, Record Company, or a Music Publisher?
- ☐ For a Satellite Radio company?
- ☐ For a Market Research Company or Public Relations Agency?
- ☐ For a Streaming Music company, such as Pandora or Spotify?
- ☐ None of the above

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Questions | Comments | Need help?

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.

- ☐ Broadband Internet (e.g., cable, fiber optic or DSL)
- ☐ Satellite Radio (Sirius XM)
- ☐ Music Streaming Service (e.g., Apple Music, Spotify or Pandora)
- ☐ None of the above
- ☐ Don't know/unsure

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Which of the following Sirius XM satellite radio subscriptions do you currently have?

Please select all that apply.

- ☐ A paid subscription to Sirius XM satellite radio
- ☐ A subscription to Sirius XM as part of package from DISH network
- ☐ A free trial subscription to Sirius XM satellite radio (e.g., available with the purchase of some new cars)
- ☐ Don't know/unsure

→

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If you have more than one paid subscription to Sirius XM satellite radio, please answer the following questions based on the one you have the longest.

Please continue when you are ready.



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question comments I need help

Which of the following is your Sirius XM Satellite Radio subscription package?

Select	MONTHLY 15 ⁹⁹	All Access	MONTHLY 19 ⁹⁹	Mostly Music	MONTHLY 10 ⁹⁹
See OFFER DETAILS below		See OFFER DETAILS below		See OFFER DETAILS below	
  		  		  	
View Select Channel Lineup		View All Access Channel Lineup		View Mostly Music Channel Lineup	
140+ Channels Commercial-Free Music Channels Howard Stern Exclusive Artist-Dedicated Music Channels 24/7 Comedy Channels Every NFL Game Every NASCAR® Race		150+ Channels Listen Online + On the App Commercial-Free Music Channels Howard Stern Exclusive Artist-Dedicated Music Channels 24/7 Comedy Channels Every NFL Game Every NASCAR® Race MLB®, NBA, and NHL® Games PGA TOUR® Coverage		80+ Channels Listen Online + On the App (add \$4/mo) Commercial-Free Music Channels	

Please select one answer.

☐ Select
☐ All Access
☐ Mostly Music
☐ Other (Please specify-you will not be constrained by the size of the box)

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questions | comments | need help

Who made the decision to get this paid subscription to Sirius XM satellite radio?

Please select one answer.

- ☐ I made the decision myself
- ☐ I played a major role in the decision
- ☐ I played a minor role in the decision
- ☐ I was not involved in the decision at all
- ☐ Don't know/unsure

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- 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.

☐ I understand and agree to the above instructions

☐ I do not understand or do not agree to the above instructions

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Questions | Comments | Need help?

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

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App: stop.v1.0 - Extended Driving Directions stop.v1.0 - Extended New Tab Wildwood Rentals Weather, forecasts Design My Own Eng 18K White Gold Hud

questions | comments | need help

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 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.**

Please continue when you are ready.



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Questions | Comments | Need help?

If right now you were to be charged **\$11.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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Questions | Comments | Need help


If right now you were to be charged **\$12.99** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure



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Questions | Comments | Need help?


If right now you were to be charged **\$14.49** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure



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question | comments | need help

If right now you were to be charged **\$15.99** per month for the same Sirius XM Satellite Radio subscription you currently have, would you... ?

Please select one answer.

☐ Continue to subscribe to Sirius XM Satellite Radio

☐ Cancel your subscription to Sirius XM Satellite Radio

☐ Don't know/unsure

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You mentioned that you would cancel your subscription to **Sirius XM** if you were charged **\$15.99** 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.

Click [here](#) if you want to review the music services definitions.

Please select one answer.

- ☐ Yes, I would subscribe to an **On-Demand** music streaming service like Apple Music or Spotify at **\$9.99** per month
- ☐ Yes, I would subscribe to a **Not-On-Demand** music streaming service like Pandora One at **\$4.99** per month
- ☐ No, I would not subscribe to a paid music service in place of **Sirius XM**
- ☐ Don't know/unsure

→

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You mentioned that you would not subscribe 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.


☐ I would purchase CDs and/or music downloads

☐ I would listen to free music

☐ Other (Please specify-you will not be constrained by the size of the box):

☐ None of the Above

☐ Don't know/unsure



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questions | comments | need help

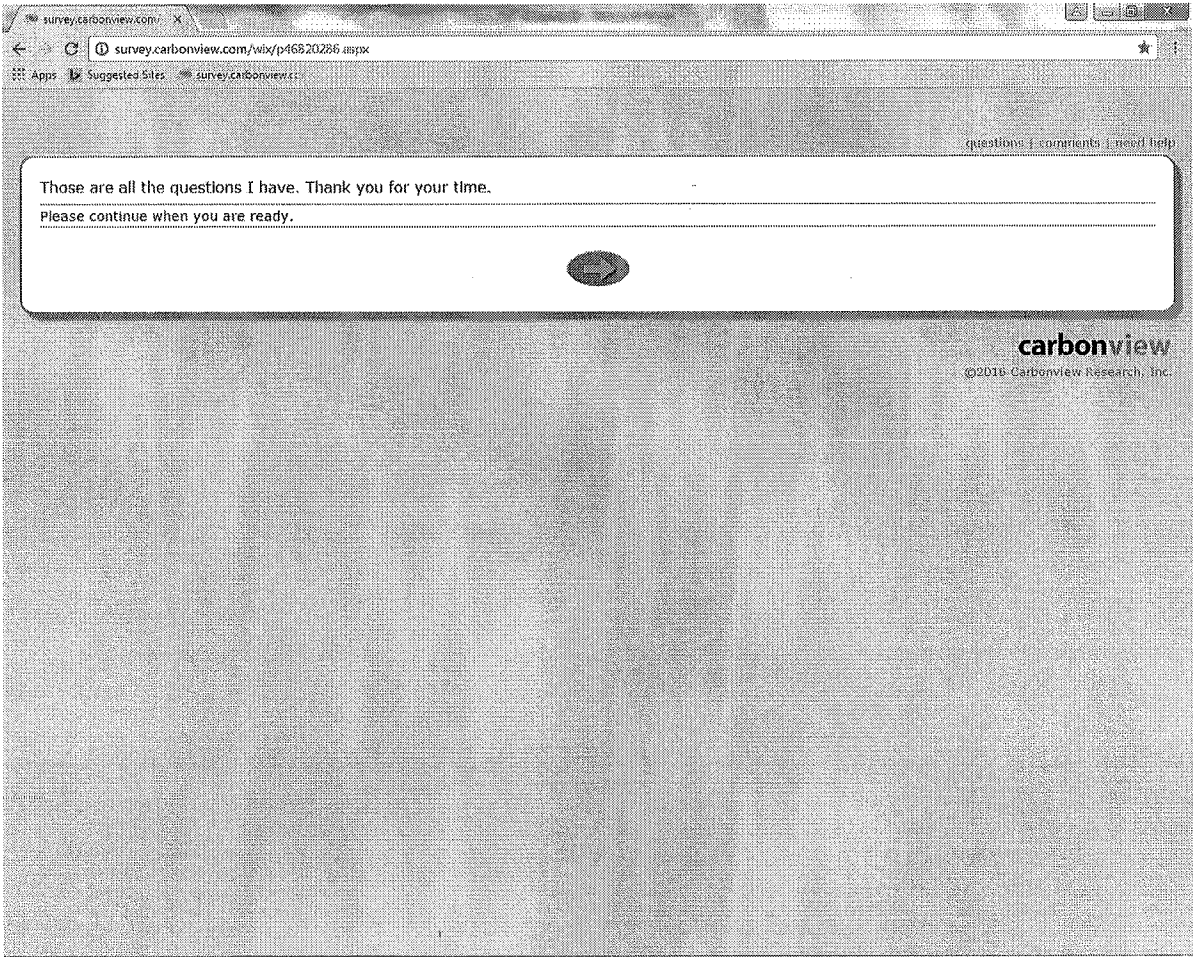
You said that you would listen to free music. How would you listen to free music instead of Sirius XM Satellite Radio?

Please select all that apply.

- ☐ Borrow CDs, vinyl or tapes from friends or a library
- ☐ Music obtained through Peer-to-Peer file sharing or free download sites
- ☐ Free On-Demand music video sites with ads (e.g., YouTube)
- ☐ Continue listening to the music collection I already own
- ☐ Free On-Demand music services with ads (e.g., free, ad-supported Spotify)
- ☐ Free Not-On-Demand internet radio with ads (e.g., Pandora; or AM/FM radio stations over the internet)
- ☐ AM/FM radio or AM/FM HD radio
- ☐ Music channels included in an existing cable or satellite TV subscription (e.g., Music Choice)
- ☐ Other (Please specify-you will not be constrained by the size of the box):
- ☐ Don't know/unsure

➔

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Appendix F: Screening Statistics

Question	Description	Total
Q25	CAPTCHA	2,092
Q30	Gender - Panel Gender Mis-Match	225
Q35	Age: Panel Age Mis-Match or Under 18/Refused	528
Q50	Industry Security Question	388
Q51	Service Subscription Question (i.e. no subscriptions)	5,811
Q52	Sirius XM Subscription (Trial from Dish and no other subscription)	55
	No Cells Qualified ("NOC")	11
Q52.2	NOC, Respondent had other Sirius Subscription Type	729
Q52.2, Q54	NOC, Respondent had other Sirius Subscription Type, "Other" Streaming Service	25
Q52.2, Q54	NOC, Respondent had other Sirius Subscription Type, "Don't Know/Unsure" Streaming Service	11
Q52.2, Q54	NOC, Respondent had other Sirius Subscription Type, Checked both Free and Paid Spotify	9
Q52.2, Q54	NOC, Respondent had other Sirius Subscription Type, Checked both Free and Paid Pandora	4
Q52.2, Q54	NOC, Respondent had other Sirius Subscription Type, Checked both Free and Paid Spotify and Pandora	2
Q52.2, Q55_2	NOC, Respondent had other Sirius Subscription Type, Did not make decision for Spotify Premium	2
Q52p2, Q55_4	NOC, Respondent had other Sirius Subscription Type, Did not make decision for Pandora One	1
Q54	NOC, Checked Both Free and Paid Spotify	21
Q54	NOC, Checked Both Free and Paid Pandora	24
Q54	NOC, Checked Both Free and Paid Spotify and Pandora	3
Q54	NOC, "Other" Streaming Service	159
Q54	NOC, "Don't Know/Unsure" Streaming Service	40
Q53	NOC, Respondent did not make decision for Sirius XM	24
Q53, Q54	NOC, Respondent did not make decision for Sirius XM, "Don't Know/Unsure" Streaming Service	1
Q55_1	NOC, Respondent did not make decision for Apple Music	7
Q55_1, Q54	NOC, Respondent did not make decision for Apple Music, Checked both Free and Paid Pandora	1
Q55_2	NOC, Respondent did not make decision for Spotify Premium	12
Q55_2, Q54	NOC, Respondent did not make decision for Spotify Premium, "Other" Streaming Service	1
Q55_4	NOC, Respondent did not make decision for Pandora One	7
	Qualified Cells Filled	2,350
Q140	Non-Agreement with Survey Instructions	4
Q201	Did Not Understand Service Descriptions - Cell 1	2
Q301	Did Not Understand Service Descriptions - Cell 2/3	3
Q401	Did Not Understand Service Descriptions - Cell 4	0
Q600	Listen to Free Pandora/Spotify Less than an Hour per Week (Cells 5/6)	129
Q500	Sirius XM Trial Period has been More than 12 Months	16
Q501	Did Not Understand Service Descriptions - Cell 7	11
Total Terminates		12,708

Note: Gender and age categories are based on panel gender and age fields. One respondent was terminated because the panel gender and age were both NA.

Appendix G: Survey Weighting

1. To ensure accurate representation of the U.S. adult population, the survey responses were weighted by age, gender and the U.S. Census region.
2. The first weighting procedure involved calculating the proportion of each age-gender-region group in the U.S. Census⁵⁸ and in the survey sample.⁵⁹ The ratio of these two proportions was then used to construct weights for each age-gender-region group, and adjust the survey sample for discrepancies with the U.S. Census. Each respondent was assigned a weight based on the age-gender-region group he or she belonged to, and these weighted responses were then aggregated and analyzed. The weighted survey responses are presented in the middle panels of Table 20 through Table 28.
3. The second weighting procedure used in this survey is generally referred to as “raking” or calibration. Rather than calculating the individual weights for each age-gender-region group, a set of independent weights for each category was calculated: one for age groups, one for gender groups and one for region groups. The weights were then used to adjust the survey sample. After initial adjustment, the modified survey sample was again compared with the U.S. Census, and the new set of category weights was calculated. These new weights were then compared with the previous set of weights, and if deemed sufficiently close, the process was stopped. Otherwise, the adjustment and re-weighting process continued, until weight convergence was achieved. After the final set of weights was calculated and the survey sample was adjusted, weighted survey responses were aggregated and analyzed. The weighted survey responses are presented in the right panels of Table 20 through Table 28.

⁵⁸ For the U.S. residents aged 18 and over. See U.S. Census Bureau, “Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015,” Population Division, June 2016.

⁵⁹ Survey sample refers to the 15,903 respondents that clicked into the survey.

Table 20: Weighted Responses for Sirius XM Sirius Select Subscribers

Price	Unweighted			Age-gender-region weighted			Rake-weighted		
	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel
\$ 11.49	509	390	82	502.8	387.3	76.9	513.1	395.0	81.4
\$ 12.99	427	343	43	425.9	343.5	41.9	431.6	343.5	41.9
\$ 14.49	384	259	71	384.0	257.4	70.9	389.8	257.4	70.9
\$ 15.99	313	209	50	313.1	207.6	49.4	318.9	207.6	49.4
\$ 17.49	263	140	80	263.7	134.1	85.9	269.5	134.1	85.9
\$ 18.99	183	122	24	177.8	117.1	23.9	183.6	117.1	23.9
\$ 20.49	159	92	38	153.9	87.2	38.2	159.7	87.2	38.2

Table 21: Weighted Responses for Sirius XM Sirius Select Subscribers Switching to On-Demand and Not-On-Demand Music Streaming Services

Price	Unweighted				Age-gender-region weighted				Rate-weighted			
	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Not-On-Demand	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Not-On-Demand	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to On-Demand	Cancel and Switch to Not-On-Demand	Cancel and Switch to Not-On-Demand	Cancel and Switch to Not-On-Demand
\$ 11.49	82	17	11	76.9	15.3	9.9	81.4	17.4	11.3			
\$ 12.99	43	11	7	41.9	11.0	6.4	41.9	11.1	6.8			
\$ 14.49	71	25	10	70.9	25.4	9.2	70.9	25.5	10.0			
\$ 15.99	50	22	8	49.4	21.3	7.6	49.4	22.5	8.1			
\$ 17.49	80	17	8	85.9	18.8	9.8	85.9	17.3	8.5			
\$ 18.99	24	5	5	23.9	4.9	4.5	23.9	5.2	5.0			
\$ 20.49	38	13	5	38.2	14.6	4.8	38.2	13.0	5.0			

Table 22: Weighted Responses for Sirius XM Trial Subscribers

Price	Unweighted				Age-gender-region weighted				Rate-weighted			
	Number of Respondents	Subscribe	Not Subscribe	Number of Respondents	Subscribe	Not Subscribe	Number of Respondents	Subscribe	Not Subscribe	Subscribe	Not Subscribe	Not Subscribe
\$ 11.49	503	280	151	502.9	278.3	152.5	506.6	285.4	149.8			
\$ 12.99	352	246	42	350.3	243.1	44.5	356.8	243.1	44.5			
\$ 14.49	310	184	85	305.8	181.4	83.7	312.3	181.4	83.7			
\$ 15.99	225	165	40	222.1	161.3	40.9	228.5	161.3	40.9			
\$ 17.49	185	135	27	181.2	131.4	27.2	187.6	131.4	27.2			
\$ 18.99	158	122	18	153.9	117.0	19.6	160.4	117.0	19.6			
\$ 20.49	140	108	16	134.3	104.6	14.7	140.8	104.6	14.7			

Table 23: Weighted Responses for Sirius XM Trial Subscribers Switching to On-Demand and Not-On-Demand Music Streaming Services

Price	Unweighted			Age-gender-region weighted			Rake-weighted		
	Not Subscribe	Not Subscribe and Switch to On-Demand	Not Subscribe and Switch to Not-On-Demand	Not Subscribe	Not Subscribe and Switch to On-Demand	Not Subscribe and Switch to Not-On-Demand	Not Subscribe	Not Subscribe and Switch to On-Demand	Not Subscribe and Switch to Not-On-Demand
\$ 11.49	151	7	15	152.5	8.2	14.7	149.8	7.4	14.9
\$ 12.99	42	6	7	44.5	7.8	7.4	44.5	6.3	7.1
\$ 14.49	85	30	9	83.7	28.1	10.4	83.7	30.7	9.4
\$ 15.99	40	18	8	40.9	19.8	7.5	40.9	18.5	8.4
\$ 17.49	27	11	7	27.2	11.9	6.7	27.2	11.5	6.9
\$ 18.99	18	8	5	19.6	9.4	5.2	19.6	8.3	5.2
\$ 20.49	16	7	2	14.7	6.8	1.7	14.7	7.0	2.0

Table 24: Weighted Responses for On-Demand Paid Subscribers (Apple Music and Spotify Premium)

Price	Unweighted			Age-gender-region weighted			Rake-weighted		
	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel
\$ 6.99	504	474	20	512.0	480.4	21.8	519.1	488.1	20.6
\$ 7.99	484	432	29	490.2	437.4	28.7	498.5	445.0	29.8
\$ 8.99	455	385	33	461.6	387.5	33.2	468.6	396.3	34.0
\$ 9.99	422	358	31	428.3	359.9	32.9	434.6	369.1	31.7
\$ 10.99	391	274	67	395.4	275.0	65.6	402.9	282.6	68.6
\$ 11.99	324	245	37	329.8	242.7	41.4	334.3	252.5	37.9
\$ 12.99	287	221	29	288.3	218.2	30.5	296.3	227.9	29.8

Table 25: Weighted Responses for On-Demand Paid Switching to Not-On-Demand Music Streaming Services and Sirius XM

Price	Unweighted			Age-gender-region weighted			Rake-weighted		
	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Sirius XM	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Sirius XM	Cancel	Cancel and Switch to On-Demand	Cancel and Switch to Sirius XM
\$ 6.99	20	6	11	21.8	6.5	11.4	20.6	6.1	11.3
\$ 7.99	29	12	7	28.7	11.6	6.7	29.8	12.3	7.0
\$ 8.99	33	12	11	33.2	11.9	11.4	34.0	12.4	11.4
\$ 9.99	31	9	13	32.9	9.5	13.2	31.7	9.2	13.2
\$ 10.99	67	28	12	65.6	26.9	11.8	68.6	29.1	12.3
\$ 11.99	37	18	7	41.4	20.3	5.9	37.9	18.5	7.3
\$ 12.99	29	10	8	30.5	10.2	7.9	29.8	10.3	8.3

Table 26: Weighted Responses for Not-On-Demand Paid Subscribers (Pandora One)

Price	Unweighted			Age-gender-region weighted			Rake-weighted		
	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel	Number of Respondents	Continue	Cancel
\$ 3.49	499	461	22	504.1	465.8	23.1	512.5	473.3	22.9
\$ 3.99	477	446	18	481.0	450.1	18.4	489.6	450.1	18.4
\$ 4.49	459	382	42	462.6	382.8	43.6	471.2	382.8	43.6
\$ 4.99	417	362	21	419.0	362.1	21.8	427.6	362.1	21.8
\$ 5.49	396	303	50	397.2	303.8	49.8	405.8	303.8	49.8
\$ 5.99	346	296	21	347.4	297.2	21.4	356.0	297.2	21.4
\$ 6.49	325	254	35	326.0	253.6	36.4	334.6	253.6	36.4

Table 27: Weighted Responses for Not-On-Demand Paid Switching to On-Demand Music Streaming Services and Sirius XM

Price	Unweighted			Age-gender-region weighted			Rate-weighted		
	Cancel	Cancel and Switch		Cancel	Cancel and Switch		Cancel	Cancel and Switch	
		to On-Demand	to Sirius XM		to On-Demand	to Sirius XM		to On-Demand	to Sirius XM
\$ 3.49	22	6	9	23.1	6.3	9.5	22.9	6.3	9.4
\$ 3.99	18	6	4	18.4	6.9	3.1	18.4	6.0	4.3
\$ 4.49	42	16	10	43.6	16.1	10.6	43.6	16.6	10.1
\$ 4.99	21	14	3	21.8	14.8	2.7	21.8	14.4	3.0
\$ 5.49	50	16	7	49.8	14.9	7.4	49.8	16.7	7.3
\$ 5.99	21	6	5	21.4	6.8	4.8	21.4	6.1	5.1
\$ 6.49	35	16	11	36.4	16.7	11.7	36.4	16.4	11.4

Table 28: Weighted Responses for On-Demand/Not-On-Demand Free Subscribers

Percent Discount	Unweighted			Age-gender-region weighted			Rate-weighted		
	Number of Respondents	Subscribe		Number of Respondents	Subscribe		Number of Respondents	Subscribe	
		to On-Demand	to Free		to On-Demand	to Free		to On-Demand	to Free
10%	501	154	285	524.5	159.3	300.8	510.1	157.5	289.9
20%	347	25	268	365.2	24.6	281.5	352.6	25.3	271.9
30%	322	11	257	340.6	11.7	269.0	327.3	10.9	261.5

Exhibits Sponsored by Ravi Dhar

Exhibit No.	Description	Designation*
SX Ex. 034	[Redacted]	Restricted
SX Ex. 035	[Redacted]	Restricted
SX Ex. 036	[Redacted]	Restricted
SX Ex. 037	[Redacted]	Restricted
SX Ex. 038	[Redacted]	Restricted
SX Ex. 039	[Redacted]	Restricted

*Exhibits designated Restricted are omitted from this public version in their entirety.

**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)

WRITTEN DIRECT TESTIMONY OF

George Ford

**Chief Economist
Phoenix Center for Advanced Legal and Economic Public Policy Studies**

October, 2016

My name is George S. Ford. I am the President of Applied Economic Studies, a private consulting firm specializing in economic and econometric analysis, located in Birmingham, Alabama. I am also the Chief Economist of the Phoenix Center for Advanced Legal & Economic Policy Studies, a Washington, D.C. based 501(c)(3) research organization that specializes in the legal and economic analysis of public policy issues involving the communications and technology industries. In addition, I am an Adjunct Professor at Samford University, a private university located in Birmingham, Alabama, and Auburn University, a public land-grant university located in Alabama. Since moving to Alabama from Florida in 2005, I have served as a member of the Alabama Broadband Taskforce upon appointment by Alabama Governors Bob Riley and Robert Bentley.

I received a Ph.D. in Economics from Auburn University in 1994. In graduate school, my attention turned to research on communications industries, primarily competition in the cable television industry. Since graduate school, I have worked as a professional economist in both government and industry. In 1994, I became an economist in the Competition Division of the Federal Communications Commission, an organization located in the General Counsel's Office that provided competition analysis support to the many bureaus of that organization. My primary interests were multichannel video services and broadcasting policies, though my work ranged from international communications policy to radio interference standards to statistical analysis. After my government tenure, I became an economist at MCI Communications, where my work focused on telecommunications policy, but I continued an active research agenda in others areas including broadcasting. In April 2000, I became the Chief Economist of Z-Tel Communications in Tampa, Florida, a small competitive telephone company where I performed both regulatory and business analysis. I have been in my present employment since the summer of 2004.

My areas of specialty in economics include Industrial Economics, Regulation, Intellectual Property, and Public Policy, with an emphasis on the communications industries, including broadcast radio and television. I have written many papers on telecommunications, intellectual property, and media policy, and much of this work has been published in economic and law journals including the *Journal of Law & Economics*, *Empirical Economics*, the *Journal of Business*, the *Journal of Regulatory Economics*, the *Antitrust Bulletin*, *Energy Economics*, the *Yale Journal on Regulation*, the *Federal Communications Law Journal*, and many others. I have testified before numerous public service commissions, state legislative bodies, and committees of the U.S. Congress. Over the past decade, I have provided written and/or oral testimony before the U.S. Copyright Royalty Judges in a number of proceedings, including: *In the Matter of Distribution of the 2004 and 2005 Cable Royalty Funds*, 73 FR 5397 (2008); *In the Matter of Digital Performance Rights in Sound Recordings and Ephemeral Recordings*, 79 FR 23102 (2014); and, *In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, 78 FR 23054, 23066 (2013). My prior testimony on ephemeral copies was refiled as designated testimony in *In re Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV)*, 81 FR 26316-01 (2016). Outside of the U.S., I filed testimony on behalf of the rights collective Re:Sound before the Copyright Judges of Canada regarding Tariffs 8.A and 8.B (regarding royalties for simulcasting and webcasting) in 2012. A copy of my curriculum vitae is attached as Appendix A.

I. Overview

The purpose of this proceeding is to establish the rates and terms for certain digital public performances of sound recordings by satellite digital audio radio services (SDARS) and preexisting subscription services (PSS). Sirius XM operates under the SDARS license. Two services, Music Choice and Muzak, operate under the PSS statutory license, though only Music Choice is participating in this proceeding.

In setting royalty rates, the Copyright Royalty Judges often employ a benchmarking approach, a rate-setting methodology that uses the rates, terms and conditions from marketplace agreements as benchmarks for the target statutory services. There is an active market for music property so there are a variety of potential benchmarks. Even so, the benchmark and target services do not always perfectly align in the way music is used, the features and functionality of the customer experience, or in the manner in which the use of music can be metered. Consequently, the negotiated license rates serving as benchmarks often must be modified as necessary to account for any differences in functionality, features, and usage levels across the benchmark and target statutory services. It is my understanding that SoundExchange's witness Jonathon Orszag has proposed the use of license rates for subscription-based, interactive webcasting benchmarks for Sirius XM in this proceeding and has made a number of adjustments to account for any material differences between the two service types.

In past proceedings, including those regarding the rates and terms for SDARS/PSS, the Services have requested the Judges modify the benchmarks to account for promotional effects.¹ The Services' argument is grounded in the idea that the target service's programming exposes listeners to music and thereby promotes the sales of CDs and digital downloads, which in turn increases the incomes of the record labels. As a result, the Services contend they "should receive a credit for this effect."² SoundExchange, representing the parties allegedly benefitting from this promotional effect, has consistently questioned the importance of promotion in rate setting, and asserts that music services are mostly substitutes rather than complements.³ Record company executives Michael Kushner and Aaron Harrison reiterate this position from an industry perspective.

Citing a lack of empirical evidence showing a "net substitution/promotion difference" between the benchmark and target services and finding "no acceptable empirical basis for quantifying promotion/substitution for purposes of adjusting rates," in prior SDARS/PSS decisions the Copyright Royalty Judges did not provide a credit for promotional effects.⁴ Likewise, the Judges rejected promotion-based discounts to rates in the recent Web IV decision,

¹ *In re Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV)*, 81 FR 26316-01, 26318 (2016) (hereinafter "Web IV") ("rates-setters must consider the promotion/substitution and relative contribution factors").

² *In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, 73 FR 4080, 4095 (2008) (hereinafter "SDARS I").

³ See, e.g., *In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, 78 FR 23054, 23066 (2013) (hereinafter "SDARS II").

⁴ SDARS I at 4095; see also Web IV at 26326 n.60 (citing earlier Webcasting determinations that take this approach).

citing similar evidentiary and conceptual shortcomings in the positions of the parties.⁵ In that decision, the Judges offered a number of clarifying conclusions about promotion and substitution: (1) promotion or substitution effects are “baked in” to market rates (i.e., the benchmarks already account for these effects);⁶ (2) it is not the *absolute* but the *relative* promotional effect between the benchmark and target service that matters;⁷ (3) the evidence supporting a promotional effect is too weak to justify a modification of the benchmark rate;⁸ (4) it is the net promotional or substitutional effect that matters;⁹ and, more generally, (5) the Judges require “detailed financial and economic data” to support their determinations.¹⁰

I have been asked by SoundExchange to provide some economic analysis of promotion and substitution effects and their possible role in establishing a rate for a compulsory license. I recently co-authored a paper¹¹ that used a simple bargaining model to demonstrate how promotion and substitution effects like those receiving attention in proceedings like this one are, in the Judges words, “baked in” to license rates negotiated in a market setting.¹² In the instant report, I build on that basic insight and the model discussed in my paper, and I further discuss how the bargaining framework can be used to shed more light on the question of promotion and substitution.

My testimony comports with the conclusions already reached by the Judges in Web IV and prior decisions. Specifically, my analyses of the issues before the Judges in this proceeding lead me to the following conclusions.

1. Promotional and substitutional effects influence observed, negotiated license rates.
2. Promotion is just one of many factors that can potentially affect license fees. The income of the music service is also an important input to the negotiation.
3. The mere presence of a promotional effect is not alone sufficient to “justif[y] a discounted rate.”¹³ Rather, the *magnitude* of the promotional effect must be quantified in incremental income for the record label and then compared to the *magnitude* of the incremental subscription and/or advertising income the service obtains from playing the label’s music.

⁵ Web IV, at 26326-29.

⁶ Web IV, at 26326 (“promotion and substitution effects on royalty rates are ‘baked in’ to a negotiated license rate”); *id.* at 26326-27 (“An important aspect of the benchmarking approach is that it credits sophisticated business entities that have carefully negotiated their agreements with an understanding of market forces”).

⁷ Web IV, at 26327.

⁸ Web IV, at 26326-29.

⁹ Web IV, at 26329.

¹⁰ Web IV, at 26329.

¹¹ T.R. Beard, G.S. Ford, and M.L. Stern, *Promotional Effects and the Determination of Royalty Rates for Music*, Paper presented at the 44th Annual Telecommunications Policy Research Conference (September 2016).

¹² Web IV, at 26326 (“promotion and substitution effects on royalty rates are ‘baked in’ to a negotiated license rate”); *id.* at 26327 (“An important aspect of the benchmarking approach is that it credits sophisticated business entities that have carefully negotiated their agreements with an understanding of market forces”).

¹³ *Id.* at 26322.

4. A broad, inter-platform analysis of promotion and substitution is necessary to correctly determine a promotional discount, whether in this proceeding or in market negotiations. Platform substitution across modern digital services, not the promotion of the fading permanent copy platform, is likely to be where the large income effects are to be found.
5. A net promotional benefit may not support a lower negotiated license rate if the label has alternative means by which to achieve the same promotion a lower cost.
6. The concept of promotion of CDs and downloads is out of date. Sales of permanent copies have fallen nearly 80% over the past 15 years and continue to fall.¹⁴ These permanent copies can no longer be considered the primary product that record labels seek to sell.
7. Anecdotes of promotion related to individual artists do not support a promotion-based discount.
8. Direct licensing deals do not encourage promotion-based discounting, but instead encourage the Judges to set a royalty rate that is as independent of this consideration as possible.
9. There is no reason to believe non-interactive services have more of a promotional effect or less of a substitutional effect with respect to sales of permanent copies than do interactive services.

As a consequence of these conclusions, which comport with the expert testimonies of other SoundExchange witnesses, I believe that the Copyright Royalty Judges can safely and responsibly ignore any proposed adjustment to a benchmark rate to account for relative promotional effects for the permanent copy platform. To the extent that this issue affects the Judges' consideration, such attention should be focused on platform substitution, not relative promotion.

My testimony is divided into the following broad sections. Section II will examine the conceptual issue of "promotional effects" within the context of a simple bargaining model of the market determination of royalties. Section III considers the evolution of the music industry and explains why anecdotes referencing specific contracts between artists/record companies and music service providers are incapable of providing any insights on the measurement of promotional effects relevant in this proceeding. Section IV addresses the relevance of direct licenses – which are defections from the statutory rates and terms – to the question of promotion. Section V briefly considers the consequences of competition (i.e., substitution by buyers) between different platforms (e.g., interactive versus non-interactive streaming services) for observed market prices. Section VI considers the promotional differences across interactive versus non-interactive services. Section VII notes my previous testimony that is being designated in this proceeding. I summarize my conclusions in Section VIII.

II. Promotion, Substitution, and License Rates

What is a "promotional effect" and how might such an effect influence the license fees established in market transactions or the royalty rates for compulsory licenses set in proceedings such as this one? In its standard form the argument goes as follows: The use of music by one music platform, say terrestrial radio, affects the demand for purchases on another platform, say CDs and digital downloads. The income of the record label – the seller of the rights to the music property – is the sum of label's incomes from all the platforms on which its music is served up to

¹⁴ See SoundExchange Exhibit 44, RIAA, U.S. Sales Database, available at <https://www.riaa.com/u-s-sales-database/>; calculations discussed *infra*.

listeners. If two platforms are complements – that is, the use of one platform increases the demand for the other – then economic theory suggests a profit-maximizing record label will take that complementarity into consideration and perhaps lower the license fee to one platform in order to increase the demand for the other.¹⁵ By the same logic, if two platforms are substitutes, then the profit-maximizing record label will internalize that fact and may raise the license fee to one or both of the platforms to account for the competition between the two.¹⁶ In a world of multiple platforms, the income effects of the interdependencies between one service and all other services and platforms, some of which may be promotional and others substitutional, are relevant both to market negotiations and rate setting under the compulsory license. A simple bargaining model illustrates the point and helps organize my testimony.

A. A Simple Bargaining Model for License Fees to a Label's Catalog

Say a music delivery service using a particular platform negotiates with a record label and (without government interference) the two rational, profit-maximizing entities seek to agree on a license rate that the service will pay in exchange for the right to use the label's catalog.¹⁷ Let P denote the negotiated license fee (a lump sum) for the catalog.

By using the label's catalog, the music service earns an incremental income equal to an amount A , which may come from advertising, subscriptions, or some mix of the two.¹⁸ The service's payoff from a deal with the label is equal to the incremental income from its customers less the license fee paid for the rights to the music (i.e., $A - P$). The payoff to the record label is simply the license fee, P , which is likewise incremental to income the label receives from other sources.

Under some simplifying assumptions¹⁹ and using the simple Nash bargaining equilibrium, where the surplus available from an agreement is divided evenly between the two willing participants, the Nash Equilibrium license fee is,

¹⁵ See, e.g., J. Tirole, *THE THEORY OF INDUSTRIAL ORGANIZATION* (1995), at pp. 70-1 ("The divisions are de facto competitors because of the substitutability between their goods. Hence, they must be given incentives to raise their own price (eliminate the externalities between them).").

¹⁶ *Id.*

¹⁷ The benchmarks in this proceeding, and most others, typically involve a negotiation between a single music service and a single record label.

¹⁸ Income is equal to the additional surplus from the transaction (i.e., incremental gross margins or incremental gross profits).

¹⁹ I've assumed here that the parties have equal bargaining power, which may or not be true but the assumption has no impact on the conceptual nature of my discussion. Also, I've assumed that the disagreement utilities (or conflict payoffs) are zero. The disagreement utilities are equal to the payoffs the two parties obtain if a deal is not reached. It is entirely possible that the disagreement utilities preclude a satisfactory deal for one or both parties. Some agreements are just not sensible to make from a business perspective. It is certainly not the case that the record label must take half of anything a music service can muster as a profit. As the Judges have consistently held over numerous decisions, the panel's mandate does not "ensure[] the financial viability of any entity." Web IV, at 26390. In normalizing for the disagreement utilities, I do not mean to imply they are not important. The assumption just makes the exposition more transparent.

$$P^* = \frac{1}{2}A. \quad (1)$$

That is, the music service's income attributable to the use of the label's catalog is divided evenly between the record label and the music service.

1. *The Effect of Promotion and Substitution*

A music service permits listeners to consume music, and in doing so, the service earns an income. For the most part, music services are substitutes (i.e., competitors) for one another. Services carefully choose features and functionalities in an effort to secure the patronage of listeners to the exclusion of other services. Although I have not seen compelling evidence of such an effect, it is also plausible that listening to music on one platform increases the *total* demand for consuming music on other platforms. For instance, proponents of terrestrial radio often claim that hearing songs on the radio encourages listeners to buy CDs and downloads.²⁰ Such inter-platform promotion is largely an unintended by-product of the service's use of music, but the effect on other platforms may nonetheless alter the income of a record label and thus affect the negotiation between that service and that label.

How does an interdependency across platforms influence the bargain? Consider a case where the use of music by the service affects the demand for some other platform from which the record label obtains income. For now, assume there is only one other platform. Let the incremental income from this interdependency be labeled E , which is positive for a "promotional" effect and negative for a "substitution" effect. The payoff to the label from this negotiation is now the license fee plus the additional income from the interdependent platform (i.e., $P + E$), while the payoff to the music service is as before ($A - P$). The Nash equilibrium license fee is now,

$$P^* = \frac{1}{2}(A - E). \quad (2)$$

This expression shows that any promotion or substitution across platforms (E) is internalized in the bargain. If a music service has no effect on the other platform, then $E = 0$ and the equilibrium rate evenly splits the service's incremental income from the use of the label's catalog as before. If the service increases sales (and presumably the label's income) on the other platform (i.e., promotion), then E is positive and the license rate P^* is lower than it would be in the absence of promotion. This case reflects the promotion-based discount proposals common in these proceedings.²¹ If, however, the use of music on the service reduces the sales (and thus the label's income) on the interdependent platform, then E is negative and the negotiated license fee will be higher than it would be without such an effect.

Some numerical examples may be helpful. Let A , the music service's income from the use of the label's catalog, be 10. As a benchmark case, assume that E is 0, so there is no relationship

²⁰ As discussed in Part III *infra*, the fact that the permanent copy platform appears to be in a terminal decline draws this assertion into question.

²¹ Claims of a promotion-based discount are also central to the present debate over whether terrestrial radio stations should be made to pay royalties to labels and artists. W. Henslee, *What's Wrong with U.S.?: Why the United States Should have a Public Performance Right for Sound Recordings*, 13 VANDERBILT JOURNAL OF ENTERTAINMENT AND TECHNOLOGY LAW 739 (2011) (available at: http://www.jetlaw.org/wp-content/journal-pdfs/Henslee_PDF.pdf); C.C. Anderson, *We Can Work It Out: A Chance to Level the Playing Field for Radio Broadcasters*, 11 NORTH CAROLINA JOURNAL OF LAW & TECHNOLOGY ONLINE EDITION 72 (2009) (available at: <http://www.ncjolt.org/sites/default/files/Anderson.pdf>).

between the two platforms. The equilibrium license rate is 5 [= $(10 - 0)/2$]. Next, assume that the music service in the negotiation will increase sales on the other platform so the exposure effect is positive. Let E equal 2. Now, the equilibrium license rate is 4 [= $(10 - 2)/2$]. In this example, there is a positive promotional effect and the negotiated license rate is lower, though not by the total amount of the promotional effect. By contrast, assume the negotiating music service is expected to reduce sales on the other platform. Let E equal -2. The license rate is now 6 [= $(10 + 2)/2$]. In the presence of a substitution effect, the negotiated license fee is higher than when the two platforms are unrelated.

This expression also points to the importance of the income of the music service to the negotiation. For instance, if there are two music services that consumers view as entirely independent of one another (an admittedly peculiar situation), then even if one service has a larger promotional effect than the other it may still pay a higher license fee. Say, for instance, Service X has an income of 10 and a promotional effect of 4. The negotiated license fee is 3 [= $(10 - 4)/2$]. Alternately, Service Y has a promotional effect of 8, which is twice as large as Service X, but also has an income of 16. The negotiated license fee for Service Y is 4 [= $(16 - 8)/2$], which is larger than that for Service X despite the larger promotional effect for service Y. Plainly, determining the size of a promotional discount must include an analysis of the marginal income for the service in addition to any promotion or substitution effects. Of course, in real world negotiations, there may be many factors influencing the determination of royalty rates.²²

B. Promotion and Substitution Across Multiple Platforms

In the old days, music was consumed mostly by listening to the radio and buying and listening to permanent copies. A plausible argument can be made that, at least in the past, radio play altered the mix of music purchases, though it is unclear whether such play increased overall record sales.²³ Payola – the practice where radio stations were paid to play certain artists and songs – certainly suggests that record labels believed radio play could sway listeners to certain artists, perhaps to the detriment of others.²⁴

In the modern music marketplace, however, listeners can consume and purchase music using a large number of platforms (and services within those platforms), some in states of growth and others in decline, some legal and some not. Music is consumed and obtained by listeners using terrestrial radio, satellite radio, cable services like Music Choice, digital downloads, CDs, non-interactive streaming services, interactive streaming services, YouTube, vinyl albums, sharing with friends and family, peer-to-peer sites, live performances, among others.

²² See, e.g., Harrison Testimony, at ¶¶ 33-44.

²³ S. Liebowitz, *The Elusive Symbiosis: The Impact of Radio on the Record Industry*, 1 REVIEW OF ECONOMIC RESEARCH ON COPYRIGHT ISSUES 93-118 (2004) (available at: <http://www.serci.org/docs/liebowitz.pdf>); M. Bandookwala, *Radio Airplay, Digital Music Sales and the Fallacy of Composition in New Zealand*, 7 REVIEW OF ECONOMIC RESEARCH ON COPYRIGHT ISSUES 67-81 (2010) (available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1646647).

²⁴ *Id.* Regulations have now limited this practice by, e.g., requiring disclosures around payola. See Federal Communications Commission, *The FCC's Payola Rules*, available at <https://www.fcc.gov/consumers/guides/fccs-payola-rules>.

Most of the services within these platforms are businesses themselves, using music to earn incomes. Terrestrial radio, non-interactive ad-based streaming services (e.g., Pandora), and YouTube use music to gather eyes, ears, and information about viewing and listening habits, which they then sell to advertisers to earn income. Interactive webcasters and Sirius XM use music to sell subscriptions to their services to earn income. Apple uses music to earn income by selling subscriptions to its streaming services and also selling digital downloads. Amazon earns additional income by sweetening the deal on its Prime service by including a music streaming service with a Prime subscription as well as selling an interactive streaming service, digital tracks, and even CDs. Consumers choose among these varied services and platforms based on relative prices, convenience, the degree of interactivity, available music on each service or platform, fidelity preferences, listening habits, and so forth. Music services and platforms compete with one another for the attention and/or subscription dollars of listeners.²⁵ As observed by Sirius XM in its 2015 Form 10K, “[o]ur ability to retain and attract subscribers depends on our success in creating and providing popular or unique music”²⁶

In any market negotiation over a license fee, the record label will take into account any and all interdependencies among the varied services and platform. Consistent with the standard argument for promotion-based discounting, say there is a service (e.g., radio), which I will call Platform R. Platform R promotes sales (and thus income) on some other Platform X (e.g., permanent copies). In the modern marketplace, it is also likely that the Platform R reduces sales (and thus income) on a competing Platform Y (i.e., non-interactive and interactive webcasting, Sirius XM, and so forth). Plainly, the record label will not focus attention solely on the service’s promotion of Platform X and ignore the substitution for Platform Y. The label’s income is derived from all three platforms, and a rational record label will count it all when bargaining over a license fee.

Going back to the expression for the license fee, we may divide the promotion/substitution term E into two parts, e_X and e_Y . The equilibrium license fee can be written as,

$$P^* = \frac{1}{2}[A - (e_X + e_Y)]. \quad (3)$$

The negotiation now includes consideration of the promotion of and substitution for the Platforms X and Y. (In the real world, there may be many such relationships.) Say that the music service has an income of 10, promotes sales on Platform X at a level equal to 2 and reduces sales on Platform Y by 2. The negotiated license is 5 $[= (10 - (2 - 2))/2]$; the substitution effect offsets the promotion effect so no discount is provided for promotion.

Or, say sales on Platform Y fall by 3. Now, the negotiated license rate is 5.5 $[= (10 - (2 - 3))/2]$. Despite the promotion effect for Platform X, the negotiated license rate rises above the “no promotion/substitution” rate (which is 5) to account for the relatively large substitution for Platform Y. So, even if there is solid evidence that the service increases the sales on Platform X, absent equally solid evidence on the manner in which sales are affected on Platform Y, nothing can be said about a promotional discount. I will focus on this issue more in Section III below.

²⁵ Web IV, at 26327 (“the availability of noninteractive services could cause listeners to substitute noninteractive listening at the expense of interactive services.”).

²⁶ Sirius XM Form 10-K (2015), at p. 10.

These promotion/substitution terms (e_X, e_Y) may include far more than just inter-platform complements and substitutes. In his testimony, Aaron Harrison observes, for instance, that market-negotiated license agreements provides the record labels with user data.²⁷ Such data is very useful to the labels, helping them increase their income through various promotional means. Also, market agreements allow the labels to better manage the release of new recordings in the form of exclusive deals and windowing, devices that permit the labels to increase the income from recordings and, as such, act as a form of promotion.²⁸ These, among other negotiated terms, are “promotional” benefits that statutory services cannot provide. The value of these promotional tools would count against the statutory services in negotiations, thereby increasing their relative license rates in a (hypothetical) market negotiation.²⁹

C. *Alternative Promotion Choices*

In the bargaining model presented above, if the music service at the negotiating table provides incremental income from some other platform, the record label may internalize that effect and offer a discount on the license fee. In effect, the music service acts as a type of advertising for the related platform. The music service, however, is in business to make money for itself, not the record label. Any promotional effect is largely an unintended by-product of the service’s use of music property. It’s not always the case that an unintended promotional effect will lead to a discounted license rate. The record label may not be willing to pay for advertising services it could effectively obtain elsewhere for lower cost.

Record companies promote artists or albums through many alternative and overlapping avenues, including websites, print and television advertising, tours, and special events.³⁰ Where a record company could more cheaply and suitably promote its property through these other channels rather than by contracting with the music service, the promotional value E is reduced, in some cases to zero. This is because the record company “pays for” the service’s promotion of its music by reducing its negotiated license rate; and, the existence of alternative, cheaper means of promotion would therefore make a rational rights holder unwilling to agree to a reduced royalty rate in a market setting. Thus, one must recognize that the promotional value E affects the negotiated rate under the assumption that this form of promotion is part of the best business plan of the rights holder.

These alternative promotional options show up in the disagreement utilities. Say that a music service earns income equal to 10 from the use of the label’s catalog and has no promotional effect. The negotiated license rate would be 5 [= 10/2]. Alternately, say there is a promotional effect of 2. The negotiated license rate is now 4 [= (10 – 2)/2], so the label effectively pays 1 unit for the advertising product of the music service. What if, for instance, the label could obtain the same promotional benefit of 2 by running internet advertisements at a price of 0.5 units. In this case,

²⁷ Harrison Testimony, at ¶ 31.

²⁸ *Id.*

²⁹ *Id.*, at ¶ 32 (“the statutory license does not contain any of the valuable additional terms we would obtain in a negotiated agreement”), ¶ 26 (“Moreover, the statutory license offers none of the additional benefits to UMG that are common features of our marketplace agreements.”).

³⁰ Kushner Testimony, at ¶ 56; Harrison Testimony, at ¶ 31.

the advertising service implicit in the licensing agreement will not be incorporated into the market license rate because the same service can be obtained elsewhere for less net cost.

In the case at hand, the disagreement utility is $(2 - 0.50)$, which is the net benefit obtained if no agreement is reached.³¹ The royalty would now be $4.75 [= (10 - (2 - (2 - 0.5)))/2]$. While the license rate is *less* than 5, it is well above the license rate of 4 if there was no alternative promotional tool available to the label. This occurs because the outside option allows the record company to enjoy some promotional effect without an agreement with the service, thus strengthening the record label's bargaining position. So, a full analysis of a promotion discount must not only consider all potential interdependencies across services and platforms, it must also consider the range of alternative promotional strategies. There may be many relatively minor promotional and substitutional effects offsetting each other to varying degrees and rendering a net effect on income, but the fact is that a listener can only listen to one song at a time. Thus, substitution across various platforms, some paying hugely different royalties, is what the industry experts, such as SoundExchange witnesses Kushner and Harrison, believe to be the dominant consideration in the modern music marketplace.

D. Insights from the Bargaining Model

This simple bargaining framework shows, and these examples illustrate, at least five important considerations as the Judges consider promotion and substitution.

First, promotion or substitution do not represent externalities that market negotiations are incapable of handling. That is, promotion and substitution are indeed "baked in to a negotiated license rate."³² Or, as the Copyright Office has observed, "promotional value [] can be taken into account [] in private negotiations."³³

Second, a third-party effect is just one of many factors that can potentially affect license fees. The income of the music service is also an important input to the negotiation. As the award-winning musician Herbie Hancock has stated, "[w]hile there is no question that radio promotes music, it is also clear that music promotes radio."³⁴ Negotiations may, as the Judges recognize, fully account for promotion and substitution, but this does not mean that some portion of such effects are assigned a net value of zero.

Third, this analysis suggests that the mere presence of a promotional effect is not alone sufficient to "justif[y] a discounted rate."³⁵ Rather, the *magnitude* of the promotional effect must be quantified in incremental income for the record label and then compared to the *magnitude* of

³¹ That is, if no deal is reached with the music service, the label still gets 2 in promotion at a price of 0.5.

³² Web IV, at 26326.

³³ *Copyright and the Music Marketplace, A Report of the Register of Copyrights* (February 2015) at 139 (hereinafter "*Register of Copyrights 2015 Report*") (available at: <http://www.copyright.gov/policy/musiclicensingstudy/copyright-and-the-music-marketplace.pdf>).

³⁴ Testimony of Herbie Hancock, Hearing Before the Committee on the Judiciary House of Representatives One Hundred Eleventh Congress, First Session on H.R. 848, Serial No. 111-8, (March 10, 2009) at p. 192 (available at: http://judiciary.house.gov/files/hearings/printers/111th/111-8_47922.PDF).

³⁵ Web IV, at 26322.

the incremental subscription and/or advertising income the service obtains from playing the label's music. To put it bluntly, a party seeking a promotion-based discount must "show me the money."³⁶ Promotion only matters if it provides bigger checks to the record label from complementary music platforms net of any substitutional effect on other platforms. As the Judges observed in Web IV, a promotional discount or any other specific adjustment to a rate requires "detailed financial and economic data."³⁷

Fourth, when seeking a promotion-based discount, it is not enough to discuss the relationship between the service and one platform for which an alleged promotional effect exists. The party seeking a discount must quantify the income effects across *all* interdependent platforms. No doubt, given the large number of services and platforms and the varied relationship among them, quantifying a promotion/substitution-based discount is a complex task. Yet, this broad, inter-platform analysis of promotion and substitution is necessary to correctly determine a promotional discount, whether in this proceeding or in market negotiations. In practice, it may be that promotional effects are so trivial, especially in relation to other more important factors like platform substitution, that they are simply ignored. The lack of compelling evidence on promotional effects would support setting the issue aside in negotiations or assigning such effects little weight. Special circumstances, however, may warrant more attention to such effects, but those special circumstances can be handled outside of the statutory license.

Fifth, even if a service provides a net promotional benefit it may not get a lower license rate. If the label has other promotion options that can be obtained at a lower cost, the incentive to reduce the license rate based on promotion is reduced.

III. Promoting Sales of CDs and Digital Downloads

In early ratesetting proceedings, to my knowledge, the plea for a promotion-based discounts was focused solely on the sales of CDs and digital downloads. Anyone familiar with the sales trends for the music industry's is likely to be bit befuddled by the attention to permanent copies. As detailed below, sales of permanent copies are down nearly 80% since 2000, and both CD and download sales continue to fall. Permanent copies can be obtained from a variety of sources at no cost and these that provide little to no royalty payments. Furthermore, the evidence on promotional effects for individual songs and artists focuses on entirely the wrong question.

A. Global Music Sales Revenues

There was a time when promoting CD and download sales may have been a worthwhile consideration, but even if that was once the case, it appears not to be today. In Figure 1, data from the Recording Industry Association of America (RIAA) on the global sales of music is illustrated. The data shows that in 2000 annual global sales of permanent copies -- including CDs, digital downloads and vinyl (which has a made recent, though perhaps "trendy," comeback) -- was a little over \$19 billion (in 2015 dollars).³⁸ In 2015, sales of permanent copies were down to \$4.2

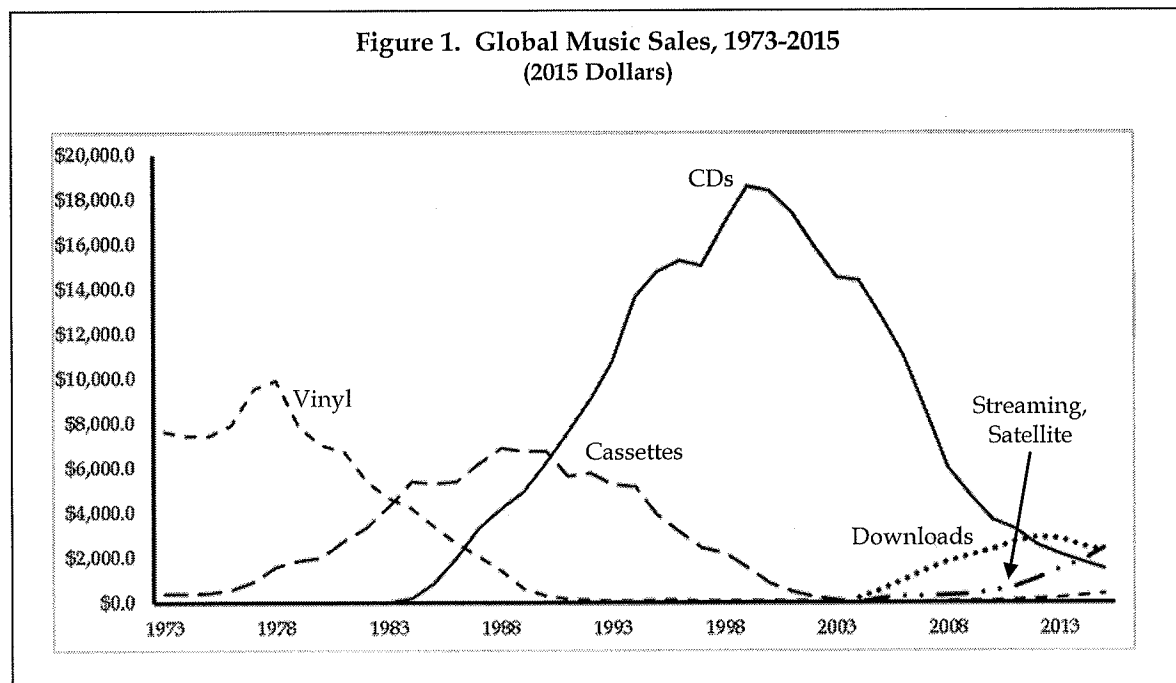
³⁶ This phrase was made popular by the film *Jerry McGuire* (1996).

³⁷ Web IV, at 26329.

³⁸ C. Poladian, *The Vinyl Renaissance Continues in 2015, But Can the Old Pressing Machines Keep Up?*, INTERNATIONAL BUSINESS TIMES (September 9, 2015) (available at: <http://www.ibtimes.com/pulse/vinyl-renaissance-continues-2015-can-old-pressing-machines-keep-2097653>).

billion. That's a 78% decline in sales of permanent copies. Thus, a promotional benefit of \$1 in 2000 is worth only 22-cents today. In contrast, since 2000, satellite radio has grown from zero to about 30 million subscribers, streaming services have grown from nothing to about 156 million users, and paid subscriptions have surged from zero to about 16 million.³⁹

This downward trend is continuing. From 2012 to 2015, sales of permanent copies have fallen by 41%. Even sales of digital downloads are trending downward, falling 21% from the peak in 2012 through 2015.⁴⁰



The data on sales in the Figure 1 present a clear story about the evolution of music consumption; a story of platform substitution. With the rise of cassette recordings, the sales of vinyl plummeted. A few years later, the sales of CDs rose and the sales of cassettes fell. Then, as the sales of digital downloads rose, accompanied by the digitization of music that led to piracy and increased file sharing, the sales of CDs began to decline. Now, both CD and download sales are falling as the revenue from digital streaming/satellite services are rising.⁴¹ People keep listening to music, but how they acquire it has changed dramatically. As explained by Mr.

³⁹ Sirius XM Form 10-K (2015), at p. 2; see also SoundExchange Exhibit 26, MusicWatch, Annual Music Study 2015, Final Report to RIAA Research Committee, March 2016, at p. 55-6.

⁴⁰ P. Resnikoff, *Music Downloads Post Their Worst Decline EVER*, DIGITAL MUSIC NEWS (July 7, 2016) (available at: <http://www.digitalmusicnews.com/2016/07/07/music-downloads-worse-decline/>).

⁴¹ As commentators have observed, the decline in CD usage has been so precipitous that many auto manufacturers are no longer installing CD players in their cars. D. Welch, *A Relic Is Disappearing, Finally, From Car Dashboards in America*, BLOOMBERG (November 6, 2015) (available at: <http://www.bloomberg.com/news/articles/2015-11-06/a-relic-is-disappearing-finally-from-car-dashboards-in-america>); C. Woodyard and K. Mays, *CD Players Make Quiet Exit from Cars*, USA TODAY (August 5, 2013) (available at: <http://www.usatoday.com/story/money/cars/2013/08/04/cd-players-cars-disappear/2601827/>).

Kushner, Mr. Harrison, and Professor Willig, these changes have profound implications for the music industry and, in turn, the proper determination of royalties.⁴²

The data in Figure 1 suggests that the request for a discount based on “promoting” the sale of CDs and digital downloads is a concept that is largely out-of-date. Permanent copies are still a big business, but those sales decline each year. In fact, many auto manufacturers are no longer installing CD players in new cars.⁴³ The CD functionality of the car radio has been replaced with Sirius XM and Bluetooth functionalities. As such, it’s difficult to take seriously the idea that granting a discount on license fees based on a claim any service, and especially Sirius XM, promotes CD sales.⁴⁴ Satellite radios have replaced the CD player in automobiles. Moreover, the number of brick-and-mortar retail outlets for CD sales have fallen substantially, and big-name retailers like WalMart and Best Buy have cut back considerably the shelf space allocated to CDs.⁴⁵ Unquestionably, any promotional effect related to the permanent copies is less significant today than it was in ten or fifteen years ago, and will likely be less significant next year than today.

Sales trends also suggest that subscriptions, and to a much lesser extent ad-based non-interactive services, are the future of music consumption and music industry revenues.⁴⁶ Thus, to the extent that any service, including Sirius XM or the PSS, seeks a discount for its purported promotional effects, the analysis should focus on how the service drives sales of these contemporary distribution platforms. Such a claim would be extremely difficult to support, however, as these modern distribution platforms are more likely to be substitutes than complements. As Sirius XM’s own documents bear out, the most popular and growing music

⁴² I understand that other SoundExchange witnesses are providing testimony regarding the rates for statutory licenses in the context of the modern music marketplace. See, e.g., Willig Testimony (discussing this issue based on an economic theory and survey evidence); Kushner Testimony and Harrison Testimony (addressing this issue from an industry perspective).

⁴³ D. Welch, *A Relic Is Disappearing, Finally, From Car Dashboards in America*, BLOOMBERG (November 6, 2015) (available at: <http://www.bloomberg.com/news/articles/2015-11-06/a-relic-is-disappearing-finally-from-car-dashboards-in-america>); C. Woodyard and K. Mays, *CD Players Make Quiet Exit from Cars*, USA TODAY (August 5, 2013) (available at: <http://www.usatoday.com/story/money/cars/2013/08/04/cd-players-cars-disappear/2601827/>).

⁴⁴ From the perspective of the record industry the purported promotion of CDs and downloads does not justify a discount, even with regard to terrestrial radio, a service that many contend is highly promotional. See E. Christman, *‘Fair Pay for Fair Play Act’ Introduced, Seeks Cash from Radio Stations*, BILLBOARD (April 13, 2015) (available at: <http://www.billboard.com/articles/business/6531693/fair-play-fair-pay-act-performance-royalty-radio>).

⁴⁵ See, e.g., J. Pan, *Say Goodbye to Record Stores and Physical Sales*, MASHABLE (July 24, 2012) (available at: <http://mashable.com/2012/07/24/music-sales-decline/#19a1U79eGkqC>); E. Christman, *Walmart to Cut its CD Stock by Nearly Half*, BILLBOARDBIZ (April 8, 2014) (available at: <http://www.billboard.com/biz/articles/news/retail/6042188/walmart-to-cut-its-cd-stock-by-nearly-half>); Maura, *Big Box Stores’ Cutbacks May Give CDs Even Less Shelf Space than Sugary Cereal*, IDOLATOR (October 4, 2007) (available at: <http://www.idolator.com/306861/big-box-stores-cutbacks-may-give-cds-even-less-shelf-space-than-sugary-cereals>).

⁴⁶ Kushner Testimony, at ¶ 78 (“[digital music] services clearly represent the future of the music business”); Harrison Testimony, at ¶ 34 (“Our future is streaming, and we need those subscription on-demand services to grow their subscriber base (and thus our revenues.)”); J.E. Solsman, *Streaming Music Drowns Out CD sales in US for the First Time*, CNET.COM (March 19, 2015) (available at: <http://www.cnet.com/news/streaming-music-drowns-out-us-cd-sales-for-the-first-time/>).

platforms “compete directly with [Sirius XM’s] services.”⁴⁷ Therefore, it is unlikely that a hypothetical market negotiation between record labels and Sirius XM or the PSS would be much interested in offering a discount based on a promotional effect, though it is likely that a negotiated license fee may be higher due to a substitution effect.

The testimony of Michael Kushner, Executive Vice President of Atlantic Recording Corporation, which is part of Warner Music Group, suggests this is so. Mr. Kushner states that the record labels now “have to view use of our music in every type of service as competing to some extent with every other such use of our music. We view none of them as promotional of any other, and indeed, we view each as potentially cannibalizing others.”⁴⁸ Similarly, Aaron Harrison explains that “in the current market climate, we recognize that regardless of whether the Spotify on-demand subscription service or the Apple Music on-demand subscription service are promotional or substitutional of sales, they are now the digital platforms that best monetize our sound recordings and pay the highest royalties.”⁴⁹

These trends in sales should be considered in setting a rate. Importantly, the rate set in this proceeding will apply for a five-year period, ending in 2022. Accordingly, the quantification of a discount for promotion or markup for substitution must be based on forecasts of *future* sales of the various, inter-related music platforms.

E. Diminishing Promotional Income Due to Stream-Ripping and Piracy

Even if a music service exposes a listener to a song or artist that motivates the listener to obtain a permanent copy, such a copy need not be purchased through legal, royalty-paying platforms. As long as the listener has access to the internet, most music can be listened to on demand for free in ways that have little to no effect on artist and label incomes. YouTube, for instance, has broad coverage of both modern and older music that users can access and play at will at no cost, and YouTube pays little if any royalties for such plays.⁵⁰

Even if a listener wants a permanent digital copy of a song, it is possible to acquire such a copy at little to no cost. For instance, stream-ripping apps permit a YouTube user to download video and sound files in high-quality mp3 or mp4 formats. Even new releases can be obtained in this way. For instance, Lady Gaga released her new song “Perfect Illusion” on September 8, 2016. On that very day, anyone with an internet connection could obtain a high-quality mp3 of the song from YouTube using readily-available, stream-ripping add-ons to internet browsers.⁵¹ Van Halen’s self-titled album from 1978 can be downloaded from YouTube using stream-ripping software, as can both volumes of Robert Johnson’s “King of the Delta Blues Singers.”⁵² It is

⁴⁷ Sirius XM Form 10-K (2015), at p. 5.

⁴⁸ Kushner Testimony, at ¶ 21.

⁴⁹ Harrison Testimony, at ¶ 18.

⁵⁰ Harrison Testimony, at ¶ 15-16; A. Badanes, *5 Things You Had Wrong about YouTube Royalties*, SONGTRUST.COM (April 16, 2015) (available at: <http://blog.songtrust.com/music-publishing-news/5-things-you-had-wrong-about-YouTube-royalties/>).

⁵¹ See Appendix B (screenshot showing the ready availability of this song).

⁵² See Appendix C (screenshot of a search for Robert Johnson’s full album on YouTube).

perhaps only a mild exaggeration to say that the world's music catalog can be listened to "on demand" if not stream-ripped off YouTube.

Software is also available that allows listeners to capture streams from free streaming services and even Sirius XM's streaming website. Replay Radio, which is a subscription service costing \$2.95 per month or about \$30 per year, allows users to record any streaming service. This software makes it possible for any Sirius XM subscriber to record their webcasting streams.⁵³ A subscriber could, for instance, obtain copies of all the latest hits by simply recording Ryan Seacrest's "American Top 40" on Sirius XM, iHeart Radio, or other online streams of the show. Or, a subscriber who wants to avoid commercials and Ryan Seacrest's commentary could do so by instead recording pop radio channels on Sirius XM. Replay Radio also works on other streaming services, including Pandora and Amazon Prime with their millions of subscribers.

There are, of course, many other low-cost or cost-free ways to obtain music. Digitization makes sharing music among friends and family essentially free. In addition, numerous piracy websites still exist, despite some success in shutting down major infringers.⁵⁴ The legality of each of these recording options and the policies that permit them is beyond the scope of my testimony. But regardless of whether such recordings are permissible or not, they serve as a means by which listeners are *able* to gain greater access and exposure to music, without increasing the income of labels and artists.

F. Catalog-Level Income, Not an Individual Artist's Sales, is Relevant to the Promotion Analysis

In previous proceedings, the evidence used to support a promotional effect included primarily anecdotal evidence such as thank you letters from artists and labels or presentations on how a service's spins may have affected an individual artist's record sales. The Judges have repeatedly deemed these anecdotes unsupportive of a discount,⁵⁵ and the bargaining framework supports this finding.

Evidence regarding income based on individual artists' spins is not what concerns the record label in a negotiation; rather, the negotiation concerns access to the label's entire catalog. The relevant evidence is thus how the service affects the total income from the related platform (and all other platforms) which is the total incremental income (i.e., gross profits) the label obtains from any alleged complementarity. If a music service spins one artist and listeners then buy that artist's recordings, then the service is not spinning another artist and presumably listeners are not

⁵³ See Replay Radio website, <http://applian.com/replay-radio/>.

⁵⁴ For instance, GOLDENMP3.RU, an off-shore music website, offers recently released music for about \$2.00 per album. Also see, e.g., A. Bazenkova, *Musicians Struggle to Claim Royalties in Russia*, MOSCOW TIMES (April 15 2015) (available at: <https://themoscowtimes.com/articles/musicians-struggle-to-claim-royalties-in-russia-45811>); Ernesto, *Top 10 Most Popular Torrent Sites of 2016*, TORRENTFREAK (June 2, 2016) (available at: <https://torrentfreak.com/top-10-most-popular-torrent-sites-of-2016-160102/>).

⁵⁵ See, e.g., SDARS II, at 23066 ("Much of the evidence that Sirius XM presented to show the promotional effect of Sirius XM's service on phonorecord sales consists of testimony detailing record labels' efforts to get their artists airplay on Sirius XM and elsewhere. . . . Those facts alone, even if assumed to be true, would not provide the type of substantial empirical evidence that might support a downward adjustment from the rates most strongly suggested by the evidence in the record.")

buying that artist's records. It's not the mix of what is sold that matters, but the total quantity sold and the resulting income that influences a negotiation.

We can see how the analysis above functions by considering the promotion effects on Artist X (e_X) and Artist Y (e_Y) using Expression (3). While spinning Artist X may increase the sales of Artist X, it may at the same time reduce the sales of Artist Y. What matters to the label in terms of promotion is whether or not the sum of all the plays for all artists in its catalog rises and, more importantly, what income this all produces. Evidence concerning the experience of individual artists cannot distinguish between an altering of *the mix of what is purchased from the total quantity of purchases* from the label's catalog, much less quantify the incremental income of such changes.

Even the effect of terrestrial radio on recording sales is disputed. In a study of record sales at the advent of terrestrial radio in the United States and the United Kingdom, Professor Stan Liebowitz found no evidence supporting the claim that terrestrial radio increases total record sales.⁵⁶ In fact, Professor Liebowitz presents evidence suggesting that record sales fell after the advent of terrestrial radio in the United States in the 1920s and 1930s, and sales did not rise following the introduction of commercial radio in the United Kingdom soon thereafter. Although this study examines a distant past, it was precisely in the past that the promotional effects of broadcast radio were felt to be the strongest since at the time the permanent copy platform was the dominant source of income for the labels. There are many more ways to consume music today than then.

In a more recent study of radio play on sales of digital copies, Bandoowala uses data from New Zealand to evaluate whether radio play just alters the mix or whether it increases the total sales of digital downloads.⁵⁷ This study finds that while the play of an individual song may increase the sales of that particular song, radio play does not increase total sales of digital copies. If "promotion" merely alters the mix of what is sold it would not justify a promotion-based discount on an entire catalog or a statutory license.

In sum, promotional effects must increase record company income on *net* to be a relevant consideration in the negotiation of a license rate. Any evidence presented at the artist level is largely irrelevant. Furthermore, any increase in income from the sales of permanent copies must be weighed against any lost royalty income for the label due to a service's substitution effect on other services and platforms. Promotion is obviously a complex question that a few courtesy letters and case studies can't effectively answer; a fact the Judges have repeatedly acknowledged.

IV. Promotion and Defection from the Statutory License

The royalty rates set in proceedings like this one typically apply to all music subject to the relevant statutory license. In Web IV, for instance, the Judges set a single rate for subscription webcasters and a single rate for non-subscription webcasters.⁵⁸ A single statutory rate presently exists for music broadcasts by Sirius XM and the PSS. Yet, there is likely to be great variation in the extent, and even the direction, of promotion and substitution effects on this massive pool of songs, albums, and artists. What, then, does it mean to incorporate a discount or markup for

⁵⁶ Liebowitz, *supra* n. 23.

⁵⁷ Bandoowala, *supra* n. 23.

⁵⁸ Web IV, at Appendix A.

promotional and substitutional effects generally? When each musical work, album, or artist has its own promotional or substitutional effect, and these differ widely, how should the Judges determine the proper adjustment to apply?

If the statutory rate will be applicable to *all* music, at least that music not subject to separate agreements, the concept of a promotional effect must, by necessity, refer to an *average* promotional effect among that property subject to the statutory rate. That is, if, *on average*, works sold under the compulsory license, at the statutory royalty, enjoy a promotional effect, then this average effect is the magnitude sought. But, some fraction of music property is sold under direct licenses that avoid recourse to the statutory license, its mandated royalty, and/or the performance complement. In previous proceedings, a number of witnesses have pointed to the reduced royalty rates (or other concessions) in contracts between individual artists and certain non-interactive platforms, such as satellite radio.⁵⁹ Some of these deals involve new artists, independent labels, certain popular artists, and other specially-situated property owners who are very interested in additional exposure.

Witnesses sometimes claim that agreed reductions in royalties and other concessions are evidence of the existence and scope of a promotional effect—but these anecdotes are completely irrelevant to determining a rate adjustment for a statutory license. Such special deals seek to avoid, or occur outside, the statutory license. Any adjustment to a statutory rate intended to reflect the appropriate *average* promotional effect among property realistically subject to that rate cannot be inferred from the terms of contracts made to *supplant* that mechanism.

Moreover, the great majority of artists and properties do not engage in extra-statutory contracting, although it is available to them. Taking the royalty rates seen in these special contracts and using them to infer a promotional adjustment applicable to all property sold under the compulsory license is rather like looking at bar tabs to infer the value of whiskey to teetotalers. The compulsory royalty should reflect the value of promotion to those properties that do not have enough incentive to buy promotion services through a separate contract.

In fact, rather than supporting a promotion-based discount, these direct licensing deals encourage the Judges to set a statutory rate that is as devoid of artist or label-specific promotional effects as possible. Consider an admittedly crude example to illustrate the point. Say, for instance, that there are only three songs: X, Y, and Z. Song X gets no promotion at all from its spins and say the market license fee to play the song is equal to \$1. Song Y gets a relatively small promotional effect and its market rate is \$0.90. Finally, Song Z has a relatively larger promotional effect and its market rate is \$0.80. If a single rate is to apply to all three songs, each played in equal amounts, then the rate is \$0.90.

At this average rate, the rightsholder for Song Z may wish to defect from the statutory rate in order to get more spins to realize a larger promotional effect. Say Song Z does defect and the rate is reset at the average of the remaining services, or \$0.95. Now, the rightsholder to Song Y may wish to defect, and if she does, then the average market rate of songs still under the group license is \$1. Another reset brings the rate to \$1. What this scenario demonstrates is that if defection from the statutory rate is possible, and evidence suggest it is, then the proper statutory rate is a rate that includes no promotional effect. If an artist or label believes that more spins on a service

⁵⁹ See, e.g., Web IV, at 26325-26, 26356-58.

will increase its income from related markets, then it can defect and charge a lower rate. Such a program ensures that no rightsholder is being undercompensated by being forced to purchase a promotional service that has no value to that particular artist or label.

Finally, licensing agreements made by record companies, which often implicate the entire catalog, face quite different financial considerations than targeted agreements proffered by individual artists. Anecdotal evidence of independent contracts that promote certain artists or sound recordings at reduced royalties do not shed light on whether promotional effects exist more generally. Any evidence of promotion of a particular artist, album or recording cannot be extrapolated and meaningfully understood as promotion of a catalog. Any request for a promotional discount (or a relative promotion discount) must quantify the incremental income to the record label directly caused by the requesting parties use of music, and do so for both the benchmark and target service, as well as the differences in income from all other promotion and substitution effects between the benchmark and target service.

V. Platform Substitution

Determining whether or not promotion warrants a discounted license fee (or regulatory royalty rate) is far more complex than singling out a promotional effect on one specific platform. Music services and platforms are, in large part, substitutes for one another. Most apparently, music is consumed one service and one platform at a time, so the platforms and services are inherently substitutional in this regard. When the same song is played on Spotify, Pandora, Sirius XM, terrestrial radio, or Music Choice, the song is consumed exclusively on that platform at the loss of another, and while it's the same song the label gets often hugely disparate royalties. But it is also the case that listeners view many (if not most) services and platforms as competitors. While the various services within the market for music consumption may not be perfect substitutes, they are substitutes nonetheless.

Including a wide array of services in a broad market for music consumption has good support. Perhaps most relevant to the present proceeding, Sirius XM states in its 2015 Form 10K that the music services of "Apple, Google Play, Pandora and iHeartRadio [] compete directly with our services, at home, in the automobile, and wherever audio entertainment is consumed."⁶⁰ Also listed as competitors are terrestrial radio, direct broadcast satellite and cable television audio (e.g., Music Choice), and other digital media services in a "audio entertainment marketplace [that] continues to evolve rapidly."⁶¹ Sirius XM's financial report puts interactive webcasting, non-interactive webcasting, simulcasting, multichannel video music services (e.g., Music Choice), terrestrial radio, and satellite radio all in the same market. As such, if Sirius XM obtains the patronage of a subscriber, then one or more of these other services likely loses out, and this substitution effect must be accounted for in any proper analysis of promotion.

Relative royalties and license fees matter in sizing promotion and substitution effects. Say, for instance, a listener is willing to pay \$150 or so annually for a subscription to a music service. As detailed in Mr. Harrison's testimony, if that listener subscribes to Sirius XM, the annual

⁶⁰ Sirius XM Form 10-K (2015), at p. 5.

⁶¹ *Id.*, at pp. 5-6.

royalties paid to record labels are approximately [REDACTED].⁶² Alternately, if a subscriber chooses Google Play or Spotify's subscription service, then the annual revenue to the labels is about [REDACTED] for that subscriber.⁶³ From the perspective of the label, that's a [REDACTED] difference. These two services are likely substitutes among at least some listener who are willing to pay subscription fees for music. No doubt, Sirius XM is a popular service and pays a non-trivial amount in royalties; the record labels have a strong interest in Sirius XM's success. Still, if Sirius XM shut down and only one in [REDACTED] of its listeners subscribed to an interactive service and nothing else changed, then financially the labels would be no worse off (and maybe better off given other income effects between the two services). It is unlikely that this sizeable differential in royalties would persist in a market setting.⁶⁴ As Mr. Harrison observes, "it would be foolish for us to agree to license Sirius XM at [REDACTED] per year when we make so much more from other kinds of services."⁶⁵

This comparison of royalty payments for subscriptions across platforms provides some feel for the magnitude of the platform substitution problem. Per-capita expenditures on CDs and digital downloads is, in contrast, only [REDACTED] per year.⁶⁶ That's pretty close to [REDACTED] permanent copies per year.⁶⁷ Record labels and artists perhaps get about [REDACTED] of this amount, not all of which is incremental income (i.e., profit).⁶⁸ So, if I assume generally that Sirius XM increases the demand for permanent copies more than the benchmarks by 10% (rather than just shift demand for artists around), that would be worth about [REDACTED] per subscriber per year in revenue (not income) to the labels. Of persons buying CDs and downloads, the average annual spend was about [REDACTED].⁶⁹ Assuming that every Sirius XM subscriber is the average buyer, the income effect of a 10% increase in sales is less than [REDACTED]. Yet, an average interactive service subscriber pays about [REDACTED] per year in royalties. Plainly, platform substitution is far more relevant to the labels, even under what are likely to be generous assumptions about relative promotion

Likewise, internal record label documents show that platform substitution is a significant concern to record labels, [REDACTED]

⁶² SoundExchange Exhibit 21, Sony, Artist/Manager Education, June 2016; Harrison Testimony, at ¶ 27.

⁶³ *Id.*

⁶⁴ Generally, in a market setting, sellers want the buyers to at pay similar, and in some cases identical, rates regardless if the buyers vary from one another.

⁶⁵ Harrison Testimony, at ¶ 29.

⁶⁶ SoundExchange Exhibit 26, MusicWatch, Annual Music Study 2015, Final Report to RIAA Research Committee, March 2016, at p. 12.

⁶⁷ On Amazon.com, Shawn Mendes' album *Illuminate*, for instance, sells for \$11.99 in CD format and \$10.49 in MP3 format (as of October 2016). See Appendix D.

⁶⁸ D. Rapaport, *How Record Companies Make Money*, TAXI (Viewed October 10, 2016) (available at: <http://www.taxi.com/music-business-faq/music-business/money-record-companies.html>).

⁶⁹ SoundExchange Exhibit 26, MusicWatch, Annual Music Study 2015, Final Report to RIAA Research Committee, March 2016, at p. 13.

⁷⁰ See, e.g., SoundExchange Exhibit 46, Sony Music, MRP Phase II Review; SoundExchange Exhibit 10, Bain & Company, U.S. Music Consumer Insights Discussion, August 27, 2014; SoundExchange Exhibit 11, Warner Music Group, Digital Strategy; SoundExchange Exhibit 7, Warner Music Group, Streaming

[REDACTED]⁷²

Looking again to relative royalties, the average revenue to the record labels from ad-based, non-interactive webcasting is around [REDACTED] per year.⁷³ Much attention is devoted to the promotional differences across interactive and non-interactive services. Considering the difference in royalties, however, exposes the triviality of such disputes. Record labels and artists make vastly *more* money from paid subscription services than from their ad-based competitors – a difference of nearly [REDACTED]-fold. Naturally, record labels now *want* to drive consumers to spend money on paid subscriptions.⁷⁴ (Even Sirius XM pays better on average than ad-based streaming services.) Whatever trivial and unmeasured (and perhaps unmeasurable) differences in promoting sales on a dying platform may exist, such concerns pale in comparison to the income effects of platform substitution. Given attention to the promotion of CDs and downloads and ignoring platform substitution is a bit like fussing over whether the bank robber parked legally or not and ignoring the robbery at gunpoint.

The market behavior of record companies confirms that platform substitution is the primary, if not the only, concern. The practice of “windowing” new releases, for instance, supports this observation. In order to promote paid subscription services, record companies may release music first on subscription interactive services, while withholding it from free on-demand services.⁷⁵ “Windowing” the release in this way is designed to incentivize consumers of music on lower-value platforms to upgrade to a paid subscription service. If record companies saw interactive services as substitutional for sales of permanent copies and saw non-interactive radio-type play as promotion, they would take the opposite approach: they would release new music *first* on non-interactive services and only later on interactive services. I am aware of no data indicating that record companies are reverse windowing in this way.

Overview, Global Digital Summit, January 2015; *see also* SoundExchange Exhibit 12, Universal Music Group, 2015 in Review.

⁷¹ SoundExchange Exhibit 21, Sony, Artist/Manager Education, June 2016, at p. 6.

⁷² SoundExchange Exhibit 26, MusicWatch, Annual Music Study 2015, Final Report to RIAA Research Committee, March 2016, at p. 76.

⁷³ SoundExchange Exhibit 21, Sony, Artist/Manager Education, June 2016, at p. 5.

⁷⁴ *See, e.g.*, SoundExchange Exhibit 21, Sony Music, Artist/Manager Education, June 2016; Harrison Testimony, at ¶ 18.

⁷⁵ *See, e.g.*, SoundExchange Exhibit 21, Sony Music, Artist/Manager Education, June 2016 [REDACTED].

Music delivery platforms and the services within those platforms may complement or substitute for each other in complex ways and to varying degrees. When a record label sits down to negotiate with any given music service, it may rationally assign some weight to the possible promotion of CDs and downloads, but it will be far more concerned about how the service may affect the sales of Apple, Google Play or Spotify, and how the service may redirect listening from no- or low-paying services like YouTube, terrestrial radio, or PSS to higher royalty-paying services. This complex analysis is made even more difficult as a result of statutory licenses, safe harbors, and piracy, factors which the record labels have little to no ability to influence.

VI. Comparing Interactive vs. Non-interactive Services

Sirius XM and Music Choice are “non-interactive” services, whereas potential benchmark services are “interactive.” Thus, these Services are likely to argue that the benchmarking exercise requires a determination of whether interactive streaming services are more or less promotional than non-interactive services with respect to sales of permanent copies. In past rate-setting proceedings, Services have not surprisingly argued that non-interactive services are highly promotional of CDs and downloads and not substitutional, whereas interactive services substitute for permanent copies and are not promotional. As I have already discussed, the question of whether there is a difference between interactive streaming services and non-interactive streaming services in terms of their impact on sales of permanent copies is only one small part of the rate-setting equation. Even on this limited question, there are multiple reasons to question both halves of the Services’ argument.

A. *Interactive and Noninteractive Services as Promotional Tools*

Arguments about relative substitution stem from purported differences in how interactive and non-interactive services are used: Interactive services are typically thought of as “on-demand,” meaning they permit users to listen to what they want to when they want to. Non-interactive services, by contrast, do not permit the user to request a specific song; instead, they typically provide highly curated playlists that facilitate “lean back” listening. But this distinction from a listener’s perspective is not so clear cut.

Interactive services are no longer purely “on demand,” and the rationale for the claim that they therefore are not promotional has been substantially undermined. As discussed in the testimony of Aaron Harrison, on-demand service subscribers often listen to playlists created by the services themselves and other third parties.⁷⁶ Those playlists provide an important way for subscribers to discover new music. For example, Spotify has a “Discover Weekly” playlist that, as the name suggests, is refreshed weekly with thirty new sound recordings that subscribers use as a tool to discover new music. Apple’s on-demand service has similar features. Record companies work with third parties to get their label’s music added to playlists, and record companies create playlists featuring their own music as well. For instance, Sony offers a playlist called Filtr that it makes available on on-demand services.⁷⁷

⁷⁶ Harrison Testimony, at ¶¶ 28, 36-43.

⁷⁷ Notably, the per play rate for music accessed through non-subscriber created playlists is the same as the rate for music accessed any other way. That the rate is constant regardless of how an interactive service user accesses a song suggests that record companies do not see different types of plays as having

As a result, subscribers to on-demand services are not simply requesting sound recordings with which they are already familiar or which they first heard about from other sources. Previously unheard music is recommended to them by on-demand services via playlists, web pages and search features specifically aimed at new music discovery. Once discovered, users of interactive services may add songs to their own playlists, and they can share the playlists with their friends and family—effectively recommending the songs to others. Friends of the first user may, in turn, add the recommended song(s) to their own playlists, potentially piquing the interest of even more users. As this cycle continues, the promotional effect grows. This cycle also creates data that is useful to record companies and even other services looking for popular songs to attract listeners. By tracking the listeners' plays of music on interactive services, companies are able to garner information that they can use to further promote their music.⁷⁸ Even radio stations use trends from streaming services to choose songs for their own rotations.⁷⁹ Interactive services, in short, have become music discovery services, and when subscribers discover new music and add it to their own playlists, they are generating incremental plays for which the record companies are compensated.

On the other hand, satellite radio in some respects lacks the functionality of interactive services from the perspective of promotion. As a purely audio service, Sirius XM lacks the homepage and browse features that interactive services use to foster music discovery. Once new music is discovered on an interactive service, it can easily be added to the subscriber's own playlists, generating more plays and more revenue for the record companies, whereas new music heard on Sirius XM requires that the listener take separate steps off the Sirius XM service in order to acquire the music. In fact, the cost to the consumer of implementing a promotional effect in transactions costs alone are considerably higher for Sirius XM than for interactive services, since doing so requires both the use of a different platform to purchase and a different platform to play a permanent copy.

In any event, third party surveys find that [REDACTED]

different exposure effects. If instead record companies viewed non-subscriber created playlists as promotional of sales in other markets, and on-demand plays as substitutional, one might expect to see a higher royalty rate for on-demand plays and a lower rate for third-party playlist plays. We do not, however, see any such a difference in rates.

⁷⁸ Record companies' strategy decks illustrate this point. See SoundExchange Exhibit 20, Sony, Spotify Path of a Hit [REDACTED]; SoundExchange Exhibit 7, Warner Music Group, Streaming Overview, Global Digital Summit, January 2015 [REDACTED]; SoundExchange Exhibit 6, Warner Music Group, Global Playlist Integration Playlist and Opportunities, January 2015 [REDACTED].

⁷⁹ See, e.g., *For Radio Programmers, Streaming Data is Key Audience Insight*, NIELSEN (February 10, 2016) (available at: <http://www.nielsen.com/us/en/insights/news/2016/for-radio-programmers-streaming-data-is-key-audience-insight.html>).

⁸⁰ SoundExchange Exhibit 22, Edison Research Infinite Dial Survey, March 2016.

[REDACTED] Importantly, music discovery need not lead to more total music purchases, which is only relevant issue for assessing promotional effects for permanent copies.

[REDACTED]⁸²

B. Non-Interactive Services as Substitutes

Available data also undercuts any argument that non-interactive services are not substitutional for sales of CDs and digital downloads. Survey evidence shows that non-interactive services are the principal reason that consumers are buying fewer permanent copies of sound recordings. [REDACTED]

[REDACTED]⁸³ This evidence suggests that non-interactive platforms function as substitutes for the permanent copy platform, at least for many consumers.

What is true for non-interactive services would seem even more true of Sirius XM. A \$15 per month subscription costs \$180 per year, surely taking a significant bite out of the subscribers' music budget. Sirius XM offers upwards of 70 highly specialized, niche music channels that can satiate the subscribers' desire to hear particular types of music for even those with the most narrowly tailored tastes. Survey evidence discussed by Professor Willig reveals that some of Sirius XM's subscribers would purchase *more* CDs and downloads if they no longer subscribed to the service.⁸⁴

Conversely, on-demand service subscribers *do* buy music they heard on line. [REDACTED]

[REDACTED]⁸⁵

Given the evolution of interactive streaming services, it is simply no longer logical to assume that they are less promotional or more substitutional for sales of CDs and downloads compared to Sirius XM, and I have seen no data that suggests any measurable difference between the two.

⁸¹ SoundExchange Exhibit 27, Music Acquisition Monitor, Q2 2015, prepared for RIAA at 57.

⁸² SoundExchange Exhibit 29, [REDACTED].

⁸³ SoundExchange Exhibit 26, MusicWatch, Annual Music Study 2015, Final Report to RIAA Research Committee, March 2016, at p. 29-30.

⁸⁴ See, e.g., Willig Testimony, at ¶ 40-41 (citing Dhar survey).

⁸⁵ SoundExchange Exhibit 25, MusicWatch, Playlisting 2016 at 27-28, 35.

C. *Only Income Effects Matters*

In discussing the survey results and other evidence in the preceding section, I do not mean to suggest that I consider this evidence dispositive on the question. I have not seen evidence that conclusively establishes one way or the other which service platform has a greater positive or negative impact on permanent copies sales. Directionally, the evidence I have seen suggests that there is little difference between the two. My larger point is that cross-platform effects are now more important than the effects on permanent copy sales, and in any event, one must look at the overall income effect on all parties to determine whether the benchmark must be adjusted.

VII. Designated Testimony - Ephemerals


In addition to the testimony above, I understand that SoundExchange is submitting my testimony from the *Webcasting III* proceeding as designated testimony in the current proceeding. That testimony relates to how to value ephemeral copies under Section 112(e) of the Copyright Act. I re-affirm that testimony here, and would be glad to answer any questions the Judges may have about it.

VIII. Summary and Recommendations

Whether or not a promotional effect is relevant to license fee or royalty rate determination does not depend on a particular artist's spin rates and sales of CDs and downloads. The irrelevance of such relationships is not based solely on the fact there is no evidence to support them. Rather, promotional effects only matter to the extent the use of music on one platform affects the income derived by the record label from *all* platforms. Promotion matters only when it increases or reduces the label's income. In the modern music marketplace, music platforms don't promote each other, they substitute for one another. Thus, rather than makes royalty and licensing rates more dissimilar based on stale arguments about dying platforms, these rates should be getting closer and closer over time.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: 10/12/16



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Appendix A

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- "Taxation by Regulation: Spectrum Repurposing at the FCC and the Prolonging of Spectrum Exhaust," with T.R. Beard, L.J. Spiwak, and M. Stern, *Hastings Journal of Law & Technology*, Forthcoming, 2015.
- "Reflecting on Twenty Years Under the Telecommunications Act of 1996," *Federal Communications Law Journal*, Vol. 68, 2016.
- "Lessons Learned from the U.S. Unbundling Experience," with Lawrence J. Spiwak, *Federal Communications Law Journal*, Vol. 68, 2016.
- "Tariffing Internet Termination: Pricing Implications of Classifying Broadband as a Title II Telecommunications Service," with Lawrence J. Spiwak, *Federal Communications Law Journal*, Vol. 67, 2015.
- "Section 10 Forbearance: Asking The Right Questions To Get The Right Answers," with Lawrence J. Spiwak, *CommLaw Conspectus*, Vol. 23, 2014.
- "Market Mechanisms and the Efficient Use and Management of Scarce Spectrum Resources," with T. Randolph Beard, Lawrence J. Spiwak, and Michael Stern, *Federal Communications Law Journal*, Vol. 66, 2014.
- "Market Definition and the Economic Effects of Special Access Price Regulation," with T. Randolph Beard and Lawrence J. Spiwak, *CommLaw Conspectus*, Vol. 22, 2014.
- "Internet Use and Depression among Retired Older Adults in the U.S.: A Longitudinal Analysis," with S. Cotten, S. Ford, and T. Hale, *Journals of Gerontology: Social Sciences*, Vol. 69, 2014.
- "Capital Investment and Employment in the Information Sector," with T. Randolph Beard and H. Kim, *Telecommunications Policy*, Vol. 38, 2014.
- "Secularism, Religion and Political Choice," with R. Ekelund Jr., T. R. Beard, R. Gaskins, and R. Tollison, *Politics & Religion*, Vol. 6, 2013.
- "Theft and Welfare in General Equilibrium: A Theoretical Note," with T. R. Beard, M. Stern, and L. Stern, *Theoretical Economic Letters*, Vol. 2, 2012.
- "Justifying the Ends: Section 706 and the Regulation of Broadband," with L. J. Spiwak, *Journal of Internet Law*, Vol. 16, 2013.
- "Wobbling Back to the Fire: Economic Efficiency and the Creation of a Retail Market for Set-Top Boxes," with T. R. Beard, L. J. Spiwak, and M. Stern, *CommLaw Conspectus*, Vol. 21, 2012.
- "Wireless Competition Under Spectrum Exhaust," with T. R. Beard, L. J. Spiwak, and M. Stern, *Federal Communications Bar Journal*, Vol. 65, 2012.

"Endogenous Sunk Costs, Quality Competition and Welfare," with M. Stern, *Theoretical Economic Letters*, Vol. 1, 2011.

"Internet Use and Job Search," with T. R. Beard, R. Seals, and R. Saba, *Telecommunications Policy*, Vol. 36, 2012.

"Internet Use and Depression Among Older Adults," with S. Cotten, S. Ford, and T. Hale, *Computers in Human Behavior*, Vol. 28, 2012.

"The Economics of Religious Schism and Switching," with T. R. Beard, R. B. Ekelund Jr., and R. D. Tollison (Forthcoming in *Oxford Handbook on the Economics of Religion* 2012).

"Broadband Expectations and the Convergence of Ranks," *Telecommunications Policy*, Vol. 35, 2011.

"The Frontier of Broadband Adoption Across the OECD: A Comparison of Performance," *International Economic Journal*, Vol. 25, 2011.

"The Pricing of Pole Attachments: Implications and Recommendations," with T. R. Beard and L. J. Spiwak, *Review of Network Economics*, Vol. 9, 2010.

"The Broadband Credibility Gap," with L. J. Spiwak and M. L. Stern, *CommLaw Conspectus*, Vol. 75, 2010.

"The Burden of Network Neutrality Mandates on Rural Broadband Deployment," with T. M. Koutsy and L. J. Spiwak, *Journal of Applied Economy*, 2010.

"An Investigation into the Relationship of Retail Gas Prices on Oil Company Profitability," *Applied Economics*, Vol. 43, 2011.

"The Need for Better Analysis of High Capacity Services," with L. J. Spiwak. *John Marshall Journal of Computer & Information Law*, Vol. 28, 2010.

"Tort Liability for Software Developers: A Law & Economics Perspective," with T. R. Beard, T. M. Koutsy and L. J. Spiwak, *John Marshall Journal of Computer & Information Law*, XXVII, 2010.

"Quantifying the Cost of Substandard Patents: Some Preliminary Evidence," with T. R. Beard, T. M. Koutsy and L. J. Spiwak, *Yale Journal on Law and Technology*, Vol. 12, 2010.

"The Broadband Adoption Index: Improving Measurements and Comparisons of Broadband Deployment and Adoption," with T. R. Beard, L. J. Spiwak, and M. L. Stern, *Federal Communications Bar Journal*, Vol. 62, 2010.

- "A Valley of Death in the Innovation Sequence," with T. R. Beard, T. M. Koustky, and L. J. Spiwak, *Research Evaluation*, Vol. 18, 2009.
- "A Policy and Economic Exploration of Wireless Carterfone Regulation," with T. M. Koutsy, and L. J. Spiwak, *Santa Clara Computer & High Technology Law Journal*, Vol. 25, 2009.
- "HAC Standard Errors and the Event Study Methodology: A Cautionary Note," with J. Jackson. *Applied Economics Letters*, Vol. 16, 2009.
- "Sample Size and the Accuracy of the Generalized Lambda Distribution," with S. Skinner. *Communications in Statistics - Simulation and Computation*, Vol. 38, 2009.
- "Network Neutrality and Foreclosing Market Exchange," with T. R. Beard, T. M. Koutsy, and L. J. Spiwak. *International Journal of Management and Network Economics*, Vol. 1, 2009.
- "Developing a National Wireless Regulatory Framework: A Law and Economics Approach," with T. R. Beard, T. M. Koutsy, and L. J. Spiwak. *CommLaw Conspectus*, Vol. 16, 2008.
- "Constituency Size and the Growth of Public Expenditures: The Case of the United Kingdom," with M. Thornton and M. Ulrich. *Journal of Public Choice and Finance*, Vol. 24, 2006 (published in 2008).
- "The Competitive Effects of Quantity Discounts," with T. R. Beard and D. L. Kaserman. *Antitrust Bulletin*, Vol. 52, 2007.
- "Network Neutrality and Industry Structure," with T. R. Beard, Thomas M. Koutsy and Lawrence J. Spiwak. *Hastings Communications and Entertainment (Comm/Ent) Law Journal*, Vol. 29, 2007.
- "A La Carte and 'Family Tiers' as a Response to a Market Defect in the Multichannel Video Programming Market," with T. R. Beard and Thomas M. Koutsy. *CommLaw Conspectus*, Vol. 15, 2006.
- "The Impact of Video Service Regulation on the Construction of Broadband Networks to Low-Income Households," with Thomas M. Koutsy and Lawrence J. Spiwak. *I/S: A Journal of Law and Policy for the Information Society*, Vol. 3, 2007.
- "Competition After Unbundling: Entry, Industry Structure and Convergence," with Thomas M. Koutsy and Lawrence J. Spiwak. *The Federal Communications Law Journal*, Vol. 59, 2007.
- "Does Municipal Supply of Communications Crowd-Out Private Communications Investment? An Empirical Study," *Energy Economics*, Vol. 29, 2007.

"Broadband and Economic Development: A Municipal Case Study from Florida," with T. M. Koutsky. *Review of Urban and Regional Development Studies*, Vol. 17, 2006.

"The Economics of Build-out Rules in Cable Television," with T. M. Koutsky and L. W. Spiwak. *Hastings Communications and Entertainment (Comm/Ent) Law Journal*, Vol. 28, 2006.

"Issues in Empirical Merger Analysis," with T. Randolph Beard
Introductory article by the Guest Editors in a Special Issue of the
International Journal of the Economics of Business, Vol. 13, 2006.

"Empirical Simulation of Mergers: The Cingular and AT&T Wireless Merger," with T. Randolph Beard and Richard P. Saba. *International Journal of the Economics of Business*, Vol. 13, 2006.

"Event Studies for Merger Analysis: An Evaluation of the Effects of Non-Normality on Hypothesis Testing," with Audrey D. Kline. In *Antitrust Policy Issues*, Nova Publishers, 2006.

"Are Unbundled and Self-Supplied Telecommunications Switching Substitutes? An Empirical Study," with T. Randolph Beard. *International Journal of the Economics of Business*, Vol. 12, 2005.

"Misleading Inferences from Panel Unit-Root Tests: A Comment," with John Jackson and Audrey Kline. *Review of International Economics*, Vol. 14, 2006.

"Splitting the Baby: An Empirical Test of Rules of Thumb in Regulatory Price Setting," with T. Randolph Beard. *Kyklos*, Vol. 58, 2005.

"Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition," with T. Randolph Beard and Thomas W. Koutsky. *Quarterly Review of Economics and Finance*, Vol. 45, 2005.
Presented at *The Drivers and Significance of Local Telecommunications Competition*, United States Department of Justice, July 23, 2002 as
"Facilities-based Entry in Local Telecommunications: An Empirical Investigation").

"On the Relationship between Telecommunications Investment and Economic Growth: Three Empirical Studies," with R. Beil and J. Jackson. In *Economic Growth Issues*, Nova Publishers, 2005.

"On the Relationship between Telecommunications Investment and Economic Growth in the United States," with R. Beil and J. Jackson. *International Economic Journal*, Vol. 19, 2005.

"Access Charge Reductions and Long Distance Rates: A Bootstrap Analysis," with T. Randolph Beard, R. Carter Hill, and Richard P. Saba. *Empirical Economics*, Vol. 30, 2005.

"Fragmented Duopoly: A Conceptual and Empirical Investigation," with T. Randolph Beard, R. Carter Hill, and R. Saba. *Journal of Business*, Vol. 78, 2005.

"Competition and Investment in Telecommunications," with John D. Jackson. *Atlantic Economic Journal*, Vol. 32, 2004.

"Pursuing Competition in Local Telephony: The Law and Economics of Unbundling and Impairment," with T. R. Beard and R. B. Ekelund Jr., *Journal of Law, Technology and Policy*, Vol. 2003, Fall 2003.

The Financial Implications of the UNE-Platform: A Review of the Evidence," with T. Randolph Beard and Christopher C. Klein *CommLaw Conspectus: Journal of Communications Law and Policy*, Vol. 12, 2004. Also published in the handbook for the 21st Annual Institute on *Telecommunications Policy & Regulation*, Practising Law Institute, New York, 2003.

"Innovation, Investment, and Unbundling: An Empirical Update," with Robert B. Ekelund Jr., *Yale Journal on Regulation*, Vol. 20, 2003.

"Discrimination and Minority Ownership in Radio Broadcasting," with Audrey B. Davidson and Barry Hayworth, *International Journal of the Economics of Business*, Vol. 10, 2003.

"Preliminary Evidence on the Demand for Unbundled Elements in Telephony," with Robert B. Ekelund, Jr., *Atlantic Economic Journal*, Vol. 30, 2002.

"Demand Elasticities for International Message Telephone Service," with John D. Jackson, *Applied Economics*, Vol. 36, 2004.

"Competition and Market Structure in Local Exchange and Long Distance Telecommunications Markets," with T. Randolph Beard. *International Handbook on Telecommunications Economics*, Vol. I, Ch. 6, Gary Madden ed., Edward Elgar: 2002.

"Why Adco? Why Now? An Economic Exploration into the Future of Industry Structure in Local Telecommunications Markets," with T. Randolph Beard and Lawrence Spiwak. *Federal Communications Law Journal*, Vol. 54, 2002.

"Price, Quality, and Consumer Welfare in the Cable Television Industry," with T. Randolph Beard, Robert B. Ekelund, Jr., and Richard P. Saba. *Journal of Regulatory Economics*, Vol. 20, 2001

"The Fallacy of Regulatory Symmetry: An Economic Analysis of the "Level Playing Field" in Cable TV Franchising Statutes," with Thomas W. Hazlett. *Business & Politics*, Vol. 3, 2001.

"The Measurement of Merger Delay in Regulated and Restructuring Industries," with Robert B. Ekelund Jr. and Mark Thornton. *Applied Economics Letters*, Vol. 8, 2001.

"Changing Industry Structure: The Economics of Entry and Price Competition" with Jerry B. Duvall. *Telecommunications and Space Journal*, Vol. 7, 2000.

"Market Power in Radio Markets: An Empirical Analysis of Local and National Concentration," with Robert B. Ekelund, Jr. and Thomas Koutsy. *Journal of Law and Economics*, Vol. XLIII, 2000.

"TV Advertising, Local Markets and Merger Guidelines: An Empirical Study," with Robert B. Ekelund, Jr. and John D. Jackson. *International Journal of the Economics of Business*, Vol. 7, 2000.

"Preserving Free Television? Some Empirical Evidence on the Efficacy of Must Carry," with John D. Jackson. *Journal of Media Economics*, Vol. 13, 2000.

"Is Radio Advertising a Distinct Local Market: An Empirical Analysis," with R. B. Ekelund, Jr. and John D. Jackson. *Review of Industrial Organization*, Vol. 14, 1999.

"On the Interpretation of Policy Effects from the Estimates of Simultaneous Systems of Equations," with John D. Jackson. *Applied Economics*, Vol. 30, 1998.

"Information Costs and Nirvana Revisited: Edwin Chadwick on Nineteenth Century Urban Funeral Markets," with Robert B. Ekelund, Jr. *Journal of Regulatory Economics*, Vol. 12, 1997. Reprinted in the *The Foundations of Regulatory Economics*, Ed. R. B. Ekelund, Jr., Edward Elgar Publishing.

"Horizontal Concentration and Vertical Integration in the Cable Television Industry" with John D. Jackson. *Review of Industrial Organization*, Vol. 12, 1997.

EXAMPLES OF LITIGATION, REGULATORY DOCUMENTS, TESTIMONY:

"The Impact of Government-Owned Broadband Networks on Private Investment and Consumer Welfare," written for the State Government Leadership Foundation (April 6, 2016).

Alabama Attorney General, Consumer Advocate Office (Rate Proceeding before the Alabama Public Service Commission, Summer 2013).

Testimony of Phoenix Center Chief Economist Dr. George S. Ford before the United States Senate Committee on Commerce, Science and Transportation - Subcommittee on Communications, Technology, and the Internet, Hearing on the "State of Wireless Communications" (June 4, 2013).

Testimony of Phoenix Center Chief Economist Dr. George S. Ford before the United States the House of Representatives Committee on Energy and Commerce Subcommittee Communications and Technology, Hearing on "Health Information Technologies: Harnessing Wireless Innovation" (March 19, 2013).

A Legal and Economic Review of the U.S. Unbundling Experience, Prepared for USAID under contract No. EEM-I-00-07-00009-00; Order No. AID-527-TO-10-00002, for the Peru Andean Trade Capacity Building (PATCB) (May 2012). Presentation of the Report to OSIPTEL in Lima, Peru, in a two-day seminar in October 2012.

Testimony on Copyright Royalties (Proceeding in 2012, Canada): Client: Re:Sound.

Testimony on Webcasting Copyright Royalties (Multiple proceedings in years 2009-12): Client: Soundexchange, Inc.

Testimony on Cable Retransmission Copyright Royalties 2004-2005 (Proceeding in years 2009-10), Client: Motion Picture Association of America.

National Telecommunications and Information Administration: Broadband Data Transparency Workshop, U.S. Department of Commerce, National Telecommunications and Information Administration, Herbert C. Hoover Building, Washington, DC (October 30, 2009).

Business News Network's Market Morning Talk Time: How Much Americans and Canadians Really Pay for Cell Phone Use, Television Appearance, (September 18, 2009).

Federal Communications Commission Workshop: Deployment Unserved/Underserved, Federal Communications Commission, Washington, DC (August 12, 2009).

OECD Expert Workshop on Measuring Mobile/Wireless Service Data, Evaluating Broadband Adoption, Lisbon, Portugal (February 19-20, 2009).

Autoridade Nacional de Comunicações (ANACOM), Agência Nacional de Telecomunicações (ANATEL) (Broadband Adoption Project, 2009).

17th ANACOM Seminar, Study and Presentation, The Broadband Efficiency Index: What Really Drives Broadband Adoption Across the OECD (September 25, 2009).

Developing a "National Broadband Strategy" - Understanding the OECD Rankings and the Drivers of Broadband Adoption. Presentation at the U.S. Congress Rayburn House Office Building (July 28, 2008).

Testimony Before the Federal Communications Commission's Open Meeting on Network Neutrality and Broadband Network Management, Stanford University (April 17, 2008).

A Valley of Death in the Innovation Sequence: An Economic Investigation, United States Department of Commerce, Technology Administration (September 2007).

Testimony Before the House Committee on Commerce and Energy - Subcommittee on Telecommunications and the Internet Hearing on "Digital Future of the United States: Part IV: Broadband Lessons from Abroad" (April 24, 2007).

Testimony Before the House Committee on Commerce and Energy - Subcommittee on Telecommunications: A Discussion Draft Addressing Broadband Mapping and Data Collection (May 17, 2007).

Capitol Hill Inter-Active Workshop: Sound Internet Policy for the 21st Century: Understanding the Economic Fundamentals (Feb. 2007).

Broadband Connectivity Competition Policy, Federal Trade Commission (Feb. 2007).

3rd Annual State of the Net Conference 2007, Advisory Committee to the Congressional Internet Caucus (Jan. 2007).

Carter Estate v. CSXT, Louisville, Kentucky (2006).

Ken Hecht v. Comcast of Indiana, Inc., et al, Indianapolis, Indiana (2005/6).

"Crummy Duopoly" or Vigorous Inter-Modal Competition? The Impact of Cable Franchise Requirements on New Fiber Builds. Phoenix Center Congressional Briefing (July 21, 2005).

Florida Bill HB 1325 and SB 1322 (Municipal Broadband). Testimony before numerous Committees of the Florida House of Representatives (Spring 2005).

Z-Tel Communications, Inc. v. SBC Communications, Inc., Texarkana, Texas (2003).

A Response to Olbeter and Robinson's 'Breaking the Backbone', released by MCI Worldcom (August 1999).

An Economic Analysis of the FCC's Notice of Inquiry on Flat Rate Charges in the Long Distance Industry, filed in CC Docket No. 99-249 (September 1999).

Further Thoughts on Payphone Compensation, filed in CC Docket No. 96-128 (November 1998).

Effective Enforcement of Non-Discriminatory Performance by Incumbent Local Exchange Carriers, with John D. Jackson (filed with New York Public Service Commission, October 1999).

A Review of the Texas Performance Plan, with John D. Jackson filed with the Federal Communications Commission (2000).

Investigation into Pricing of Unbundled Network Elements, Testimony filed before the State of Florida Public Service Commission, Docket No. 990649-TP (2000).

Investigation into Pricing of Unbundled Network Elements, Testimony filed before the State of Florida Public Service Commission, Docket No. 990649-TP (2000).

Investigation into Pricing of Unbundled Network Elements, Testimony filed before the State of New York Public Service Commission, Docket No. 98-C-1357 (2000).

In the Matter of US West Communications, Inc.'s Compliance with Sec 271 of the Telecommunications Act of 1996, Statement before the Arizona Corporation Commission, Docket No. T-00000B-97-0238 (2000).

Performance Measurements for Telecommunications Interconnection, Unbundling and Resale, Testimony before the Georgia Public Service Commission, Docket No. 7892-U (2000).

Investigation and Generic Proceeding on Ameritech Indiana's rates for Interconnection, Service, Unbundled Elements, and Transport and Termination, Declaration and Reply before the Indiana Public Service Commission, Cause No. 40611 (2000 2000).

Inquiry by the Department of Telecommunications and Energy Pursuant to Section 271 of the Telecommunications Act of 1996, Comments filed before the Massachusetts Department of Telecommunications and Energy, Docket No. DTE 99-271 (2000).

Commission Review of Various Submissions of Ameritech Indiana to Show Compliance with Section 271(C) of the Telecommunications Act of 1996, Multiple filings before the Indiana Utility Regulatory Commission (2000).

In the Matter of US West Communications, Inc.'s, Compliance with §271 of the Telecommunications Act of 1996, Comments and studies filed before the Arizona Corporation Commission (2000).

In the Matter of Investigation into US West Communications, Inc.'s Compliance with Certain Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts, Docket No.T-00000A-00-0194 (2001).

In the Matter of the Commission Investigation and Generic Proceeding on Ameritech Indiana's Rates for Interconnection, Service, Unbundled Elements, and Transport and Termination Under the Telecommunications Act of 1996 and Related Indiana Statutes, Cause No. 40611-S1 (2001).

In the Matter of the Petition of Indiana Bell Telephone Company, Incorporated d/b/a Ameritech Indiana Pursuant to I.C. 8-1-2-61 For a Three Phase Process For Commission Review of Various Submissions of Ameritech Indiana to Show Compliance with Section 271(c) of The Telecommunications Act of 1996, Cause No. 41657 (2001).

Application by Bell Atlantic New York for Authorization Under Section 271 of the Communications Act To Provide In-Region, InterLATA Service in the State of New York, Federal Communications Commission, CC Docket No. 99-295 (1999).

Application by SBC Communications Inc., Southwestern Bell Telephone Company, And Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance Pursuant to Section 271 of the Telecommunications Act of 1996 To Provide In-Region, InterLATA Services In Texas, Federal Communications Commission, CC Docket No. 00-65 (2000)

Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma, Federal Communications Commission, CC Docket No. 00-217 (2000/2001).

Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance Pursuant to Section 271 of the Telecommunications Act of 1996 To Provide In-Region, InterLATA Services in Arkansas and Missouri, Federal Communications Commission, CC Docket No. 01-194 (2001).

Joint Application by BellSouth Corporation, BellSouth Telecommunications, Inc., And BellSouth Long Distance, Inc for Provision of In-Region, InterLATA Services In Georgia and Louisiana, Federal Communications Commission, CC Docket No. 02-35 (2002).

Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Federal Communications Commission, CC Docket No. 01-338 (2003).

In Through the Back Door: Embedded Cost and the FLC, Working Paper (June 2002).

How Many Days in a Year? Creative Cost Modeling and the Cost to Competition, Working Paper (June 2002).

A Fox in the Hen House: An Evaluation of Bell Company Proposals to Eliminate Their Monopoly Positions in Local Telecommunications, Working Paper, June 2002.

PHOENIX CENTER WORKS (Author/Co-Author):

Policy Papers

"Eroding the Rule of Law: Regulation as Cooperative Bargaining at the FCC," PHOENIX CENTER POLICY PAPER No. 49 (October 2015).

"The Price Effects of Intra-Brand Competition in the Automobile Industry: An Econometric Analysis," PHOENIX CENTER POLICY PAPER No. 48 (March 2015).

"An Economic Framework for Retransmission Consent," PHOENIX CENTER POLICY PAPER No. 47 (December 2013).

"Market Mechanisms and the Efficient Use and Management of Scarce Spectrum Resources," PHOENIX CENTER POLICY PAPER No. 46 (December 2013).

"Lessons Learned from the U.S. Unbundling Experience," PHOENIX CENTER POLICY PAPER No. 45 (June 2013).

"Taxation by Condition: Spectrum Repurposing at the FCC and the Prolonging of Spectrum Exhaust," PHOENIX CENTER POLICY PAPER No. 44 (September 2012).

"Wireless Competition Under Spectrum Exhaust," PHOENIX CENTER POLICY PAPER No. 43 (February 2012).

"A Policy Framework for Spectrum Allocation in Mobile Communications," PHOENIX CENTER POLICY PAPER No. 42 (March 2011).

Wobbling Back to the Fire: Economic Efficiency and the Creation of a Retail Market for Set-Top Boxes,” PHOENIX CENTER POLICY PAPER No. 41 (December 2010).

“The Broadband Credibility Gap,” PHOENIX CENTER POLICY PAPER No. 40 (June 2010).

“Internet Use and Job Search,” PHOENIX CENTER POLICY PAPER No. 39 (January 2010).

“Internet Use and Depression Among the Elderly,” PHOENIX CENTER POLICY PAPER No. 38 (October 2009).

“Market Definition and the Economic Effects of Special Access Price Regulation,” PHOENIX CENTER POLICY PAPER No. 37 (October 2009).

“The Broadband Adoption Index: Improving Measurements and Comparisons of Broadband Deployment and Adoption,” PHOENIX CENTER POLICY PAPER No. 36 (July 2009).

“The Need for Better Analysis of High Capacity Services,” PHOENIX CENTER POLICY PAPER No. 35 (June 2009).

“The Pricing of Pole Attachments: Implications and Recommendations,” PHOENIX CENTER POLICY PAPER No. 34 (December 2008).

“The Broadband Efficiency Index: What Really Drives Broadband Adoption Across the OECD?,” PHOENIX CENTER POLICY PAPER No. 33 (May 2008).

“The Welfare Impacts of Broadband Network Management: Can Broadband Service Providers Be Trusted?” PHOENIX CENTER POLICY PAPER No. 32 (March 2008).

“The Demographic and Economic Drivers of Broadband Adoption in the United States,” PHOENIX CENTER POLICY PAPER No. 31 (November 2007).

“Quantifying the Cost of Substandard Patents: Some Preliminary Evidence,” PHOENIX CENTER POLICY PAPER No. 30 (September 2007).

“The Broadband Performance Index: A Policy-Relevant Method of Comparing Broadband Adoption Among Countries,” PHOENIX CENTER POLICY PAPER No. 29 (July 2007).

“Network Neutrality and Foreclosing Market Exchange: A Transaction Cost Analysis,” PHOENIX CENTER POLICY PAPER No. 28 (March 2007).

"Tort Liability for Software Developers: A Law & Economics Perspective," PHOENIX CENTER POLICY PAPER No. 27 (January 2007).

"An Investigation into the Influence of Retail Gas Prices on Oil Company Profits," PHOENIX CENTER POLICY PAPER No. 26 (August 2006).

"The Burden of Network Neutrality Mandates on Rural Broadband Deployment," PHOENIX CENTER POLICY PAPER No. 25 (July 2006).

"Network Neutrality and Industry Structure," PHOENIX CENTER POLICY PAPER No. 24 (April 2006).

"The Impact of Video Service Regulation on the Construction of Broadband Networks to Low-Income Households," PHOENIX CENTER POLICY PAPER No. 23 (September 2005).

"The Consumer Welfare Cost of Cable "Build-out" Rules," PHOENIX CENTER POLICY PAPER No. 22 (July 2005).

"Competition After Unbundling: Entry, Industry Structure and Convergence," PHOENIX CENTER POLICY PAPER No. 21 (July 2005).

"Quantity-Discount Contracts as a Barrier to Entry," PHOENIX CENTER POLICY PAPER No. 20 (November 2004).

"The Positive Effects of Unbundling on Broadband Deployment," PHOENIX CENTER POLICY PAPER No. 19 (September 2004).

"Set It and Forget It? The Consequences of Market Power and Deregulation in Telecommunications Markets Services," PHOENIX CENTER POLICY PAPER No. 18 (June 2003).

"What Determines Wholesale Prices for Network Elements in Telephony? An Econometric Evaluation," PHOENIX CENTER POLICY PAPER NO. 16 (September 2002).

"A Fox in the Hen House: An Evaluation of Bell Company Proposals to Eliminate their Monopoly Position in Local Telecommunications Markets," PHOENIX CENTER POLICY PAPER No. 15 (September 2002).

"Make or Buy? Unbundled Elements as Substitutes for Competitive Facilities in the Local Exchange Network," PHOENIX CENTER POLICY PAPER No. 14 (September 2002).

"Why Adco? Why Now? An Economic Exploration into the Future of Industry Structure in Local Telecommunications Markets," PHOENIX CENTER POLICY PAPER No. 12 (November 2001).

"An Economic Analysis of the FCC's Notice of Inquiry on Flat Rate Charges in the Long Distance Industry," PHOENIX CENTER POLICY PAPER No. 11 (May 2001).

"Changing Industry Structure: The Economics of Entry and Price Competition" PHOENIX CENTER POLICY PAPER No. 10 (April 2001).

"Flow Through and Competition in the International Message Telephone Service Market," PHOENIX CENTER POLICY PAPER No. 7 (September 2000).

Policy Bulletins

"Section 10 Forbearance: Asking the Right Questions to Get the Right Answers," PHOENIX CENTER POLICY BULLETIN No. 37 (November 2014).

"Tariffing Internet Termination: Pricing Implications of Classifying Broadband as a Title II Telecommunications Service," PHOENIX CENTER POLICY BULLETIN No. 36 (September 2014).

"Will Bidder Exclusion Rules Lead to Higher Auction Revenue? A Review of the Evidence," PHOENIX CENTER POLICY BULLETIN No. 34 (April 2014).

"Equalizing Competition Among Competitors: A Review of the DOJ's Spectrum Screen Ex Parte Filing," PHOENIX CENTER POLICY BULLETIN No. 33 (May 2013).

"Social Well-Being and IP Theft: A Dynamic Economic Analysis," PHOENIX CENTER POLICY BULLETIN No. 32 (March 2012).

"Can Government Spending Get America Working Again? An Empirical Investigation," PHOENIX CENTER POLICY BULLETIN No. 31 (November 2011).

"Shocks to the Broadband Ecosystem: Implications for Competition and Market Structure," PHOENIX CENTER POLICY BULLETIN No. 30 (September 2011).

"Ending the Section 629 Problem: A Law and Economics Argument," PHOENIX CENTER POLICY BULLETIN No. 29 (June 2011).

"Regulatory Expenditures, Economic Growth and Jobs: An Empirical Study," PHOENIX CENTER POLICY BULLETIN No. 28 (April 2011).

"Challenges in Using the National Broadband Map's Data, PHOENIX CENTER POLICY BULLETIN No. 27 (March 2011).

“Public Safety or Commercial Use? A Cost/Benefit Framework for the D Block,” PHOENIX CENTER POLICY BULLETIN No. 26 (March 2011).

“Jobs, Jobs, Jobs: Communications Policy and Employment Effects in the Information Sector,” PHOENIX CENTER POLICY BULLETIN No. 25 (October 2010).

“Evaluating Broadband Stimulus and the National Broadband Plan: Establishing Expectations for Broadband Rankings,” PHOENIX CENTER POLICY BULLETIN No. 24 (March 2010).

“Expanding the Digital Divide: Network Management Regulations and the Size of Providers,” PHOENIX CENTER POLICY BULLETIN No. 23 (October 2009).

“Do High Call Termination Rates Deter Broadband Deployment?,” PHOENIX CENTER POLICY BULLETIN No. 22 (October 2008).

“Consumers and Wireless Carterfone: An Economic Perspective,” PHOENIX CENTER POLICY BULLETIN No. 21 (September 2008).

“Using Auction Results to Forecast the Impact of Wireless Carterfone Regulation on Wireless Networks,” PHOENIX CENTER POLICY BULLETIN No. 20 (May 2008).

“An Economic Approach to Evaluating a National Wireless Regulatory Framework,” PHOENIX CENTER POLICY BULLETIN No. 19 (October 2007).

“Wireless Net Neutrality: From Carterfone to Cable Boxes,” PHOENIX CENTER POLICY BULLETIN No. 17 (April 2007).

“The Efficiency Risk of Network Neutrality Rules,” PHOENIX CENTER POLICY BULLETIN No. 16 (May 2006).

“Unnecessary Regulations and the Value of Spectrum: An Economic Evaluation of Lease Term Limits for the Educational Broadband Service,” PHOENIX CENTER POLICY BULLETIN No. 15 (February 2006).

“A La Carte and ‘Family Tiers’ as a Response to a Market Defect in the Multichannel Video Programming Market,” PHOENIX CENTER POLICY BULLETIN No. 14 (February 2006).

“In Delay There Is No Plenty: The Consumer Welfare Cost of Franchise Reform Delay,” PHOENIX CENTER POLICY BULLETIN No. 13 (January 2006).

“Franchise Fee Revenues After Video Competition: The ‘Competition Dividend’ for Local Governments,” PHOENIX CENTER POLICY BULLETIN No. 12 (November 2005).

“Higher Prices Expected from the Cingular/ AT&T Wireless Merger,” PHOENIX CENTER POLICY BULLETIN No. 11 (May 26, 2004).

“Fixed-Mobile “Intermodal” Competition in Telecommunications: Fact or Fiction?” PHOENIX CENTER POLICY BULLETIN No. 10 (March 30, 2004).

“Federalism in Telecommunications Regulation: Effectiveness and Accuracy of State Commission Implementation of TELRIC in Local Telecoms Markets,” PHOENIX CENTER POLICY BULLETIN No. 9 (March 9, 2004).

“The \$10 Billion Benefit of Unbundling: Consumer Surplus Gains from Competitive Pricing Innovations,” PHOENIX CENTER POLICY BULLETIN No. 8 (January 27, 2004).

“The Positive Effects of Competition on Employment in the Telecommunications Industry,” PHOENIX CENTER POLICY BULLETIN No. 7 (October 15, 2003).

“UNE-P Drives Bell Investment - A Synthesis Model,” PHOENIX CENTER POLICY BULLETIN No. 6 (September 17, 2003).

“Competition and Bell Company Investment in Telecommunications Plant: The Effects of UNE-P,” PHOENIX CENTER POLICY BULLETIN No. 5 (Originally released July 9, 2003 and updated September 17, 2003).

“The Truth About Telecommunications Investment after the Telecommunications Act of 1996,” PHOENIX CENTER POLICY BULLETIN No. 4 (June 24, 2003).

Policy Perspectives

“Proper Incentives? The Economics of Spam Management by the Mobile Wireless Industry,” PHOENIX CENTER POLICY PERSPECTIVE No. 16-05 (May 4, 2016).

“Cost or Benefit? A Review of the Consumer Federation of America’s Report on Regulating Special Access Services,” PHOENIX CENTER POLICY PERSPECTIVE No. 16-04 (April 18, 2016).

“Are Government-Owned Networks Abusing Market Power in the Set-Top Box Market? A Review of Rates,” PHOENIX CENTER POLICY PERSPECTIVE No. 16-03 (April 14, 2016).

“The Road to Nowhere: Regulatory Implications of the FCC’s Special Access Data Request,” PHOENIX CENTER POLICY PERSPECTIVE No. 16-02 (February 23, 2016).

"The Economic Impact of Expanding Fair Use in Singapore: More Junk Science for Copyright Reform," PHOENIX CENTER POLICY PERSPECTIVE No. 16-01 (February 16, 2016).

"Ugly is Only Skin Deep: An Analysis of the DE Program in Auction 97," PHOENIX CENTER POLICY PERSPECTIVE No. 15-04 (July 20, 2015).

"The Lisbon Council's 2015 Intellectual Property and Economic Growth Index: A Showcase of Methodological Blunder," PHOENIX CENTER POLICY PERSPECTIVE No. 15-03 (June 29, 2015).

"Auction 97 and the Value of Spectrum," PHOENIX CENTER POLICY PERSPECTIVE No. 15-02 (February 4, 2015).

"Why Chattanooga is not the "Poster Child" for Municipal Broadband," PHOENIX CENTER POLICY PERSPECTIVE No. 15-01 (January 20, 2015).

"Movie Leaks, Box Office Success and Child's Play: Using an On-Line Game is No Way to Quantify the Effects of Piracy," PHOENIX CENTER POLICY PERSPECTIVE No. 14-07 (October 28, 2014).

"Have We Got it All Wrong? Forecasting Mobile Data Use and Spectrum Exhaust," PHOENIX CENTER POLICY PERSPECTIVE No. 14-06 (October 21, 2014).

"The Unpredictable FCC: Politicizing Communications Policy and its Threat to Broadband Investment," PHOENIX CENTER POLICY PERSPECTIVE No. 14-05 (October 14, 2014).

"Free Markets, Monopolies, and Copyright," PHOENIX CENTER POLICY PERSPECTIVE No. 14-04 (June 25, 2014).

"Should the Internet Tax Moratorium be Made Permanent?" PHOENIX CENTER POLICY PERSPECTIVE No. 14-03 (June 2, 2014).

"What is the Effect of File Sharing on the Creation of New Music? A Critical Review of *A Case Study of File Sharing and Music Output*," PHOENIX CENTER POLICY PERSPECTIVE No. 14-02 (March 6, 2014).

"Do Municipal Networks Offer More Attractive Service Offerings than Private Sector Providers? A Review and Expansion of the Evidence," PHOENIX CENTER POLICY PERSPECTIVE No. 14-01 (January 27, 2014).

"Piracy and Movie Revenues: A Critical Review of "A Tale of the Long Tail," PHOENIX CENTER POLICY PERSPECTIVE No. 13-05 (September 16, 2013).

"The Economics of Bidder Exclusion Rules: A Response to Dr. Baker," PHOENIX CENTER POLICY PERSPECTIVE No. 13-04 (July 18, 2013).

"Will Bidder Exclusions Increase Auction Revenue? A Review of the Arguments," PHOENIX CENTER POLICY PERSPECTIVE No. 13-03 (June 11, 2013).

"Revisiting Internet Use and Depression Among the Elderly," PHOENIX CENTER POLICY PERSPECTIVE No. 13-02 (June 7, 2013).

"Searching for a New Regulatory Paradigm: A Comment on AT&T's Petition for Wire Center Trials," PHOENIX CENTER POLICY PERSPECTIVE No. 13-01 (February 25, 2013).

"What is the Effect of Regulation on Broadband Investment? Regulatory Certainty and the Expectation of Returns," PHOENIX CENTER POLICY PERSPECTIVE No. 12-05 (September 19, 2012).

"Justifying the Ends: Section 706 and the Regulation of Broadband," PHOENIX CENTER POLICY PERSPECTIVE No. 12-04 (August 13, 2012).

"Approximating the Distribution of Broadband Usage from Publicly-Available Data," PHOENIX CENTER POLICY PERSPECTIVE No. 12-03 (May 31, 2012).

"A Most Egregious Act? The Impact on Consumers of Usage-Based Pricing," PHOENIX CENTER POLICY PERSPECTIVE No. 12-02 (May 23, 2012).

"Regulatory Expenditures, Economic Growth and Jobs: A Reply to Comments," PHOENIX CENTER POLICY PERSPECTIVE No. 12-01 (April 24, 2012).

"On the Road to More Efficient Pricing of Telecommunications Services: A Look at the Evidence," PHOENIX CENTER POLICY PERSPECTIVE No. 11-06 (October 5, 2011).

"What is the Effect of Regulation on Broadband Investment? Regulatory Certainty and the Expectation of Returns," PHOENIX CENTER POLICY PERSPECTIVE No. 12-05 (September 19, 2011).

"Mobile Broadband and Job Search: An Empirical Test," PHOENIX CENTER POLICY PERSPECTIVE No. 11-05 (September 6, 2011).

"Internet Use and Labor Market Participation: Additional Insights from New and Old Data," PHOENIX CENTER POLICY PERSPECTIVE No. 11-04 (August 18, 2011).

"Justifying the Ends: Section 706 and the Regulation of Broadband," PHOENIX CENTER POLICY PERSPECTIVE No. 12-04 (August 13, 2011).

"Re-Auction of the D Block: A Review of the Arguments," PHOENIX CENTER POLICY PERSPECTIVE No. 11-03 (May 24, 2011).

“Wireless Mergers and Employment: A Look at the Evidence,”
PHOENIX CENTER PERSPECTIVE No. 11-02 (May 10, 2011).

“The Impossible Dream: Forbearance After the Phoenix Order,”
PHOENIX CENTER PERSPECTIVE No. 10-08 (December 2010).

“Endogenous Sunk Costs, Quality Competition and Welfare: A Technical
Note,” PHOENIX CENTER PERSPECTIVE No. 10-07 (December 2010).

“Be Careful What You Ask For (Redux): A Comment on the New
America Foundation’s Mobile Price Metrics,” PHOENIX CENTER
PERSPECTIVE No. 10-06 (November 2010).

“Fabricating a Broadband Crisis? More Evidence on the Misleading
Inferences from OECD Rankings,” PHOENIX CENTER PERSPECTIVE
No. 10-05 (July 2010).

“Substantial Profits in the Broadband Ecosystem: A Look at the
Evidence,” PHOENIX CENTER PERSPECTIVE No 10-04 (April 2010).

“Non-Discrimination or Just Non-Sense: A Law and Economics Review
of the FCC’s New Net Neutrality Principle,” PHOENIX CENTER
PERSPECTIVE No. 10-03 (March 2010).

“Sabotaging Content Competition: Do Proposed Net Neutrality
Regulations Promote Exclusion?” PHOENIX CENTER PERSPECTIVE No.
10-02 (March 2010).

“Internet Use and Job Search: More Evidence,” PHOENIX CENTER
PERSPECTIVES No. 10-01 (January 2010).

“Internet Use and Job Search: More Evidence,” PHOENIX CENTER
PERSPECTIVE No. 10-01 (January 2010).

“Whoops! Berkman Study Shows “Open Access” Reduces Broadband
Consumption,” PHOENIX CENTER PERSPECTIVES No. 09-05
(November 2009).

“Finding the Bottom: A Review of Free Press’s Analysis of Network
Neutrality and Investment, PHOENIX CENTER PERSPECTIVES No. 09-
04 (October 2009).

“Expanding the Digital Divide: Network Management Regulations and
the Size of Providers,” PHOENIX CENTER POLICY BULLETIN No. 23
(October 2009).

“Be Careful What You Ask For: A Comment on the OECD’s Mobile Price
Metrics,” PHOENIX CENTER PERSPECTIVES No. 09-03 (September 16,
2009).

"Econometric Analysis of Broadband Subscriptions: A Note on Specification," PHOENIX CENTER PERSPECTIVES No. 09-02 (May 12, 2009).

"Normalizing Broadband Connections," PHOENIX CENTER PERSPECTIVES No. 09-01 (May 12, 2009).

"Broadband Expectations and the Convergence of Ranks," PHOENIX CENTER PERSPECTIVES No. 08-03 (October 1, 2008).

"Valuing the AWS-3 Spectrum: A Response to Comments," PHOENIX CENTER POLICY PERSPECTIVE No. 08-02 (July 2008).

"Calculating the Value of Unencumbered AWS-III Spectrum," PHOENIX CENTER POLICY PERSPECTIVE No. 08-01 (June 2008).

"University of Florida Study Shows Only Winners from Network Neutrality Regulation to be Content Providers, Consumers Lose." PHOENIX CENTER POLICY PERSPECTIVE No. 07-01 (March 2007).

OTHER WRITINGS:

"The Obama Administration is Misleading Consumers on Set-Top Box Prices," *The Hill* (April 22, 2016).

"The FCC's Cynical Set-Top Box Play," *The Hill* (February 3, 2016).

"FTC Staff Bias on Intra-Brand Car Competition is a Bad Deal for Consumers," *The Hill* (January 19, 2016).

"Is the FCC's Regulatory Revival Deterring Infrastructure Investment?" *Bloomberg BNA* (November 13, 2015).

"How Congress Lost Control of the Regulators," *The Hill* (October 27, 2015).

"Bait-and-Switch—Or Why the FCC's 'Virtuous Circle' Theory is Nonsense," *Bloomberg BNA* (May 18, 2015).

"Tax Unfairness Is A Job Killer," *The Hill* (December 3, 2014).

"The Unpredictable FCC: Politicizing Communications Policy and its Threat to Broadband Investment," *Bloomberg BNA* (October 30, 2014).

"Will Net Neutrality Politics Scuttle the FCC's Upcoming Incentive Auction?" *The Hill* (September 3, 2014).

"Congressional Gridlock Threatens to Tax the Internet," *The Hill* (June 05, 2014).

"FCC Puts Funding for Public Safety Network and Debt Reduction in Jeopardy," *The Hill* (April 24, 2014).

"Shared Spectrum is a Pipe Dream," *The Hill* (February 6, 2014).

"Opportunities for Local Exchange Competition Are Greatly Exaggerated." *Electric Light & Power* (April 1998).

"Book Review: Welfare Economics and Externalities in an Open Ended Universe: A Modern Austrian Perspective," by Roy E. Cordato. *Southern Economic Journal* (April 1994).

"Book Review: Toward Competition in Local Telephony," by William J. Baumol and Gregory Sidak. *Southern Economic Journal* (April 1996).

"Competition Will Decrease Cable Rates: On Curbing Cable Costs," with Audrey B. Davidson. *Business First* (September 6, 1993).

"TKR Cable Not Living Up To Promises To Cut Rates," with Audrey B. Davidson. *The Louisville Cardinal* (September 2, 1993).

"The Cable Television Industry: An Annotated Bibliography" Published and Funded by the *Auburn Utilities Research Center* (Summer 1994).

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Appendix B

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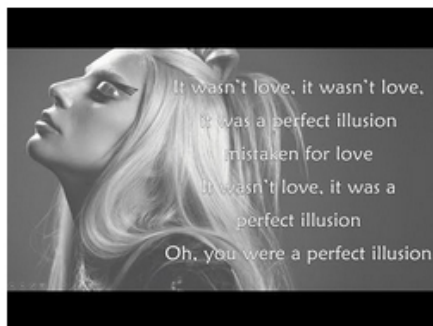
\$205 raised

\$300 goal

Updated: September 25th

August = 267 - July = \$307 - June = \$163 - May = \$249 - April = \$340 - March = \$367

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1:51:12



Robert Johnson \ King Of The Delta Blues Singers Vol. I, 1961 [Full Album]

Roque Saldaña

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Robert Johnson Album: King of the Delta Blues Singers Year:1961 Tracklist: 1. Cross Road Blues 00:00 2. Terraplane Blues ...

43:26



ROBERT JOHNSON - KING OF THE DELTA BLUES VOL.II (FULL ALBUM)

JIMBLUESROCK CHANNEL

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ROBERT JOHNSON - KING OF THE DELTA BLUES VOL.II (1970) TRACK LISTING SIDE A 00:00 Kind Hearted Woman Blues ...

41:43

Appendix D



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by Shawn Mendes

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Exhibit No.	Description	Designation*
SX Ex. 010	Bain & Company: U.S. Music Consumer Insights Discussion, dated August 27, 2014	Restricted
SX Ex. 011	Warner Music Group: Digital Strategy, dated November 15, 2012	Restricted
SX Ex. 020	[Redacted]	Restricted
SX Ex. 021	[Redacted]	Restricted
SX Ex. 022	Edison Research: The Infinite Dial 2016	Restricted
SX Ex. 024	MusicWatch: Playlisting 2016 Report	Restricted
SX Ex. 025	MusicWatch: Playlisting 2016	Restricted
SX Ex. 026	MusicWatch: Annual Music Study 2015 Final Report to RIAA Research Committee, dated March, 2016	Restricted
SX Ex. 027	MusicWatch: Music Acquisition Monitor Q2 2015 Prepared for RIAA	Restricted
SX Ex. 029	[Redacted]	Restricted
SX Ex. 044	RIAA: U.S. Sales Database	Public
SX Ex. 045	RIAA: Shipments Database	Restricted
SX Ex. 046	Sony Music Entertainment: MRP Phase II Review, dated October 8, 2014	Restricted

*Exhibits designated Restricted are omitted from this public version in their entirety.

**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)

WRITTEN DIRECT TESTIMONY OF

Thomas S. Lys

**Eric L. Kohler Chair in Accounting and
Professor of Accounting and Information Management
Kellogg School of Management, Northwestern University**

October, 2016

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I. Introduction

I.A. Case Background and Assignment

- (1) I have been retained by SoundExchange as an expert witness in connection with the above-referenced matter.
- (2) My assignment consists of two parts. First, I was asked to evaluate the financial stability, past performance, and future financial outlook of Sirius XM Radio Inc. (“Sirius XM”), particularly as they relate to the governing legal standard in this matter and Sirius XM’s ability to pay increased royalties for the use of copyrighted sound recordings.
- (3) Second, I was asked to evaluate certain direct licenses signed by Sirius XM with independent record companies (“indies”), in order to understand the financial incentives offered in those direct license arrangements and their relationship to the existing statutory rate.
- (4) Discovery in this matter has only recently begun, and as additional evidence becomes available, I reserve the right to amend my testimony with new information to add to or modify my analysis and the resulting conclusions.

I.B. Summary of Opinions

- (5) My analysis shows that Sirius XM has enjoyed dramatic financial success and is the proverbial “home run” by every financial measure. Its subscriber levels and revenue have increased dramatically since the last proceeding before this Court, with the company reaching almost 30 million subscribers and \$4.57 billion in revenue by the end of 2015.
- (6) By contrast, the wholesale revenues earned by the entire recording industry (*i.e.*, all record companies and artists) from the sale and streaming of sound recordings have been estimated at \$[REDACTED] in 2015.¹ Acknowledging that a material portion of Sirius XM’s revenue is attributable to non-music content, it is nevertheless striking that a company which distributes only a small proportion of the sound recordings sold and streamed in the United States each year is earning revenues equal to the total sound recording revenues of all of the record companies and all of the artists who created, produced, promoted and marketed those sound recordings.

¹ *News and Notes on 2015 RIAA Shipment and Revenue Statistics*, SoundX_000035350; *see also* Sony MRP – Key Market Assumptions, SoundX_000107586 (indicating total industry revenues of \$4.9B for FY2015).

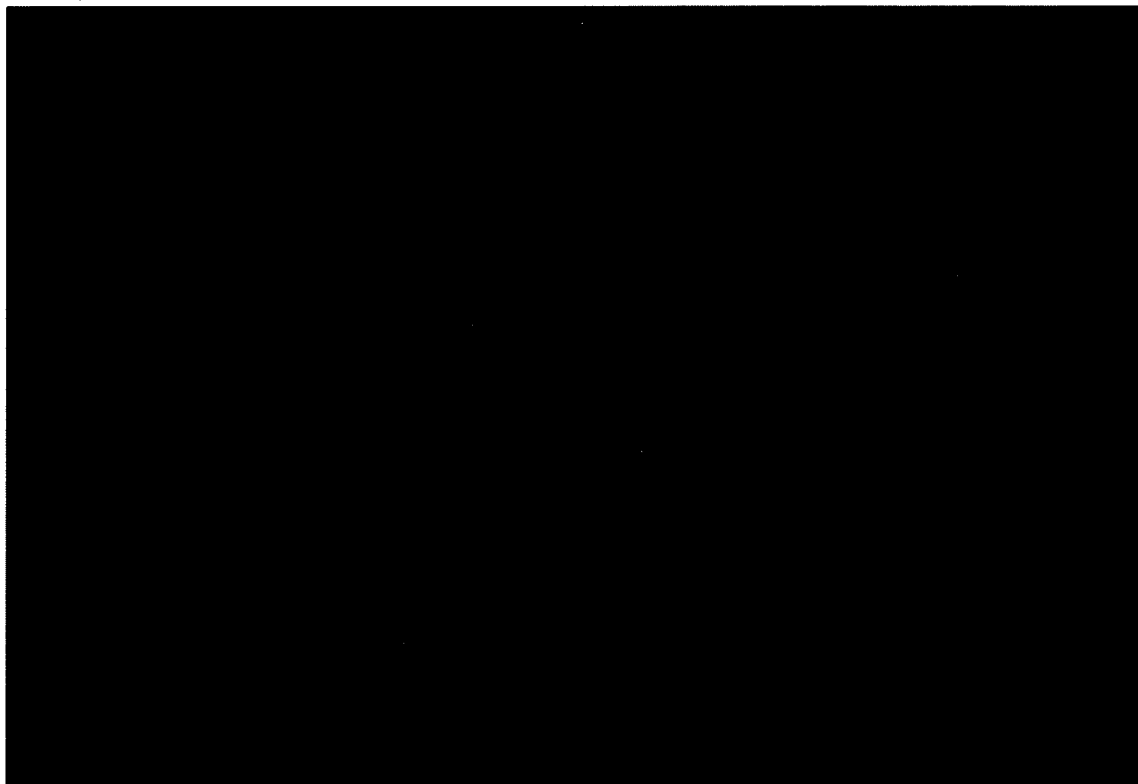
- (7) While Sirius XM's revenues have climbed since the last proceeding in this Court, both its fixed and variable costs per subscriber have declined. As a result, Sirius XM is now highly profitable, earning a net after-tax income of \$510 million in 2015.
- (8) Sirius XM's extraordinary financial performance is particularly notable because, in the prior two proceedings before this Court, Sirius XM argued for below market rates on the grounds that its financial position was precarious and its survival in substantial doubt. During the *SDARS I* proceeding, Sirius and XM, which then were two separate and competing companies, were unprofitable, cash flow negative, and facing substantial outlays for satellites and other broadcasting infrastructure. They persuaded the Judges in that case to establish sound recording royalties at a rate more than 50 percent lower than "the upper boundary most strongly indicated by marketplace data."² Five years later, Sirius and XM had merged, eliminating all price competition between its two predecessor companies for both subscribers and exclusive content offerings, and allowing the company to become cash-flow positive. Nevertheless, Sirius XM contended in the *SDARS II* proceedings that "it is evident that Sirius XM faces a threat of disruption that is 'equal to or even greater than the one it faced at the time of the last rate proceeding.'"³
- (9) However, as I document in this report, Sirius XM can no longer "cry wolf." Figure 1 below illustrates Sirius XM's remarkable financial performance by showing the evolution of Sirius XM's total revenue, its adjusted earnings before interest, taxes, depreciation and amortization ("EBITDA," a common metric used to track operating profitability), and its free cash flow ("FCF," a metric that captures the amount of cash available, after necessary business investments, to pay dividends, etc.) at four points in time: the full year preceding the *SDARS I* decision (2006), the full year preceding the *SDARS II* decision (2012), the most recent full year preceding the current proceedings (2015), and the outlook for 2020.⁴ Sirius XM's financial success is clearly visible in Figure 1: all three metrics indicate significant improvements in Sirius XM's financial performance compared to its performance at the time of prior proceedings. Moreover, the outlook for the next five years is just as promising. [REDACTED]

² Determination of Rates and Terms for Preexisting Satellite Services and Satellite Digital Audio Radio Services, 73 Fed. Reg. 4080, 4097 (Jan. 24, 2008) [hereinafter *SDARS I*]; see also *id.* at 4094, 4098.

³ See Sirius XM Radio Inc.'s Proposed Findings of Fact, Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Final Rule and Order [hereinafter *SDARS II*] ¶ 304 (Sept. 26, 2012); see also *id.* ¶ 328 ("it is reasonably likely that Sirius XM will suffer a reduction in its subscriber base between 2013 and 2017" and "is reasonably likely to experience financial distress during the 2013-2017 period").

⁴ Sirius XM began reporting adjusted EBITDA in its 10-K filings in 2008. However, Sirius XM's adjusted EBITDA for 2006 is calculated using the same formula, *i.e.*, by adding depreciation and amortization expense to net operating income.

Figure 1: Comparison of Sirius XM performance for full year preceding SDARS I decision (2006), preceding SDARS II decision (2012), preceding SDARS III (2015), and forecasted results for 2020 (in \$ million) [RESTRICTED]



Source: Sirius XM 10-K filings and SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (10) As Figure 1 illustrates, and later sections of my report explain in greater detail, the requirement of Section 801(b)(1)(D) that this Court set rates to “minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices” should in no way limit potential rate increases in this proceeding. Not only is Sirius XM highly profitable at the current rates, but as I show in Section II.D of this report, it would remain highly profitable if the current rates were increased to 24 percent of revenue.
- (11) The remaining three Section 801(b)(1) factors, considered in light of Sirius XM’s extraordinary financial performance, suggest a substantial increase in the current rates.
- (12) The first factor, Section 801(b)(1)(A), directs the Court to consider whether the rate that it sets will “maximize the availability of creative works to the public.” Increasing the current rate in line with SoundExchange’s rate proposal would not require Sirius XM to increase the subscription prices it charges consumers in order to preserve a reasonable level of profitability. Consequently, such a rate increase should not in any way diminish the size of the audience to which Sirius XM

distributes creative works. On the other hand, although I was not tasked with studying the recording industry, economic logic suggests that increased royalties would permit the creation, promotion and distribution of additional sound recordings by the recording industry.

- (13) The second factor, Section 801(b)(1)(B), directs the Court to set a rate that will “afford the copyright owner a fair return for his or her creative work and the copyright user a fair income under existing economic conditions.” There is no doubt that under the existing rates Sirius XM is earning a “fair income under existing economic conditions,” and then some. As shown in my analysis later in this report (e.g., in Figure 28 and Figure 29), in 2015 Sirius XM dominated all comparable industry groups that I have used as benchmarks to assess its financial performance, including Sirius XM’s narrow industry group, broadcast radio (SIC 4832); its broader industry group, radio and television broadcasting (SIC 483); and Pandora and iHeartRadio [REDACTED]. My analysis shows that Sirius XM comfortably outperforms these benchmark company groups on every relevant financial metric.
- (14) My analysis also shows that even if Sirius XM’s 2015 statutory royalty rate were increased to 24%, Sirius XM would still have dominated all three benchmark company groups. In fact, Sirius XM’s ROA would exceed that of its comparator groups unless the royalty rate were increased to 48.6% (compared to SIC 4832); 39.9% (compared to Pandora and iHeartRadio); or 35% (compared to industry group SIC 483).
- (15) Sirius XM’s stock repurchase program, which commenced in 2013, confirms the conclusion that Sirius XM has reaped a more than fair income at the current royalty rates. By the second quarter of 2016, Sirius XM had returned through stock repurchases \$7.3 billion to its shareholders. This return of capital is particularly impressive when compared to the total shareholder capital contributions of its predecessor companies, which totaled approximately \$6.9 billion, or to its total shareholder capital contributions since its inception, which totaled \$10.5 billion. By Q2-2016, Sirius XM returned to its investors more than the entire capital investments in its two predecessor companies (Sirius and XM) and 70% of all shareholder capital contributions since Sirius XM’s inception.
- (16) The third factor, Section 801(b)(1)(C), counsels setting a royalty rate that reflects the relative roles of the copyright owner and the copyright user “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.” Here, my analysis shows that current level of capital investments, costs and risks are quite low for Sirius XM.
- (17) I understand that economists engaged by SoundExchange to analyze the rates suggested by marketplace agreements and public policy considerations have proposed a rate of \$2.37 - \$2.58 per

subscriber, or 22 to 24 percent of revenue. Based on my analysis of Sirius XM's current and projected future financial performance, I believe such rates are consistent with the Section 801(b)(1) factors.

- (18) For comparison purposes, I have calculated the effective rate that would exist today if the rates that the *SDARS I* court found most strongly supported by marketplace evidence were increased by the cost of living index since the time of that decision. In *SDARS I*, the Court determined that SoundExchange's interactive services benchmark "suggests a rate of \$1.40 per subscriber per month."⁵ As I explain below, if one were to simply increase that per-subscriber rate by the cost of living index since the date of the *SDARS I* decision (December 2007), to the period covered by the present proceeding, the equivalent rate would be \$1.74 in 2018, increasing to \$1.92 in 2022. Applying the same technique to extend the *SDARS I* rate to 2016 and dividing into Sirius XM's average revenue per subscriber in 2016, as that revenue is defined by the regulations found at 37 C.F.R. Part 382 Subpart B, yields a \$1.68 per subscriber rate divided by \$10.72 revenue per subscriber, or 15.7 percent of revenue.
- (19) Finally, as noted above, I was asked to review agreements signed between Sirius XM and certain indie record labels that license sound recordings for use by Sirius XM satellite radio service, as well as Sirius XM's internal records of the royalties flowing through those agreements. I find that [REDACTED]. Moreover, the royalty rates offered in direct licenses [REDACTED] – and direct licenses [REDACTED] the prevailing statutory rate. As explained herein, a direct licensor's reasons for signing a direct license with Sirius XM for a royalty rate slightly below the statutory rate include (1) receiving the benefit of Sirius XM's methodology for calculating royalties, which differs from the SoundExchange methodology; (2) receiving 100 percent of the royalty payment, versus the 50 percent share paid to record companies under the statutory license; (3) obtaining an agreement from Sirius XM to pay for pre-1972 sound recordings; (4) the ability to provide content and metadata feeds directly to Sirius XM to increase payments; (5) royalty advances; (6) avoiding the SoundExchange administrative fee; and (7) the possibility (although not the promise) of increased market share due to lower prices. These economic incentives may differ from one indie record company to another; however, as I explain below, items (1) to (6) – each of which are expressly recognized by direct license agreements and used by Sirius XM to solicit direct licenses – provide indies with the potential to earn more under a direct license than the statutory rate, without any increase in plays on Sirius XM's satellite service.

⁵ *SDARS I* at 4093.

I.C. Qualifications

- (20) My name is Thomas Z. Lys. I am the Eric L. Kohler Professor Emeritus at the Kellogg School of Management, Northwestern University, located in Evanston, Illinois.
- (21) I have been a faculty member at Kellogg, one of the leading business schools in the world, since 1981 until my transition to emeritus status on August 31, 2015. For the period September 1, 2015 to August 31, 2018, I am the Eric L. Kohler Professor Emeritus in service at the Kellogg School.⁶ Thereafter, I will transition to an emeritus position as the Eric L. Kohler Professor Emeritus.
- (22) In addition to my tenure at Kellogg, I have held visiting academic positions at the Graduate School of Business at the University of Chicago (1986–1987) and the Graduate School of Business at Stanford University (1997).
- (23) I am a specialist in accounting and in financial economics, holding a PhD in accounting and finance from the University of Rochester (1982); an MS in accounting, also from the University of Rochester (1980); and a BS in Economics (summa cum laude) from the University of Berne, Switzerland (1976).
- (24) At Kellogg, I taught courses in financial reporting, mergers and acquisitions, security analysis, behavioral finance, security price analysis, and corporate governance in Kellogg's PhD, MBA, Executive MBA, and International Executive MBA programs (which are taught in the United States, Europe, and Asia), as well as in numerous non-degree programs. In addition, I was the faculty director of Kellogg's executive program, "Corporate Governance: Effectiveness and Accountability in the Boardroom" since its inception in 2004 to my transition to emeritus status in 2015.
- (25) For my teaching at Kellogg, I was awarded the Outstanding Professor of the Year Award for the Executive Master's Program in 1996, 1997, 1998, 2000, and 2002, and the Sidney J. Levy Teaching Award in the regular MBA program in 1998-1999.
- (26) My most recent scholarly research integrates the rational models of decision-making in economics, accounting, and finance, with the descriptive models of behavioral decision theory in order to predict the actions of various financial decision-makers. My research also includes issues relating to corporate valuations in mergers and acquisitions.
- (27) My research has been published in peer-reviewed academic journals, including the Journal of Accounting and Economics, the Journal of Financial Economics, the Journal of Monetary

⁶ The Emeritus in service position allows me to supervise and guide my remaining two PhD students through their dissertations.

Economics, The Journal of Business, The Accounting Review, and the Journal of Accounting Research.

- (28) I have served as one of the editors of the Journal of Accounting and Economics (a leading academic journal in accounting and in financial economics) for eleven years. I have been a member of the American Accounting Association since 1981.
- (29) In addition to my academic work, I have consulted for a number of leading private and public companies, including Ciba Specialty Chemicals, Cox Communications, General Electric, IBM, Eastman Chemical, Guidant Corporation, and USX.
- (30) In the past, I have testified in a variety of commercial, antitrust, and tax disputes on behalf of numerous corporate clients, including the trustee in the Enron bankruptcy, AMD, Sovereign Bank and many others, as well as government entities including the U.S. Department of Justice, the U.S. Department of the Treasury, the Russian Federation, and the Commonwealth of Australia.
- (31) I have testified previously on matters relating to, among other topics, financial reporting and GAAP compliance, business valuation (involving both tangible and intangible assets), business purposes of certain transactions, liquidity, bankruptcy, antitrust, and pricing.
- (32) In 2011, I testified on behalf of SoundExchange in the matter of Determination of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, Docket No. 2011-1 CRB (*SDARS II*). In 2015, I testified on behalf of SoundExchange in the matter of Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings, Docket No. 14-CRB-0001-WR (*Web IV*). Finally, in 2016 I also submitted a report in a rate dispute between Sirius XM and SoundExchange, Civil Action No. 2006-1 CRB DSTR (2007-2012).
- (33) Some of the analyses underlying my opinions in this matter were supported by my research staff, working under my direction. All of the opinions expressed in this report are my own independent conclusions. I am compensated at a rate of \$1,200 per hour for my work in this matter. My compensation is not dependent on the outcome of this case or on any of the opinions expressed in this matter.
- (34) My *curriculum vitae* is attached as Appendix A to this report, along with a list of my prior testimony for the past four years and the articles I have written.

II. Section 801(b)(1) Analysis

- (35) Counsel has advised me that the statutory standard guiding the determination of appropriate royalty rates in the *SDARS III* includes the following four objectives set forth in Section 801(b)(1) of the Copyright Act, 17 U.S.C. § 801(b)(1):
- 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.
- (36) In this Section I analyze whether SoundExchange's proposal for SDARS royalty rates of 20 to 24 percent of revenue between 2018-2022 would allow these objectives to be achieved. I conclude that it would.
- (37) I commence my testimony by presenting a qualitative background of Sirius XM's business in Section II.A. Next, I summarize Sirius XM's current financial performance and analyze the drivers of this performance in Section II.B. In Section II.C, I assess Sirius XM's performance relative to comparable corporations. I then examine the effect of a royalty rate increase in Section II.D, and conclude with an analysis of Sirius XM's expected future performance in Section II.E.

II.A. Description and History of Sirius XM's Business

- (38) Through its proprietary satellite radio systems, Sirius XM broadcasts music and entertainment on a subscription-fee basis mostly to automobile-based radio receivers. Sirius XM has stated in 2015 that "Satellite radios are available as a factory or dealer-installed option in substantially all vehicle makes sold in the United States."⁷ Subscribers may also purchase satellite radio receivers in retail stores or through Sirius XM's website, which Sirius XM markets for use in homes, automobiles,

⁷ Sirius XM Holdings Inc., 2015 Form 10-K Annual Report at 2 [hereinafter Sirius XM 2015 Form 10-K].

businesses, boats, or as portable devices.⁸ Sirius XM also offers its content via internet webcasting, which includes additional channels and features.⁹

- (39) Presently, Sirius XM offers over one hundred and seventy-five channels of satellite radio, including seventy-two channels of commercial-free music.¹⁰ In addition to music, Sirius XM airs content consisting of news, talk, entertainment, and sports programming.¹¹
- (40) In addition, Sirius XM offers connected vehicle applications and services, which are designed to enhance safety and security for drivers and provide marketing and operational benefits to automakers and dealers.¹² These services include access to maps, weather, restaurants, and points of interest, the ability to schedule service and repair appointments, remote vehicle diagnostics, stolen or parked vehicle locator services, and monitoring of vehicle emission systems.¹³
- (41) Sirius XM offers different packages of channels that range in price from \$7.99 to \$19.99 per month.¹⁴
- (42) Sirius XM's primary source of revenue comes from subscription fees, while smaller sources of revenue include activation and other fees, advertising revenue from non-music channels, direct sales of radios and equipment, and sales of ancillary services such as weather, traffic, and data services.¹⁵
- (43) At the time of the *SDARS I* proceeding, Sirius and XM were two separate companies. These two satellite radio companies competed for subscribers based on price, and likewise engaged in price competition for non-music content such as sports leagues and talk show personalities (they did not, of course, compete on price for music content, because the statutory licenses eliminated such competition). In July 2008, Sirius and XM merged to form Sirius XM.¹⁶ Through this merger,

⁸ See *What is SiriusXM?*, <http://www.siriusxm.com/whatissiriusxm> (last visited Oct. 14, 2016); see also Sirius XM 2015 Form 10-K at 3.

⁹ Sirius XM 2015 Form 10-K at 2.

¹⁰ *What is SiriusXM*, *supra*, note 8.

¹¹ Sirius XM 2015 Form 10-K at 2.

¹² Sirius XM 2015 Form 10-K at 1.

¹³ See *SiriusXM to Expand Next Generation Connected Vehicle Services for American Honda*, <http://investor.siriusxm.com/investor-overview/press-releases/press-release-details/2016/SiriusXM-to-Expand-Next-Generation-Connected-Vehicle-Services-for-American-Honda/default.aspx> (last visited Oct. 14, 2016); see also Sirius XM 2015 Form 10-K at 5-6.

¹⁴ See *SiriusXM All-In-One Packages*, <http://www.siriusxm.com/subscriptions/siriusxmallechoices> (last visited Oct. 14, 2016); see also *Sirius A La Carte*, <http://www.siriusxm.com/subscriptions/packages/siriusalacarte> (last visited Oct. 14, 2016).

¹⁵ Sirius XM 2015 Form 10-K at 22-24.

¹⁶ Sirius XM Radio Inc., 2012 Form 10-K Annual Report at 1.

Sirius XM became the sole provider of satellite radio in the United States, holding a virtual monopoly in this market segment.

- (44) The merger had a dramatic impact on Sirius XM's financial fortunes. Not only did the merger eliminate price competition between the two satellite radio services for subscribers and non-music content, but it also allowed the combined companies to take advantage of the economies of scale that are central to its business model.
- (45) Sirius XM's operating costs are predominantly fixed with respect to subscriber revenue, meaning that they do not vary with subscriber revenue. Fixed costs include programming and content, satellite and transmission, sales and marketing, engineering and design, subscriber acquisition costs, and general and administrative. Thus, for example, Sirius XM's satellite transmission network costs are the same whether one person is listening to a broadcast, or millions.
- (46) Sirius XM's variable operating costs (i.e., costs that do vary with subscriber revenue) are small in comparison, and include revenue share and royalties, customer service, and cost of equipment.¹⁷
- (47) Because of its largely fixed cost structure, Sirius XM's profits increased dramatically once its sales reached its "break-even point," that is a level such that its fixed costs are covered. The company was able to achieve this level of performance soon after -- and in large part because of -- the merger in 2008. Sirius XM's contribution margin (i.e., the fraction of each additional revenue dollar that increases profits) is thus very high. By 2015, Sirius XM achieved a contribution margin of 71%, meaning that each additional dollar of revenue increases pre-tax net income and cash flows by \$0.71.¹⁸
- (48) Profitability has increased significantly in every period since the post-merger Sirius XM obtained sufficient revenue to cover its fixed costs. As Sirius XM CEO James Meyer put it:

"[...] the model works and it works exactly like you think it works. This was a highly scalable, highly leveraged model and that if you look back and look, it is really when we reached about 20 million subscribers when the model took off and now our model is highly scalable and nothing changes but getting better going forward."¹⁹
- (49) Sirius XM has also been extremely successful in generating cash from those high revenue levels. Free cash flow ("FCF") is a metric that captures the amount of cash that is available, after

¹⁷ This categorization of fixed and variable costs comes from Sirius XM's internal categorizations. See Sirius XM Radio Inc. 2011 Q2 Earnings Call (Aug. 2, 2011) at 6.

¹⁸ Sirius XM frequently touts this point in its earnings calls: "Most of the incremental revenue we generate flows to the bottom line, and we have a tremendous ability to convert our growing operating earnings into free cash flow at very high levels." James Meyer, CEO, Sirius XM, Sirius XM Radio Inc. 2015 Q1 Earnings Call (April 28, 2015) at 2; "We have a reoccurring subscription revenue model with low marginal costs that enables us to keep the vast majority of our incremental revenue." James Meyer, CEO, Sirius XM, Sirius XM Radio Inc. 2012 Q4 Earnings Call (Feb. 5, 2013) at 4.

¹⁹ James Meyer, CEO, Sirius XM, Citi Internet, Media & Telecommunications Conference (Jan. 7, 2014) at 3.

necessary business investment, to pay dividends and repurchase shares.²⁰ Sirius XM's business model and extraordinary performance have enabled it to translate those already high operating margins into FCF at a higher percentage than its competitors. Figure 2, Sirius XM's own illustration, shows that in 2012 FCF represented [REDACTED] of Sirius XM's EBITDA (a measure of operating cash flows)—far exceeding the next most competitive companies in the entertainment-media space. To put it differently, Sirius XM can distribute [REDACTED] of its EBITDA to its shareholders without affecting its operations.

Figure 2: Media Business FCF as a percentage of EBITDA [RESTRICTED]



Source: Sirius XM, Annual Stockholder Meeting (May 21, 2013), SXM_DIR_00003998, at 24.

²⁰ Sirius XM describes FCF as follows: "Free cash flow is a metric that our management and board of directors use to evaluate the cash generated by our operations, net of capital expenditures and other investment activity and significant items that do not relate to the on-going performance of our business. In a capital-intensive business, with significant investments in satellites, we look at our operating cash flow, net of these investing cash outflows, to determine cash available for future subscriber acquisition and capital expenditures, to repurchase or retire debt, to acquire other companies and to evaluate our ability to return capital to stockholders. We believe free cash flow is an indicator of the long-term financial stability of our business." Sirius XM Holdings, Inc., Proxy Statement & 2015 Annual Report 29 [hereinafter Sirius XM 2015 Annual Report].

- (50) What emerges from this analysis is that Sirius XM's business model has not only worked, it has thrived. It expected to lose money at the outset, because its business required substantial capital investment in a satellite transmission system and other infrastructure before even one subscriber could be served. The business model dictated that the subscriber base grow to a certain level before Sirius XM could cover its fixed costs and become profitable. While that was happening, Sirius XM persuaded the *SDARS I* Court that the royalty rates for its most important content – music – should be set below the market rates that the Court found most strongly supported by the evidence, to facilitate Sirius XM's continued growth. With the benefit of below-market royalty rates and the merger, Sirius XM passed the break-even point and is now reaping impressive financial rewards.

II.B. Sirius XM's Financial Performance

II.B.1. Overview of Sirius XM's Financial Performance, 2006-2015

- (51) Over the past decade,²¹ Sirius XM has significantly expanded its business by virtually every financial and operating metric. Sirius XM's outstanding financial performance and profitability is directly relevant to the first three factors under Section 801(d)(1), which I understand the Judges consider in determining the appropriate statutory rate. Namely, Sirius XM's performance bears heavily on determining a rate that would allow "a fair income under existing economic conditions," while affording "the copyright owner a fair return for his or her creative work."²² It is also relevant to setting a rate that will "maximize the availability of creative works to the public."²³ As discussed below, Sirius XM's robust financial performance, which is unparalleled by its self-identified competitors, supports a substantially higher rate than present.

²¹ As I have already discussed, Sirius and XM merged in July 2008. To allow comparison, I present the financial results for 2006-08 on a pro forma basis (prepared by the company), as if the merger had taken place on January 1, 2006. All references to 2006 are to pro forma financials that combine the performance of Sirius and XM, which were separate companies at that time. While this common financial technique normalizes the financial performance and eliminates any discontinuities in financial results from the combination of two separate companies, it is nonetheless important to keep in mind that there are two distinct phases in the past performance of Sirius XM. Specifically, the pro-forma results shown for 2006-08 combine the two then-separate entities (Sirius and XM), and it is important to remember that during that time Sirius and XM were aggressively competing against each other, fighting for market share and market dominance. In contrast, following the merger (i.e., starting in 2009) the results are those of a single company with a monopoly in the satellite radio market, a fact that is clearly reflected in the data. As such, the results from 2009 onwards are the most relevant to assessing the impact of changes in the statutory royalty rates on the future performance of Sirius XM. However, because, the merger also coincided with the recession in the United States, the initial impact of the merger is somewhat dampened.

²² 17 U.S.C. § 801(b)(1)(B).

²³ *Id.* § 801(b)(1)(C).

- (52) According to the company's executives, "Sirius XM is one of the best growth stories in media,"²⁴ whose "business is thriving,"²⁵ a claim fully supported by my analysis. Sirius XM's management regularly highlights its exceptionally strong financial performance. For example, statements made by Sirius XM executives at recent earnings calls include:

"2015 was an incredible year for SiriusXM. We exceeded all of our original operational and financial goals, and we are predicting continued growth in subscribers and all of our financial metrics this year."²⁶

"It's difficult for me to imagine how Sirius XM could have delivered a stronger quarter. Self-pay additions more than doubled, revenue is up 8%, adjusted EBITDA is off – almost 20%, free cash flow is up 24% and free cash flow per share is up 36% and adjusted EBITDA margin rose to almost 37%. We have record levels of new and used car conversions for our first quarter, and self-pay churn improved 10 basis points overall. This was a very strong quarter."²⁷

"I thought our first quarter was pretty hard to beat, but the second quarter was even better. Self-pay sub additions were up nearly 37% and revenues up 8%, adjusted EBITDA 12% to a margin of 37%, free cash flow is up nearly 11%, and free cash flow per share is up 25%. So, it's an extraordinary performance."²⁸

"SiriusXM turned in an excellent performance in 2014 on all fronts."²⁹

"Once again, SiriusXM posted exceptional operating results."³⁰

- (53) EBIT (earnings before interest and taxes) and EBITDA (adjusted earnings before interest, taxes, depreciation and amortization) are two common indicators used to track firms' performance. EBIT is an indicator of a firm's pre-tax operating income. EBITDA (calculated by adding depreciation and amortization to EBIT) is an indicator of a firm's pre-tax operating cash flows. Figure 3 presents Sirius XM's EBIT and its adjusted EBITDA from 2006 through 2015.

²⁴ David Frear, CFO and Executive VP, Sirius XM, Q4 2012 Earnings Call (Feb. 5, 2013) at 7.

²⁵ James Meyer, CEO, Sirius XM, Q1 2016 Earnings Call (April 28, 2016) at 2.

²⁶ James Meyer, CEO, Sirius XM, Q4 2015 Earnings Call (Feb. 2, 2016) at 2.

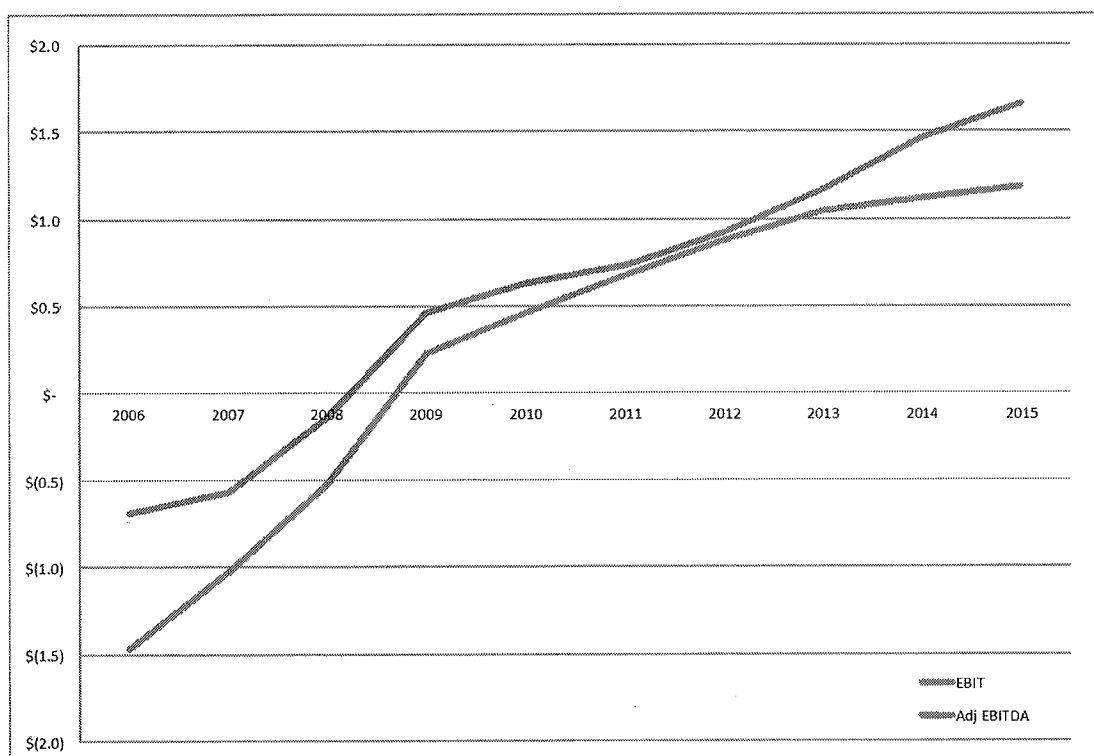
²⁷ David Frear, CFO and Senior Executive VP, Sirius XM, Q1 2015 Earnings Call (April 28, 2015) at 4.

²⁸ David Frear, CFO and Senior Executive VP, Sirius XM, Q2 2015 Earnings Call (July 28, 2015) at 4.

²⁹ James Meyer, CEO, Sirius XM, Q4 2014 Earnings Call (Feb. 5, 2015) at 2.

³⁰ James Meyer, CEO, Sirius XM, Q3 2014 Earnings Call (Oct. 28, 2014) at 4.

Figure 3: Sirius XM's EBIT and adjusted EBITDA,³¹ 2006-2015, in \$ billion



Source: Sirius XM 10-K filings.

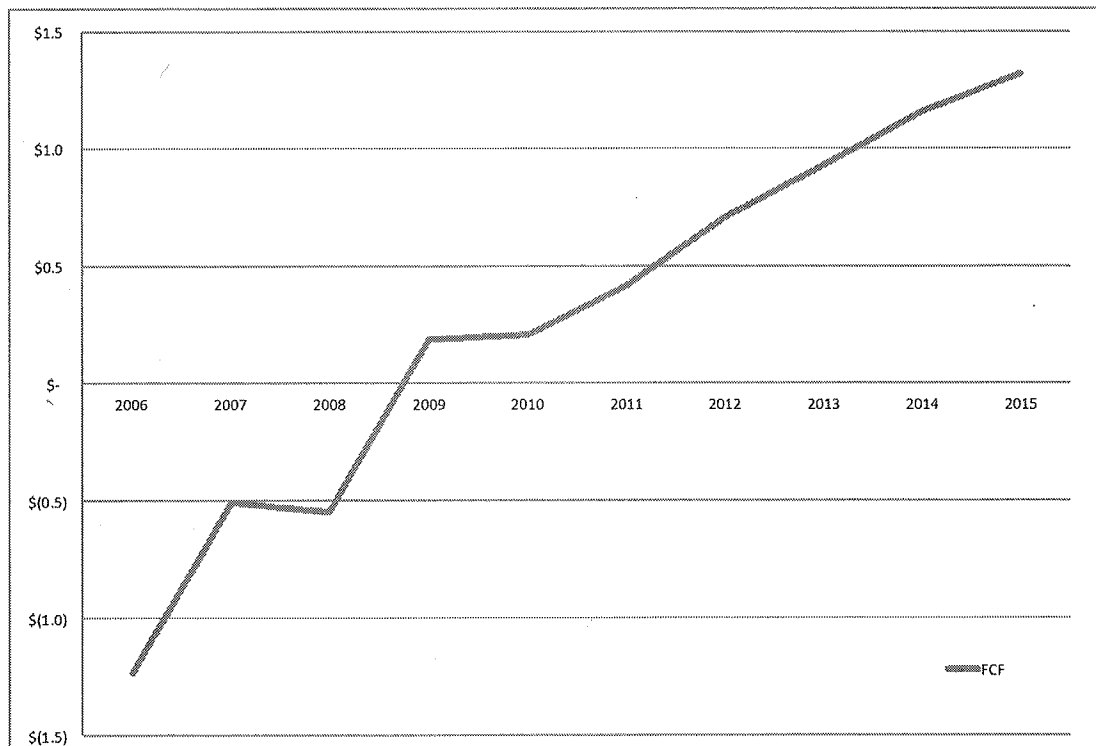
- (54) As Figure 3 shows, starting in 2009 Sirius XM became profitable both in terms of EBIT and EBITDA. In the post-merger period (2009-15), Sirius XM earned a total of \$5.6 billion in EBIT.³² Similarly, in the seven-year period since the merger, Sirius XM has generated over \$7 billion in adjusted EBITDA, which increased from a negative \$690 million in 2006 to positive \$1.66 billion in 2015.
- (55) Sirius XM's performance has been even more impressive in generating free cash flows. FCF is the after-tax and after-investment cash flows that can be distributed to investors. As Figure 4 shows, Sirius XM's FCF has increased from a deficit of \$1.23 billion in 2006 (meaning that the company was not generating sufficient cash and needed to rely on external funding sources for its operations and investments) to a positive \$1.32 billion in 2015. This means that after it satisfied its

³¹ Sirius XM only started disclosing its adjusted EBITDA following the merger, starting in 2009. I calculate the 2006-08 adjusted EBITDA using the same methodology, based on financial data in the company's SEC filings. For some key line items Sirius XM published pro forma financial statements going back to 2006 presenting the results as if the merger had occurred on January 1, 2006, which enabled me to calculate adjusted EBITDA back to 2006

³² Calculation details of EBIT and EBITDA appear in Sirius XM's financial statements. *See, e.g.*, Sirius XM 2015 Annual Report at 13.

investment needs, its operations generated \$1.32 billion in cash that it could distribute to its investors.

Figure 4: Sirius XM's free cash flow, 2006-2015, in \$ billion



Source: Sirius XM 10-K filings.

- (56) From these numbers, it is obvious that Sirius XM's overall operating performance in the 2009-2015 period was exceptional. In the sections that follow, I explore this financial performance in more detail, including showing how Sirius XM's financial metrics exceed that of industry competitors and [REDACTED].

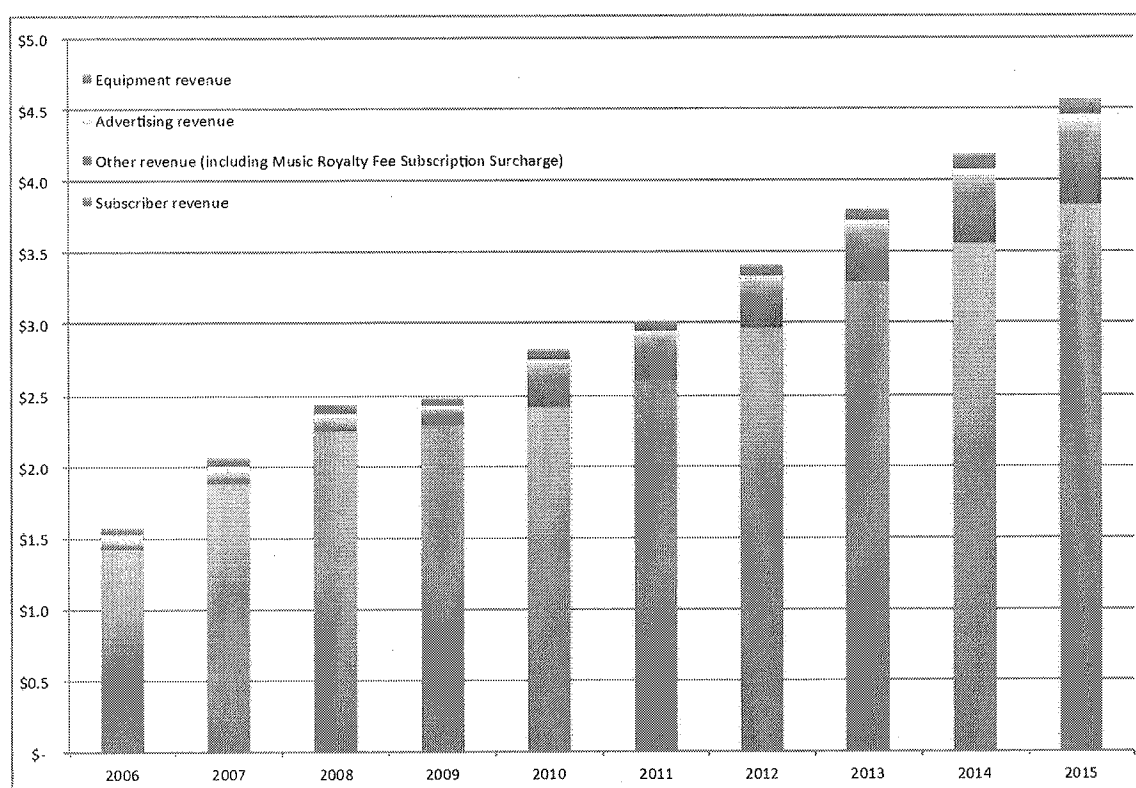
II.B.2. Analysis of Sirius XM's Financial Performance, 2006-2015

II.B.2.a. Steady Subscriber Growth and Price Increases Have Driven Top Line Revenue

- (57) Over the past decade, Sirius XM has experienced a substantial increase in its number of subscribers, while it has consistently increased its prices and fees to the consumer, leading to substantial growth in revenue.

- (58) Subscriber revenue is the largest component of Sirius XM's revenue. From 2006-2015, subscription fees represent 87% of Sirius XM's total revenue. Sirius XM's remaining revenue includes advertising, which takes place primarily on non-music channels,³³ as well as revenue from selling its equipment to customers. Sirius XM separately records "other revenue," which is predominantly composed of its U.S. Music Royalty Fee Surcharge—a fee that the company started charging customers in 2009 in order to recover the royalties paid to copyright owners. As such, the royalty fee is essentially another form of subscriber revenue. Figure 5 demonstrates the importance of subscription revenue to Sirius XM.

Figure 5: Sirius XM Revenue by type, 2006-2015, in \$ billion



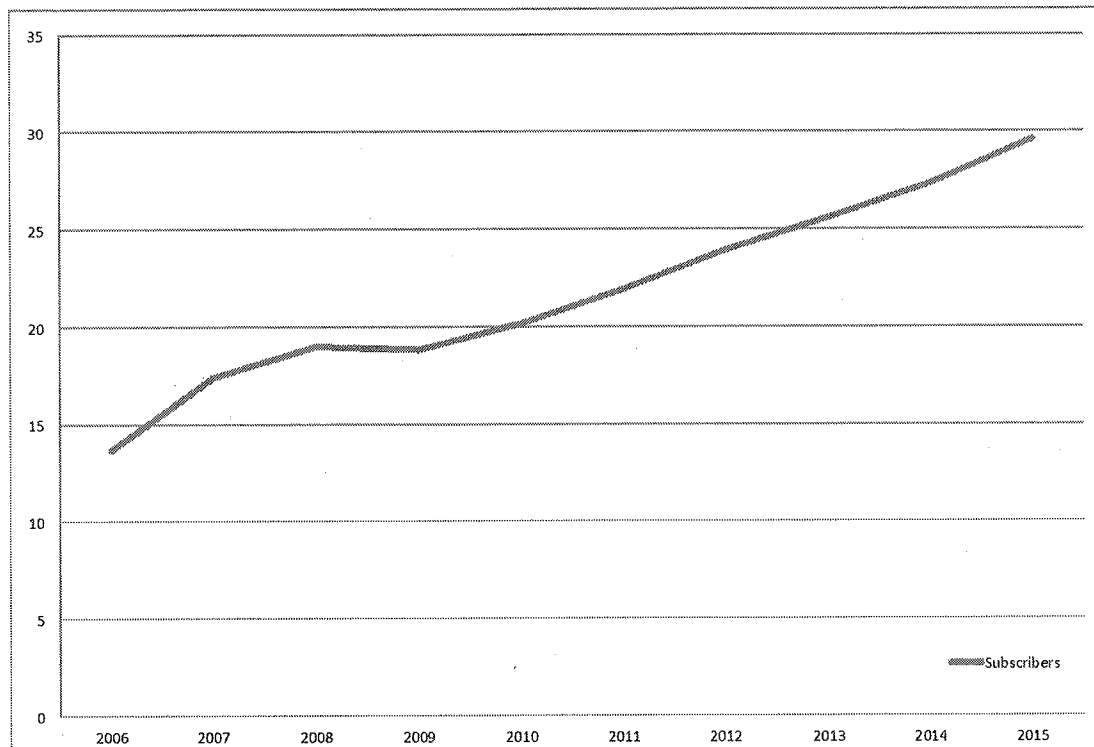
Source: Sirius XM 10K filings, 2009-2015.

- (59) As of March 2016, Sirius XM has over 30 million subscribers.³⁴ As Figure 6 shows, over the past decade Sirius XM's subscriber base has grown on average 9.0% per year, more than doubling from 13.7 million subscribers in 2006 to 29.6 million subscribers at the end of 2015.

³³ See Sirius XM 2015 Form 10-K at 2 ("We also derive revenue from the sale of advertising on select non-music channels.").

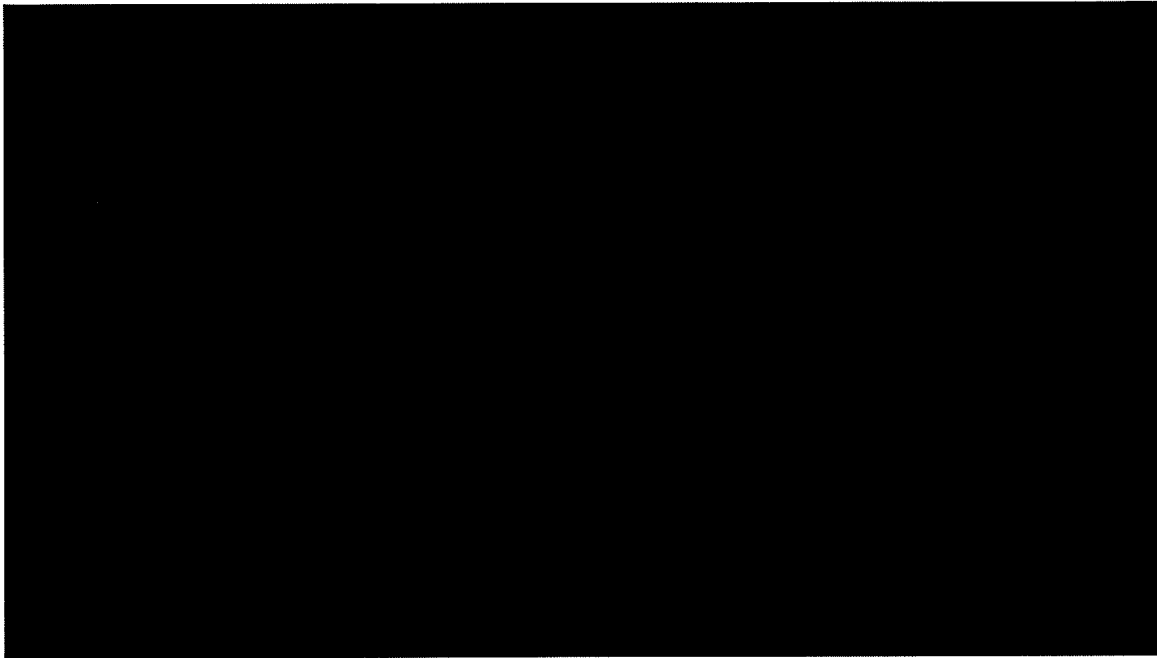
³⁴ 30.1 million as of March 31, 2016. See Sirius XM Holdings, Inc, Form 10-Q (Mar. 31, 2016) at 23.

Figure 6: Sirius XM subscribers, 2006-2015, in millions



Source: Sirius XM 10-K filings 2009-2015.

- (60) Sirius XM's subscriber growth is closely tied to vehicle sales, as the vast majority of its subscribers are at least partially connected through in-vehicle equipment. To be more precise, the number of Sirius XM's new subscribers is a product of:
- a) vehicle sales (number of cars sold);
 - b) the penetration rate (percent of those vehicles equipped with Sirius XM receivers); and,
 - c) the conversion rate (percent of owners of those Sirius XM receiver who sign up for service after the trial period ends).
- (61) Underpinning Sirius XM's strong growth has been the steady rise in U.S. vehicle sales. According to Sirius XM's own projections, it expects [REDACTED], as seen in Figure 7.

Figure 7: Sirius XM-enabled vehicles in operation [RESTRICTED]

Source: SXM_DIR_00004888.

- (62) Similarly, Sirius XM's penetration (that is, the percent of new vehicles equipped Sirius XM receivers) has also been consistently improving. Figure 8 shows that Sirius XM's penetration rate in US-sold vehicles has been steadily rising from 21% in 2006 to approximately 75% in 2015.

Figure 8: Sirius XM penetration in US-sold vehicles, 2006-15

Penetration in US-sold vehicles	21%	32%	44%	56%	62%	67%	~67%	~70%	~70%	~75%
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Source: Sirius XM Annual Reports, Letter to Shareholders 2009-2015.

- (63) Finally, Figure 9 depicts Sirius XM's new vehicle consumer conversion rate, which tracks the percentage of promotional subscribers that convert to self-paid subscriptions after the initial promotion period.³⁵

³⁵ Sirius XM has stated: "We measure conversion rate three months after the period in which the trial service ends." Sirius XM 2015 10-K at 40. The metric excludes rental and fleet vehicles. Of the 29.6 million subscribers at the end of 2015, 24.3 million (or 82.1%) were "self-pay" subscribers (paying a regular monthly (or annual) fee for the service), and 5.3 million were "paid promotional" subscribers with a time-limited promotional subscription. *Id.* at 22. Sirius XM's goal, of course, is to convert "paid promotional" (as well as its "unpaid promotional") subscribers into "self-pay" subscribers.

Figure 9: Sirius XM new vehicle consumer conversion rate, 2006-15

New vehicle consumer conversion rate	51.9%	50.9%	47.5%	45.4%	46% ³⁶	45%	45%	44%	41%	40%
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Source: Sirius XM 10-K statements 2009-2015.

- (64) As indicated in Figure 9, from 2006 to 2015, Sirius XM's conversion rate for consumers who purchased new vehicles declined.³⁷ As Sirius XM explains, this decline has primarily been a result of the rapid rise in penetration rates³⁸ and lower conversion rates in lower-priced vehicles.³⁹ However, as the Sirius XM's rapid increase in subscribers indicates, the decline in conversion rate has been overshadowed by the growth in vehicle sales and penetration.
- (65) Sirius XM's increases in the number of its subscribers does not entirely explain Sirius XM's revenue growth. In fact, as illustrated in Figure 10, Sirius XM's total revenue has grown even faster than the number of subscribers, from \$1.57 billion in 2006 to \$4.57 billion in 2015, a 12.6 percent compounded annual growth rate (CAGR).

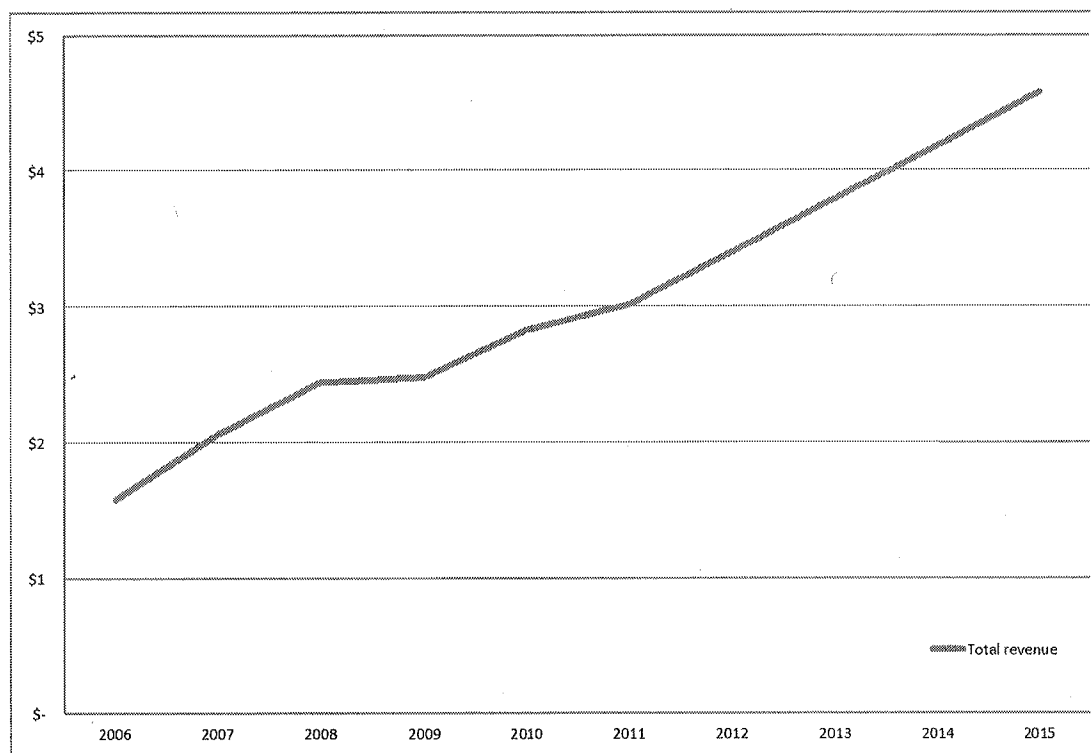
³⁶ Prior to 2010, Sirius XM published the new vehicle consumer conversion rate with one decimal place; however, starting with 2010 the data has been reported in integer values only.

³⁷ In relative terms; the absolute decline of 11.9% (51.9% - 40.0%) represents 23% of 51.9%.

³⁸ See 2015 Annual Report at 12 ("2015 vs. 2014: For the years ended December 31, 2015 and 2014, the new vehicle consumer conversion rate was 40% and 41%, respectively. The decrease in conversion was primarily due to an increased vehicle penetration rate . . .").

³⁹ See *id.* ("2014 vs. 2013: For the years ended December 31, 2014 and 2013, the new vehicle consumer conversion rate was 41% and 44%, respectively. The decrease in the new vehicle consumer conversion rate was primarily due to an increased vehicle penetration rate and lower conversion of first-time satellite enabled car buyers and lessees in lower priced vehicles.").

Figure 10: Sirius XM total revenue, 2006-2015, in \$ billion



Source: Sirius XM 10-K filings 2009-2015.

- (66) This has resulted from the fact that, at the same time as it has grown its subscriber base, Sirius XM has been able to increase the subscription prices and fees it charges subscribers, leading to rising average revenue per user (“ARPU”).⁴⁰ As illustrated in Figure 11, between 2008 and 2015, Sirius XM’s ARPU increased from \$10.82 to \$12.53, a 15.8% increase, corresponding to a compounded annual growth rate of 1.6%.

⁴⁰ In its SEC filings, Sirius XM provides a detailed breakdown of its ARPU calculations. *See, e.g.*, Sirius XM 2015 Form 10-K at 31 (“ARPU is derived from total earned subscriber revenue (excluding revenue derived from our connected vehicle services business), net advertising revenue and other subscription-related revenue, net of purchase price accounting adjustments, divided by the number of months in the period, divided by the daily weighted average number of subscribers for the period.”). In 2014 there were also “changes in contracts with an automaker and a rental car company.” *Id.*

Figure 11: Sirius XM Average Revenue per User (ARPU), 2006-2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ARPU	\$10.82	\$10.66	\$10.56	\$10.95	\$11.73	\$11.58	\$12.00	\$12.23	\$12.38	\$12.53
ARPU growth	n/a	-1.5%	-0.9%	3.7%	7.1%	-1.2%	3.7%	1.9%	1.2%	1.2%

Source: Sirius XM 10-K statements.

- (67) This increase in ARPU is the combined result of increases in the Sirius XM subscription rates and fees, partially offset by the growth in subscription discounts and (cheaper) limited channel plans offered through customer retention and acquisition programs, as well as a shift to longer-term promotional data and service plans with lower rates.⁴¹
- (68) The most significant fee item is the U.S. Music Royalty Fee surcharge, introduced in 2009. Although created ostensibly for the purpose of covering the statutory royalty fees Sirius XM is obligated to pay, it appears to be a response to restrictions imposed by the FCC against raising rates following the 2008 merger and simply amounts to another price increase.⁴²
- (69) Sirius XM explained the U.S. Music Royalty Fee as follows:⁴³
- The FCC's order approving the Merger allows us to pass through cost increases incurred since the filing of our FCC merger application as a result of statutorily or contractually required payments to the music, recording and publishing industries for the performance of musical works and sound recordings or for device recording fees.
- (70) Figure 12 presents the total effective monthly cost of subscribing to Sirius XM, combining the subscription fee (I focus on the company's most popular offering, the "Select" subscription package)⁴⁴ and the U.S. Music Royalty Fee.⁴⁵

⁴¹ Sirius XM Form 2015 10-K at 31.

⁴² CNET, *Sirius XM must raise prices to pay music royalties* (June 25, 2009), available at <http://www.cnet.com/news/sirius-xm-must-raise-prices-to-pay-music-royalties/>.

⁴³ Sirius XM 2010 Annual Report at 4.

⁴⁴ See Sirius XM, *Our Most Popular Packages*, <http://www.siriusxm.com/ourmostpopularpackages?hpid=02010028>, for detailed information on this package.

⁴⁵ Beginning in 2009, Sirius XM implemented a surcharge for the music royalty fee. The original reason for this "surcharge" was that the FCC barred the company from raising subscription prices as a condition of the 2008 merger between Sirius and XM Radio until July 28, 2011 (see Sirius XM Holdings, Inc. 2008 Form 10-K Annual Report at 10). This was extended through December 31, 2011 as part of a settlement that Sirius XM reached in a class action lawsuit filed against it, *Carl Blessing et al. v. Sirius XM Radio Inc.* See Sirius XM Radio, Inc. Form 8-K (May 16, 2011) at 2.

Figure 12: Sirius XM historical effective monthly total subscription cost for the Select subscription package

1-Jan-06	\$12.95 ⁴⁶	\$0.00	\$12.95	n/a	n/a
29-Jul-09	\$12.95	\$1.98 ⁴⁷	\$14.93	\$1.98	15.3%
6-Dec-10	\$12.95	\$1.40 ⁴⁸	\$14.35	\$(0.58)	-3.9%
1-Jan-12	\$14.49 ⁴⁹	\$1.42 ⁵⁰	\$15.91	\$1.56	10.9%
1-Feb-13	\$14.49	\$1.81 ⁵¹	\$16.30	\$0.39	2.5%
1-Jan-14	\$14.99 ⁵²	\$1.81	\$16.80	\$0.50	3.1%
5-Jan-15	\$14.99	\$2.08 ⁵³	\$17.07	\$0.27	1.6%
27-Apr-16	\$15.99 ^{54,55}	\$2.22 ⁵⁶	\$18.21	\$1.14	6.7%

Source: As noted in footnotes.

- (71) As Figure 12 shows, Sirius XM's pricing on its Select subscription package has increased by 41% over the past decade, from \$12.95 in 2006 to \$18.12 as of April 2016. This corresponds to a total increase of \$5.26 or a compounded annual increase of 3.5%.
- (72) Interestingly, Sirius XM's pricing increases appear to have had little effect on demand for its services. To illustrate this, I analyze the impact of Sirius XM's price increases on churn, defined by Sirius XM as "the monthly average of self-pay deactivations for the period divided by the average number of self-pay subscribers for the period."⁵⁷ I present Sirius XM's historical average self-pay⁵⁸ monthly churn rate in Figure 13.

⁴⁶ See, for example, Sirius XM 2008 Annual Report at 1.

⁴⁷ Sirius XM 2009 Form 10-K at 2.

⁴⁸ Sirius XM 2010 Form 10-K at 8.

⁴⁹ Sirius XM 2011 Form 10-K at 6.

⁵⁰ Sirius XM Q4 2011 Earnings Call (Feb. 9, 2012) at 8.

⁵¹ David Frear, CFO and Executive VP, Sirius XM, Q4 2012 Earnings Call (Feb. 5, 2013) at 7.

⁵² Sirius XM Q3 2013 Earnings Call (Oct. 24, 2013) at 2.

⁵³ *Summary of U.S. Music Royalty Fees by Package*, <https://www.siriusxm.com/usmusicroyalty/chart> (last visited Oct. 14, 2016).

⁵⁴ *Subscription Rate Change Effective April 27, 2016*, <http://www.siriusxm.com/2016rates/pricing> (last visited Oct. 14, 2016).

⁵⁵ Note that a similar monthly \$1.00 increase in pricing was applied to a different set of subscription packages on June 30, 2015. See *Subscription Rate Change Effective April 27, 2016*, <http://www.siriusxm.com/2016rates/pricing> (last visited Oct. 14, 2016).

⁵⁶ *Id.*

⁵⁷ See, e.g., Sirius XM 2015 Annual Report at 21.

⁵⁸ "Self-pay" subscribers are subscribers who pay a subscription fee (as opposed to subscribers who do not pay for their service because they are receiving a promotional subscription).

Figure 13: Sirius XM's churn rate, 2006-2015

Churn	1.7%	1.7%	1.8%	2.0%	1.9%	1.9%	1.9%	1.8%	1.9%	1.8%
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Source: Sirius XM 10-Ks.

- (73) Thus, while Sirius XM's subscription price, including royalty surcharge, has increased by 3.5% per year, and its ARPU has increased by 1.6% per year, Sirius XM's churn rate has stayed virtually constant. In 2006, Sirius XM's churn was 1.7% and in 2015 churn was 1.8%.⁵⁹ The only noticeable bump is in 2009 when churn increased from 1.8% to 2.0%. While this occurred in the year when Sirius XM introduced the U.S. Music Royalty Fee, and thus had the largest percentage increase in the effective subscription price, it also coincided with the 2008-09 recession.
- (74) Based on this analysis, I conclude that Sirius XM has been facing a relatively inelastic demand, enabling it to increase prices to consumers without negatively impacting its churn rate. This conclusion is consistent with statements of Sirius XM management whenever price increases have been instituted. For example:
- a) In August 2011, then-CEO Mel Karmazin commented that the new U.S. Music Royalty Fee was effectively "a double-digit price increase affecting the consumer and our churn remained relatively flat."⁶⁰
 - b) When Sirius XM instituted its first increase in the nominal subscription price in ten years during January of 2012, then-CEO Mel Karmazin commented that the company's churn rates actually improved:

"Our churn rate improved in the first quarter year-over-year from 2.0 to 1.9, and our conversion rate held at 45%. Given the approximately 12%-based package price increase we implemented in January, this positive churn result and no dip in conversion certainly exceeded our expectations and is an excellent demonstration of the value consumers place on our service."⁶¹
 - c) Finally, prior to Sirius XM's most recent \$1.00 subscription price increase in April of 2016, management once again expressed confidence in the effect of price increases on churn. Related statements at recent conference calls include:

"And in the last seven years, prices have gone up about 40%. So that's a lot. [...] and we haven't seen that much churn come out of it."⁶² "[...] you know we've had quite a

⁵⁹ Sirius XM only discloses the churn rate to one decimal point and the observed movement has been very small, thus making CAGR calculations too imprecise to be meaningful.

⁶⁰ Q2 2011 Sirius XM Radio Inc. Earnings Conference Call-Final (Aug. 2, 2011) at 8.

⁶¹ Mel Karmazin, CEO, Sirius XM, Q1 2012 Earnings Call (May 1, 2012) at 2.

⁶² David Frear, Senior Executive VP and CFO, Sirius XM, Morgan Stanley Technology, Media & Telecom Conference (Mar. 2, 2016) at 10.

bit of pricing action in the last four years. And to be honest with you, it's a real testimonial to our content that our churn is remaining very steady during that period."⁶³

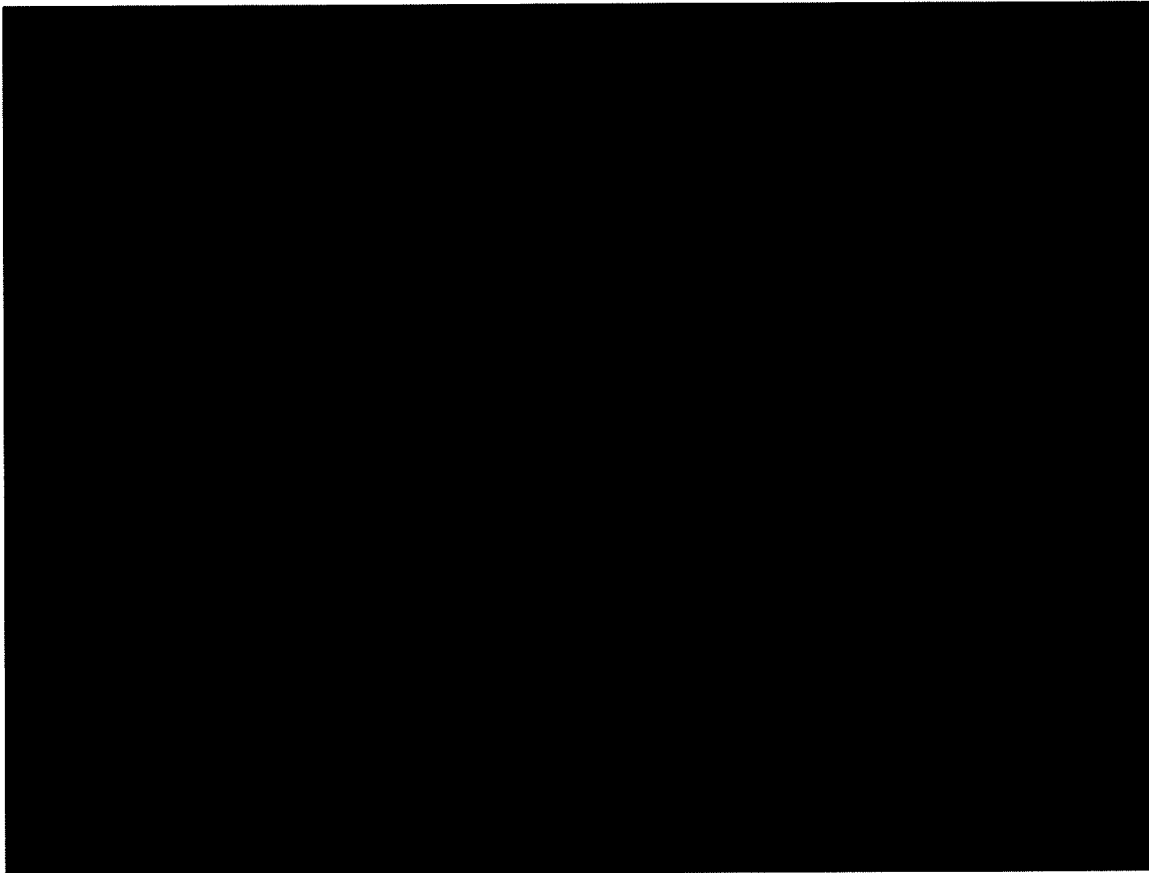
- (75) In summary, Sirius XM's revenues have shown remarkable growth since the last rate-setting proceeding, both because of growth in subscriber numbers and growth in ARPU. At the same time, Sirius XM's average costs per subscriber have declined, and I turn in the following sections to a more detailed exploration of costs.

II.B.2.b. Fixed vs. variable costs

- (76) In its public filings or SEC forms, Sirius XM does not explicitly label its various cost line items as fixed or variable. However, [REDACTED]

⁶³ James Meyer, CEO, Sirius XM, Deutsche Bank 2016 Media, Internet & Telecom Conference (Mar. 8, 2016) at 4.

Figure 14: Breakdown of Sirius XM's costs between fixed and variable [RESTRICTED]



Source: 2016 budget (SXM_DIR_00021472)

(77) I note that the analysis is presented on a non-GAAP basis.

II.B.2.c. Capital costs have declined

(78) Sirius XM has described itself as “a capital intensive business, with significant investments in satellites.”⁶⁴ This was true at the outset of its business. In the *SDARS II* proceedings, Sirius XM represented that its capital expenditures would continue to increase during the past rate term, stating, for example, that “Sirius XM has spent over \$10 billion in creating and supporting its service - capital costs that have not been recovered ... Sirius XM's massive contributions only continue to increase . . .”⁶⁵ That statement was not correct. To the contrary, as I show below, the company's financials show declining capital expenditure (“CapEx”) outlays.

⁶⁴ Sirius XM 2015 Annual Report at 10.

⁶⁵ Sirius XM Radio Inc.'s Proposed Findings of Fact, *SDARS II*, ¶ 278.

- (79) In contrast to the claims made by Sirius XM, the fact that cash investments in capital items have been declining is shown by the line item “additions to property and equipment” found on its consolidated statement of cash flows.⁶⁶ As summarized in Figure 15, Sirius XM’s financial statements indicate that the company’s annual investments have actually declined by 63% over the past decade from \$368 million in 2006 to only \$135 million in 2015, which represents a decade-long average annual decline of 10.5%. This decline in investment is even more remarkable if one takes Sirius XM’s growth into account. For example, in 2006, 22.3⁶⁷ cents of every revenue dollar was reinvested. In contrast, by 2015, Sirius XM reinvested just 3.0 cents of every revenue dollar in its infrastructure.⁶⁸ A similar picture emerges when viewing Sirius XM reinvestments relative to operating cash flows. In 2009 (the first year that Sirius XM achieved positive operating cash flows), Sirius XM reinvested a full 57.3% of operating cash flows into its business.⁶⁹ By 2015 that number had fallen to just 11.2%.⁷⁰

⁶⁶ This line item is often referred to as “CapEx,” short for “capital expenditures.”

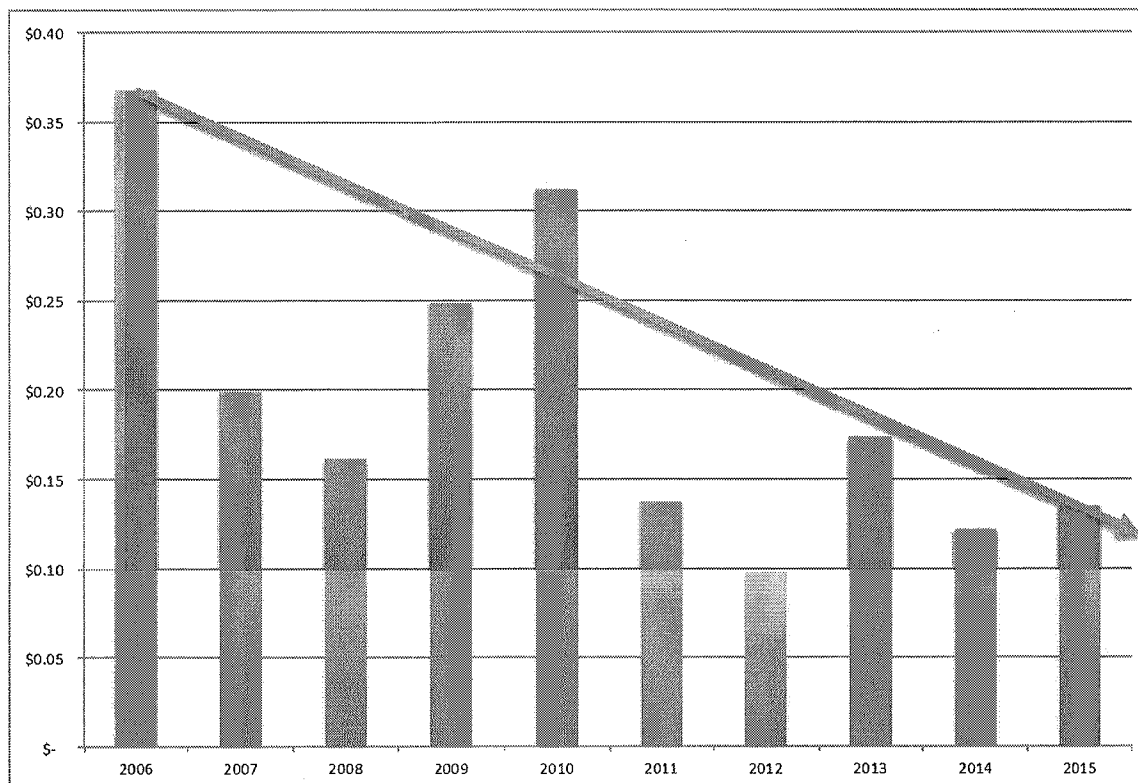
⁶⁷ .223 = \$351 million [Cash from investments] / \$1,571 million [Total revenue].

⁶⁸ .030 = \$139 million [Cash from investments] / \$4,570 million [Total revenue].

⁶⁹ 57.3% = \$249 million [Cash from investments] / \$434 million [Cash from operations].

⁷⁰ 11.2% = \$139 million [Cash from investments] / \$1,244 million [Cash from operations].

Figure 15: Sirius XM's CapEx cash outlays, 2006-2015, in \$ billion



Source: Sirius XM 10-K filings 2009-2015.

- (80) Sirius XM's satellites have been designed to last up to 15 years, which means that the company goes through cycles of investment needs.⁷¹ At the end of 2015, Sirius XM had eight satellites in orbit, as depicted in Figure 16. The first three satellites listed – FM-1, 2 and 3 – are fully depreciated but were still in operation in 2015. Sirius XM has indicated that it will begin a 12-year cycle of satellite projects at the end of 2016,⁷² but the average spend per year will be consistent with historical CapEx outlays over the past four years.

⁷¹ Sirius XM 2015 10-K at F-16.

⁷² Hooper Stevens, Vice President of Investor Relations and Finance, Sirius XM (Mar. 2, 2015), Morgan Stanley Technology, Media & Telecom Conference at 7-8.

Figure 16: Sirius XM's satellites

FM-1	2000	2013
FM-2	2000	2013
FM-3	2000	2015
FM-5	2009	2024
FM-6	2013	2028
XM-3	2005	2020
XM-4	2006	2021
XM-5	2010	2025

Source: Sirius XM 2015 10-K, at F-17.

- (81) Sirius XM's expenses for satellite and transmission not only are steadily declining (from \$106 million in 2006 to \$95 million in 2015, a decline of 1.2% per year), but actually are the second smallest expense category in Sirius XM's cost of service structure. Furthermore, the Satellite and transmission cost represented only 2.1% of Sirius XM'S 2015 total revenue.⁷³ This is small in comparison to similar costs for Sirius XM's peers; for example, Pandora spent 6.9% of its 2015 revenue on serving music and advertisements on its service.⁷⁴ Thus, it is no longer true that Sirius XM is a capital-intensive business.
- (82) Indeed, cumulatively, while over the past decade Sirius XM has invested just under \$2 billion in CapEx, in 2015 alone the company spent more than that on stock repurchases.⁷⁵

II.B.2.d. Variable costs and contribution margins

- (83) Sirius XM's performance has been particularly impressive in terms of gross margin—a standard financial metric that approximates earnings after variable costs, and represents the amount available to cover fixed costs and ultimately profits. Gross margin is a standard and scalable metric easily applicable across different companies.
- (84) Gross margin is the difference between revenue and the Cost of Services, often expressed as a percentage of revenue. As Figure 17 shows, Sirius XM's gross margin percentage has, over the

⁷³ Sirius XM 2015 Satellite and transmission cost ÷ total revenue = \$94.6 ÷ \$4,570.1 = 2.1%. See SiriusXM 2015 Form 10-K.

⁷⁴ Pandora 2015 Other cost of revenue ÷ Total Revenue = \$79.9 ÷ \$1,164.0 = 6.9%. Other cost of revenue consists of various advertising and music serving costs. See Pandora Media, Inc., 2015 Form 10-K Annual Report [hereinafter Pandora 2015 Form 10-K].

⁷⁵ Total CapEx investment between 2006 and 2015 was \$1.952 billion; the 2015 cash amount spent for common stock repurchase and retirement was \$2.018 billion.

past decade, increased steadily from 40% to 60%. This represents an annualized growth rate of 4.5%.

Figure 17: Sirius XM's gross margin, 2006-2015

GM%	40.1%	40.7%	45.3%	57.0%	61.0%	62.8%	63.9%	63.3%	61.5%	59.7%	4.5%
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Source: Sirius XM 10-K filings.

- (85) Instead of gross margin (the more commonly used financial reporting metric), Sirius XM occasionally discusses its operating profitability in terms of a contribution margin. Contribution margin is an estimate of profitability after only variable costs - calculated as revenue minus variable costs. Contribution margin is not a GAAP-defined term, and my review of documents shows that Sirius XM did not include this metric in its SEC financial statements or press releases accompanying earnings results. However, because Sirius XM executives [REDACTED], as well as external analysts, discuss contribution margin, I address it briefly here.⁷⁶
- (86) To calculate contribution margin, Sirius XM subtracts from revenue three line items that it views as truly variable costs [REDACTED].⁷⁷ Sirius XM presents its contribution margin on a non-GAAP basis. Figure 18 presents Sirius XM's contribution margin.

Figure 18: Sirius XM contribution margin, 2006-2015 [RESTRICTED]

Contribution margin	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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Source: Data prior to 2011 comes from various statements by executives on earnings calls; for 2011-15 data is from Sirius XM budgets for 2013-2016 (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

- (87) My review of the data shows that Sirius XM's contribution margin has remained remarkably consistent over time, at ~70%.

II.B.2.e. Free Cash Flow and Net Operating Income Have Increased Dramatically

- (88) As discussed, Sirius XM's improved performance has resulted from both top-line revenue growth and cost reduction in most of the relevant cost categories. For example, Sirius XM reduced the cost of service by about one third, from approximately 60% of revenue in the 2006-2007 period to approximately 40% of revenue in 2015. More dramatically, operating expenses fell by about 100

⁷⁶ For example, analyst reports from Deutsche Bank and Pivotal include the line item contribution margin.

⁷⁷ 2016 budget, SXM_DIR_00021472.

percentage points, from 134% of revenue to about 34%. As a result of these increased efficiencies, by 2015 operating income represented 26% of revenue – meaning that Sirius XM earns 26 cents on each revenue dollar – a truly remarkable performance.

- (89) Figure 19 presents Sirius XM's statement of cash flows.^{78,79}

Figure 19: Sirius XM's cash flow statement, 2006-2015, in \$ billion⁸⁰

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Cash from operations	\$(0.88)	\$(0.30)	\$(0.40)	\$0.43	\$0.51	\$0.54	\$0.81	\$1.10	\$1.25	\$1.24	\$5.90
Cash from investments	\$(0.35)	\$(0.20)	\$(0.15)	\$(0.25)	\$(0.30)	\$(0.13)	\$(0.10)	\$(0.70)	\$(0.10)	\$(0.14)	\$(1.71)
Cash from financing	n/a	n/a	n/a	\$(0.18)	\$(0.01)	\$(0.23)	\$(0.96)	\$(0.79)	\$(1.14)	\$(1.14)	\$(4.45)
Net cash change	n/a	n/a	n/a	\$0.00	\$0.20	\$0.19	\$(0.25)	\$(0.39)	\$0.01	\$(0.04)	\$(0.27)

Source: Sirius XM 10-K filings 2009-2015.

- (90) Figure 19 indicates that over the 2006-2015 period, Sirius XM has earned \$5.9 billion in operating cash flows, and that since the merger, starting in 2009 Sirius XM's operating cash flows were positive in every single year.
- (91) The most commonly used metric to assess a company's performance and value is FCF, which represents the amount of cash that a company is able to generate after required investment in the company's current and future operations. It is calculated as cash flows from operations minus CapEx and other related capital investments in the business.⁸¹ This essentially amounts to combining cash flows from operations and cash flows from investments, as seen in Figure 19 with two notable exceptions:

⁷⁸ CapEx is included in the "Cash from investments" line item.

⁷⁹ Pre-merger data for 2006-08 is not available on a pro-forma basis for all line items. Where available, it is presented here; however, the total columns only sums the years with complete data, 2009-15.

⁸⁰ All available data-points shown; no data for cash flows from financing available before 2009 on a pro-forma (including the effects of the merger) basis.

⁸¹ See Sirius XM 2015 Annual Report at 10 ("Free cash flow, which is reconciled to 'Net cash provided by operating activities,' is a Non-GAAP financial measure. This measure can be calculated by deducting amounts under the captions 'Additions to property and equipment', deducting or adding. Restricted and other investment activity and the return of capital from investment in unconsolidated entity from 'Net cash provided by operating activities' from the consolidated statements of cash flows, adjusted for any significant legal settlements.").

- a) In 2013, cash flows from operations included a \$525 million cash acquisition of the connected vehicle business of Agero, Inc. that Sirius XM excluded from the computation of FCF as an extraneous event;⁸² and,
- b) In 2015 Sirius XM adjusted the calculation of FCF by adding back a \$210 million pre-1972 sound recordings legal settlement.⁸³
- (92) Figure 20 shows that over the past decade Sirius XM has generated \$2.6 billion in free cash flow – which again is excess cash available after all of the capital investments (e.g., satellite costs) have been met. Since the merger, starting in 2009 Sirius XM has recorded seven straight years of positive FCF and has over that period generated \$4.91 billion of FCF.

Figure 20: Sirius XM's free cash flow, 2006-2015, in \$ billion

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006-2015
Net cash provided by operating activities	-0.88	-0.30	-0.40	0.43	0.51	0.54	0.81	1.10	1.25	1.24	4.31
Additions to property and equipment ⁸⁴	-0.37	-0.20	-0.16	-0.25	-0.31	-0.14	-0.10	-0.17	-0.12	-0.13	-1.95
Purchases of restricted and other investments	0.02	0.03	0.04	-	-	-	-	-	-	-	0.07
Merger-related costs	-	-0.03	-0.02	-	-	-	-	-	-	-	-0.05
Sale of restricted and other investments	-	-	-	-	0.01	-	-	-	-	-	0.01
Return of capital from investment in unconsolidated entity	-	-	-	-	-	0.01	-	-	0.02	-	0.03
Release of restricted investments	-	-	-	-	-	0.00	-	-	-	-	0.00
Pre-1972 sound recordings legal settlement	-	-	-	-	-	-	-	-	-	0.21	0.21
Free Cash Flow (FCF)	-1.23	-0.50	-0.55	0.19	0.21	0.42	0.71	0.93	1.16	1.32	2.63

Source: Sirius XM 10-K filings 2009-2015.

- (93) The 2015 FCF alone (\$1.32 billion) is almost equal to the amount of property, plant and equipment on the company's books (\$1.42 billion; see Figure 24) – meaning that Sirius XM is generating more than sufficient amounts of cash to fund its capital needs.

⁸² Sirius XM Holdings, Inc., 2013 Form 10-K Annual Report at F-17.

⁸³ See Sirius XM 2015 Form 10-K at 29 (“We have excluded the \$210,000 payment related to the pre-1972 sound recordings legal settlement from our free cash flow calculation in the year ended December 31, 2015.”).

⁸⁴ For avoidance of confusion, the line item “Additions to property and equipment” is a subset of the line item “Cash from Investments,” as seen in Figure 19.

- (94) Net operating income, too, has improved as a result of the revenue and cost trends I have described, as Figure 21 demonstrates.

Figure 21: Sirius XM's income statement, 2006-2015, in \$ billion

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Total revenue	\$1.57	\$2.06	\$2.44	\$2.47	\$2.82	\$3.01	\$3.40	\$3.80	\$4.18	\$4.57	\$30.32
Cost of service	\$0.94	\$1.22	\$1.33	\$1.06	\$1.10	\$1.12	\$1.23	\$1.39	\$1.61	\$1.84	\$12.86
Gross margin	\$0.63	\$0.84	\$1.10	\$1.41	\$1.72	\$1.89	\$2.17	\$2.40	\$2.57	\$2.73	\$17.47
Operating expenses	\$2.10	\$1.86	\$1.62	\$1.18	\$1.25	\$1.22	\$1.30	\$1.36	\$1.45	\$1.55	\$14.89
Operating income	\$(1.47)	\$(1.02)	\$(0.52)	\$0.23	\$0.47	\$0.68	\$0.87	\$1.04	\$1.12	\$1.18	\$2.57
Other	\$(0.35)	\$(0.22)	\$(0.38)	\$(0.57)	\$(0.42)	\$(0.23)	\$(0.40)	\$(0.41)	\$(0.29)	\$(0.29)	\$(3.56)
Income before taxes	\$(1.82)	\$(1.25)	\$(0.90)	\$(0.35)	\$0.05	\$0.44	\$0.47	\$0.64	\$0.83	\$0.89	\$(0.99)
Tax	\$(0.00)	\$(0.00)	\$(0.00)	\$(0.01)	\$(0.00)	\$(0.01)	\$3.00	\$(0.26)	\$(0.34)	\$(0.38)	\$1.99
Net income	\$(1.82)	\$(1.25)	\$(0.90)	\$(0.35)	\$0.04	\$0.43	\$3.47	\$0.38	\$0.49	\$0.51	\$1.00

Source: Sirius XM 10-K filings 2009-2015.

- (95) As indicated in Figure 21, over the past 10 years Sirius XM has earned \$1 billion in net, after-tax, income. Since 2010, the performance has been even more impressive, as Sirius XM has earned a net after-tax income in each of those years, totaling \$5.3 billion or over \$1 billion per year.⁸⁵
- (96) In Figure 22, I represent the same income statement (as seen in Figure 21) in a common-size format – that is, dividing each item by that year's total revenue. This common-size analysis reveals how each income statement item evolves as the company grows.

⁸⁵ I note that in 2012 Sirius XM reversed a reserve they had been carrying due to the previously held uncertainty over the applicability of net operating loss carry-forwards ("NOL"). This reversal of the reserve was due to Sirius XM's determination that its profitability had increased significantly, making it highly likely that it would be able to take advantage of the NOLs it accumulated during its start-up phase. Consequently, the tax line for 2012 shows an accounting benefit of \$3 billion, and a corresponding \$3 billion increase in net income. Absent that effect, the net income for 2012 would have been approximately \$0.47 billion, in line with both 2011 and 2013 (preceding and following years). However, because this reserve reduced the income of the years prior to 2012, the reversal of the reserve must be included when analyzing cumulative income and average income over the entire period.

Figure 22: Sirius XM's common-size income statement, 2006-2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of service	59.9%	59.3%	54.7%	43.0%	39.0%	37.2%	36.1%	36.7%	38.5%	40.3%
Gross margin	40.1%	40.7%	45.3%	57.0%	61.0%	62.8%	63.9%	63.3%	61.5%	59.7%
Operating expenses	133.7%	90.4%	66.5%	47.7%	44.5%	40.4%	38.2%	35.8%	34.8%	33.9%
Operating income	-93.6%	-49.8%	-21.2%	9.2%	16.5%	22.4%	25.6%	27.5%	26.8%	25.8%
Other	-22.3%	-10.8%	-15.7%	-23.2%	-14.8%	-7.8%	-11.7%	-10.7%	-6.9%	-6.3%
Income before taxes	-116.0%	-60.5%	-36.9%	-14.0%	1.7%	14.6%	13.9%	16.8%	19.9%	19.5%
Tax	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.5%	88.1%	-6.8%	-8.1%	-8.4%
Net income	-116.1%	-60.6%	-37.0%	-14.2%	1.5%	14.2%	102.1%	9.9%	11.8%	11.2%

Source: Lys analysis, based on Sirius XM 10-K filings 2009-2015.

- (97) Thus, since 2010, Sirius XM's profitability has grown significantly faster than its revenue, indicating an improved ability to monetize the operational gains and scale. During the most recent five-year period, Sirius XM's revenue on average grew 10.2% annually. Over the same period, Sirius XM experienced significantly larger annual increases in EBIT (20.4%), Adjusted EBITDA (21.5%), net income (61.3%) and free cash flow (44.3%).

II.B.2.f. Sirius XM's Stock Repurchase Program

- (98) Sirius XM has not only become extremely profitable, but its operations also no longer require significant investments. As a result, it has transitioned to massively returning cash to its investors, largely by using its available free cash flow and borrowed funds to re-purchase its own common stock.⁸⁶
- (99) The cash returned to (debt and equity) investors rose steadily from \$182 million in 2009 to \$1.14 billion in 2015. These payments to investors are even more impressive when compared to sales and operating cash flows. In 2009, 7.4 cents of every revenue dollar and 42 cents of every operating cash flow dollar were returned to investors.⁸⁷ In contrast, by 2015, the amount returned

⁸⁶ Starting in 2013, Sirius XM has borrowed money (long-term debt has increased from \$2.2 billion to \$5.4 billion) and used FCF (\$3.4 billion) and the reduction in cash on hand (\$0.5 billion) to fund a share-repurchase program. Thus, any perceived weakness in Sirius XM's balance sheet is solely a result of management's strategy to fund stock repurchases in part through borrowing, and does not reflect any fundamental weakness in Sirius XM's business.

⁸⁷ $.074 = \$182 \text{ million [Cash from financing]} / \$2,473 \text{ million [Total revenue]}$. $.420 = \$182 \text{ million [Cash from financing]} / \$434 \text{ million [Cash from operations]}$.

to investors rose to 25.0 cents of every revenue dollar and 91.7 cents of every operating cash flow dollar.⁸⁸

- (100) The above picture becomes even more dramatic when one considers the cash returned to shareholders (as opposed to all investors). Specifically, in December 2012, Sirius XM's Board of Directors approved a stock repurchase program authorizing the company to buy back up to \$8 billion of its common stock.⁸⁹ There is no set end date for the program, and "shares may be purchased from time to time on the open market, pursuant to pre-set trading plans meeting the requirements of Rule 10b5-1 under the Exchange Act, in privately negotiated transactions, including transactions with Liberty Media and its affiliates, or otherwise The size and timing of our repurchases will be based on a number of factors, including price and business and market conditions."⁹⁰
- (101) As Figure 23 shows, through the second quarter of 2016, Sirius XM has repurchased \$7.3 billion worth of its own stock. In doing so, Sirius XM has reduced the number of shares outstanding from 6.1 billion shares at the end of 2013 to 4.9 billion shares at the end of Q2-2016.⁹¹

Figure 23: Sirius XM cash outlays for common stock repurchase and retirement, 2013-2016 (first half), in \$ billion

	2013	2014	2015	2016 (through Q2)	TOTAL
Common stock repurchases	\$1.762	\$2.523	\$2.016	\$0.991	\$7.292

Source: Sirius XM 10-K filings 2013-2015; 10-Q filings for Q1-2016 and Q2-2016.

- (102) To put the size of this stock-repurchase program into perspective, the pre-merger investors in Sirius and in XM contributed a total of \$6.9 billion, and all shareholder investments to date amounted to \$10.5 billion. Thus, Sirius XM has already repurchased more than its pre-merger shareholders contributed and by completion of the repurchase program, would have returned 76% of all capital invested by its shareholders since inception of the two predecessor companies. In 2015 alone, the amount of cash Sirius XM spent repurchasing its stock (\$2.0 billion) is greater than the full value of the property plant and equipment on the company's balance sheet (\$1.42 billion; see Figure 24).

⁸⁸ .250 = \$1,141 million [Cash from financing] / \$4,570 million [Total revenue]. .917 = \$1,141 million [Cash from financing] / \$1,244 million [Cash from operations].

⁸⁹ Sirius XM 2015 Form 10-K at 19.

⁹⁰ Sirius XM 2015 Form 10-K at 19.

⁹¹ Based on Sirius XM's most recent SEC filing, the 10-Q statement for the second quarter of 2016, the company had 4,938,820,000 shares outstanding as of June 30, 2016. See Sirius XM Holdings, Inc, Form 10-Q (June 30, 2016) at 2.

(103) Sirius XM's massive stock repurchase is indicative of managements' outlook. Under the "signaling theory" in economics, when a company is buying back its stock and issuing debt to do so, it is signaling to the market a strong belief by insiders that the company is undervalued. The fact pattern with Sirius XM, issuing debt and buying back significant amounts of its stock, is consistent with this theory and indicates to me a bullish belief by insiders about the future of the company.⁹²

(104) Not surprisingly, Sirius XM's management has indicated that the company has decided to aggressively buy back shares of its own stock because they believe the company is undervalued:

"If we didn't think that the stock was meaningfully undervalued, we wouldn't be buying it. And it is just a capital allocation decision, it's not really an operating decision, it is an attractively priced asset, so we've been busy looking at how do we deploy our capital right, do we hold the cash, do we reinvest in more business initiatives, do we acquire things on the outside or do we buy our own stock? ... we're buying the stock because we think it's cheap."⁹³

"And our buyback program I'll remind investors is not aggressive it is real aggressive. I mean if you think about our guidance this year is we're going to generate about 1.3 billion of cash if you look at the last couple of years we have bought back about 2 billion of shares a year. So, I had an investor outside ask me when we were going to get more aggressive in buyback, and I said what do you mean by aggressive he is like 100% of cash flow. I said like we're at 170% of cash flow."⁹⁴

"I think it's no secret we continue to aggressively buy our stock back in the marketplace. And certainly we don't see a foreseeable change in that. So we're pretty bullish about 2015 as we sit here right now."⁹⁵

(105) Sirius XM's decision to use its abundantly available cash to return money to investors is strong evidence of the impressive financial health and future prospects of the company.

II.B.2.g. Balance sheet analysis

(106) Finally, I conclude my analysis of Sirius XM's financial performance by reviewing its balance sheet. Figure 24 presents Sirius XM's balance sheet between 2008 and 2015.⁹⁶

⁹² See, e.g., Myers, Stewart C. and Nicholas S. Majluf, *Corporate financing and investment decisions when firms have information that investors do not have*, J. of Financial Economics 13, 187-221 (1984); Myers, Stewart C., *The capital structure puzzle*, J. of Finance 39, 575-592 (1984).

⁹³ David Frear, Senior Executive VP and CFO, Sirius XM, JPMorgan Global High Yield & Leveraged Finance Conference (Feb. 29, 2016) at 10.

⁹⁴ James Meyer, CEO, Sirius XM, Goldman Sachs 24th Annual Communacopia Conference (Sept. 17, 2015) at 11.

⁹⁵ James Meyer, CEO, Sirius XM, Deutsche Bank Media, Internet & Telecom Conference (Mar. 10, 2015) at 2.

⁹⁶ Sirius XM did not disclose a pro forma balance sheet for periods prior to 2008.

Figure 24: Sirius XM's balance sheet, 2008-2015, in \$ billion

Current assets	\$0.79	\$0.86	\$0.99	\$1.28	\$1.83	\$1.42	\$1.55	\$0.56
Property and equipment	\$1.70	\$1.71	\$1.76	\$1.67	\$1.57	\$1.59	\$1.51	\$1.42
Other assets	\$4.97	\$4.75	\$4.63	\$4.55	\$5.65	\$5.83	\$5.31	\$6.07
TOTAL ASSETS	\$7.46	\$7.32	\$7.38	\$7.50	\$9.05	\$8.84	\$8.37	\$8.05
Current liabilities	\$2.41	\$2.08	\$2.35	\$2.25	\$2.31	\$2.74	\$2.31	\$2.50
Long-term debt	\$2.82	\$3.11	\$3.05	\$3.03	\$2.45	\$3.11	\$4.50	\$5.45
Other liabilities	\$2.22	\$2.04	\$1.78	\$1.51	\$0.25	\$0.25	\$0.24	\$0.26
TOTAL LIABILITIES	\$7.45	\$7.23	\$7.18	\$6.79	\$5.02	\$6.10	\$7.06	\$8.21
Stock ⁹⁷	\$0.00	\$0.00	\$0.00	\$0.00	\$0.01	\$0.01	\$(0.02)	\$(0.02)
Accumulated other loss	\$(0.01)	\$(0.01)	\$(0.01)	\$0.00	\$0.00	\$(0.00)	\$(0.00)	\$(0.00)
Additional paid in capital	\$9.72	\$10.35	\$10.42	\$10.48	\$10.35	\$8.67	\$6.77	\$4.78
Accumulated deficit	\$(9.71)	\$(10.25)	\$(10.21)	\$(9.78)	\$(6.31)	\$(5.93)	\$(5.44)	\$(4.93)
SHAREHOLDER EQUITY	\$0.01	\$0.10	\$0.21	\$0.70	\$4.04	\$2.75	\$1.31	\$(0.17)
TOTAL LIABILITIES + EQUITY	\$7.46	\$7.32	\$7.38	\$7.50	\$9.05	\$8.84	\$8.37	\$8.05

Source: Sirius XM 10-K filings.

- (107) Sirius XM's balance sheet shows that at the end of 2015 the total value of property and equipment (which includes satellites) was \$1.4 billion. Thus, satellites comprise only 12.2% of Sirius XM's assets, truly not a significant percentage.
- (108) The largest components on the asset side are intangible assets (\$2.6 billion or 32.3% at the end of 2015) and goodwill stemming from the merger (\$2.9 billion or 36.0% at the end of 2015).
- (109) On the equity side, Sirius XM has \$5.5 billion in long-term liabilities, consisting of \$5.2 billion in senior notes⁹⁸ and \$0.3 billion from a Senior Secured Revolving Credit Facility.⁹⁹ As of the end of

⁹⁷ For simplicity, this line item combines common stock at par (2015 value of \$5.2 million), preferred stock (\$0), and treasury stock (-\$23.7 million), for a combined total of -\$18.5 million or -\$0.02 billion.

⁹⁸ Consisting of seven different issues of Senior Notes maturing between May 2020 and August 2022, and carrying a coupon interest between 4.25% and 6.00%.

⁹⁹ Sirius XM 2015 Form 10-K at F22-23.

2015, it also has an additional \$1.4 billion available for future borrowings under the Credit Facility.¹⁰⁰

- (110) The negative net equity at the end of 2015 is a result of two effects. First, Sirius XM has an accumulated deficit (retained earnings) of \$4.93 billion. This deficit stems from an accumulated deficit of \$9.71 billion that predated the merger between Sirius and XM (the period when Sirius and XM were competing for market share). That is, in the seven post-merger years, Sirius XM was able to reduce that deficit by \$4.78 billion. Second, Sirius XM embarked on the massive stock repurchase program that I previously discussed, reducing its owner's equity by \$6.3 billion through 2015. Absent the stock buyback, as of December 31, 2015, Sirius XM's owners' equity would have been \$6.13 billion, a whopping \$15.84 billion above its pre-merger level. Thus, I conclude that the shareholders' deficit is the result of a deliberate strategic decision and is not indicative of a fundamental weakness in the company's operations.
- (111) Most importantly, I note that (as a result of the massive stock repurchase program) Sirius XM's total assets increased by only \$590 million (or 7.9%) over this 8-year period. Thus, comparing its balance sheet to its earnings and cash-flow performance highlights the dramatic improvements in Sirius XM's ability to profitably utilize its assets.
- (112) In summary, I find that Sirius XM has exhibited tremendous growth over the past decade, and in particular since the Sirius – XM merger. The company has increased its penetration rates in US-sold vehicles, which led to a strong growth in paying subscribers. More impressively yet, Sirius XM has posted even stronger growth in virtually all profitability categories (EBIT, EBITDA, net income, free cash flow), indicating that it has reached significant scale which enables it to better control its variable costs and improve margins. Sirius XM is easily able to fund its CapEx needs, which, along with depreciation and amortization, have been steady and flat. Next, I document Sirius XM's return on investment.

II.C. Comparison of Sirius XM's Return on Investment and Financial Performance to Market and Other Industry Participants

- (113) The statutory standard for rate-setting in this matter includes the objective that the copyright user earns a fair income under existing economic conditions.¹⁰¹ In this section, I assess the "fairness" of Sirius XM's returns by comparing Sirius XM's performance to the market as a whole and to the industry in which it operates.

¹⁰⁰ Sirius XM 2015 Annual Report at 15.

¹⁰¹ 17 U.S.C. § 801(b)(1)(B).

- (114) My analysis of Sirius XM's stock performance indicates that its investors have earned above-market returns. Figure 25 demonstrates that since the Sirius – XM merger on July 29, 2008, investors in Sirius XM have earned a return of 165%,¹⁰² far surpassing the returns on the market, as measured by the S&P 500 index (68%) and the Dow Jones Industrial Average (59%).

Figure 25: Return on Sirius XM's common stock since the merger, compared to the market

SIRI ¹⁰⁴	\$1.55	\$4.11	164.9%
S&P 500	1,263.20	2,126.50	68.3%
DJIA	11,397.56	18,086.40	58.7%

Source: Yahoo finance.

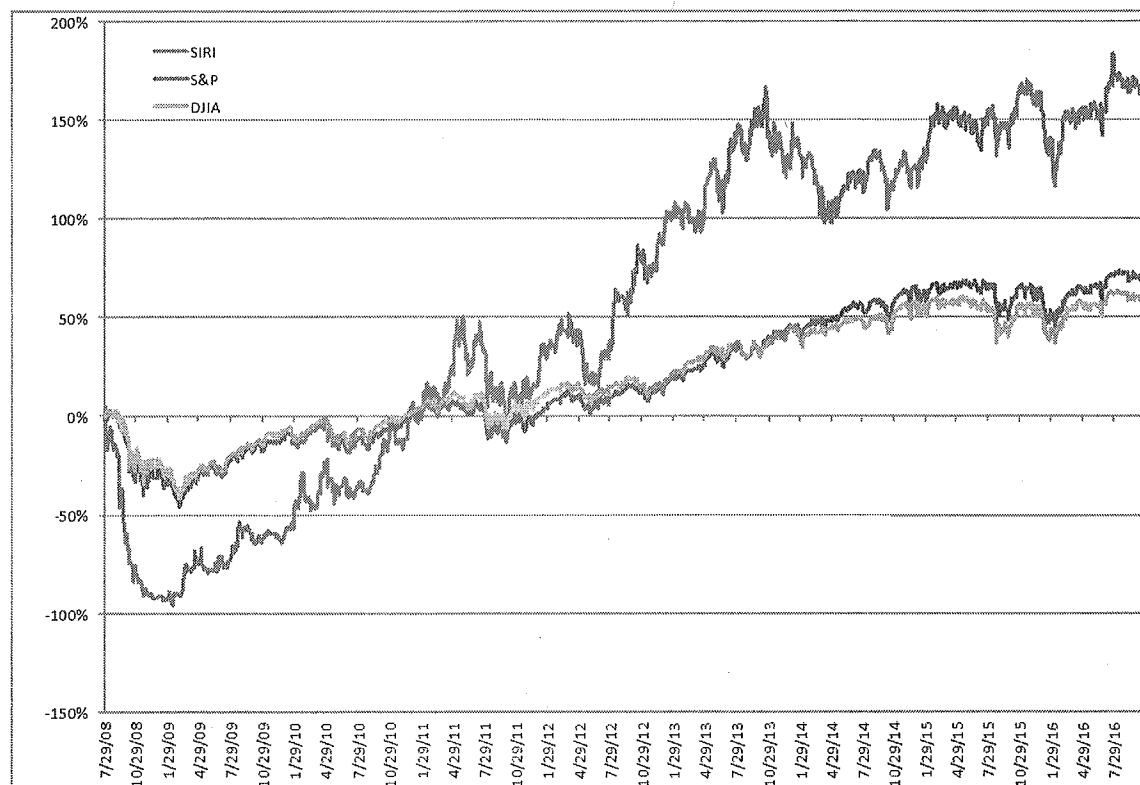
- (115) Figure 26 depicts the performance of the Sirius XM stock since the merger and compares it to the market. This period includes the recession that began in 2008, and shows that Sirius XM has recovered from the downturn far better than the market in general.

¹⁰² This return includes price appreciation and stock dividends, and measures the change in the “adjusted” closing stock price of SIRI.

¹⁰³ Calculated as of the closing price on Monday, October 17, 2016, the most recent trading day before I finalized the publication of this report.

¹⁰⁴ SIRI is the ticker symbol for Sirius XM's common stock.

Figure 26: Performance of Sirius XM's common stock since the merger, compared to the market



Source: Yahoo finance.

- (116) I now compare Sirius XM's financial performance to other companies in the same industry based upon both 4-digit and 3-digit Standard Industry Classification (SIC) codes. I compare Sirius XM to the broadcast radio industry (SIC 4832) because the company identifies broadcast radio¹⁰⁵ as a major source of competition in its 10-K filings.¹⁰⁶ Because there are relatively few publicly traded companies in this industry,¹⁰⁷ I also make comparisons to the broader radio and television broadcasting industry (SIC 483).^{108, 109} I note that the 3-digit industry classification is on average much more profitable than the 4-digit classification, and therefore comparison to the 3-digit industry classification holds Sirius XM to a higher standard, thus biasing my results in favor of Sirius XM.

¹⁰⁵ SIC code 4832 includes both traditional AM/FM broadcasters and internet radio companies such as Pandora and iHeartMedia.

¹⁰⁶ For example, see Sirius XM 2015 Form 10-K at 5.

¹⁰⁷ Including Sirius XM, SIC 4832 includes twelve companies in 2015. See Appendix C, Figure 74 for complete list.

¹⁰⁸ The three-digit industry 483 includes all the sub-industries 483X.

¹⁰⁹ Including Sirius XM, SIC 483 includes twenty-five companies in 2015. See Appendix C, Figure 73 for complete list.

- (117) I also compare Sirius XM's financial performance to the weighted-average performance of Pandora and iHeartMedia, [REDACTED],¹¹⁰
- (118) To begin, it bears noting that by 2013, Sirius XM had become the largest radio company in the world. [REDACTED].

Figure 27: Sirius XM revenue compared to other radio companies [RESTRICTED]



Source: SXM_DIR_00004031, Sirius XM, Annual Stockholder Meeting, May 19, 2014, at 15.

¹¹⁰ Sirius XM's other competitors, such as Spotify and Apple Music, are not included in my analysis because their financial data is not available, either because they are not publicly traded or because they represent a small part of a much larger company.

- (119) Sirius XM is not only the biggest, as measured by revenue. It is also, as my analysis shows, higher in terms of profitability relative to its comparators. I perform this analysis by calculating various performance metrics and comparing the value of these metrics for Sirius XM to the weighted-average value of the relevant metrics for the industry.¹¹¹ Because the companies differ in size, my comparative analysis is based on margins and returns as opposed to dollar amounts. The performance metrics I consider include EBITDA margin, free cash flow margin, return on invested capital ("ROIC"), return on assets ("ROA"), net profit margin, and net operating margin.¹¹²
- (120) First, some definitions:
- a) I have defined free cash flow previously. I use Sirius XM's reported free cash flow from its 10-K filings, and I calculate this amount for other firms in the industry by simply subtracting capital expenditures from cash flows from operations.
 - b) I have defined EBITDA previously. EBITDA margin measures a company's EBITDA as a percentage of its total revenue.
 - c) ROIC (return on invested capital) measures the aggregate return available to a firm's debt and equity investors. ROIC is calculated by dividing net income by average total invested capital, where total invested capital is equal to the book value of debt plus the book value of equity.
 - d) ROA (return on assets) measures the profitability of a company relative to its total assets, or the efficiency of management in using the company's assets to generate earnings. Net profit margin is equal to the net income of the company divided by total revenue, and net operating margin expresses operating profits as a percentage of total revenue. ROA is equal to net income plus after-tax interest expense, divided by average total assets.
- (121) Figure 28 presents the amounts calculated for each of these metrics for Sirius XM, and the weighted-average calculated for these metrics for all other companies in the broadcast radio and television industry and for Pandora/iHeartMedia for the fiscal year 2015.

¹¹¹ Industry averages exclude Sirius XM. For the 3-digit SIC, Liberty Media, Inc. is also excluded since it is the majority owner of Sirius XM and therefore consolidates the company in its financial statements.

¹¹² In my computations of weighted averages, weights are based on total revenue for EBITDA margin, free cash flow margin, net profit margin and net operating margin. For ROA, weights are based on average total assets, and for ROIC weights are based on average total invested capital.

Figure 28: Fiscal year 2015 performance metrics for Sirius XM vs. broadcast radio (SIC 4832), broadcast radio and television (SIC 483), and Pandora/iHeartMedia

Weighted average: broadcast radio (SIC 4832)	16.1%	-1.8%	-8.3%	-0.2%	-13.7%	7.7%
Weighted average: broadcast radio and television (SIC 483)	19.9%	6.1%	0.2%	3.0%	0.4%	13.3%
Weighted average: Pandora and iHeartMedia	22.7%	-6.0%	-8.1%	1.8%	-12.2%	13.2%
Sirius XM	36.3%	28.8%	9.2%	8.6%	11.2%	25.8%

Source: Lys analysis, data from 10-K filings.

- (122) Sirius XM's performance clearly exceeds both the 4-digit and the 3-digit industry averages, as well as Pandora/iHeartMedia, as measured by every one of these metrics. In order to ensure that this result is not due to an anomaly in the year 2015, I performed the same analysis, averaged over the years 2010 through 2015, as seen in Figure 29.

Figure 29: 2010-2015 average performance metrics for Sirius XM vs. broadcast radio (SIC 4832), broadcast radio and television (SIC 483), and Pandora/iHeartMedia

Weighted average: broadcast radio (SIC 4832)	22.9%	2.7%	-3.9%	2.5%	-7.1%	13.6%
Weighted average: broadcast radio and television (SIC 483)	22.2%	8.2%	2.8%	4.8%	4.1%	16.1%
Weighted average: Pandora and iHeartMedia	25.5%	-0.3%	-4.8%	2.8%	-8.5%	14.7%
Sirius XM	29.3%	20.5%	7.3%	6.5%	9.5%	24.1%

Source: Lys analysis, data from 10-K filings.

- (123) While not as pronounced due to Sirius XM's lower performance in the earlier years, Sirius XM still clearly outperforms each of these comparison groups on every metric I considered. Thus, what these comparisons show is that Sirius XM's start-up problems are definitely behind it and that it has become one of the most profitable companies in the industry.

- (124) These results are clearly reflected in statements made by Sirius XM executives. When asked about competition at a conference in 2014, Sirius XM CFO David Frear touted Sirius XM's superior performance:¹¹³

"I know which business plan I like best. And it's driven us to being the largest company in the radio space by revenue, measured by revenue in North America. And then as you look at other media companies that you guys may consider investing in that, I think it's helpful to stack us up as to how do we perform relative to the pro-margin perspective. We have among the best margins in media that our guidance this year will -- goes to about a 34% EBITDA margin. We do believe that there is upside in that margin as we continue to grow and continue to show good cost controls.

We have the best free cash flow conversion ratio among all of the companies out there and some will say, wait a minute, you don't have your taxes in there, okay. So, since we won't pay taxes for another five years or so, you can take this 80% conversion ratio and you can knock it down to something it looks more like 58% it's still the best then. There are another group of people, who'll say wait a minute, what about your satellite expenditures, you just finished doing your launch and you're not -- you're kind of been in this period you're not building. So okay, take another 3% off and say that when we order back in the build program that we might have 150 million a year, we're spending on satellites. And you still end up with the mid 50s free cash flow conversion factor."

II.D. Effect of an Increase in Royalty Rates

- (125) In this section I calculate the expected effects on Sirius XM of a royalty rate increase. This is relevant to at least three of the statutory factors for rate-setting in this matter:¹¹⁴
- a) First Factor: Maximizing the availability of creative works;
 - b) Second Factor: Determining a rate that affords the copyright user a fair income under existing economic conditions; and
 - c) Fourth Factor: Minimize any disruptive impact on the industry structure and generally prevailing industry practices.
- (126) Sirius XM is obligated to pay SoundExchange a royalty fee calculated as the product of (A) a pre-defined statutory royalty rate which changes from year to year, and (B) gross revenues, as defined in the regulations.¹¹⁵ Royalty payments are then reduced according to "the proportion of certain

¹¹³ David Frear, EVP and CFO, Sirius XM, Morgan Stanley Leveraged Finance Conference (June 12, 2014,) at 4.

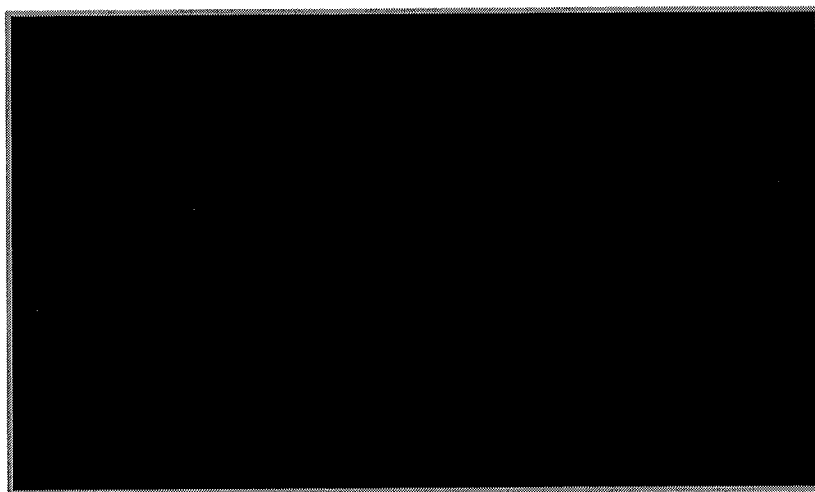
¹¹⁴ 17 U.S.C. § 801(b)(1)(B).

¹¹⁵ 37 CFR §382 Subpart B.

transmissions of directly licensed sound recording and/or transmissions of certain sound recordings fixed prior to February 14, 1972 as set forth by a formula in the regulations.”¹¹⁶

- (127) Figure 30 depicts the computation of Sirius XM’s statutory royalty obligation to SoundExchange, based on provided statements.¹¹⁷

Figure 30: Sirius XM calculation of its statutory royalty payment, 2007-2015, \$ millions. [RESTRICTED]



Source: Sirius XM Statements of Account to SoundExchange 2007-2015.

- (128) As depicted in Figure 30, over the past nine years Sirius XM has paid a total of \$1.6 billion in SDARS statutory royalty fees to SoundExchange. To put this amount in perspective, the nine-year total royalty payment is less than Sirius XM’s Adjusted EBITDA for 2015 alone (\$1.7 billion). Indeed, Sirius XM generated enough free cash flow last year alone (\$1.3 billion) to pay the entire remaining SDARS statutory royalty obligation generated in the previous 8 years combined (2007-14).
- (129) In the paragraphs that follow, I calculate the impact of increasing Sirius XM’s royalty rate in 2015 to 24%. Figure 31 below provides the details of this calculation.

¹¹⁶ SoundExchange, *Preexisting satellite digital audio radio services*, <http://www.soundexchange.com/service-provider/other-service-providers/sdars/> (last visited Sept. 14, 2016).

¹¹⁷ My understanding is that the nature of the form design necessitated a procedural change in how the numbers are presented that does not affect the accuracy of the final calculation. The regulations envision the computation of gross revenue, which is then multiplied by the statutory royalty rate to arrive at a royalty sub-total, which is then further reduced by the proportion of directly licensed and pre-1972 performances. However, since the form has no space for the direct license and pre-1972 reduction, Sirius XM reports an already reduced gross revenue amount.

¹¹⁸ As discussed, this is not “gross revenue,” as defined by the regulations but rather a gross revenue figure already reduced by the proportion of directly licensed and pre-1972 performances.

Figure 31: Calculation of Sirius XM royalty payments in 2015 under 24% royalty rate, in millions.
[RESTRICTED]

		Value

Source: Lys analysis, based on Sirius XM Statement of Account.

- (130) When assessing an impact on pre-tax items such as EBITDA, one needs to use the pretax amount of \$[REDACTED] million. In contrast, when analyzing the impact on after-tax metrics such as net income and free cash flows, the royalty increase is partially offset by a reduction in taxes. Every dollar of additional expenses will affect net income and other after-tax line items reduced by the tax rate (assumed at the statutory 35% rate). Therefore, the net after-tax impact is calculated by multiplying the gross pre-tax impact of \$[REDACTED] million by (1-35%), yielding \$[REDACTED] million.
- (131) Figure 32 below shows how this royalty rate structure would affect 2015 net income, EBITDA, and free cash flow.

Figure 32: Sirius XM 2015 net income, EBITDA, and free cash flow – current vs. 24% royalty rate, \$ million

	Current Value	Impact of a 24% royalty rate	Adjusted value after impact of royalty rate increase to 24%
	A	B	C=A-B
Net Income	\$509.7	\$263.2	\$246.6
Adjusted EBITDA	\$1,657.6	\$404.9	\$1,252.8
Free Cash Flow	\$1,315.2	\$263.2	\$1,052.0

Source: Lys analysis.

- (132) My analysis demonstrates that even if Sirius XM were to increase its statutory royalty rate in 2015 to 24%, the company would still earn substantial returns as measured by net income, adjusted EBITDA, and free cash flows. In fact, these returns would still exceed those earned by other companies in the industry based on the relevant performance metrics, as seen in Figure 33.

Figure 33: Sirius XM 2015 performance metrics under 24% royalty rate vs. SIC 483

	Sirius XM, 24% royalty rate	Average for SIC 483 (Broadcast Radio and Television Industry)
Return on Assets (Net income ÷ average total assets)	5.5%	3.0%
EBITDA Margin (EBITDA ÷ total revenue)	27.4%	19.9%
Free Cash Flow Margin (free cash flow ÷ total revenue)	23.0%	6.1%

Source: Lys analysis.

- (133) To further illustrate Sirius XM's ability to absorb the rate increase proposed by SoundExchange in this matter, I now calculate how much higher the royalty rate could have been set in 2015, assuming current payment calculation mechanics, while still allowing Sirius XM to earn a profit commensurate with its industry. I assume no change in the payment computation mechanics, meaning that Sirius XM still would apply the hypothetical royalty rate to the same amount of gross revenue. As for the "returns commensurate with its industry," I set the hypothetical royalty rate such that it would allow Sirius XM to earn the same return as its industry peers. I define Sirius XM's industry peers as either the "Broadcast radio" set of companies (SIC 4832), the "Broadcast radio and television" (SIC 483) set of companies, or as its competitors in the industry of seamless/high-tech alternatives to traditional radio (Pandora and iHeartMedia). As discussed previously, in 2015 those companies recorded the following measures of profitability:
- a) EBITDA margin of 16.1% (SIC 4832), 19.9% (SIC 483) and 22.7% (Pandora/iHeartMedia);
 - b) Free cash flow margin of negative 1.8% (SIC 4832), 6.1% (SIC 483) and negative 6.0% (Pandora/iHeartMedia); and,
 - c) Return on assets of negative 0.2% (SIC 4832), 3.0% (SIC 483) and 1.8% (Pandora/iHeartMedia).
- (134) For each metric separately I show the maximum royalty rate that would reduce the selected metric to the average level of profitability observed in each industry comparison group.
- (135) I start with Adjusted EBITDA margin in Figure 34. Recall that Sirius XM's 2015 Total revenue (the driver of the EBITDA margin ratio) was \$4.6 billion. The average 2015 industry EBITDA margin, measured as a percentage of total revenue, was 16.1% for SIC 4832, 19.9% for SIC 483 and 22.7% for Pandora/iHeartMedia. Applying these percentages to Sirius XM's 2015 total revenue I show that the company's profitability commensurate with its industry was at an EBITDA level of \$736 million for SIC 4832, \$910 million for SIC 483 and \$1.037 billion for

Pandora/iHeartMedia, and that it would have earned that much, *ceteris paribus*, had its statutory royalty rate been increased to 41.9%, 35.9% and 31.4%, respectively

Figure 34: Computation of maximum 2015 statutory royalty rate that would lead to Sirius XM EBITDA equal to its industry peers.

	2015 Value – SIC 4832	2015 Value – SIC 483	2015 Value – P/IHRT
Sirius XM Total Revenue	\$4,570.1	\$4,570.1	\$4,570.1
Target EBITDA Margin	16.1%	19.9%	22.7%
Target Sirius XM EBITDA	\$735.7	\$909.5	\$1,037.4
Sirius XM royalty rate leading to target EBITDA	41.9%	35.9%	31.4%

Source: Lys analysis.

- (136) Put differently, Figure 34 demonstrates that Sirius XM could have afforded to have its 2015 statutory royalty rate increased from 10.0% to up to 41.9%, 35.9% or 31.4% and still earned an average EBITDA level of \$735.7 million (SIC 4832), \$909.5 million (SIC 483), or \$1.037 billion (Pandora/iHeartMedia), respectively. While this level of the royalty rate would have reduced Sirius XM's EBITDA profitability by \$921 million, \$747 million and \$620 million, respectively (from the actual \$1,657 million), that would only result in equating Sirius XM's performance with its industry peers' EBITDA profitability levels.
- (137) Next, I perform the same calculation with regard to the free cash flow margin in Figure 35. The average 2015 industry free cash flow margin, measured as a percentage of total revenue, was negative 1.8% for SIC 4832, 6.1% for SIC 483 and negative 6.0% for Pandora/iHeartMedia. Applying these percentages to Sirius XM's 2015 total revenue, I show that the company's profitability commensurate with its industry was at a free cash flow level of negative \$82.3 million for SIC 4832, \$278.8 million for SIC 483 and negative \$274.2 million for Pandora/iHeartMedia, and that it would have earned that much, *ceteris paribus*, had its statutory royalty rate been increased to 84.3%, 65.1% and 94.6%, respectively.

Figure 35: Computation of maximum 2015 statutory royalty rate that would lead to Sirius XM Free cash flow equal to its industry peers.

	2015 Value – SIC 4832	2015 Value – SIC 483	2015 Value – P/IHRT
Sirius XM Total Revenue	\$4,570.1	\$4,570.1	\$4,570.1
Target Free cash flow Margin	-1.8%	6.1%	-6.0%
Target Sirius XM Free cash flow	-\$82.3	\$278.8	-\$274.2
Sirius XM royalty rate leading to Target Free cash flow	84.3%	65.1%	94.6%

Source: Lys analysis.

- (138) In other words, Figure 35 demonstrates that Sirius XM could afford to have its 2015 statutory royalty rate increased from 10.0% to 65.1% and still earn a free cash flow level commensurate with SIC 483 of \$278.8 million. This metric demonstrates how strong Sirius XM's cash generation is under the current terms.
- (139) Finally, I also perform the same calculation for profitability measured by net income. The computations are identical, except that (1) the driver is return on assets (ROA), (2) the computation of ROA includes net income and the tax-affected interest expense, and (3) profitability is measured on an after-tax basis.
- (140) Because return on assets is calculated as: $ROA = [\text{Net income} + (1-t) * \text{interest expense}] \div \text{average assets}$, this means that the net income commensurate with the industry component is $\text{Net income} = [\text{ROA} * \text{average assets}] - [(1-t) * \text{interest}]$. Additionally, since the ending total assets balance will change when the royalty rate is changed, the royalty rate necessary to achieve the industry average level of performance must be estimated using an iterative procedure.
- (141) In Figure 36, I show the results of this iterative procedure. I compute that Sirius XM would have earned the industry-average net income, *ceteris paribus*, had its statutory royalty rate been increased to 48.6%, 35.0% and 39.9% for SIC 4832, SIC 483 and Pandora/iHeartMedia, respectively.

Figure 36: Computation of maximum 2015 statutory royalty rate that would result in Sirius XM ROA being equal to its industry peers.

		2015 Value – SIC 4832	2015 Value – SIC 483	2015 Value – P/IHRT
A	Sirius XM 2014 ending Total assets	\$8,369.1	\$8,369.1	\$8,369.1
B	Sirius XM 2015 ending Total assets	\$7,320.9	\$7,576.5	\$7,484.5
C=AVG (A, B)	Sirius XM 2015 average Total Assets	\$7,845.0	\$7,972.8	\$7,926.8
D	Target ROA	-0.2%	3.0%	1.8%
E=D*C	Target Sirius XM Return	-\$21.7	\$234.0	\$141.9
F	Sirius XM 2015 interest expense	\$299.1	\$299.1	\$299.1
G=E-(1-35%)*F	Target Sirius XM Net income	-\$216.1	\$39.6	-\$52.5
H	Sirius XM royalty rate leading to Target Net income	48.6%	35.0%	39.9%

Source: Lys analysis.

- (142) Figure 36 demonstrates that Sirius XM could afford to have its 2015 statutory royalty rate increased from the actual 10.0% to 35.0% and still earn an average SIC 483-level (in terms of return on assets) net income level of \$39.6 million.

II.D.1. Computation of Adjusted *SDARS* / Rate

- (143) For comparison purposes, in this section I consider the rate set by the Court in *SDARS I*, updated to today by adjusting it for increases in the cost of living since that rate was set ten years ago.
- (144) In the *SDARS I* ruling, the Judges concluded that a 2006 royalty rate of \$1.40 per subscriber represented “the upper boundary for a zone of reasonableness for potential marketplace benchmarks from which to identify a rate that satisfies any 801(b) policy considerations not adequately addressed in the market.”¹¹⁹ The Judges concluded that \$1.40 per subscriber, although the upper bound of a market rate, was the rate most strongly supported by the evidence.¹²⁰ I note that the Judges in *SDARS I* reached these adjusted per-subscriber amounts at a time when Sirius XM claimed that it was on the brink of bankruptcy – a situation far removed from Sirius XM’s financial posture and market dominance today.
- (145) In the *Web IV* decision, the Judges determined that they would adjust any effective benchmark rates that were relied upon to reflect inflation or deflation as measured by the Consumer Price Index (CPI-U) announced by the Bureau of Labor Statistics, between the year in which the data for the benchmark was collected and 2016, the first year for which the rates determined in that decision would be effective.¹²¹
- (146) Therefore, I adjust the \$1.40 per subscriber per month royalty benchmark from the original *SDARS I* decision using the CPI-U, consistent with the *Web IV* decision. Figure 37 below calculates the adjusted royalty rates for each year based on CPI-U, beginning with the benchmark of \$1.40 per subscriber per month in 2006.

¹¹⁹ *SDARS I* at 4094.

¹²⁰ *Id.* at 4093.

¹²¹ Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings, No. 14-CRB-0001-WR, at 198 (Dec. 16, 2015) [hereinafter *Web IV*].

Figure 37: Per subscriber per month royalty rates, adjusted using CPI-U, 2006-2022

	Inflation growth ¹²²	Adjusted per subscriber per month royalty rate
2006	N/A (baseline)	\$1.40
2007	1.97%	\$1.43
2008	4.31%	\$1.49
2009	1.07%	\$1.51
2010	1.84%	\$1.53
2011	1.14%	\$1.55
2012	3.39%	\$1.60
2013	1.76%	\$1.63
2014	1.24%	\$1.65
2015	1.32%	\$1.67
2016	0.50%	\$1.68
2017	1.33%	\$1.70
2018	2.33%	\$1.74
2019	2.38%	\$1.79
2020	2.39%	\$1.83
2021	2.42%	\$1.87
2022	2.42%	\$1.92

Source: Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers (CPI-U), series id CUUR0000SA0;¹²³ Congressional Budget Office, The Budget and Economic Outlook: 2016 to 2026, January 2016;¹²⁴ Lys Analysis.

- (147) As the chart above shows, the original per-subscriber amount reached in *SDARS I*, increased for CPI-U to cover the *SDARS III* period, would be the equivalent of \$1.74 per subscriber in 2018 and would increase to \$1.92 per subscriber in 2022.
- (148) In *SDARS I*, although the Judges derived a per-subscriber rate using the benchmarking analysis presented by SoundExchange, they converted that per-subscriber rate into a percentage of revenue rate. The *SDARS I* per-subscriber amount, adjusted for CPI to 2016, would yield a percentage of revenue of approximately 15.7% based on Sirius XM's revenue in the first six months of 2016. I

¹²² For historical periods, per the Judges' approach in *Web IV*, inflation growth is measured by the rise in the annual CPI-U index as of November of the previous year. For example, the inflation growth rate for 2007 of 1.97% is calculated as the increase in the CPI-U levels between November 2005 (197.600) and November 2006 (201.500). $1.97\% = (201.5 / 197.6) - 1$. For forecasted periods (shaded) I use the Congressional Budget Office's estimate of calendar year annual growth in the "Consumer Price Index, All Urban Consumers (CPI-U)."

¹²³ Available at http://data.bls.gov/timeseries/CUUR0000SA0?years_option=all_years&periods_option=all_periods&output_type=column&output_format=text&delimiter=comma.

¹²⁴ Available at <https://www.cbo.gov/sites/default/files/51135-2016-01-Economic%20Projections.xlsx>.

reach this percentage by dividing the adjusted per subscriber amount for 2016 of \$1.68 by the average revenue per subscriber, as gross revenues are defined by 37 C.F.R. Part 382 Subpart B.

- (149) In order to calculate gross revenue, as Sirius XM understands that term to be defined by the regulations, I start with the revenue reported by Sirius XM to SoundExchange and adjust it due to the fact that Sirius XM excludes revenues associated with direct licenses and pre-1972 performances from its reported totals.¹²⁵ I follow Sirius XM's methodology which is based on the share of performances. My calculations are presented in Figure 38.

Figure 38: Calculation of Sirius XM's exclusions from reported revenues to SoundExchange, first half of 2016 [RESTRICTED]

2016	Total performances	Pre-72 performances	Direct License performances	Pre-72 percentage	Direct License percentage	Total percentage
JAN						
FEB						
MAR						
APR						
MAY						
JUN						

Source: Monthly cover emails provided by Sirius XM to SoundExchange.

- (150) Next, I gross up the revenue Sirius XM reported to SoundExchange for the share excluded based on direct license and pre-1972 performances in order to calculate Sirius XM's understanding of "gross revenue," as defined by the regulations. My calculations are shown in Figure 39.

¹²⁵ Although the number reported by Sirius XM to SoundExchange in its monthly statements of account excludes an amount based on the proportion of pre-1972 and directly licensed performances, as this Court explained in *SDARS II*, the deduction allowed for performances of pre-1972 and directly licensed content under the regulations is not a deduction from gross revenue, but an adjustment that may be taken from the royalties paid by Sirius XM. See *SDARS II* at 23072-73 (explaining that "revenue exclusion is not the proper means for addressing" pre-1972 and directly licensed sound recordings). It is for this reason that, to calculate the "gross revenue" that Sirius XM has applied under the statutory license, I must adjusted the figures that Sirius XM reports to include the revenue that was excluded based on the proportion of pre-1972 and directly licensed performances (as shown in Figure 38).

Figure 39: Calculation of Sirius XM's gross music-related revenue, first half of 2016 [RESTRICTED]

2016	Sirius XM revenue reported to SoundExchange on monthly statements of account	Adjustment percentage	Gross revenue
JAN			
FEB			
MAR			
APR			
MAY			
JUN			
TOTAL			

Source: Monthly statements of account; monthly cover emails provided by Sirius XM to SoundExchange.

- (151) I calculate Sirius XM's average monthly revenue per subscriber under the statutory definition of revenue by dividing the sum of monthly gross revenues between January 2016 and June 2016 by Sirius XM's total paid subscribers of 30.044 million.¹²⁶ Based on a weighted average for these months, I calculate an average revenue per subscriber of \$10.72.¹²⁷ Finally, by combining the royalty per subscriber into revenue per subscriber I am able to calculate a percentage of revenue royalty rate of 15.7%.¹²⁸ In other words, the per-subscriber rate that the Judges arrived at in *SDARS I* (at a time when Sirius and XM were separate companies engaged in fierce competition and claimed that increases in rates would post an existential threat) would be the equivalent of 15.7% of revenue for 2016 (and, as discussed above, the equivalent of \$1.74 to \$1.92 per subscriber for the period that will be covered by the Judges' determination in this proceeding).

II.E. Sirius XM's Projected Future Performance

II.E.1. Introduction

- (152) In prior proceedings, Sirius XM has argued that any increase in the sound recording royalty rate would disrupt its business, contrary to the requirements of Section 801(b)(1)(D). Thus, in *SDARS II*, although Sirius and XM had by then completed their merger and the combined company exhibited improved financial performance, the experts for Sirius XM painted a gloomy picture of

¹²⁶ Sirius XM, Q2-2016 10-Q, at 31. The number of subscribers provided in Sirius XM SEC filings likely includes subscribers for services other than satellite radio and for Sirius XM's non-music satellite radio packages. However, I use these numbers because Sirius XM has not provided its number of subscribers by subscription type, in a manner that would allow me to exclude subscribers to its other services and to non-music packages.

¹²⁷ $\$1.72 = \$1,932,596,322 / 30,044,000 / 6$.

¹²⁸ $15.7\% = \$1.68 / 10.72$.

Sirius XM's future performance, even suggesting that it may have to file for bankruptcy. For example, in his report in that matter, Sirius XM expert witness David Stowell stated:¹²⁹

"[I]t is my opinion that Sirius XM is reasonably likely to experience financial distress during the 2013-2017 period because of increased competition and the tumultuous economic climate. [...] If the royalty rate is materially increased, the likelihood of bankruptcy would increase significantly."

- (153) Similarly, Sirius XM's expert William R. Rosenblatt argued against a rate increase on the basis that Sirius XM could face "life-threatening competitive challenges to the business of satellite radio during the 2013-2017 license term"¹³⁰ And Sirius XM's then-CEO Mel Karmazin testified that "[t]o increase the rate by any measure" would have a "disruptive effect" given the "the fragile environment in which Sirius XM operates."¹³¹
- (154) I have shown previously that given its current financial performance, Sirius XM can easily absorb a rate increase without any disruption of its business. In this section I demonstrate that Sirius XM's future financial performance over the upcoming five-year rate term is expected to remain strong, with subscriber levels, revenues, EBITDA, free cash flow and net operating income all expected to increase.
- (155) I base my analysis on Sirius XM's own forecasts and statements, as well as Wall Street consensus estimates. I note that I offered a similar analysis in the *SDARS II* case, which was challenged by Sirius XM as unreliable. It is worth pointing out, therefore, that this method of analysis in fact produced quite accurate results in the *SDARS II* case. Figure 40 presents a comparison between Sirius XM's actual revenue¹³² and my forecast of that metric prepared in 2012.

Figure 40: Comparison of Sirius XM's total revenue between my forecast from 2012 and actual performance, 2012-2015, \$ million

Forecast in Lys 2012 report	\$3,372	\$3,709	\$4,039	\$4,404	\$15,529
Actual	\$3,402	\$3,799	\$4,181	\$4,570	\$15,952
Difference	-\$30	-\$90	-\$142	-\$162	-\$423
% difference	-0.9%	-2.4%	-3.4%	-3.5%	-2.7%

Source: 2012.03.26 Lys report, Attachment 9; Sirius XM 10-Ks.

¹²⁹ Written direct testimony of David P. Stowell, *SDARS II*, at 4.

¹³⁰ Written direct testimony of William R. Rosenblatt, *SDARS II*, at 4.

¹³¹ Written direct testimony of Mel Karmazin, *SDARS II*, ¶¶ 7, 46..

¹³² I focus on the top-line estimate because profitability is a function of the royalty rates, and any discrepancies there are primarily a function of the Judges adopting rates different from those that were being advocated for; at the time of my forecast, this was a "known unknowable," thus any variance is not reflective of the accuracy of the forecasting technique itself.

- (156) As Figure 40 demonstrates, Sirius XM's performance exceeded my 2012 revenue forecast by 2.7% over the ensuing four years. Thus, it is fair to say that my 2012 forecast was quite accurate (albeit slightly too conservative).

II.E.2. Sources of Sirius XM Forecasts

- (157) I present two separate forecasts of Sirius XM's expected future performance that come from two different sources. One is internal, based on Sirius XM's own long-term forecast, while the other is external and represents the "market" view, as contained in the forecasts published in various Wall Street equity analysts' research reports.
- (158) I first describe these sources and then present the actual forecasts.

II.E.2.a. Sirius XM's internal long-term forecast

- (159) My review of Sirius XM documents produced in this proceeding indicates that the company believes internally what its executives are stating publicly – that the future is bright.
- (160) I base my analysis on a document entitled "SiriusXM Forecast – 2015 LRS plan" which was produced by Sirius XM in Excel format. This appears to be a detailed internal long-term forecast, through the year 2020. [REDACTED]
[REDACTED]
[REDACTED]¹³³ The document appears to have been created in August 2014 and was last printed out in August 2015; it contains actuals through 2014 and a forecast for 2015, which indicates that it was updated at some point in 2015.
- (161) I note, as seen in Figure 41, that [REDACTED]
[REDACTED]. This implies that Sirius XM's forecast for the 2016-2020 period (discussed in the following section) would have likely been higher (more optimistic), had it incorporated the higher than expected 2015 results.

¹³³ [REDACTED]
[REDACTED].

Figure 41: Comparison of 2015 actuals to the Sirius XM Forecast – 2015 LRS plan, in millions [RESTRICTED]

EOP subscribers				
Total revenue				
Adjusted EBITDA				
FCF				

Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919) and 2016 budget (SXM_DIR_00021472)

(162) [REDACTED], as depicted in Figure 42.

Figure 42: Internal Sirius XM projections 2015¹³⁴-2020, in millions [RESTRICTED]

EOP subscribers								
Total revenue								
Adjusted EBITDA								
Net income								
FCF								

Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919) and 2016 budget (SXM_DIR_00021472).

(163) Figure 42 indicates that through the year 2020 [REDACTED]
[REDACTED]
[REDACTED]. As for
profitability, [REDACTED]
[REDACTED]

[REDACTED]¹³⁵

II.E.2.b. Relationship between Sirius XM's internal forecasting and Wall Street analyst estimates

(164) Sirius XM does not publicly provide guidance on its expected performance beyond approximately one year ahead. This makes it difficult to ascertain what the company's internal projections are on

¹³⁴ The forecast was prepared during 2015 and thus 2015 is a forecasted value.

¹³⁵ I note that I have thus far been unable to verify the circumstances surrounding the creation of Sirius XM's internal forecast, as the discovery process is ongoing. In the event that I am able to obtain further details regarding these internal forecasts and any additional forecasts, I may update my analysis and conclusions.

the long-term future. I note that [REDACTED]
[REDACTED]. Figure 43 compares Sirius XM's 2016 budget and guidance for several key categories.

Figure 43: Comparison of Sirius XM's 2016 budget and guidance, in million [RESTRICTED]

External net additions	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Self Pay net additions	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total Revenue	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
EBITDA	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
FCF	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

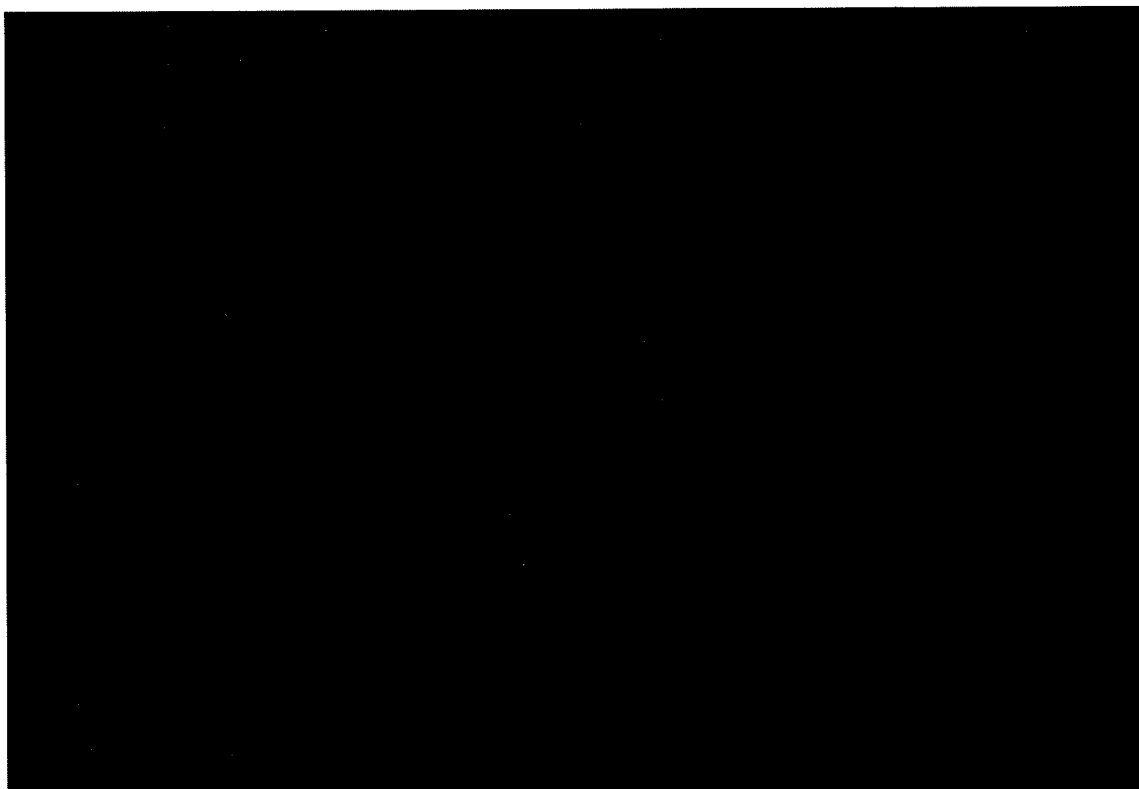
Source: 2016 budget (SXM_DIR_00021472), at 20.

(165) Figure 43 shows that according to Sirius XM's own internal data, [REDACTED]

[REDACTED].

(166) This phenomenon is testable on 2015 data. Figure 44 provides a graphic representation of the relationship between Sirius XM's guidance, analyst consensus estimates, and eventual actual performance.

Figure 44: Sirius XM's 2015 guidance, analyst consensus, and actuals, in \$ million [RESTRICTED]



Source: 2016 budget (SXM_DIR_00021472), at 4.

(167) Figure 44 demonstrates [REDACTED]

[REDACTED]

(168) Figure 45 measures the relationship between 2015 consensus and actuals, for the same line items.

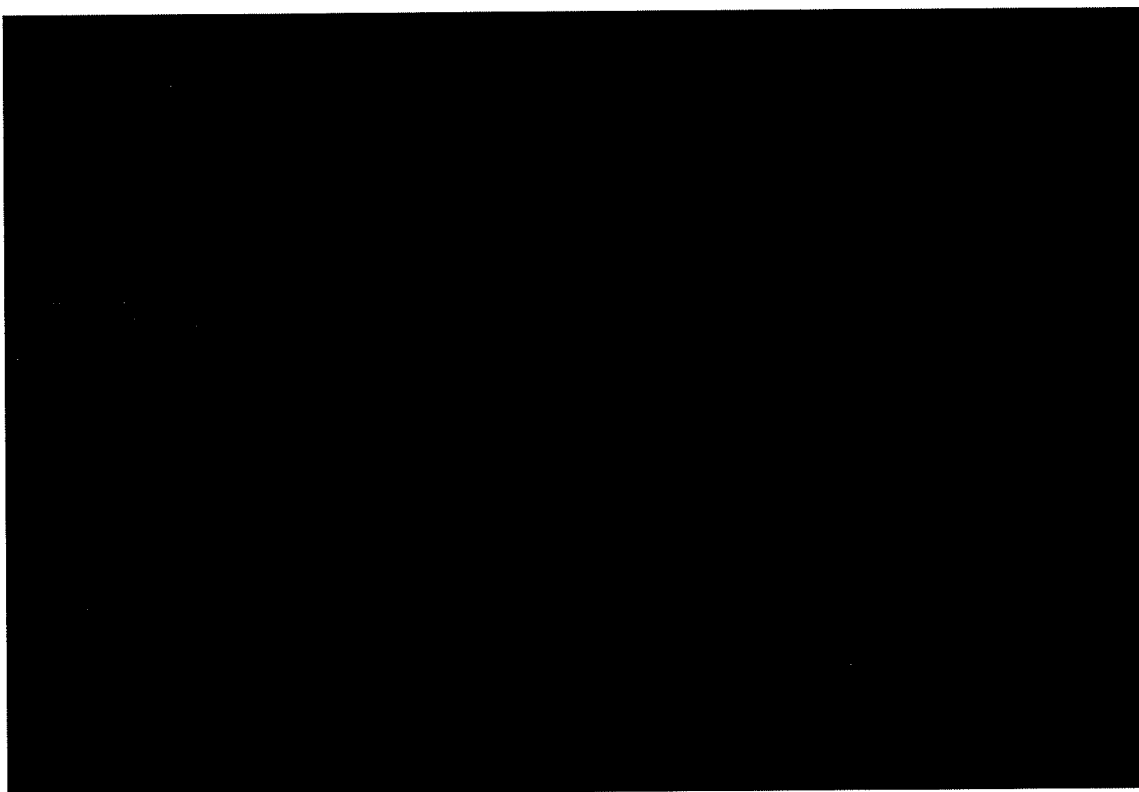
Figure 45: Comparison of 2015 performance to analyst estimates, in million [RESTRICTED]

External net additions	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Self Pay net additions	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total Revenue	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
EBITDA	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
FCF	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Source: 2016 budget (SXM_DIR_00021472), at 4.

- (169) Figure 45 shows that [REDACTED].
- (170) Finally, it is also worth noting that [REDACTED]. This analysis is shown in Figure 46, where positive values indicate that actuals came out above budget.

Figure 46: Difference between actual and budgeted amounts for Sirius XM, 2012-15 [RESTRICTED]



Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

(171) Figure 46 shows that [REDACTED]. I provide additional information on these calculations in Appendix B see Figure 75 – Figure 79.

(172) I conclude that Sirius XM has [REDACTED].

II.E.2.c. Wall Street analysts' consensus forecast

- (173) For the external forecast, I rely on data from a database called “Thomson One,” a renowned source for tracking analysts’ estimates owned by Thomson Reuters.¹³⁷ For Sirius XM, the analysts tracked by the service provide forecasts as far as the year 2020. I have reviewed individual analyst reports and found that a few analysts track some of the line items further into the future;¹³⁸ however, because of the small sample size, I do not rely on those forecasts beyond 2020.
- (174) Not every analyst provides a forecast for each line item or for the same number of years. However, by capturing the median value of all available forecasts for each year I present the consensus estimate of the analyst community.
- (175) As a preliminary step, I consulted the summary of analyst forecasts for Sirius XM’s various line items, as shown in Figure 47.

¹³⁷ I most recently downloaded information from Thomson One on October 6. Analysts typically update their estimates following company earnings calls. Sirius XM is expected to announce its Q3-2016 earnings, and hold an earnings call with analysts, on October 27, 2016 – shortly after the publication of my report. I reserve the right to update this section, as well as the remainder of my report, as pertinent information becomes available to me.

¹³⁸ JP Morgan, for example, estimates revenue, EBITDA, and free cash flow through 2025.

Figure 47: Thomson One summary of Sirius XM consensus forecasts, by line item, 2016-2020

	CURRENT FY-Dec.16	FY-Dec.17	FY-Dec.18	FY-Dec.19	FY-Dec.20
Income Statement					
Revenue	4,999.19	5,330.27	5,674.71	5,962.83	6,256.26
Gross Margin (%)	60.95	62.50	44.00	NA	NA
EBIT	1,463.56	1,676.09	1,841.62	1,999.28	2,185.03
EBITDA	1,820.24	2,000.43	2,180.57	2,293.40	2,466.30
Pre-tax Profit	1,150.69	1,302.69	1,462.43	1,570.30	1,710.17
Net Income	703.15	799.84	901.55	984.93	1,075.97
Reported Net Profit	710.46	803.76	907.85	982.68	1,072.97
Reported Pre-tax Profit	1,150.76	1,291.73	1,472.32	1,571.80	1,712.17
Per Share Data					
EPS	0.14	0.18	0.23	0.27	0.31
EPS - Fully Reported	0.14	0.18	0.23	0.27	0.34
EBITDA per Share	0.37	0.44	0.54	0.54	NA
Dividend per Share	0.00	0.00	0.00	0.32	0.32
Cash Flow					
Capital Expenditure	175.56	227.16	221.29	287.20	237.00
Per Share Data					
Cash Flow per Share	0.31	0.36	0.39	0.42	0.47
Free Cash Flow per Share	0.30	0.33	0.41	0.35	0.39
Balance Sheet					
Net Asset Value	-1,312.17	-2,592.39	-4,097.11	-5,503.50	-5,946.40
Net Debt	6,038.16	6,415.45	7,039.42	7,892.35	7,867.07
Per Share Data					
Book Value per Share	-0.21	-0.29	-0.73	-0.54	NA
Valuation					
ROA (%)	13.79	15.57	17.35	10.26	2.18
ROE (%)	-75.29	-35.71	-26.58	NA	NA
Enterprise Value	22,719.79	22,508.03	25,055.80	24,769.30	21,928.20
Recommendations		P/E Ratios		More Ratios	
# of Brokers		Month Ago		Target Price and Long Term Growth	
Current		1 2 3		Target Price(USD)	
Strong Buy		FY0		Mean	
Buy		FY1		Median	
Hold		FY2		High	
Underperform		FY3		Low	
Sell				Standard Dev	
Total				Total#	
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Source: Thomson One.

- (176) Thomson One provides this level of detail for revenue, EBITDA, net income and free cash flow per share. I collected data for ending subscribers myself by referring to the actual analyst reports, also provided by Thomson One.
- (177) Figure 48 presents the analyst consensus forecasts for some of Sirius XM's key metrics. I discuss each of these metrics in more detail later in this section. Although Thomson One typically summarizes average (mean) values, the figures shown here are medians of the various analyst estimates. As I show later in this section the differences between mean and median values with these datasets are trivial, and I elected to rely on median figures because they are statistically more reliable.¹³⁹

¹³⁹ Research shows that median figures are more relevant than mean (average) figures. See Zhaoyang Gu and Joanna Shuang Wu, *Earnings Skewness and Analyst Forecast Bias*, Journal of Accounting and Economics 5, 14-15 and Table 1 (2003).

Figure 48: Consensus estimates of Sirius XM's key metrics, 2016-2020, in millions

	2016	2017	2018	2019	2020	2021	2022
Ending accounts	29.6	31.4	32.8	34.1	35.4	36.6	4.4%
Revenue	\$4,570	\$4,998	\$5,314	\$5,635	\$5,927	\$6,245	6.4%
EBITDA	\$1,658	\$1,821	\$1,991	\$2,159	\$2,289	\$2,434	8.0%
Free cash flow per share	\$0.24	\$0.30	\$0.33	\$0.39	\$0.36	\$0.42	11.7%
Net income	\$510	\$705	\$794	\$886	\$1,000	\$1,110	16.8%

Source: Thomson One.

- (178) As Figure 48 demonstrates, equity analysts covering Sirius XM are predicting strong growth in the company's performance over the next 5 years, with the number of paid subscribers increasing more than 4% annually, revenue growing almost 7% annually and EBITDA improving 8% annually. Most impressively, net income is predicted to rise 16.8% annually over the next five years, more than doubling from the \$510 million in 2015 to \$1.1 billion in 2020.

II.E.3. Forecasted Sirius XM Performance 2016-2020

- (179) In the remainder of this section I provide a deeper look at both the internal (i.e., Sirius XM's) and the external (i.e., analyst's) forecasts of each of the individual line items, including year-over-year growth.

II.E.3.a. Subscribers

- (180) I start by reviewing the forecasts of total (ending) subscribers. This information is not tracked by Thomson One so for the external estimate I manually collected the data from the analyst reports identified by Thomson One as comprising the set from which they report revenue, EBITDA and net income estimates.
- (181) Figure 49 presents the internal and external forecasts of ending subscribers. (I present more detail on the external estimate, including forecast values by individual analyst in Appendix C, Figure 88.)

Figure 49: Internal and external forecasts of Sirius XM's Ending Subscribers, 2016-2020, in thousands
[RESTRICTED]

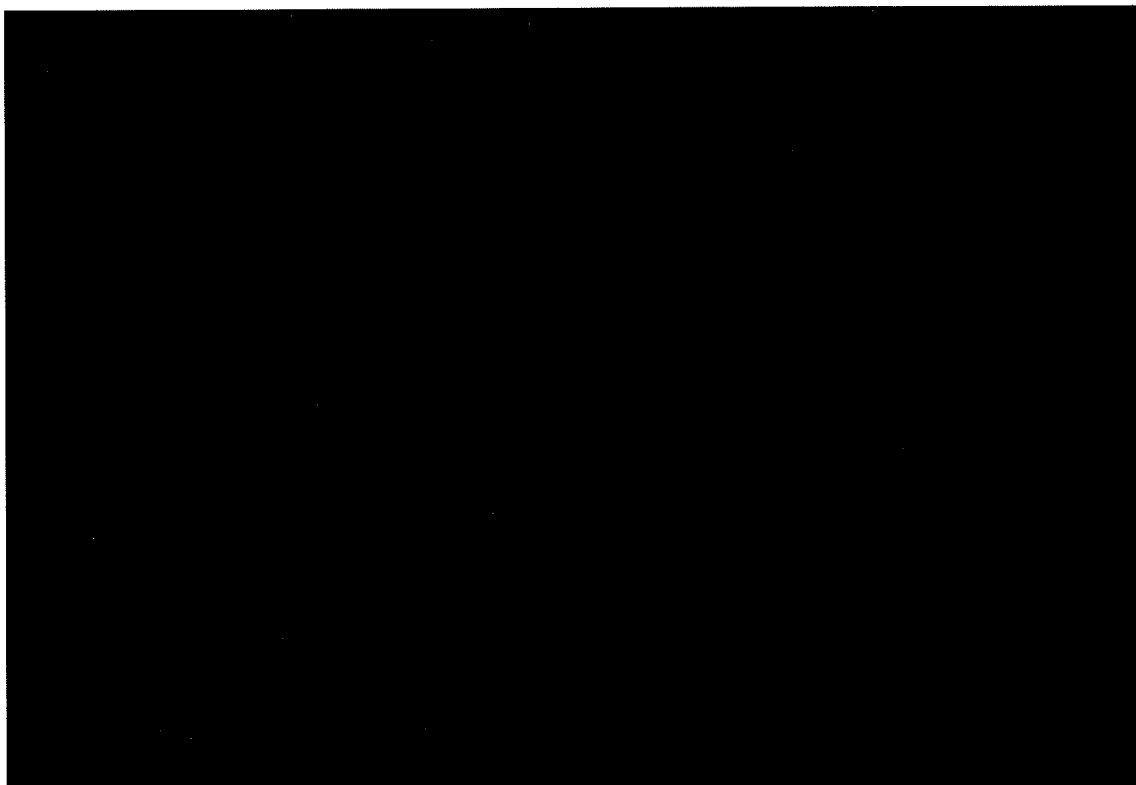
INTERNAL						
EXTERNAL (median)	31,382	32,811	34,075	35,442	36,617	4.4%
Mean	31,365	32,820	34,117	35,388	36,516	4.3%
Median growth	6.0%	4.6%	3.9%	4.0%	3.3%	
# analysts	11	10	10	3	3	

Source: Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (182) As Figure 49 demonstrates, [REDACTED].
- (183) Analysts are [REDACTED] about the company's future, predicting [REDACTED] the internal forecast. (Recall, however, that Sirius XM's forecasts do not take into account the results for 2015, which were better than it had predicted). By 2020, Sirius XM expects it will have [REDACTED] million subscribers while analysts expect Sirius XM will have 36.6 million subscribers, which is 24% more than the 29.6 million it had at the end of 2015. These 7 million net new subscribers will drive the growth in Sirius XM's revenue and profitability.
- (184) The graph in Figure 50 compares Sirius XM's historical ending subscribers with the internal and external forecasts through 2020.

¹⁴⁰ In order to present a meaningful comparison, throughout this section the Sirius XM internal forecast 2015-2020 5-year compounded annual growth rate is calculated based on 2015 actuals as opposed to the 2015 forecast that is contained in the internal long-term plan, and which was completed when the final actuals for the year 2015 were not known.

Figure 50: Sirius XM's historical and forecasted Ending Subscribers, 2006-2020, in million [RESTRICTED]



Source: Sirius XM 10-K filings for 2009-15, Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.3.b. Revenue

- (185) Next, I analyze the internal and external forecasts of Sirius XM's total revenue in Figure 51. (I present more detail on the external estimate, including forecast values by individual analyst in Appendix C, Figure 89.)

Figure 51: Internal and external forecasts of Sirius XM's Total revenue, 2016-2020, in \$ million [RESTRICTED]

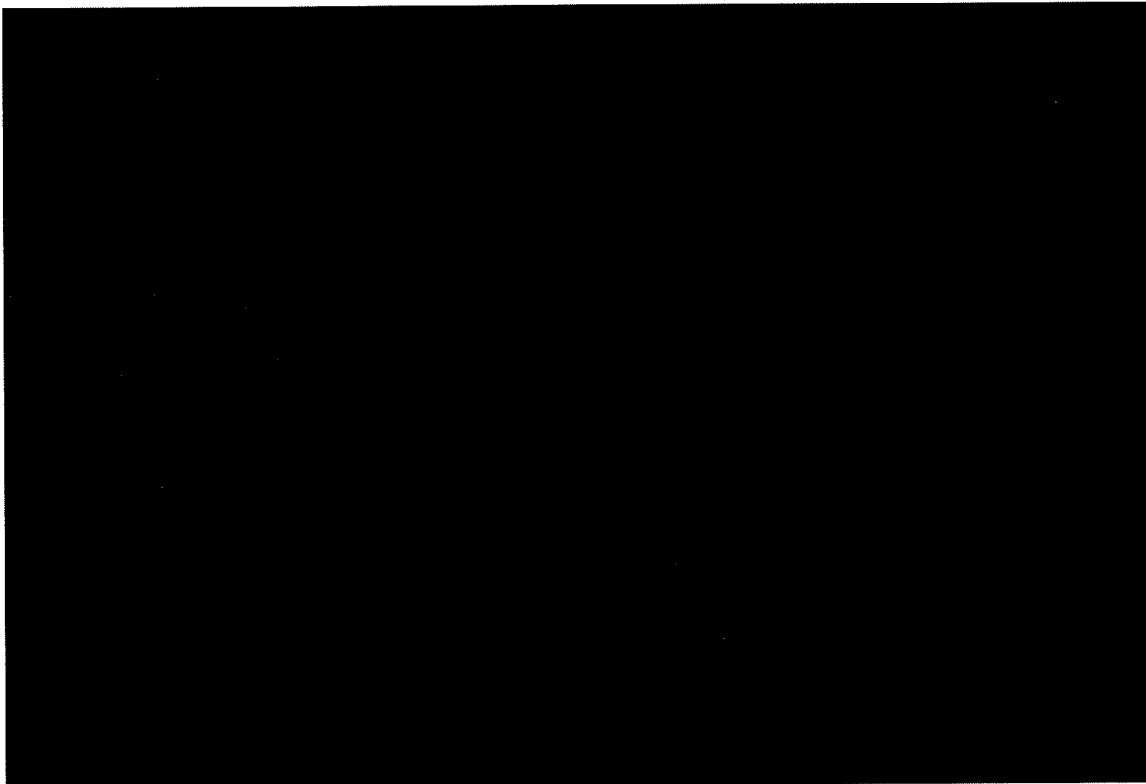
INTERNAL						
EXTERNAL (median)	\$4,998	\$5,314	\$5,635	\$5,927	\$6,245	6.4%
Mean	\$4,995	\$5,330	\$5,660	\$5,943	\$6,256	6.5%
Median growth	9.4%	6.3%	6.0%	5.2%	5.4%	
# analysts	17	17	14	7	5	

Source: Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

(186) As Figure 51 demonstrates, [REDACTED]. By 2020, analysts expect Sirius XM will be collecting \$6.2 billion in total revenue, which is 37% more than the \$4.6 billion it recorded last year. [REDACTED].

(187) The graph in Figure 52 compares Sirius XM's historical revenue with internal and external forecasts through 2020.

Figure 52: Sirius XM's historical and forecasted Total revenue, 2006-2020, in \$ million [RESTRICTED]



Source: Sirius XM 10-K filings for 2009-15, Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.3.c. Adjusted EBITDA

(188) Next, I analyze the internal and external forecasts of Sirius XM's Adjusted EBITDA in Figure 53. (I present more detail on the external estimate, including forecast values by individual analysts in Appendix C, Figure 90.)

Figure 53: Internal and external forecasts of Sirius XM's Adjusted EBITDA, 2016-2020, in \$ million
[RESTRICTED]

INTERNAL						
EXTERNAL (median)	\$1,821	\$1,991	\$2,169	\$2,289	\$2,434	8.0%
Mean	\$1,807	\$1,989	\$2,169	\$2,293	\$2,466	8.3%
Median growth	9.8%	9.3%	8.5%	6.0%	6.3%	
# analysts	16	16	13	6	5	

Source: Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (189) As Figure 53 demonstrates, [REDACTED], at an annual rate of between 8.0% according to analysts and [REDACTED], compared to an annualized growth rate of 21.5% over the past 5 years. By 2020, analysts expect Sirius XM will be earning \$2.4 billion in adjusted EBITDA, which is 47% more than the \$1.7 billion it recorded last year. [REDACTED].
- (190) The graph in Figure 54 compares Sirius XM's historical Adjusted EBITDA with internal and external forecasts through 2020.

Figure 54: Sirius XM's historical and forecasted Adjusted EBITDA, 2006-2020, in \$ million [RESTRICTED]

Source: Sirius XM 10-K filings for 2009-15, Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.3.d. Free cash flow per share

- (191) Next, I analyze the internal and external forecasts of Sirius XM's free cash flow per share in Figure 55. (I present more detail on the external estimate, including forecast values by individual analysts in Appendix C, Figure 91.)

Figure 55: Internal and external forecasts of Sirius XM's free cash flow per share, 2016-2020 [RESTRICTED]

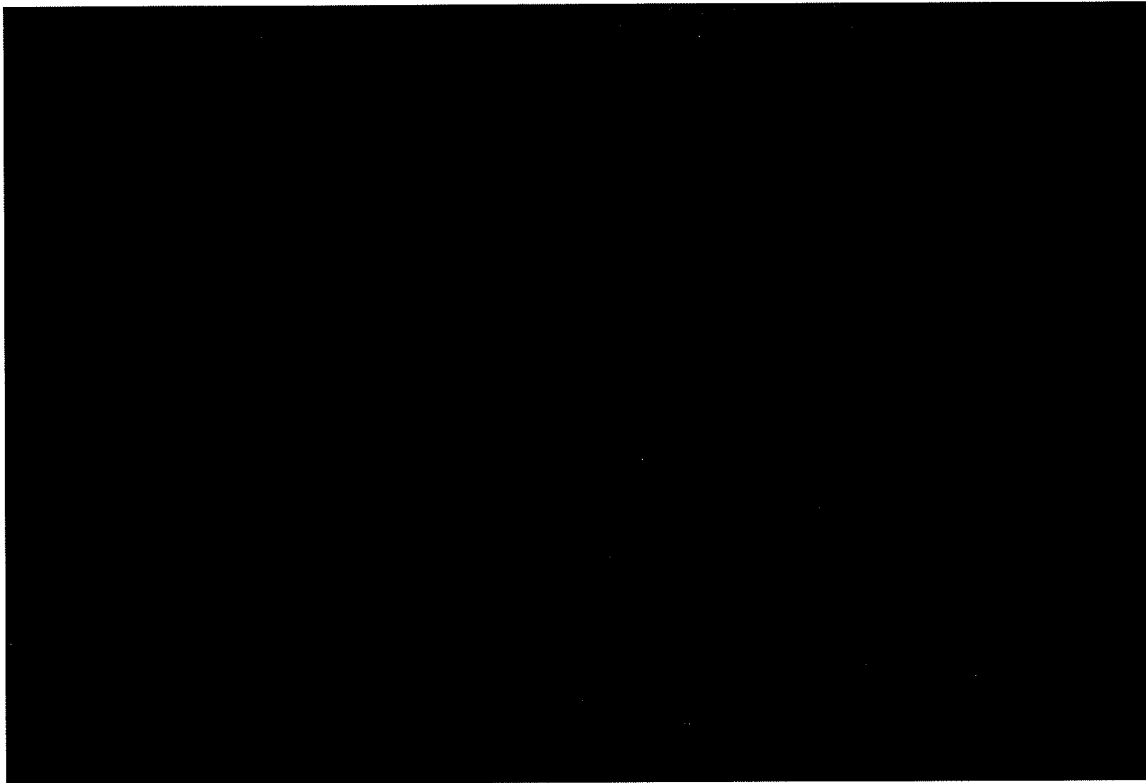
INTERNAL						
EXTERNAL (median)	\$0.30	\$0.33	\$0.39	\$0.36	\$0.42	11.7%
Mean	\$0.29	\$0.33	\$0.41	\$0.35	\$0.39	10.0%
Median growth	24.0%	10.0%	18.2%	-7.7%	16.7%	
# analysts	9	8	5	3	3	

Source: Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (192) [REDACTED].
- (193) As Figure 55 demonstrates, [REDACTED] and 11.7% according to the external forecast, compared to an annualized growth rate of 49% over the past 5 years. The results are significantly affected by [REDACTED].
- (194) By 2020, Sirius XM believes it will be generating \$[REDACTED] in free cash flow per share, which is [REDACTED] the \$0.24 in FCF per share it earned last year. On the other hand, analysts expect that in five years Sirius XM will be producing \$0.42 in free cash flow per share, which is 74% more than the \$0.24 it recorded in 2015.
- (195) The graph in Figure 56 compares Sirius XM's historical free cash flow per share with internal and external forecasts through 2020.

¹⁴¹ For external forecasts, Thomson One only tracks the free cash flow per share metric. To the extent possible, I analyzed the disclosed individual analyst reports to verify that the numerator (free cash flow) increases while the denominator (number of shares outstanding) decreases.

Figure 56: Sirius XM's historical and forecasted Free cash flow per share, 2009-2020¹⁴² [RESTRICTED]



Source: Sirius XM 10-K filings for 2009-15, Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.3.e. Net income

- (196) Finally, I analyze the internal and external forecasts of Sirius XM's net income in Figure 57. (I present more detail on the external estimate, including forecast values by individual analyst in Appendix C, Figure 92.)

¹⁴² Free cash flow per share is only presented in the post-merger period, starting with 2009. Prior to the merger the free cash flow was earned by two distinct companies with different capital structures and thus number of shares outstanding. Therefore, a computation of a "per share" free cash flow would be misleading.

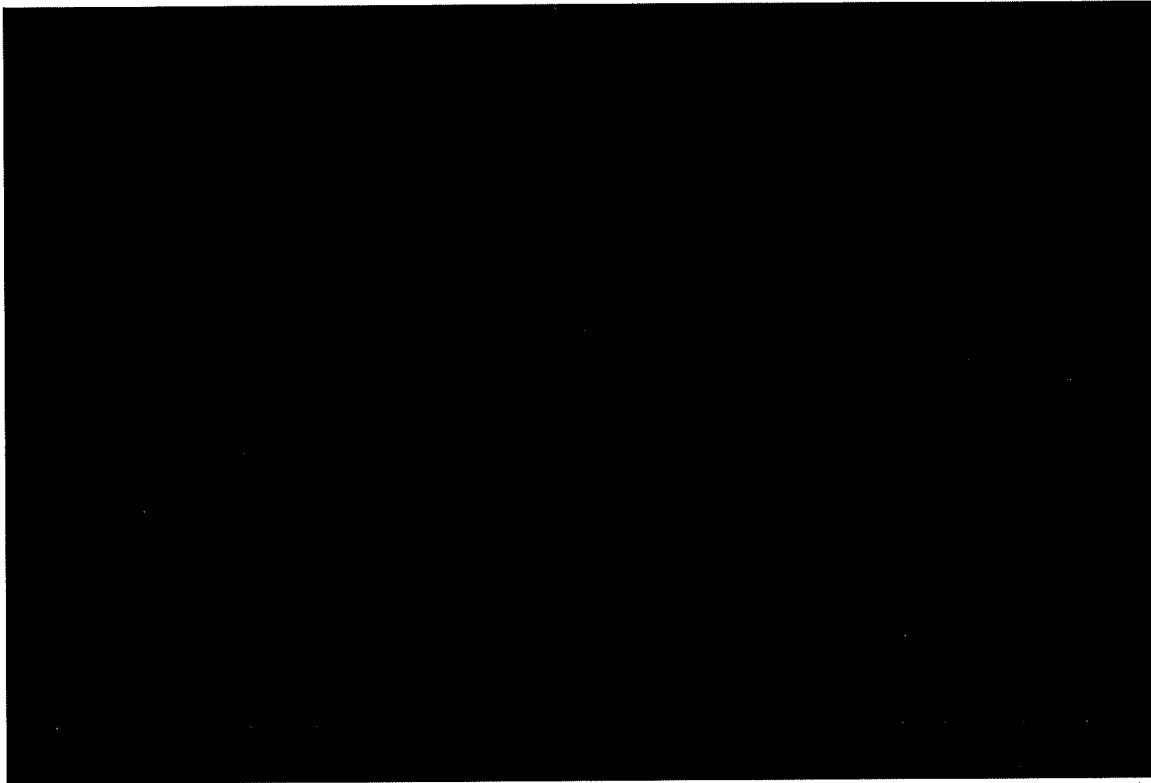
Figure 57: Internal and external forecasts of Sirius XM's Net income, 2016-2020, in \$ million
[RESTRICTED]

INTERNAL						
EXTERNAL (median)	\$705	\$794	\$886	\$1,000	\$1,110	16.8%
Mean	\$703	\$800	\$902	\$985	\$1,076	16.1%
Median growth	38.4%	12.6%	11.6%	12.9%	11.0%	
# analysts	15	15	11	4	3	

Source: Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (197) As Figure 57 demonstrates, [REDACTED], at an annual rate of between 16.8% per the external consensus and [REDACTED], compared to an annualized growth rate of 64% over the past 5 years. By 2020, analysts expect Sirius XM will be earning \$1.1 billion in net income; the \$600 million improvement is more than double (118%) the \$510 million it earned last year. Sirius XM's internal forecast is [REDACTED].
- (198) The graph in Figure 58 compares Sirius XM's historical net income with internal and external forecasts through 2020.

Figure 58: Sirius XM's historical and forecasted Net income, 2006-2020, in \$ million [RESTRICTED]



Source: Sirius XM 10-K filings for 2009-15, Thomson One; SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.4. Effect of Proposed Royalty Rate on Forecasts.

- (199) In this section, I adjust the forecast to reflect SoundExchange's maximum SDARS royalty rate proposed in these proceedings (24% of revenue) to demonstrate that even under this scenario Sirius XM's expected long-term performance remains strong.
- (200) Because of the insufficient level of detail in the external forecast data, I am only able to perform this analysis using Sirius XM's own internal forecast. Analyst reports do not disclose the underlying royalty rate assumption so it is impossible to make the adjustment. And while Sirius XM's internal forecast also does not explicitly disclose what royalty rate is being assumed, there is sufficient detail in the spreadsheets that allows me to deduce the royalty rates and estimate the impact of raising them.
- (201) The methodology I developed contains several steps:
- a) Step 1: Isolate SDARS royalties Sirius XM paid to SoundExchange from the forecasted line item programming royalties based on actual 2014 data;

- b) Step 2: Determine a reference royalty rate in the internal forecast;
 - c) Step 3: Calculate the adjustment ratio between the reference royalty rate and SoundExchange's maximum proposed royalty rate of 24%; and,
 - d) Step 4: Compute incremental SDARS royalties by multiplying the SDARS royalties (Step 1) by the adjustment ratio (Step 3).
- (202) Put differently, I calculate the incremental amount of SDARS royalties that would be payable if the forecasted rate was set to 24% as opposed to the rate included in the internal forecast. Even though the exact SDARS royalty assumption imbedded in the Sirius XM internal forecast is not disclosed, it is not necessary for this computation.

II.E.4.a. Step 1: Calculating SDARS royalties based on 2014 data

- (203) I start by isolating the SDARS royalties in the internal forecast. The long-term Sirius XM forecast breaks down the publicly disclosed line item "Revenue share and royalties" into constituent components, one of which is a line item called "Programming royalties." My understanding is that this is the line item that contains royalty obligations to SoundExchange,¹⁴³ and for 2014 (the last year of actuals in the long-term forecast), programming royalties equaled [REDACTED]. That year Sirius XM paid SoundExchange \$[REDACTED] million in SDARS statutory royalties, which means that SDARS statutory royalties comprised [REDACTED]% of programming royalties.¹⁴⁴
- (204) Without more accurate information, I assume that this ratio stays constant in the future, meaning that for all years of the Sirius XM long-term forecast SDARS royalties represent the same [REDACTED] of total Programming royalties. Figure 59 shows the calculation of the SDARS royalties I assume are imbedded in Sirius XM's long-term plan.

Figure 59: Calculation of assumed SDARS royalties imbedded in the Sirius XM long-term plan
[RESTRICTED]

A	Programming royalties	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
B=A*[REDACTED]%	Estimated SDARS share	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Source: Lys analysis, SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

¹⁴³ As a sensibility test, I tried to reconcile the line item programming royalties by adding up all of the various Sirius XM royalty obligations I am aware of. That analysis is presented in Appendix B Figure 83 and shows that in 2014 known royalties amounted to [REDACTED]% of programming royalties.

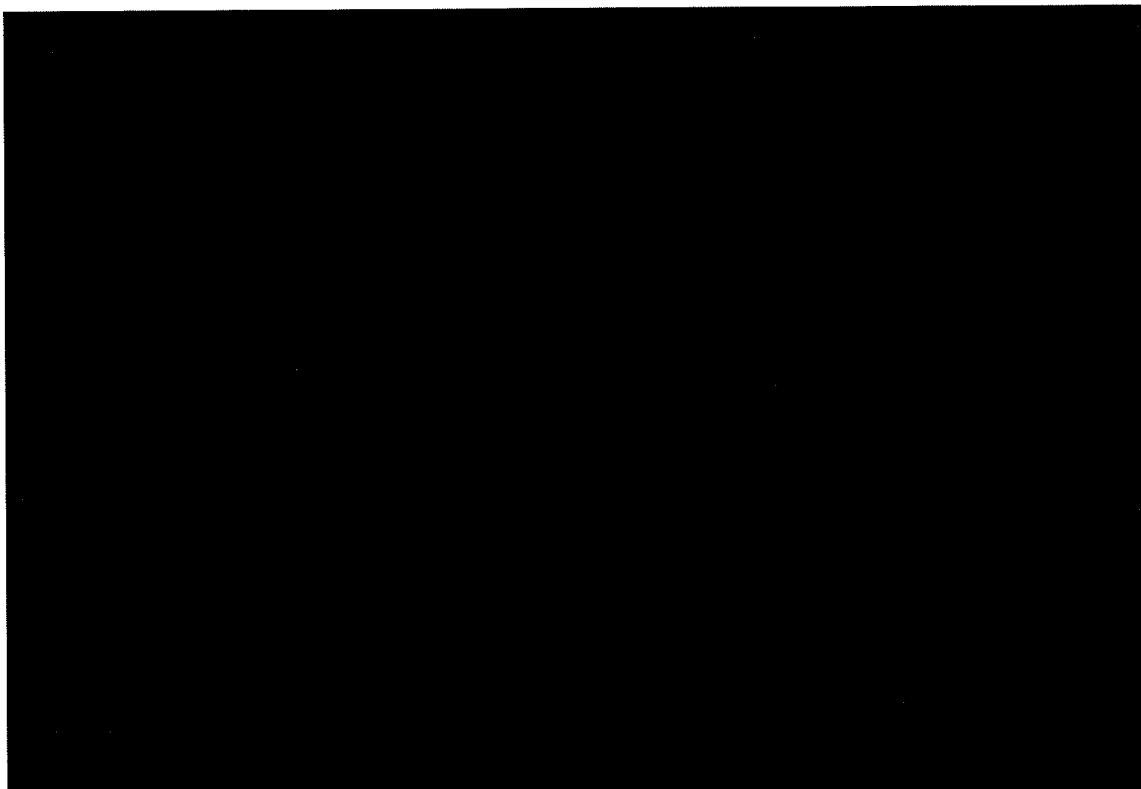
¹⁴⁴ [REDACTED]% = \$[REDACTED] million / \$[REDACTED] million.

- (205) My assumption that the SDARS royalties in Sirius XM's long-term forecast remain at a constant share of programming royalties is conservative. As I explain below, in reality the Sirius XM forecast more than likely included increases in the SDARS royalty rate, which would have made the SDARS share of programming royalties rise over time. By underestimating the initial pool of SDARS royalties I am likely overestimating the portion of programming royalties that is getting raised to the 24% alternative SDARS royalty rate. This assumption therefore benefits Sirius XM.
- (206) At the time when the long-term plan was prepared, Sirius XM knew that in actuality the SDARS royalty rates would gradually increase by one-half percent per year, from 9.5% in 2014 to 11.0% in 2017, the final year of the SDARS III regime. It is therefore very likely that the actual forecast assumes rising SDARS royalties, as my analysis in Step 2 proves.

II.E.4.b. Step 2: Determining the Reference Royalty Rate

- (207) Sirius XM does not disclose the SDARS royalty rate that it assumed when preparing the long-term plan. But I can estimate that value by triangulating known information: namely, I can calculate an approximation of the SDARS royalty rate that I call a reference rate and compare it to a known SDARS royalty rate (for example, for 2017) prescribed by CRB regulations in SDARS II (of 11.0%).
- (208) In Step 2, I calculate a reference royalty rate in order to analyze the underlying assumptions used by Sirius XM in preparing its long-term plan. This reference royalty rate is only used as a benchmark and is not informative as an absolute metric.
- (209) The numerator for the calculation of the reference royalty rate is the SDARS royalties calculated in Step 1 (row B). The denominator is a measure of revenue to which such royalty rates would be applied, which I call reference revenue. My goal is to define reference revenue as close as possible to SDARS revenue, utilizing all available information from the Sirius XM long-term plan. Consequently, for this analysis I define reference revenue as subscription revenue (non-telematics), plus the U.S. Music Royalty Fee, reduced by the expected portion of non-music revenues, which would not be subject to SDARS royalty rates. Details of this calculation appear in Appendix B, in Figure 80-Figure 82, and the results are presented below in Figure 60.

Figure 60: Reference royalty rate in Sirius XM's long-term forecast [RESTRICTED]



Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (210) The key finding from Figure 60 is that this analysis indicates that [REDACTED].
- (211) I stress that the reference royalty rates are only relevant for the purposes of adjusting the Sirius XM forecast, which is the calculation I perform next and which are only used as a relative comparison tool; they should not be compared to any statutory or effective rates I discuss elsewhere in this report.
- II.E.4.c. Step 3: Calculating the adjustment ratio**
- (212) The reference royalty rate represents an estimate of the SDARS rate based on available information in the model. I can connect it to the real world by referencing a known data point – for example, the 2017 statutory SDARS royalty rate of 11.0%.

- (213) I start with the assumption that [REDACTED].
- (214) The adjustment ratio then simply measures the relationship between the 2017 reference royalty rate of [REDACTED]% and the known statutory SDARS rate of 11.0%, and equals [REDACTED].¹⁴⁵ Put differently, real-world observations about royalty rates can be incorporated in the Sirius XM long-term plan by scaling them [REDACTED].

II.E.4.d. Step 4: Calculating the incremental impact of raising the SDARS royalty rate to 24%

- (215) In this final step, I calculate the incremental impact of raising the SDARS statutory royalty rates during the SDARS III period (2018-20) from 11.0% (which I have established is the likely level imbedded in the Sirius XM long-term plan) and the maximum SoundExchange proposed royalty level of 24%.
- (216) To do this I first establish that a royalty level of 24.0% is 2.18 times larger than a royalty level of 11.0%¹⁴⁶ and the incremental impact of the increase is 1.18 times. Put differently, if royalties were \$100 under an 11.0% regime, they would be \$218.18 under a 24.0% royalty regime, which means that the incremental impact is \$118.18.
- (217) However, to apply the real-world royalty rates to the model I need to scale them down by the adjustment ratio discussed in Step 3 (because I only know the approximate, or reference, royalty rates, used in the model).
- (218) My calculations are presented in Figure 61.

¹⁴⁵ [REDACTED] = 11.0% / [REDACTED] %.

¹⁴⁶ 2.18 = 24.0% / 11.0%.

Figure 61: Computation of the Adjustment ratio [RESTRICTED]

A	Estimated SDARS royalties in Sirius XM's long-term model ¹⁴⁷	■	■	■	■	■	■
B	Model SDARS royalty rate ¹⁴⁸	■	■	■	■	■	■
C	Target SDARS royalty rate				24.0%	24.0%	24.0%
D=C/B-1	Incremental impact multiplier				■	■	■
E	Adjustment ratio				■	■	■
F=A*D/E	Incremental impact				■	■	■
G=F*(1-35%)	After-tax impact				■	■	■

Source: Lys analysis.

- (219) My analysis shows that raising the statutory SDARS royalty rates in *SDARS III* to the maximum level proposed by SoundExchange would have an incremental pre-tax impact of \$[■] million in 2018, \$[■] million in 2019, and \$[■] million in 2020.

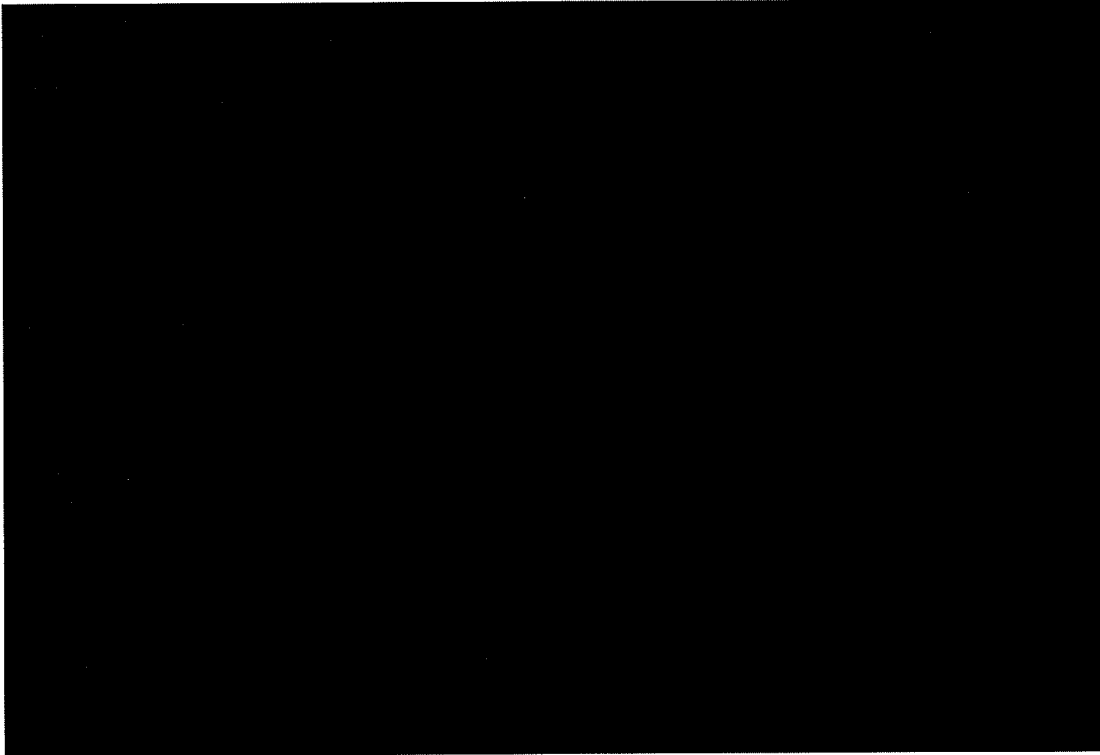
II.E.4.e. Impact on various financial metrics

- (220) Royalty payments do not affect any other line items and flow directly to the bottom line. Therefore, the pre-tax impact calculated in Figure 61 directly affects adjusted EBITDA and the after-tax impact directly affects net income and free cash flow.
- (221) In the graphs below I present key profitability metrics assuming that starting with 2017 Sirius XM was obligated to pay SDARS royalty rates at 24%. My analysis shows that even under this scenario Sirius XM's own forecast shows the company would remain highly profitable.
- (222) Figure 62 utilizes Sirius XM's own long-term forecast and shows the amount of adjusted EBITDA the company would earn assuming that starting with 2017 it was obligated to pay SDARS royalties at SoundExchange's proposed maximum royalty rate of 24%.

¹⁴⁷ See Figure 59.

¹⁴⁸ See Figure 82.

Figure 62: Sirius XM's long-term forecast for Adjusted EBITDA assuming SDARS royalties at 24%, in \$ million [RESTRICTED]



Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (223) Figure 63 utilizes Sirius XM's own long-term forecast and shows the amount of net income the company would earn assuming that starting with 2017 it was obligated to pay SDARS royalties at SoundExchange's proposed maximum royalty rate of 24%.

**Figure 63: Sirius XM's long-term forecast for net income assuming SDARS royalties at 24%, in \$ million
[RESTRICTED]**



Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

- (224) Finally, Figure 64 utilizes Sirius XM's own long-term forecast and shows the amount of free cash flow the company would earn assuming that starting with 2017 it was obligated to pay SDARS royalties at SoundExchange's proposed maximum royalty rate of 24%.

Figure 64: Sirius XM's long-term forecast for free cash flow assuming SDARS royalties at 24%, in \$ million [RESTRICTED]



Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

II.E.5. Sirius XM's Public Statements About the Future

(225) In addition to the internal forecast provided through the discovery process in this matter, I have also examined Sirius XM's public guidance on its performance for this year. Sirius XM has announced that it expects the positive trend to continue in 2016:¹⁴⁹

- a) Increase to 31 million subscribers,
- b) Achieve \$4.9 billion in revenue,
- c) Achieve \$1.78 billion in adjusted EBITDA, and
- d) Achieve \$1.4 billion of free cash flow.

(226) As I have already discussed, Sirius XM does not publicly disclose long-term projections. However, from the information in the public domain it is clear that Sirius XM's executives

¹⁴⁹ Sirius XM 2015 Annual Report at 3.

anticipate the strong growth that the company has experienced will continue in the future. For example, in February 2015 Sirius XM CFO and Senior Executive VP David Frear stated: “More ever [*sic*], it is very clear to me that in the next few years, we have plenty of runway ahead of us to continue growing our business on all fronts.”¹⁵⁰

- (227) Mr. Frear has also stated that he expects the company to maintain its high (70%) contribution margin percentage:

“I mean the contribution margin in the business, which is the revenues minus the revenue share paid to the OEMs, the royalties paid to the music industry and then customer service and billing costs, that has been a little over 70% for a really long time, and I don’t see anything changing on that right now.”¹⁵¹

- (228) In May 2016, Mr. Frear confirmed that the company expects that EBITDA margin will exceed 40%: “I think we have been saying this. We used to say that we’d get to 40% margins and we revised that I think about a year ago to say that we could get over 40%. I think we’ll get over 40%.”¹⁵²

II.E.5.a. Factors supporting improved performance in the future.

- (229) Sirius XM’s management has identified various factors that it believes will lead to improved performance for the company in the future. One of the factors most often discussed by management during recent conference calls and earnings calls is the potential for Sirius XM to increase its profits via the sale of subscriptions to buyers of used cars:

“In 2015, we estimate that our radios were in 28% of the used cars that were sold, up from about 24% in 2014. Over time, as the fleet turns over, that 28% will continue growing to approach the new car penetration rate. This channel alone will yield a predictable arc of subscriber growth for many years to come.”¹⁵³

“Over time, and really over the next few years more precisely, turnover of enabled vehicles in the secondary market will actually come to exceed the new vehicle universe. We are very excited about this opportunity and well-positioned to capitalize on it. We are on track to grow self-pay additions in this segment from approximately 1.5 million last year to close to 2 million this year. But this is just the beginning. Based on the coming growth and turnover of vehicles with radios,

¹⁵⁰ David Frear, CFO and Senior Executive VP, Sirius XM, Q4 2014 Earnings Call at 2 (Feb. 5, 2015).

¹⁵¹ David Frear, CFO and Executive VP, Sirius XM, MoffettNathanson Media & Communications Summit at 15 (May 13, 2015).

¹⁵² David Frear, CFO and Senior Executive VP, Sirius XM, MoffettNathanson Media & Communications Summit at 14 (May 19, 2016).

¹⁵³ James Meyer, CEO, Sirius XM, Q4 2015 Earnings Call at 2 (Feb. 2, 2016).

we expect substantial increase in used car additions in the coming years. Honestly, we've really just barely begun to scratch the surface here."¹⁵⁴

"And so, as we look at all this, the one thing that is clear to me is the used car market will be growing for at least for us, for at least 10 years and probably more like 2015."¹⁵⁵

"It's math and it's just math if you think about it. In this country there is about 240 million cars that number stagnated during the recession. There is a lot of pent up demand now that's starting to drive. That's another part of what's driving the new car business. But if new car sales are in the middle 17s, used car sales are closer to 40 million a year. And so, if we continue to penetrate new cars the way we do, if you think about it, somewhere out - somewhere it's hard to predict in the next five to seven years, we'll actually drive more trials through our used car business than our new car business. And the used car opportunity for us is a tremendous opportunity for a lot of reasons. One, it gets us a whole different demographic we've never seen before. Used car buyers and new car buyers tend to be very different. And second, we obviously don't have any subsidy. We only pay the subsidy the first time we put our technology in the vehicle. And so, we can accept a very low yield in the funnel and still come out way ahead."¹⁵⁶

- (230) Another major factor supporting future growth in profitability for Sirius XM is increased vehicle penetration, or the percentage of vehicles with an installed satellite radio. Sirius XM executives have repeatedly stated that penetration has a long way to go before it will reach its peak. For example:

"And so if our penetration stays at 75% assuming the automakers don't on their own take us up that the vehicles Sirius XM enabled vehicles on the road will more than double from 80 million to 180 million in the next 10 years. So there is more market opportunity in front of us than what we have seen in the 12 to 13 years that we've been in the business so far. Honestly it's a little bit like winning a lotto to have this large a market opportunity, this foreseeable."¹⁵⁷

"Our hardware is already installed in 32% of the vehicles on the road or approximately 76 million, but with our long-term penetration rate settling in the mid 70s as a percentage of new vehicles built, our addressable market will double over the coming years. This is a big deal."¹⁵⁸

¹⁵⁴ James Meyer, CEO, Sirius XM, Q1 2014 Earnings Call at 3 (April 24, 2014).

¹⁵⁵ David Frear, CFO and Senior Executive VP, Sirius XM, JPMorgan Technology, Media and Telecom Conference at 9 (May 23, 2016).

¹⁵⁶ James Meyer, CEO, Sirius XM, Goldman Sachs 24th Annual Communacopia Brokers Conference at 1-2 (Sept. 17, 2015); *see also* Sirius XM CEO James Meyer, October 22, 2015, Q3 2015 earnings call, p.7; Sirius XM President and Chief Content Officer Scott Greenstein, February 2, 2015, Q4 2014 earnings call, p.8.

¹⁵⁷ David Frear, Senior EVP and CFO, Sirius XM, Bank of America Merrill Lynch 2015 Leveraged Finance Brokers Conference at 3 (Dec. 2, 2015).

¹⁵⁸ James Meyer, CEO, Sirius XM Q2 2015 Earnings Call at 4 (July 28, 2015).

“Vehicles in operations with SiriusXM installed reached 73 million, still only about 30% of the vehicles on the road. We expect our new car penetration rate to remain above 70%. And depending upon new car sales’ volumes, we continue to expect enabled vehicles in operation to double. This tremendous increase in the enabled fleet and the continued development of the used car channel gives us confidence that we can continue growing our subscriber base for many more years to come.”¹⁵⁹

“And if you were to ask us 10 years ago where we were going to be in 10 years, the -- I mean, obviously with the numbers coming out pretty close to what everybody thought, that we thought we would be here, I think the thing that I didn’t expect to be saying in 2016 was that we are not even halfway done with building out the enabled vehicle fleet. Right? There are 85 million cars on the road today. And at the 75% incorporation rate that we are going to be building out fleet for another 100 million vehicles on the road in the course of the next sort of 10, 11 years. And then because of the dynamics of car distribution and turnover in the United States, that we won’t peak from a subscriber count perspective until you get a couple of years past that. So I just don’t -- I don’t think we appreciated how long and sustained the growth in the businesses was going to be.”¹⁶⁰

“Well, more broadly, we are driving the enabled fleet of vehicles in the United States from about 70 million vehicles today towards 140 million, 150 million over time. So with a lot more incremental vehicles on the road, we think we have an opportunity to drive more subscribers and more revenue.”¹⁶¹

- (231) Another strategy that Sirius XM plans to employ to improve future profitability is to sell more additional subscriptions to its current customers for second and third cars in the same household. Various related statements confirm that Sirius XM executives view this as a substantial area of opportunity for the company:

“I thin[k] one other area where we are not achieving as well as we could is if you go back to that 240 million kind of cars some say 230, some say 240, big number, don’t really care which one it is. I think another number is about 80% of the households in America own more than one car. And I can tell you 80% of our subscribers don’t have more than one account. And so I think there is a really big opportunity for us overtime to figure out how to get our subscribers more engaged in family plans and multiple vehicle plans that we haven’t yet done as good job.”¹⁶²

“Well, I think it’s a huge opportunity and so the statistics I have seen show that about 80% of car running households own more than one car. And so right now, I know you these stats [sic], a much smaller percentage of our households have a

¹⁵⁹ David Frear, CFO and Senior Executive VP, Sirius XM, Q1 2015 Earnings Call at 5 (April 28, 2015).

¹⁶⁰ David Frear, CFO and Senior Executive VP, Sirius XM, MoffettNathanson Media & Communications Summit at 3-4 (May 19, 2016).

¹⁶¹ Hooper Stevens, VP of Investor Relations and Finance, Sirius XM, Morgan Stanley Technology, Media & Telecom Conference at 1 (Mar. 2, 2015).

¹⁶² James Meyer, CEO, Sirius XM, Deutsche Bank 2016 Media, Internet & Telecom Conference at 2 (Mar. 8, 2016).

second subscription added. So more broadly, it's a huge opportunity to grow second subscriptions and whether that's done on an à la carte basis or eventually on some sort of householding plan to be determined right now, it's on an à la carte basis. So \$15 for the first subscription and \$10 for the incremental subscription within the same household."¹⁶³

"I'll tell you that where I think biggest opportunity is and I'll tell you why I don't think we've done a good enough job and that is as of today we've looked at our business on a car basis you are a car guys. I mean you are brand but you are a car and where I really see this going to is we're going to look at it on a household basis. I think it's over 80% of the people in this country own more than one car. I can tell you our subscriber base 80% of them don't have more than one subscription once okay far from that. And so when I see that big a gap I realized that house holding and household type plans I think are our biggest opportunity to drive going forward besides subscriber work."¹⁶⁴

- (232) Sirius XM has indicated that its future profitability may also improve as a result of future reductions in Subscriber Acquisition Cost, which include the cost Sirius XM pays for hardware subsidies, device royalties, commissions, and warranties among other items.¹⁶⁵ In April 2016 Sirius XM CFO and Senior Executive VP David Frear stated:

"I think that SAC should come down a little bit over time that it's got a lot to do with mix and timing that as newer generation radios go into vehicles, the SAC tends to come down. There is a pretty long lag from the time that we develop these newer generation radios that have lower costs and then when they get actually incorporated into automotive production. So, I think you can expect to see SAC come down a little bit as we go forward."¹⁶⁶

- (233) Sirius XM is in the process of developing a product called "SXM17" that will combine its satellite and internet services for use in connected cars.¹⁶⁷ This product is expected to be included in vehicles starting in 2017,¹⁶⁸ and the company's management has expressed confidence that the introduction of this product will improve the company's performance in the future:

"So I think we are likely to find that we sell more premium [subscriptions] as a result of this. I think we are likely to find that people are more engaged with the product, and therefore, they are likely to more engage people to churn less. And I think because we know more about what's going on with the trials, I think we will also be able to improve conversion relative to what it would be without it. So it

¹⁶³ Hooper Stevens, VP of Investor Relations and Finance, Sirius XM, Morgan Stanley Technology, Media & Telecom Conference at 3 (Mar. 2, 2015).

¹⁶⁴ James Meyer, CEO, Sirius XM, Goldman Sachs 24th Annual Communacopia Brokers Conference at 6 (Sept. 17, 2015).

¹⁶⁵ Sirius XM 2015 Form 10-K at 26.

¹⁶⁶ David Frear, CFO and Senior Executive VP, Sirius XM, Q1 2016 Earnings Call at 8 (April 28, 2016).

¹⁶⁷ Sirius XM 2015 Form 10-K at 3.

¹⁶⁸ *Id.*

kind of helps with primary demand, it helps with pricing and it helps with retention. It's a great service introduction for us."¹⁶⁹

"And overall, when you think about it, you got to look at this as product expansion and whether or not we get the economic benefit from improved conversion, improved churn, or improved pricing in all three, I think you should think of this as an improvement in our product that will improve our margins in the business."¹⁷⁰

"So we do expect benefits in churning conversion. If you ask us to quantify, we couldn't do it at this time. We'll have to wait and see as product gets in the marketplace. But we also expect to be able to lower costs through it, that this – what Jim described is [sic] one button push to effectively convert from your trial into a subscription means that we're deflecting calls away from the call center. And so I think there are benefits in churn conversion and more efficient operations in terms of on-boarding customers."¹⁷¹

- (234) Another potential future opportunity discussed by Sirius XM's management is additional spectrum. The company currently operates under two bandwidths – the Sirius spectrum and the XM spectrum. Since Sirius and XM combined, the company began transmitting its programming twice, once to each spectrum. Subsequent to the merger, new cars are only equipped with the XM chipset. Once the old Sirius chipset becomes obsolete, the company's available spectrum will effectively double. Sirius XM Executive VP and CFO David Frear discussed this opportunity at a conference call in January of 2015:

"In terms of the spectrum, it's an interesting question. That is, we're in the process of rolling out the XM chipset to all the OEMs. That's a process we started six years ago and we are probably about - our discussion earlier of how long it takes to do things in vehicle, we are probably halfway through that transition now. Sometime in the early part of the next decade, we will have a choice to make about what we do with the low band spectrum. We will no longer have to uplink the 70s channel twice, once to the XM system, once to the Sirius system. We will have a choice sometime in the early part of the next decade about what we do. What can you do with that? We could double the number of channels. We could petition for changes in our license to allow us to do regional networks. We could put up channels of video to self-driving cars. I think there's a lot of things that you can do with 12.5 megahertz of spectrum."¹⁷²

- (235) Finally, Sirius XM management has indicated that subscription prices will steadily increase in the future, which will lead to increased profits for the company. In February of 2015 Sirius XM

¹⁶⁹ David Frear, Senior EVP and CFO, Sirius XM, JPMorgan Technology, Media and Telecom Conference at 6 (May 23, 2016).

¹⁷⁰ David Frear, Senior EVP and CFO, Sirius XM, Q1 2015 Earnings Call at 9 (Apr. 28, 2015).

¹⁷¹ David Frear, Senior EVO and CFO, Sirius XM, Q1 2016 Earnings Call at 6 (Apr. 28, 2016).

¹⁷² David Frear, CFO and Executive VP, Sirius XM, Citi Global Internet, Media & Telecommunications Conference at 12 (Jan. 7, 2015).

Executive Vice President and CFO David Frear stated: “I think satellite radio you should think of like any other media property out there. I think it will generally have a rising value over time and so our subscription price will go up gently over time.”¹⁷³

II.E.6. Potential Threats

II.E.6.a. Debt

- (236) As discussed earlier in the report, at the end of 2015 Sirius XM had \$5.4 billion in long-term debt, which rose to \$5.6 billion at the end of Q2-2016, the most recent quarter for which financial statements are publicly available. Additionally, in May of 2016 Sirius XM priced a private-placement offering of \$1 billion in 5.375% Senior Notes due 2026 that is being offered to qualified institutional buyers.¹⁷⁴ (However, in August Sirius XM announced that on October 1 it would redeem \$650 million in 5.875% Senior Notes due 2020.)¹⁷⁵
- (237) However, the significant debt load that Sirius XM carries is a result of its chosen financial strategy and not the consequence of events beyond its control. Recall that, as shown in Figure 23, over the past several years Sirius XM has spent \$7.3 billion in cash to repurchase its own stock – an amount that dwarfs its total long-term debt level. Had it wanted to, Sirius XM could have used the free cash flows it used to buy back its stock to pay off the long-term debt. Had it done so, it would have been entirely debt free and still would have had \$1.8 billion to repurchase its own stock.
- (238) Figure 65 compares Sirius XM’s relative debt levels to its competitors as measured by two commonly used ratios: debt-to-assets and debt-to-trailing-EBITDA. For the purposes of this table, debt is defined as short-term and long-term liabilities. This analysis demonstrates that Sirius XM’s debt-to-trailing-EBITDA is well below that of its competitors, as is its debt-to-assets ratio relative to its competitors in broadcast radio (SIC 4832).

¹⁷³ David Frear, CFO and Executive VP, Sirius XM, JPMorgan Global High Yield & Leveraged Finance Conference at 3 (Feb. 23, 2015).

¹⁷⁴ Sirius XM, News Release, *Sirius XM Radio Inc. Prices Offering of \$1 Billion of 5.375% Senior Notes Due 2026* (May 18, 2016).

¹⁷⁵ Sirius XM, News Release, *Sirius XM Radio Inc. to Redeem \$650 Million of 5.875% Senior Notes Due 2020* (Aug. 25, 2016).

Figure 65: Relative debt levels of Sirius XM and its competitors in 2015

Debt / Total Assets	0.68	1.13	0.64	1.40	0.19	1.51
Debt / Trailing EBITDA ¹⁷⁶	3.71	10.58	5.76			11.64

Source: 10-K filings

- (239) I also performed the same analysis excluding iHeartMedia, which due to its large size, dominates the weighted average. Those results are shown in Figure 66. While Sirius XM's debt-to-trailing-EBITDA remains well below the industry averages, excluding iHeartMedia reveals that Sirius XM's debt-to-assets ratio is higher than the average for the remaining firms in the industry. At the same time, given Sirius XM's far superior profitability, it is my professional opinion that this higher leverage is not indicative of greater risk.
- (240) In fact, it is an accepted implication of modern finance theory that managers signal their beliefs about strong future performance by choosing a capital structure tilted towards more debt.¹⁷⁷ Thus, Sirius XM's choice to repurchase shares rather than reduce its debt is consistent with the optimistic outlook reflected by both the internal and the external forecasts discussed in the previous section.

Figure 66: Relative debt levels of Sirius XM and its competitors (excluding iHeartMedia) in 2015

Debt / Total Assets	0.68	0.59	0.47
Debt / Trailing EBITDA	3.71	7.84	4.34

Source: 10-K filings

II.E.6.b. Satellites

- (241) Sirius XM provides its satellite radio services through a fleet of eight orbiting satellites.¹⁷⁸ These satellites have limited useful lives, and new satellites are launched periodically to replace old satellites, representing a significant capital expenditure for the company. The last satellite launch

¹⁷⁶ I do not compute this ratio for Pandora and another company in SIC 483 (NTN Buzztime) because these companies have negative trailing EBITDA.

¹⁷⁷ See, e.g., Myers, Stewart C. and Nicholas S. Majluf, *Corporate financing and investment decisions when firms have information that investors do not have*, J. of Financial Economics 13, 187-221 (1984); Myers, Stewart C., *The capital structure puzzle*, J. of Finance 39, 575-592 (1984).

¹⁷⁸ Sirius XM 2015 10-K at 4.

by Sirius XM occurred in October of 2013,¹⁷⁹ and the next satellite replacement cycle is expected to commence in late 2016 or early 2017.¹⁸⁰

“We require kind of five discrete satellite projects every 15 years. So two active satellites on the XM side, two active on the Sirius side and one spare, that can really go in between or kind of step in, in case of any issues with either or any of those four satellites. Those projects are really roughly speaking about \$300 million a piece. So about \$1.5 billion in total satellite CapEx spending over a cycle. . . . And I think, we’ll start that spending probably late ‘16. So it would be done approximately over a 12-year period.”¹⁸¹

- (242) These projections match the observed historical (2011-15) CapEx cash expenditures of approximately \$100 million per year, as seen in Figure 15. On the other hand, some of the analysts are predicting significantly higher near-term CapEx, which means that if Sirius XM’s actual future CapEx comes more in line with the company executives’ statements as well as recent history, Sirius XM will likely outperform analysts’ expectations.¹⁸²
- (243) Although this is a large expenditure in absolute terms, in relative terms it is not. Sirius XM’s capital expenditures amounted to only 3% of its total revenues in 2015.¹⁸³ This amount is comparable to Pandora, for example, which spent 2.8% of its total revenues on capital expenditures (mainly servers) during the same period.¹⁸⁴ Sirius XM’s management has expressed confidence that this is not a major concern for the company given their strong financial performance in recent years. In September 2014, Sirius XM CEO Jim Meyer made the following statement regarding satellite replacement costs:¹⁸⁵

“By the way, it’s not near the question it was for us eight or nine years ago, you know, when we looked at kind of the 300 million to replace each one, and how big that was. You know, with our revenue well over \$4 billion, our EBITDA at \$1.4 billion, and a revenue of \$4 billion, I think that cost management for us is much easier today.”

¹⁷⁹ Sirius XM Radio, Inc. Q3 2013 Earnings Call at 5 (Oct. 24, 2013).

¹⁸⁰ Sirius XM at Goldman Sachs Communacopia Conference at 9 (Sept. 10, 2014).

¹⁸¹ Hooper Stevens, Vice President of Investor Relations and Finance, Sirius XM, Morgan Stanley Technology, Media & Telecom Conference at 7-8 (Mar. 2, 2015).

¹⁸² For example, J.P. Morgan is predicting CapEx of between \$174 million in 2016 and \$258 million in 2020. *See* J.P. Morgan, Sirius XM Radio Inc. at 8 (May 2, 2016). Similarly, Gabelli & Company is estimating CapEx levels of between \$200 million in 2016 and \$260 million in 2020. *See* Gabelli & Company, Sirius XM Radio, Inc. at 1 (May 16, 2016)).

¹⁸³ Sirius XM 2015 CapEx ÷ Total Revenue = \$134.892 ÷ \$4,570.1 = 3.0%. *See* Sirius XM 2015 Form 10-K.

¹⁸⁴ Pandora 2015 CapEx ÷ Total Revenue = \$32.1 ÷ \$1,164.0 = 2.8%. *See* Pandora 2015 Form 10-K.

¹⁸⁵ Jim Meyer, CEO, Sirius XM, Bank of America Merrill Lynch 2014 Media, Communications, and Entertainment Conference at 10 (Sept. 16, 2014).

II.E.6.c. Satellite insurance

- (244) Sirius XM currently does not hold in-orbit insurance for its satellites because it “consider[s] the premium costs to be uneconomical relative to the risk of satellite failure.”¹⁸⁶ In recent years, Sirius XM has allowed its insurance policies on certain of its satellites to expire, most recently in 2015.¹⁸⁷
- (245) Economic logic implies that, when companies perceive a risk as minor, or when their assessment of the risk is less than that of insurance carriers, they will decide to self-insure. Thus, Sirius XM’s decision to not renew the satellite insurance is indicative that they perceive those risks as “manageable” and/or smaller than assessed by insurance carriers.

II.E.6.d. Connected cars

- (246) In past proceedings, Sirius XM has contended that wired or connected cars pose a potential threat to Sirius XM, because they allow drivers to more easily access free internet alternatives to satellite radio in the car. This threat, according to Sirius XM’s past arguments, comes in the form of ease of use via built-in interfaces to streaming services such as Pandora, as well as data plans that encourage in-car use for customers who are currently reluctant to use these services on their smart phones due to limited data availability.
- (247) Today, however, Sirius XM’s management has indicated that it views the connected vehicle as an opportunity for the company rather than a threat. For example, in June 2015 Sirius XM CFO David Frear stated:¹⁸⁸

“[...] the advent of connected vehicles is a huge opportunity for us; not only does it allow us to take the Internet app capabilities into the vehicle so that we have not just our 10 megabit broadband pipe into the car, but we also have all the benefits of what you can do interactively across the wireless infrastructure, but it also for the first time gives us the opportunity to get data back from the car, what the radio is doing, right. So for the last 12 years we have been completely blind as to whether or not people are actually listening to the radios. And as you connect up cars, you can get return path data, I think that the opportunity for us to optimize both conversion rates and churn rates by knowing whether or not people are listening is probably worth far more in value to shareholders than, for instance, connected vehicles services will be.”

- (248) Similarly, Sirius XM CEO Jim Meyer has said:

¹⁸⁶ Sirius XM 2015 10-K at 4.

¹⁸⁷ Sirius XM 2014 10-K at 3.

¹⁸⁸ David Frear, Executive VP and CFO, Sirius XM, Bank of America Merrill Lynch Global Telecom and Media Conference at 3 (June 2, 2015).

“Number two, I see streaming, and it’s a place I want to be really clear with investors streaming to me is not competition, streaming to me is technology, and there is no reason why I won’t take as much advantage of streaming as anybody else. And so, I started with a promise of, however anybody wants Sirius XM Radio, they should get it. They want it broadcast in their car, great. They want it streamed on their phone, great. If they want to stream it through their phone and plug it into the car, great, I just want them to pay me and be my customer, okay. And so, I put technology aside. That said Pandora is a competitor, okay but free terrestrial radio is by far, by far the biggest competitor. There is over 200 and, I think 20 million, 230 million people who listen to terrestrial radio every day in the United States, every day. So I just see still a huge opportunity to continue to grow as we offer those people a better proposition and convince them that they should pay.”¹⁸⁹

- (249) Again, in September 2014, Mr. Meyer made the following optimistic statement regarding connected vehicles:¹⁹⁰

“[...] I can’t tell you how excited I am about this connected car. You know, everybody wants to ask me about, boy, is this – aren’t you afraid of this? Absolutely not. You know, the connected car, it will take a long time, okay. But the connected car, as it builds out over time, I am convinced, will offer new revenue service opportunities that none of us have even envisioned today.”

- (250) In part, it appears that Sirius XM discounts the potential disruptive effect of connected cars because they have not yet had a discernable impact in Sirius XM’s business. In May 2015, Sirius XM EVP and CFO David Frear made the following comment about the effect connected vehicles have had on the company’s conversion rates to date:¹⁹¹

“[Connected vehicle technology] was in the 40% new car production last year, that’s a pretty big take rate. So we’ve been looking at this for years. It’s funny. It’s not like it all just happened recently. It’s been happening over the last five years. And so as we look at vehicles with connected vehicle technology in them, and we look at what our conversion rates look like, that we cannot find the impact of connected vehicle on demand for our service.”

“Okay, so connected car, now when people talk to me about connected car for the most part they’re coming in talking about all of the competition that’s enabled by connected vehicle, and it’s true that there is more competition. I am not so worried about that these days. We’ve been looking and watching at our streaming

¹⁸⁹ Jim Meyer, CEO, Sirius XM, Goldman Sachs 24th Annual Communacopia Brokers Conference at 4 (Sept. 17, 2015).

¹⁹⁰ Jim Meyer, CEO, Sirius XM, Bank of America Merrill Lynch 2014 Media, Communications and Entertainment Conference at 2 (Sept. 16, 2014).

¹⁹¹ David Frear, EVP and CFO, Sirius XM, MoffettNathanson Media & Communications Summit at 5 (May 13, 2015).

competitors for four to five years now. To be honest, we cannot find the effect of them on demand for our service.”¹⁹²

- (251) In summary, Sirius XM has every reason to believe – and its executives in fact do believe – that the company’s financial success will continue unabated over the period of the upcoming rate term.

III. Direct licenses

- (252) Sirius XM has signed a number of direct license agreements with independent labels, or indies, wherein indies agree to a discounted percentage of revenue relative to the statutory rate, in exchange for other benefits. I have been provided with and analyzed all such licenses that Sirius XM produced in the initial discovery phase. In this section I investigate whether the royalty rates in those agreements are indicative of the underlying market value of royalty rights. To this end, I develop an economic model that shows how the royalty rate in those direct licensing agreements results from a negotiation between Sirius XM and the indies that is keyed to the statutory rate. In addition, I analyze the various benefits that might cause an indie to agree to a lower royalty rate, each of which provide the indie with the potential to earn the same or more royalties in a given period without any increase in the number of plays it receives on Sirius XM’s satellite radio service. My analysis leads to two conclusions:
- a) First, the royalty rates in the agreements are unrelated to the underlying market value of the royalty rights. The royalty rates in the direct license agreements are dependent on the statutory royalty rate. This dependence stems from the fact that Sirius XM always has the option of paying the statutory rate in the event that the indies demand a higher rate and the indies have the option of receiving the statutory rate (if Sirius XM does not offer other benefits that justify acceptance of a lower rate). The actual market value of royalty rights thus cannot be inferred from the royalty rates in the direct license agreements.
 - b) Second, although direct licenses generally contain a royalty rate lower than the statutory rate (such that Sirius XM would be willing to agree), it would be an oversimplification to assume that an indie agrees to that rate in exchange for a greater number of plays or “spins” on Sirius XM’s satellite radio service. This is because the direct licenses offer various benefits that would allow an indie to earn equal or more royalties under a direct license than it would under the statutory rate, without any increase in the number of plays it receives.

- (253) Consistent with the first implication of my model, [REDACTED]

¹⁹² David Frear, EVP and CFO, Sirius XM, Bank of America Merrill Lynch 2015 Leveraged Finance Brokers Conference at 3 (Dec. 2, 2015).

[REDACTED]
[REDACTED]. This clearly indicates that the direct license royalty rates are simply a reflection of the statutory rate and are not indicative of the fair market value or the underlying royalty rights.

- (254) As of the first half of 2016, [REDACTED]
[REDACTED].
- (255) The indies' reasons for accepting such a discount from the statutory rate include, but are not limited to (1) Sirius XM's offer to pay direct licensors on the basis of webcasting performances, rather than plays on its satellite service; (2) Sirius XM's offer to pay directly 100% of the royalty, as opposed to the 50% share that the indie would receive under the statutory rate structure; and (3) promises related to payment for pre-1972 sound recordings, providing more accurate reporting of its plays than it does under the statutory license, royalty advances, and avoiding the fee paid to SoundExchange.

III.A. An Economic Model of the Royalty Rate in the Direct License Agreements

- (256) In this section, I develop an economic analysis of the relation between royalty rates in the direct license agreements and the statutory royalty rate. My analysis is based on the fundamental principle that, in a negotiation, each party will only agree to an outcome that leaves it better off than its next best alternative.¹⁹³
- (257) My analysis demonstrates that there will be a strong positive association between royalty rates in direct license agreements and the statutory royalty rate. In addition, my model implies that the royalty rate in a voluntary direct license agreement has no relation to the market value of the royalty rights.
- (258) A fundamental principle of negotiation is that, absent coercion, neither party has an incentive to agree to a deal that leaves it worse off than it would have been by taking its next best alternative. Because Sirius XM always has the option of falling back on the statutory rate, absent any other benefits that a direct license may bring, Sirius XM has no incentive to pay more than the statutory royalty rate. Similarly, because the indies have the option of being paid according to the statutory rate, indies do not have incentives to receive less than the statutory royalty rate, absent other benefits. In other words, absent any other benefits, the royalty rate in a direct license agreement would equal the statutory royalty rate.

¹⁹³ See, e.g., Margaret A Neale & Thomas Z. Lys, *Getting More of What You Want* (2015), at 18.

- (259) Thus, economic logic implies that for direct license contracts to exist, there must be some benefits for at least one of the two parties (the indies or Sirius XM). Denoting the royalties that Sirius XM would pay under the statutory license as $R_{Statutory License}$ and the benefits to Sirius XM as B_{SXM} , Sirius XM's reservation price, that is, the most it would be willing to pay in a direct licensing agreement, is

$$Reservation Price_{SXM} = R_{Statutory License} + B_{SXM} \quad (1)$$

Or, in words, Sirius XM will not be willing to agree to pay more than it would under the statutory rate plus any benefits that it might derive under the direct license.

- (260) Therefore, the negotiated royalty rate in a direct license contract will be *less* than Sirius XM's reservation price, or, in mathematical terms

$$R_{Direct License} \leq R_{Statutory License} + B_{SXM} \quad (2)$$

- (261) Similarly, an indie will agree to a direct license contract only if it believes it will obtain the royalties it would have earned under the statutory license minus other benefits that the indie obtains from the direct license agreement. In mathematical terms

$$Reservation Price_{Indie} = R_{Statutory License} - B_{Indie} \quad (3)$$

In other words, any discount taken from the statutory rate by the indie must be made up for by other benefits that the indie believes it is obtaining through the direct license.

- (262) Because the indie will not agree to a direct license rate that is less than its reservation price, the direct license must satisfy:

$$R_{Direct License} \geq R_{Statutory License} - B_{Indie} \quad (4)$$

- (263) Combining the restrictions on the direct license rate in equations (2) and (4) implies that the direct license royalty rate must satisfy:

$$R_{Statutory License} - B_{Indie} \leq R_{Direct License} \leq R_{Statutory License} + B_{SXM} \quad (5)$$

Or, in words, the direct license royalty rate must be **more** than the Statutory royalty rate minus the benefits that the indies derive from entering into a direct licensing agreement, but **less** than the Statutory royalty rate plus any benefits that Sirius XM derives from entering into a direct licensing agreement.¹⁹⁴

¹⁹⁴ A corollary of this point is that if the benefits derived by Sirius XM from entering into direct licensing agreements are zero (or small) then the royalty rate in the direct license agreements will be strictly less than the statutory royalty rate set by

- (264) Equation (5) has several important implications. First, assume that the direct license provides no benefits for Sirius XM, that is $B_{SXM} = 0$. Then, because B_{Indie} must be positive (or the indies would not enter into a direct license agreement), it follows from equation (5) that $R_{Statutory License} - B_{Indie} \leq R_{Direct License} \leq R_{Statutory License}$. That is, the direct license royalty rate $R_{Direct License}$ will be **strictly** less than the statutory license royalty rate, $R_{Statutory License}$. As I show in the next section, this implication is fully consistent with the observed pattern in the royalty rates in the direct license agreements.
- (265) Second, the market value of the royalty rights does not figure in equation (5). In other words, the royalty rate in the direct license agreements is **NOT** dependent of the market value of the royalty rights. Thus, the fact that the royalty rate in the direct license agreements is less than the statutory rate does not support the conclusion that the unobserved market value of the royalty rights is less than the statutory royalty rate. In fact, it is equally consistent with the market value being (much) larger than the statutory royalty rate. 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.
- (266) Third, assuming that the idiosyncratic benefits to the indies and to Sirius XM are (relatively) constant over time, then equation (5) implies that the royalty rate in the direct license contracts will co-move with the statutory license rate.¹⁹⁵ Again, as I show later in this report, this result is also fully consistent with the pattern of the royalty rates in the direct license agreements.
- (267) Moreover, this effect is likely to be more pronounced than implied by a “static” view of my model, because as the statutory rate changes, indies and Sirius XM will renegotiate the terms in the same direction. For example, when interviewing an executive of an indie, his answer to my question of what were to happen if the statutory rate were unexpectedly increased was consistent with the economic logic that underlies my model: the direct license contract would be adjusted in the same direction at the next expiration date.
- (268) An important question is the nature of the idiosyncratic benefits that an indie receives under a direct license, B_{Indie} , in equation (5). As I discuss later in this report, my analysis indicates that direct licensing provides many benefits to indies. At least some of these benefits provide an indie the opportunity to earn more royalties in a given period without any increase in the number of plays that the indie receives on Sirius XM’s satellite service. These include:
- a) Sirius XM’s practice of paying directly licensed indies on the basis of their percentage of performances on Sirius XM’s webcasting service, instead of on the basis of their percentage

the Judges.

¹⁹⁵ This conclusion is not dependent on the assumption that the idiosyncratic benefits be constant. All that is sufficient to draw this conclusion is that the benefits be not dependent on the statutory royalty rate.

of plays or “spins” on Sirius XM’s satellite service (as would take place under the statutory license).¹⁹⁶ Based on this feature of Sirius XM’s direct licenses, an indie that receives a greater share of performances than it does plays (referred to as “over-indexing”) can receive more royalties under the direct license, without any increase in the number of spins that the indie receives on Sirius XM’s satellite radio service. Moreover, as I show later, as a result of how the statutory payments are computed, the additional payments that Sirius XM offers to indies via over-indexing are not borne by Sirius XM itself—rather, that risk is assumed by the pool of statutory licensors.

- b) Sirius XM offers and agrees to make direct payments of 100% of the performance royalties owed (as opposed to the 50% share that would be received under the statutory license) to all direct licensors. Because contracts between labels and artists generally allocate substantially less than 50% of royalties to the artist, the direct payment of full royalties allows an indie to obtain a greater percentage of the royalty under the statutory rate. For instance, if the label’s agreements with the artist provide for a [REDACTED]% artist share, the indie can obtain [REDACTED]% of the royalty by signing a direct license, instead of 50% under the statutory license. In addition, labels’ agreements with indies generally provide that certain costs incurred by the label may be recouped against the artist share. When a label receives the artist share directly, it is able to recoup those costs, thus keeping even more than [REDACTED]% of the royalty.
- c) Direct licenses provide several other idiosyncratic benefits that allow indies to recover more royalties than they would under the statutory rate, without any increase in the number of plays of their recordings. This includes promises related to payment for pre-1972 sound recordings (which Sirius XM otherwise refuses to pay), Sirius XM’s offer to provide more accurate reporting than it provides to SoundExchange, royalty advances, and avoiding the fee paid to SoundExchange.

(269) Although I understand that Sirius XM has not yet provided negotiation documents related to its direct licenses, my analysis strongly indicates that indies do not enter into direct licenses based upon the promise or expectation that they will receive more plays/spins on Sirius XM’s satellite radio service by doing so. Although Sirius XM produced direct licenses that it executed with approximately [REDACTED] entities, [REDACTED].¹⁹⁷ Moreover, my conversations with executives at indies and review of negotiation documents that I have received indicate that Sirius XM uses the

¹⁹⁶ “Performances” on the webcasting services denotes the number of times a creative work was listened to by an individual via the webcasting service, while “spins” on the satellite service denotes the number of times a creative work was broadcast on one of Sirius XM’s satellite channels, without regard to the size of the audience.

¹⁹⁷ See, e.g., *Web IV* 94-97, 118-21, 123, 132, 137-40, 208-09 (describing in detail and relying upon the express steering provisions and rates contained in the Pandora-Merlin agreement to conclude that it is necessary to adjust for steering).

concrete and contractually-expressed benefits above to promote its direct licenses and mentions the possibility of increased spins only as an afterthought, in noncommittal terms. In the instances in which indies have requested that steering commitments be expressly incorporated into a direct license, Sirius XM has rejected such requests out of hand.

III.B. The Royalty Rates in Direct Licenses Are Dependent Upon the Statutory Rates

- (270) In this section, I analyze the royalty rates found in direct licenses. As the model above predicts, the rates are heavily dependent upon the statutory rate.
- (271) In Figure 67 I graph the simple average of the initial royalty rates found in Sirius XM's direct license agreements against the statutory rate, over time.

Figure 67: Initial royalty rates found in direct licenses vs. statutory rate, over time [RESTRICTED]



Source: Direct license agreements.

- (272) Figure 67 demonstrates that the direct license agreements entered into by Sirius XM [REDACTED].

- (273) The average initial rate in direct licenses in 2016 (as of September 2016, the month through which Sirius XM has provided direct license agreements) is [REDACTED]%, in comparison to the current statutory rate of 10.50%. In other words, based upon a simple average, an indie signing a direct license agrees to [REDACTED]% of the statutory rate. Furthermore, [REDACTED].
- (274) In addition to the above comparison based on a simple average of the rates offered, I have conducted a comparison based on the weighted average of the royalty rates being paid under direct licenses. In particular, for each month between January 2013 and May 2016, I computed a weighted average of the rates offered in direct licenses, based on the number of performances that Sirius XM recorded at each rate. Weighting the computation of the average by the number of performances is the most sensible approach because [REDACTED].
- (275) In May 2016, for instance, Sirius XM paid royalties under direct licenses containing [REDACTED]. The weighted average royalty rate based on performances was [REDACTED]%. [REDACTED].¹⁹⁸ I have also performed a similar calculation of the average royalty rate, weighted on the basis of accrued royalties. Based on this analysis, the weighted average royalty rate is [REDACTED]%, which is equivalent to a [REDACTED] from the statutory rate.¹⁹⁹
- (276) Figure 68 shows the relation between the statutory royalty rates and the average royalty rate in direct licenses, weighted by performances. As can be seen from Figure 68, [REDACTED].²⁰⁰ Thus, consistent with my economic analysis, the royalty rate in the direct license agreements closely follows the statutory rate, thus validating my model. In turn, this supports my conclusion that the market value of the royalty rate **CANNOT** be inferred from the royalty rates in the direct license contracts.

¹⁹⁸ [REDACTED].

¹⁹⁹ I have included a breakdown of the calculation of these weighted averages in Appendix B, Figure 84 and Figure 85.

²⁰⁰ Correlation is a measure of the degree to which two variables are associated, or have a linear relationship with each other. The value of the correlation can vary between -1 (perfect negative correlation) and 1 (perfect positive correlation), and a correlation value of 0 indicates no correlation. It is calculated using the following formula:

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{n}}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}}$$

Figure 68: Effective DL royalty rate compared to the statutory rate [RESTRICTED]



Source: Direct license agreements, SXM Royalty statements.

III.C. Sirius XM's Direct Licenses Represent a Miniscule Part of its Total Royalties Paid

(277) My analysis has also shown that direct licenses account for only a small fraction of the sound recordings that Sirius XM's business relies upon and as such could not be considered informative as to the market as a whole.

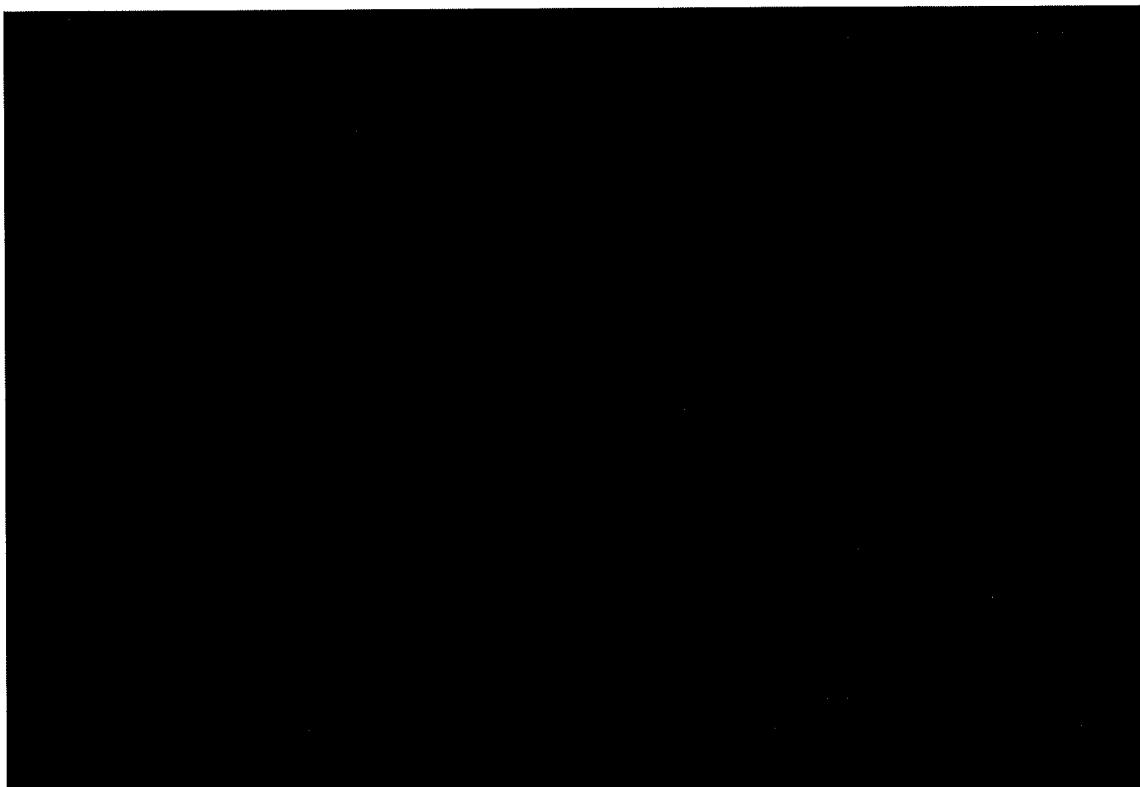
(278) Since 2013, royalties paid under direct licenses have accounted for only [REDACTED]% of the total royalties paid by Sirius XM for its satellite radio service. As Figure 69 demonstrates, [REDACTED]

[REDACTED]

].²⁰¹

²⁰¹ In fact, the average of 3.4% and the red bars in Figure 69 overstate the significance of Sirius XM's direct licenses. This is because Sirius XM's direct licenses generally cover not only satellite radio royalties, but also royalties for Sirius

Figure 69: Sirius XM royalty payments in 2016 [RESTRICTED]



Source: XM Statements of Account For a Preexisting Satellite Digital Audio Radio Service, 2013-16.

(279) Although Sirius XM has provided copies direct licenses that have been executed with

[REDACTED]
[REDACTED]. For instance, [REDACTED]
[REDACTED]

[REDACTED].²⁰³ Because the total pool of direct licensors are of limited consequence to Sirius XM's royalty obligations, and a substantial portion of the direct license agreements are of no consequence at all, it would be unsound to rely upon direct licenses to draw inferences regarding the market as a whole.

XM's Webcasting service, Business Establishment Service, and Cable and Satellite TV service. If the royalties attributable to these services were excluded from the amount attributed to Sirius XM's direct licenses, direct licenses would represent an even smaller percentage of the total royalties paid for satellite radio.

²⁰² SXM_DIR_00024462 Payments Tab.

²⁰³ SXM_DIR_00021553 Payments Tab; Sirius XM Statements of Account.

- (280) It is also worth noting that, although Sirius XM has produced agreements executed with [REDACTED]
[REDACTED]. Based on documents produced by Sirius XM in discovery, [REDACTED]²⁰⁴

III.D. Value That Direct Licensors Obtain By Signing A Direct License

- (281) Below I discuss specific examples of value obtained by direct licensors that agree to sign a direct license with Sirius XM (B_{Indies} in equation (5)).
- (282) The first three sections below – indexing based on share of performance, direct payment of 100% of royalties, and other monetary benefits – all reflect ways that an indie has the potential to earn more royalties than it would under the statutory rate (and thus justify the discount in royalty rate in the direct license), without any increase in the number of plays that the indie receives on Sirius XM’s satellite service. Each of these features [REDACTED]
[REDACTED]. Moreover, in each case, these appear to be benefits that Sirius XM uses to promote its direct licenses.
- (283) The fourth section below addresses the potential benefit of signing a direct license for the purpose of obtaining additional plays of the indie’s repertoire on Sirius XM radio (or “steering”). [REDACTED]
[REDACTED]. Furthermore, although I understand that Sirius XM has not yet produced documents related to its direct license negotiations, my conversations with executives at indie labels, and my review of negotiation documents that I have been able to obtain, suggest that Sirius XM makes only vague and noncommittal references to the possibility of steering in its negotiations, which are ancillary to the other concrete benefits discussed herein. Moreover, when indies have sought assurances related to steering, Sirius XM has expressly declined.

III.D.1. Indexing Based On Share-Of Performance

- (284) It is important to understand that there is a structural difference between the basis upon which Sirius XM pays [REDACTED] labels under direct licenses and the way that SoundExchange must allocate royalties in light of the data that Sirius XM reports.
- (285) SoundExchange is required to allocate royalties based on the monthly information that it receives from Sirius XM.²⁰⁵ Because Sirius XM does not report its audience measurement, as it is required

²⁰⁴ SXM_DIR_00024467.

²⁰⁵ 37 C.F.R. §§ 382.13(f), 370.4(d).

to do under the Judges' regulations,²⁰⁶ SoundExchange must allocate royalties received on the basis of a label's share of "plays" on Sirius XM's satellite radio service. As the regulations define, a "play" refers to each instance "sound recording is publicly performed by a Service during the relevant period, without respect to the number of listeners receiving the sound recording."²⁰⁷ This is sometimes referred to as a "spin," because a play takes place each time that Sirius XM spins a sound recording on its satellite radio service.

- (286) Through its direct licenses, however, Sirius XM offers direct licensors the opportunity to earn royalties based upon a different metric: the label's share of performances on Sirius XM's webcasting service. As the regulations (and Sirius XM's direct licenses) define, a performance "means each instance in which any portion of a sound recording is publicly performed to a Listener by means of a digital audio transmission or retransmission."²⁰⁸ In other words, a performance refers to the number users that listen to each sound recording played by Sirius XM on its webcasting service. As Sirius XM specifically advertises to indies, this feature of direct licenses provides indies that obtain more performances than plays (referred to as "over-indexing" on performances) with the opportunity to earn more royalties, independent of any increase in the number of plays that the indie receives on satellite radio.

- (287) [REDACTED]
[REDACTED]
[REDACTED].²⁰⁹ Similarly, [REDACTED] direct licenses that generated at least \$0.01 in royalties during February 2016, [REDACTED], were paid based on their share of spins, as would have been the case based on the statutory license. The remainder were paid on the basis of performances.²¹⁰

- (288) [REDACTED]
[REDACTED].²¹¹

[REDACTED]

²⁰⁶ Written direct testimony of Jonathan Bender at 7-8; 37 C.F.R. § 370.4(d)(2)(vii).

²⁰⁷ 37 C.F.R. § 370.4(b).

²⁰⁸ *Id.*

²⁰⁹ SXM_DIR_00024462, Payments Tab and DL Tier Summary Tab.

²¹⁰ SXM_DIR_00021553, Payments Tab; Sirius XM Royalty Statements.

²¹¹ SXM_DIR_00003531 at 2-3.

- (289) By offering to pay licensors on the basis of their share of performances, instead of their share of plays/spins, Sirius XM provides indies with an opportunity to earn higher royalty payments under a direct license. If the discrepancy is large enough, an over-indexed label will receive greater royalties a direct license than it would with the statutory license, even at a lower royalty rate and without any increase in plays/spins.
- (290) To demonstrate the mechanics of over-indexing, I present in Figure 70 the actual royalties earned by [REDACTED] under its direct license agreement for the month of May of 2015, compared to what it would have earned had it opted to be paid under the statutory license.

Figure 70: Over-indexing example, [REDACTED] [RESTRICTED]

	Line item	Direct license	Statutory license
A	Royalty Rate	[REDACTED]	10%
B	Revenue Base ²¹²	[REDACTED]	[REDACTED]
C=A*B	Total Royalty Pool	[REDACTED]	[REDACTED]
D	Label Spins	[REDACTED]	[REDACTED]
E	Total Spins	[REDACTED]	[REDACTED]
F	Label Performances	[REDACTED]	[REDACTED]
G	Total Performances	[REDACTED]	[REDACTED]
H=F/G (direct license) H=D/E (statutory license)	Allocation Basis	[REDACTED]	[REDACTED]
I=C*H	Accrued Royalties	[REDACTED]	[REDACTED]

Source: SXM_DIR_00021308; Sirius XM 2015 Statement of Account to SoundExchange; List of Spins By Label Provided by SoundExchange; Total Spin Data Provided by SoundExchange, Lys Analysis

²¹² The revenue base for direct licenses appears higher than that for statutory licenses because I have used the amounts

- (291) As this example shows, because the label has a greater share of total performances ([REDACTED]%) than total spins ([REDACTED]%),²¹³ it was able to receive \$[REDACTED] ([REDACTED]) excess royalties under the direct license than it would have received under the statutory license, for the same number of spins. In other words, simply by being paid on the basis of its share of performances, without any other change, [REDACTED] was able to increase the royalties received by [REDACTED]%. Importantly, it was able to earn these extra royalties notwithstanding the fact that it had agreed to a direct license rate ([REDACTED]%) that was lower than the statutory rate (10%).
- (292) By this arbitrage, Sirius XM offers direct licensors an opportunity to earn a greater share of royalties—without any additional spins. Continuing with the example of [REDACTED] during May 2015, the label would have earned \$[REDACTED] per spin ([REDACTED]) under the statutory license, but was able to earn \$[REDACTED] per spin ([REDACTED]) as a result of over-indexing with the direct license. Indeed, from January 1, 2015 through May 2016, [REDACTED] has earned approximately \$[REDACTED] more royalties simply by being paid on the basis of share-of-performances, instead of under the statutory rate.
- (293) My analysis reveals that several other sophisticated indies have similarly earned more royalties by signing direct licenses, simply as a result of being paid on the basis of the indies' share of performances. Figure 71 is an illustration (but not exhaustive) of some of the independent labels that have signed direct licenses and generated substantial excess royalties based on over-indexing.

reported by Sirius XM on its Statements of Account, which reduce gross revenues based on the proportion of performances attributable to directly licensed and pre-72 recordings (see discussion below). However, this does not affect my analysis because the total performances metric includes all performances, whereas the total spins metric excludes spins of directly licensed and pre-72 performances. In other words, the entire royalty pool under the "statutory license" column is allocated to labels, whereas only the fraction of the royalty pool under the "Direct license" column that corresponds to performances in the relevant tier is allocated to labels.

²¹³ My calculation of direct licensors' percentage of spins here and below is based on spins on Sirius XM's "reference channels," i.e. the channels on Sirius XM's satellite radio service that are also available via Sirius XM's webcasting service. I understand that under the statutory license, SoundExchange would allocate royalties based on share of spins on all channels; however, Sirius XM does not report non-reference channel spins by direct licensors to SoundExchange and has not yet provided such information in discovery. I have no reason to believe that the share of spins for any particular label differs between reference and non-reference channels. Although any such difference may require adjustments to my estimate of accrued royalties under the statutory license, I would expect such adjustments to be minor because I understand that reference channels represent virtually all plays on Sirius XM's satellite service.

Figure 71: Additional Examples of Labels That Earned Excess Royalties from Over-indexing (all numbers through May 2016) [RESTRICTED]

[illegible]

Source: Lys analysis.

- (294) To be clear, this chart shows that, notwithstanding the discounted rate offered in their direct licenses, these indies were able to earn between [REDACTED] and [REDACTED] more royalties than they would have under the higher statutory rate, simply by being paid on the basis of their share of performances, instead of their share of plays.
- (295) 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 over-indexing. The indies illustrated above have succeeded in doing so; however, even those that do not may have executed a direct license based on the perceived benefit of over-indexing. In particular, although, at this time Sirius XM has not yet provided its negotiation communications with potential direct licensors, my investigation makes clear that Sirius XM uses the prospect of over-indexing—and thus earning more royalties

than under the statutory license—as a central tenet of its direct license campaigns. In conversations I had with executives from indies, the executives consistently described over-indexing as a focal point of Sirius XM’s pitch to sign a direct license. According to those executives, Sirius XM approached them and represented that it would expect the indie to over-index based on the indie’s particular repertoire.

- (296) The indie executives with which I spoke were consistent in saying that, during negotiations, Sirius XM declined to provide data from which one could have certainty that their sound recordings had over-indexed in past months (i.e. the number of plays they had been receiving versus the number of performances). Rather, Sirius XM would represent that the indie’s recordings are played on certain of its radio channels that tend to over-index on its webcasting service. Indies were thus left to complete their own analysis as to whether they would actually over-index. Moreover, indies that I spoke with stated that upon signing a direct license, Sirius XM did not provide them with data from which they could determine whether they had, in fact, increased royalties based on over-indexing (i.e. the number of plays they were receiving versus the number of performances).
- (297) These accounts are consistent with the evidence I have seen of Sirius XM’s efforts to pitch direct licenses. For instance, in a recent email pitching its direct license to an indie, Sirius XM states:

[REDACTED]

] ²¹⁴

- (298) When the indie inquired further, Sirius XM advertised:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

215

(299) When the same indie inquired for [REDACTED]

[REDACTED],²¹⁶ Sirius XM refused, stating that [REDACTED]

217

(300) It is important to understand that when Sirius XM offers an indie the potential to be paid upon share of performances, and thus to earn more royalties through over-indexing, the extra royalties paid to a direct licensor that over-indexes are not born by Sirius XM. This is because for every payment that Sirius XM makes to a direct licensor based on its share of performances, Sirius XM is permitted under the regulations to take a deduction (also based on the number of performances) from its statutory royalty obligations. In other words, Sirius XM bears no risk regarding whether the indie label will actually under- or over-index – that risk is born by the statutory licensors.

215 [REDACTED]

216 [REDACTED]

217 [REDACTED]

- (301) In fact, it is an understatement to say that over-indexing poses no risk to Sirius XM. Because the direct license rates are always lower than the statutory rate, the additional deduction Sirius XM takes from statutory royalty payments *more than* offsets the increase in direct licenses royalties Sirius XM has to pay the over-indexed labels. Indeed, Sirius XM benefits from over-indexing in the form of decreased overall royalty payments.
- (302) Figure 72 below illustrates a simple numerical example of this dynamic. The example assumes hypothetical scenario in which Sirius XM's total revenue is \$100,000, a statutory rate of 10% of revenue, and a direct license offered at a discount of 9% of revenue. Consistent with the explanation of the potential benefit of over-indexing above, the chart shows that the royalties earned by the direct licensor (M) increase the more that it over-indexes on performances relative to spins. However, the chart shows that independent of whether the indie has underindexed or over-indexed, the total royalties paid by Sirius XM (O) is less than it would have been under the statutory rate (J).

Figure 72: Effect of indexing on Sirius XM

	Line item	Under-indexing by 20%	Under-indexing by 10%	No indexing	Over-indexing by 10%	Over-indexing by 20%
A	Total revenues	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
B	Statutory rate	10%	10%	10%	10%	10%
C	Direct License royalty rate	9%	9%	9%	9%	9%
D	Indie's spins	10	10	10	10	10
E	Total spins	100	100	100	100	100
F=D/E	Indie's % of spins	10%	10%	10%	10%	10%
G	Indie's web performances	800	900	1000	1100	1200
H	Total web performances	10,000	10,000	10,000	10,000	10,000
I=G/H	Indie % of performances	8%	9%	10%	11%	12%
J=A*B	SXM's statutory royalties absent direct license	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
K=J*I	SXM's deduction from statutory royalties based on direct license	\$800	\$900	\$1000	\$1100	\$1200
L=J-K	SXM's Statutory royalties after direct license	\$9,200	\$9,100	\$9,000	\$8,900	\$8,800
M=A*C*I	SXM's royalties paid to direct licensor	\$720	\$810	\$900	\$990	\$1080
N=J*F	Royalties direct licensor would have earned under statutory license	\$1000	\$1000	\$1000	\$1000	\$1000
O=L+M	SXM's Total Royalties paid with Direct License	\$9,920.00	\$9,910.00	\$9,900.00	\$9,890.00	\$9,880.00
P = J-O	SXM Savings From Signing DL	\$80.00	\$90.00	\$100.00	\$110.00	\$120.00

Source: Lys analysis.

III.D.2. Direct Payment of the Artist Share & Recoupment

- (303) Under direct licenses, indies also receive the benefit of receiving direct payment of 100% of the royalties paid by Sirius XM.
- (304) Under the statutory license, the regulations require SoundExchange to pay 50% of performance royalties received from Sirius XM to the rights owner and 50% to the artist (with 5% of that going to the artists union).²¹⁸
- (305) Under Sirius XM's direct licenses, however, a licensor receives 100% of the royalties paid by Sirius XM and then the licensor pays the artist according to its agreement with that artist. In fact,

²¹⁸ 17 U.S.C. § 114(g)(2). I note that this discussion pertains only to performance royalties, not the ephemeral royalty, which is paid entirely to the rightsholder.

[REDACTED]:

[REDACTED]

- (306) As the Judges recognized in *SDARS II*, this provision provides significant monetary value to direct licensors. In particular, as the Judges explained “the Direct Licenses provide for payment of 100% of the royalties to the Direct Licensors . . . thereby avoiding the statutory apportionment of 50% to record companies and 50% to artists and performers.”²²⁰ This “receipt of 100% of the royalties upfront is clearly attractive to certain record labels and was a selling point in negotiations with independent record labels.”²²¹
- (307) 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 [REDACTED] of royalties earned by the sound recording.²²² Thus, simply by obtaining direct payment of royalties through a direct deal, the label can potentially receive [REDACTED] of the royalties paid by Sirius XM, rather than the 50% that it would receive under the direct license.
- (308) The increase in percentage of royalties alone can easily justify the acceptance of a lower royalty rate in the direct license. As an example, consider an instance in which an indie’s share of performances/plays (depending on the particular agreement) would result in Sirius XM paying \$100 in royalties based on the statutory rate of 10.5% for 2016. Under the statutory license, the indie receives \$50 (with the remaining \$50 going to artists). Now assume that the indie signs a direct license at a rate of 9.5%. In that case, the royalties paid by Sirius XM would decrease to \$90.50 (\$100 x 9.5%/10.5%). However, that full amount would be paid directly to the indie. Assuming the indie pays its artist [REDACTED]

²¹⁹ See, e.g., SXM_DIR_00000027; SXM_DIR_00000035; SXM_DIR_00000043; SXM_DIR_00000051; SXM_DIR_00000060.

²²⁰ *SDARS II* at 23,064.

²²¹ *Id.* at 23,064, n.29.

²²² Written direct testimony of Michael Kushner, ¶¶ 38-39.

[REDACTED], the indie would keep a total of \$[REDACTED]. That is, it has earned almost [REDACTED]% more royalties even though it agreed to a lower royalty rate.

- (309) The value of direct payment to an indie can be much greater based on the additional fact that agreements between labels and artists generally allow the label to “recoup” certain costs that it has fronted against the artists’ share.²²⁴ In other words, where a label has incurred costs in the form of advances, recording costs, promotional costs, as well as other costs, related to an artist, the label’s contract with the artist generally allows the label to recover those costs before paying any money to the artist.²²⁵ Indies lose the benefit of such recoupment terms when they operate under the statutory license because the artist receives his or her 50% share of performance royalties directly from SoundExchange.²²⁶
- (310) In addition to offering this [REDACTED], Sirius XM specifically markets its direct licenses based on the direct payment of 100% of royalties. For instance, Sirius XM entices indies by sending an electronic agreement and stating:

[REDACTED]

- (311) Based on conversations that I have had with indies that have executed direct licenses, the desire to obtain direct payment of 100% of royalties can be a significant incentive to enter into a direct license. For instance, one former indie executive that I spoke with explained that signing a direct license was an easy decision because it had a work-for-hire relationship with artists, which did not require it to pay any artist share. Under the statutory license, SoundExchange would nonetheless be required to locate and pay the artists their 50% share of the performance royalty. By signing a direct license, the indie was able to nearly double its royalty payments. In particular, instead of receiving of 4% (50% of the 8% statutory rate applicable at the time), the indie was able to earn 7% under a direct deal – an increase in royalties of 75%.

²²³ *Id.* ¶ 38.

²²⁴ *Id.* ¶ 40.

²²⁵ *Id.*

²²⁶ 17 U.S.C. § 114(g)(2).

²²⁷ [REDACTED]

- (312) Importantly, like indexing, the direct payment of 100% of royalties provides the potential for increased royalties without any increase in the indies' spins on Sirius XM's satellite service. Moreover, like indexing, Sirius XM can provide this benefit without any cost to itself.

III.D.3. Other Benefits: Pre-1972 Recordings, More Accurate Reporting of Plays, Royalty Advances, SoundExchange Fee

- (313) My analysis of direct licenses indicates that there are other benefits that could cause an indie to sign a direct license for a rate that is lower than the statutory rate.
- (314) First, [REDACTED] indies have agreed to direct licenses in exchange for Sirius XM's agreement to pay royalties for sound recordings fixed prior to pre-1972. In particular, Sirius XM maintains that it is not required to pay any royalties for pre-1972 sound recordings. In order to obtain payment for plays related to pre-1972 sound recordings, [REDACTED]
[REDACTED]
[REDACTED] for pre-1972 sound recordings.²²⁸
- (315) By negotiating direct licenses that are contingent on the payment of royalties for pre-1972 sound recordings, indies earn extra royalties that Sirius XM would otherwise not have paid (absent litigation). This can be a substantial benefit to indies that have a significant repertoire of pre-1972 sound recordings.
- (316) As an example, Sirius XM engaged in long efforts to negotiate a direct license with [REDACTED]. In 2012, [REDACTED] declined to sign a direct license after Sirius XM refused to include payment for pre-1972 sound recordings in the license.²²⁹ Throughout the negotiations, Sirius XM encouraged [REDACTED] to sign the direct license based on suggestions that [REDACTED] would save the administrative fee paid to SoundExchange, would receive an advance, would receive direct payment of artist royalties, and might have greater access to Sirius XM programmers.²³⁰ [REDACTED] rejected the offer for a direct license out of hand, based on Sirius XM's continued position that it would not pay for pre-1972 recordings.²³¹ Ultimately, in [REDACTED]

²²⁸ See, e.g., [REDACTED]
[REDACTED].

²²⁹ [REDACTED]

²³⁰ [REDACTED]

²³¹ [REDACTED]

██████████, [██████████] agreed to a direct license with a royalty rate of [██████████] for post-1971 recordings and a rate of [██████████] for pre-1972 works from [██████████].

- (317) Based on conversations with an executive at [REDACTED], I understand that it would not have signed a direct license for its post-1971 recordings, absent the agreement royalties for pre-1972 recordings. This is reflected in the preamble of [REDACTED] direct license for post-1971 recordings. Furthermore, I understand from [REDACTED] that it was willing to take a discount from the statutory rate on its post-1971 recordings based on its own analysis that those recordings over-index on performances, so as to justify the lower rate.
- (318) Upon signing its direct license, [REDACTED] earned over [REDACTED] in royalties for pre-1972 sound recordings between January 2016 and May 2016, for which Sirius XM would have otherwise paid \$0. This alone is equivalent to a [REDACTED] increase in [REDACTED] royalties earned from Sirius XM during this period.
- (319) A second benefit that Sirius XM offers to indies is the opportunity to provide content feeds and metadata directly to Sirius XM, increasing Sirius XM's accuracy in reporting its plays of the indie's content and increasing royalties. For instance, this includes the ability to provide Sirius XM with the International Standard Recording Code (ISRC), is a unique identifier of a particular recording, for the indie's entire repertoire of recordings. I understand that when Sirius XM pays royalties under the statutory license, it provides SoundExchange with more limited data (and no ISRC) for the purposes of allocating royalties to rights owners, which can lead to labels being underpaid.
- (320) The direct licenses negotiated by Sirius XM and direct licensors [REDACTED]
- [REDACTED]²³² Moreover, Sirius XM specifically markets that direct licenses "allow you to directly submit your metadata and content to ensure maximum accuracy of reporting," as a benefit to indies in promoting its direct licenses.²³³ Based on conversations I have had with indie executives, I understand that the issue of improving the quality of Sirius XM's reporting, and thus the amount of payments to the indie, was a substantial factor in deciding to sign a direct license.

²³² See, .e.g., SXM DIR 00023531.

²³³ See, e.g., Sirius XM, Summary of License Terms, *available at* <https://www4.musicreports.com/offers/sxm/?cil=38945857440297628> (last visited Oct. 15, 2016).

- (321) Third, some direct licenses also include advances in the form of upfront payments or advances.²³⁴ Such advances can be especially valuable to an indie that does not have cash on hand.
- (322) Fourth, by signing direct licenses, indies obtain the benefit of avoiding SoundExchange's administrative fee, which was 4.6% in 2015.²³⁵ As with the benefits above, Sirius XM specifically markets this as a benefit to signing a direct license.²³⁶

III.D.4. Additional Plays on Sirius XM's Satellite Service.

- (323) An additional reason that an indie might sign a direct license with a rate that is lower than the statutory rate is the belief that the lower rate will incentivize Sirius XM to increase the number of plays that the indie's recordings receive.
- (324) At this point in time, I have not seen any evidence to suggest that indies actually obtain this benefit upon signing a direct licenses.
- (325) Unlike the several benefits above, [REDACTED].
- (326) Some of Sirius XM's promotional communications concerning direct licenses have simply referred to [REDACTED].²³⁷ However, this suggestion does not appear to be a principal basis for advancing direct licenses and, instead, generally appears after other concrete benefits, such as the potential for over-indexing, direct payment of 100% of royalties, greater accuracy in payment, and avoiding SoundExchange's fees.²³⁸
- (327) Based on conversations with indie executives, I understand that Sirius XM refuses in its negotiations to provide any guarantee of increased plays on its satellite radio service. This is consistent with evidence I have seen of Sirius XM's negotiations with indies, in which [REDACTED].²³⁹ Sirius XM's records produced in

²³⁴ See, e.g., [REDACTED].

²³⁵ Written Direct Testimony of Jonathan Bender at 3; SoundExchange Annual Report for 2015 Provided Pursuant to 37 C.F.R. § 370.5(c), at 4, <http://www.soundexchange.com/wp-content/uploads/2016/03/2015-SoundExchange-Fiscal-Report-Final.pdf> (last visited Oct. 15, 2016).

²³⁶ [REDACTED]

²³⁷ [REDACTED]

²³⁸ See, e.g., [REDACTED].

²³⁹ [REDACTED].

discovery indicate that [REDACTED]
[REDACTED].²⁴⁰

IV. Conclusion

(328) My conclusions can be summarized as follows:

- (1) The claims that Sirius XM made in the *SDARS I* and *SDARS II* proceedings – that it was under threat of bankruptcy – while not even true then, it certainly could not be further from the truth today. Sirius XM has sustained spectacular financial performance across every metric. Moreover, it would continue to be very profitable if it the Judges were to adopt a rate of 24% of revenue. In fact, even with such a rate, Sirius XM would outperform all of its comparator groups on every metric. Both Sirius XM's internal and analysts' external forecasts demonstrate that Sirius XM's strong financial performance will continue in the years to come. The 801(b)(1) factors thus counsel in favor of a substantial increase in the statutory rate.
- (2) The rates appearing in Sirius XM's direct licenses are directly tied to the statutory rate set by the Judges and are not representative of the rate that would be negotiated by Sirius XM and rightsholders in an unregulated market. Moreover, although Sirius XM has executed agreements with many entities, those entities represent a miniscule proportion of the royalties paid by Sirius XM for its satellite radio service, [REDACTED]. Finally, the discounted rate accepted by indies in direct licenses can be explained by various perceived or actual benefits, many of which allow the indie to earn more royalties than it could earn under the statutory rate, without any increase in plays on Sirius XM's satellite radio service.

Thomas Z. Lys, PhD

Appendix A. Curriculum vitae

Prof. Thomas Z. Lys

Education

- Ph.D. Graduate School of Management, University of Rochester, 1982 (Accounting and Finance).
- Lic. Rer. Pol. University of Berne, Switzerland, 1976 (Economics & Operations Research, summa cum laude).

Academic appointments

- Kellogg Graduate School of Management, Northwestern University (1981–present)
 - 2015–present: Eric L. Kohler Professor Emeritus
 - 2006–2015: Eric L. Kohler Chair in Accounting and Professor of Accounting and Information Management
 - 1999–2006: Gary A. Rosenberg Distinguished Professor of Real Estate Management, Professor of Accounting and Information Management, and Director, Guthrie Center for Real Estate Research
 - 1997–1999: Gary A. Rosenberg Distinguished Associate Professor of Real Estate Management, Associate Professor of Accounting and Information Systems, and Director, Guthrie Center for Real Estate Research
 - 1995–1997: John L. and Helen Kellogg Distinguished Associate Professor of Accounting and Information Systems
 - 1989–1995: Associate Professor of Accounting and Information Systems
 - 1981–1989: Assistant Professor of Accounting and Information Systems
- Northwestern School of Law, Northwestern University
 - 2000–2015: Professor of Law (courtesy appointment)
- Graduate School of Business, Stanford University (January–August, 1997)
 - Visiting Associate Professor of Accounting
- Graduate School of Business, University of Chicago (1986–1987)
 - Visiting Assistant Professor of Accounting

Publications—articles

(For recent articles, visit <http://ssrn.com/author=23037>)

- 35) Signaling through Corporate Accountability Reporting (with James P. Naughton and Clare Wang), *Journal of Accounting and Economics*, Volume 60, Issue 1, August 2015, Pages 56–72.
- 34) Corporate Governance Reform and Executive Incentives: Implications for Investments and Risk-Taking (with Daniel Cohen and Aiysha Dey), Forthcoming 2013 *Contemporary Accounting Research*.
- 33) An Examination of the Impact of the Sarbanes-Oxley Act on the Attractiveness of US Capital Markets for Foreign Firms (with Peter Hostak, N. Emre Karaoglu, and Yong (George) Yang), forthcoming, *Review of Accounting Studies*, Volume 18, Issue 2 (June 2013), pp. 522-559.
- 32) Earnings Management and the Predictive Ability of Accruals with Respect to Future Cash Flows (with Brad Badertscher and Daniel W. Collins), Volume 53, Issues 1–2, Pages 1-488 (February–April 2012), *Journal of Accounting and Economics*.
- 31) The Financial Reporting Environment: Review of the Recent Literature (with Anne Beyer, Daniel Cohen, and Beverly Walther), *Journal of Accounting and Economics*, December 2010, 50(2-3): 296-343.
- 30) Real and Accrual-based Earnings Management in the Pre- and Post-Sarbanes Oxley Periods (with Daniel Cohen and Aiysha Dey), *The Accounting Review*, May 2008, 82(3): 757–787.
- 29) Endogenous Entry/Exit as an Alternative Explanation for the Disciplining Role of Independent Analysts (with Jayanthi Sunder), *Journal of Accounting and Economics*, August 2008, 45(2–3): 317–323.
- 28) Earnings Announcement Premia and the Limits to Arbitrage (with Daniel Cohen, Aiysha Dey, and Shyam Sunder), *Journal of Accounting and Economics*, July 2007, 43(2–3): 153–180 (lead article).
- 27) Weighing the Evidence on the Relation between External Corporate Financing Activities, Accruals and Stock Returns (with Daniel A. Cohen), *Journal of Accounting and Economics*, October 2006, 42(1–2): 87–105.
- 26) Significant Clinical Practice Cost Savings through Downsizing Office Supply Inventory and Just in Time Ordering (with C. M. Gonzalez, T. Jang, M. Raines, and A. J. Schaeffer), *Journal of Urology*, 2006 176(1).
- 25) A Note on Analysts' Earnings Forecast Errors Distribution (with Daniel A. Cohen), *Journal of Accounting and Economics*, December 2003, 36(1–3): 147–164.
- 24) The internet downturn: finding valuation factors in spring 2000 (with Elizabeth K. Keating and Robert P. Magee), *Journal of Accounting and Economics*, January 2003, 34(1–3): 189–236.
- 23) The effect of accounting information on corporate financing choices: an examination of security issuances in the banking industry (with Marguerite Bishop), *Contemporary Accounting Research*, Fall 2001, 18(3): 397–423.
- 22) Empirical research on accounting choice (with Thomas Fields and Linda Vincent), *Journal of Accounting and Economics*, September 2001, 31(1–3): 255–307.

- 21) The Ohlson model, contribution to valuation theory, limitations, and empirical applications (with Kin Lo), *Journal of Accounting, Auditing, and Finance*, Summer 2000, 15(3): 337–367.
- 20) Auto-correlation structure of forecast errors from time-series models: Implications for post-earnings announcement drift studies (with John Jacob and Jowell Sabino), *Journal of Accounting and Economics*, December 1999, 28: 329–358.
- 19) Use of R^2 in accounting research: measuring changes in value relevance over the last four decades (with Stephen Brown and Kin Lo), *Journal of Accounting and Economics*, December 1999, 28: 83–115.
- 18) Expertise in forecasting performance of security analysts (with John Jacob and Margaret Neale), *Journal of Accounting and Economics*, November 1999, 28: 51–82.
- 17) A closer look at post earnings announcement drift: the role of the dissemination of predictable information (with Leonard Soffer), *Contemporary Accounting Research*, Summer 1999, 16: 305–31.
- 16) Abandoning the transactions-based accounting model: weighing the evidence, *Journal of Accounting and Economics*, July/September/November 1996, 22: 155–176.
- 15) An analysis of the value destruction in AT&T's acquisition of NCR (with Linda Vincent), *Journal of Financial Economics*, October–November 1995, 39: 353–378.
- 14) Analysts' forecast precision as a response to competition (with Lisa Gilbert Soo), *Journal of Accounting, Auditing, and Finance*, March 1995, 10: 751–765.
- 13) Lawsuits against auditors under the security acts (with Ross L. Watts), *Journal of Accounting Research*, Supplement 1994, 32: 65–93.
- 12) The evolution of lawsuits against auditors—determinants, consequences, and solutions, *Journal of Economics and Management Strategy*, Fall 1993, 2: 427–434.
- 11) Research design issues in grouping-based tests (with Jowell S. Sabino), *Journal of Financial Economics*, December 1992, 32: 355–387.
- 10) The association between revisions of financial analysts' earnings forecasts and security price changes (with Sungkyu Sohn), *Journal of Accounting and Economics*, December 1990, 13: 341–364.
- 9) The market for audit services: evidence from voluntary auditor changes (with W. Bruce Johnson), *Journal of Accounting and Economics*, January 1990, 12: 281–309.
- 8) Earnings expectations and capital restructuring: the case of equity for debt swaps (with Konduru Sivaramakrishnan), *Journal of Accounting Research*, Autumn 1988, 26: 273–299.
- 7) Auditor liability and information disclosure (with S.P. Kothari, Clifford W. Smith and Ross L. Watts), *Journal of Accounting, Auditing and Finance*, Fall 1988, 3: 307–340.
- 6) An empirical analysis of the incentives to engage in costly information acquisition: the case of risk arbitrage (with David F. Larcker), *Journal of Financial Economics*, March 1987, 18: 111–126.
- 5) Labor participation in private business making decisions: the German experience with code-termination (with Giuseppe Benelli and Claudio F. Loderer), *Journal of Business*, October 1987, 60: 553–575.

- 4) Daily monetary impulses and security prices (with Claudio F. Loderer and Urs Schweizer), *Journal of Monetary Economics*, July 1986, 18: 33–48.
- 3) Auditor changes following big eight takeover of non-big eight audit firms (with Paul Healy), *Journal of Accounting and Public Policy*, Winter 1986, 5: 251–265.
- 2) Discussion of: Capital analysis of reserve recognition accounting, *Journal of Accounting Research*, Supplement 1986, 24: 109–111.
- 1) Mandated accounting changes and debt covenants: the case of oil and gas accounting, *Journal of Accounting and Economics*, April 1984, 6: 39–65, reprinted in *The Economics of Accounting Policy Choice*, Ray Ball and Clifford W. Smith JR., editors, McGraw-Hill, Inc.: New York, 1992: 681–707.

Publications—books, book chapters and other publications

- Getting more of what you want, (with Margaret Neale), Basic Books, July 14, 2015
- More Reasons Women Need to Negotiate Their Salaries, (with Margaret Neale), Harvard Business Review, 2015, available at: <https://hbr.org/2015/06/more-reasons-women-need-to-negotiate-their-salaries>
- Financing Decisions by Company (Net Stock Anomalies), (with Daniel Cohen and Tzachi Zach) in *Conceptual Foundations of Capital Market Anomalies – Handbook of Investment Anomalies*, (Ed. Leonard Zacks). John Wiley Publishing, 2011
- Monetary theory and monetary policy—The collected essays of Karl Brunner, volume two, (editor), Edward Elgar Publishing Ltd: Cheltenham, UK, 1997
- Economic analysis and political ideology—The collected essays of Karl Brunner, volume one (editor), Edward Elgar Publishing Ltd: Cheltenham, UK, 1996
- Discretion in financial reports: communicating in a less-than-rational world (with Margaret Neale), *CEO Magazine*, December 1996, 119: 72–73.
- The real value of takeovers to shareholders, in *The Handbook of Communications in Corporate Restructuring and Takeovers*, Clarke L. Caywood and Raymond P. Ewing, editors, Prentice Hall: Englewood Cliffs, 1992: 86–89

Working papers

- The Paradoxical Impact of Corporate Inversions on US Tax Revenue (with Rita Nevada Gunn), 2016.
- The Nature and Implications of Acquisition Goodwill (with Linda Vincent and Nir Yehuda), 2013.
- Conservatism and analyst earnings forecast bias (with Henock Louis and Amy X. Sun), 2013.
- Are Private Targets Better Buys? (with Nir Yehuda), 2014.
- How Much Silence is Too Much? An Empirical Analysis of Firms Ceasing Guidance of Different Frequencies (with Gary Chen and Jie Zhou), 2011.
- Motives for and Risk-Incentive Implications of CEO Severance (with Tjomme Rusticus and Ewa Sletten), 2008.
- Exceptions do not Change the Rule: Substance Overrides Form in US GAAP (with N. Emre Karaoglu), 2008.
- Optimal structure of the consideration in mergers and acquisitions (with Thomas Fields), 2002.
- Bridging the Gap between Value Relevance and Information Content (with Kin Lo), 2001.
- Determinants and implications of the serial-correlation in analysts' earnings forecast errors (with John Jacob), 2000.
- Estimating auto-correlation coefficients in small samples (with Jowell S. Sabino and John Jacob), 2000.
- The role of earnings levels vs earnings changes in explaining stock returns: implications from the time series properties of earnings (with K. Ramesh and S. Ramu Thiagarajan), 1999.
- Addressing recognition issues in accounting: an evaluation of alternative research approaches (with Patricia Dechow and Jowell Sabino), 1998.

Editorial positions

- Consulting Editor, Journal of Accounting and Economics, 2010-2011.
- Editor, Journal of Accounting and Economics, 1999-2010
- Associate Editor, Journal of Accounting and Economics, 1988–1999
- Editorial Board, The Accounting Review, 1986–1989

Teaching

- MBA level:
 - Financial Accounting
 - Security Analysis
 - Financial Statement Analysis
 - Mergers and Acquisitions
- Executive MBA level:

- ☐ Financial Accounting
- ☐ Security Analysis
- ☐ Mergers and Acquisitions
- Executive non-degree:
 - ☐ Strategies for Improving Directors' Effectiveness (Academic Director)
 - ☐ Women's Director Development Program
 - ☐ Minority Director Development Program
 - ☐ Merger Week—Creating Value through Strategic Acquisitions and Alliances
 - ☐ Biotechnology—Strategies for Growth
- Lecture capabilities in English, French, German, and Polish

Honors and awards

- Outstanding Professor Award, Executive Masters' Program – KR 12, 2009
- Sidney J. Levy Teaching Award, Master of Management Program 2001–2002
- Outstanding Professor Award, Executive Masters' Program—46, 2000
- Outstanding Professor Award, Executive Masters' Program—44, 2000
- Sidney J. Levy Teaching Award, Master of Management Program 1998–1999
- Outstanding Professor Award, Executive Masters' Program—38, 1998
- Outstanding Professor Award, Executive Masters' Program—35, 1997
- Outstanding Professor Award, Executive Masters' Program—32, 1996
- State Farm Companies Foundation Business Doctoral Dissertation Awards Selection Committee 1996–2007
- Peat Marwick and Mitchell Research Grant (jointly with Ross Watts), 1987
- Notable Contribution to Accounting Literature Award Screening Committee 1987–1988
- Beatrice Foods Research Chair 1984–1985
- Ernst & Whinney Research Fellow 1983–1984

Chaired Dissertation committees

- Ira Yeung (Co-chair, Accounting), in progress (UBC)
- Spencer Pierce (Co-chair, Accounting), University of Illinois at Chicago
- Gary Chen (Accounting), University of Illinois at Chicago
- Jingjing Zang (Accounting), 2012, McGill
- Rafael Rogo (Accounting), 2012, University of British Columbia
- Jie Zhou (Accounting), 2012 Singapore Management University

- Liang Tan (Accounting), 2011, George Washington University
- Dora Altschuler (Accounting), 2011, Loyola University Chicago
- Ewa Sletten (Accounting), 2007, Massachusetts Institute of Technology
- Peter Hostak (Accounting), 2006, University of Massachusetts at Dartmouth
- Yong (George) Yang (Accounting), 2006, The Chinese University of Hong Kong
- Aiysha Dey (Accounting), 2005, University of Chicago
- Xiaohui (Gloria) Liu (Accounting), 2004, University of Houston
- Daniel Cohen, (Accounting), 2004, University of Southern California
- Nuri Emre Karaoglu, (Accounting), 2003, University of Southern California
- Elizabeth Eccher (Accounting), 1996, Massachusetts Institute of Technology
- John Jacob (Accounting), 1995, University of Colorado, Denver
- Marguerite Bishop (Accounting), 1995, New York University
- Linda Vincent (Accounting), 1994, University of Chicago
- Sungkyu Sohn, (Accounting), 1992, CUNY, Baruch College

Dissertation committees

- Ann Beyer (Accounting), 2006, Stanford University
- Thomas Fields (Accounting), 2004, Harvard University
- Yan (Rock) Gao (Finance), 2002
- Xiaoquin Hu (Finance), 2002, University of Illinois, Chicago
- Stephen Brown (Accounting), 2000, Emory
- Kin Lo (Accounting), 1999, University of British Columbia
- Rita Czaja, 1995 (Accounting), Michigan State University
- Jowell Sabino (Accounting), 1994, University of Pennsylvania
- Susan Wolcott (Accounting), 1993, University of Denver
- Byong Ho Kim (Accounting), 1992, Kook-min University, Seoul, Korea
- Billy Soo, 1991 (Accounting), Boston College
- Paula Koch, 1989 (Accounting), University of Illinois, Chicago
- Young Ho Lee (Finance), 1989, Hanwha Group, Seoul, Korea
- Naveen Khanna (Finance), 1986, University of Michigan, Ann Arbor

Service at Kellogg

- Chair EMBA Curriculum Review Committee (2013)
- Product Portfolio Review Team (2011-2012)

- Research Cluster Committee (2011-2012)
- Personnel Committee (2001–2005; 2009-2011)
- Chair Ph.D. Committee, Department of Accounting and Information Systems (1990–1996)
- Chair Recruiting Committee, Department of Accounting and Information Systems (1993–1995 and 2002–2006)
- Research Computing Committee, Kellogg Graduate School of Management (1989-2000; Chair 1989–1992)

Invited talks and presentations (last ten years)

- 2014-2015 University of Minnesota Conference
- 2012-2013 University of California at Davis Sustainability and Finance Symposium
Harvard University Conference on Corporate Social Responsibility
- 2011-2012 University of Colorado at Boulder Conference
CAR Conference
NBER Conference (Discussant)
- 2010-2011 University of British Columbia
Stanford Summer Camp
- 2009-2010 *Journal of Accounting and Economics* Conference
Stanford Summer Camp
- 2008–2009 University of Washington at Seattle
Massachusetts Institute of Technology
- 2007–2008 Washington University Conference
Accounting Symposium, London Business School
- 2006–2007 *Journal of Accounting Research* Conference
Pennsylvania State University
Journal of Accounting and Economics Conference (Discussant)
University of Oklahoma Research Conference, featured speaker
Hong Kong University of Science and Technology Summer Symposium on
Accounting Research, featured speaker
Harvard University, 2007 Information, Markets, and Organizations Conference
- 2005–2006 Leventhal School of Accounting, University of Southern California
Columbia School of Business, Columbia University
- 2004–2005 *Journal of Accounting and Economics* Conference (Discussant)
Jerusalem School of Business Administration, Hebrew University
American Accounting Association Annual Meeting, Orlando, Florida
Olin School of Business, Washington University Corporate Governance Conference

- 2003–2004 Massachusetts Institute of Technology
University of Colorado at Boulder
Georgetown University
Harvard University
London Business School
- 2002–2003 *Journal of Accounting and Economics* Conference (Discussant)

Expert witness assignments (last four years)

- Testifying expert for Plaintiff SoundExchange before the United States Copyright Royalty Judges at the Library of Congress in the matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2006-1 CRB DSTR (2007-12).
- Testifying expert for Plaintiffs in California Public Employees' Retirement System, v. Moody's Corp., Moody's Investor Service, Inc., Superior Court for the State of California, County of San Francisco, Case No. CGC-09-490241.
- Testifying expert for respondent in Yukos Capital S.A.R.L. v. The Russian Federation; in the arbitrations pursuant to the rules of the United Nations Commission on International Trade Law, Permanent Court of Arbitration, PCA Case No. 2013-31.
- Testifying expert for Plaintiffs in Anderson News LLC and Lloyd Whitaker, as the Assignee under an Assignment for the Benefit of Creditors for Anderson Services, LLC v. American media Inc., Bauer Publishing Co., LP, Curtis Circulation Company, Distribution Services, Inc., Hachette Filipacchi Media US, Inc., Hearst Communications Inc., Hudson news Distributors LLC, Kable Distribution Services, Inc., Rodale Inc., Time Inc. and Time/Warner Retail Sales & Marketing, Inc., in the United States District Court, Southern District of New York, 09-CIV-2227 PAC.
- Testifying expert for Defendants in Philip Morris Asia Limited v. Commonwealth of Australia; Arbitration Under the 2010 Arbitration Rules of the United Nations Commission on International Trade Law, PCA Case No. 2012-12
- Testifying Expert for Plaintiffs in Casino Guichard-Perrachon et al. v. Abilio Dos Santos Diniz et al.; Arbitration Pursuant to The Rules of Arbitration of the International Chamber of Commerce, ICC Case No. 17977/CA (C-18055/CA)
- Testifying Expert for Defendants in Re Rural Metro Corporation Shareholders Litigation in the Court of Chancery of the State of Delaware Consolidated C.A. No. 6350-VCL.
- Testifying Expert for plaintiff in Millennium Import, LLC v. Reed Smith LLP, Douglas J. Wood and Darren B. Cohen, Supreme Court of the State of New York, County of New York, Index No. 603350-07.

- Testifying Expert for plaintiffs in Salem Financial, Inc. as Successor-in-Interest to Branch Investments LLC, v. United States of America, in the United States Court of Federal Claims Case No. 10-192.
- Testifying Expert for plaintiffs in Santander Holdings USA, Inc. & Subsidiaries, v. United States of America, United States District Court District of Massachusetts, Case No. 09-cv-11043
- Testifying Expert for SoundExchange before the United States Copyright Royalty Judges Washington, D.C. In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services. Docket No. 2011-1 CRB PSS/Satellite II.
- Testifying Expert for plaintiffs in Oracle America, Inc. v. Micron Technology, Inc. and Micron Semiconductor Products, Inc., United States District Court for the Northern District of California, Docket No. 10-cv-4340.
- Testifying expert for defendant in Hulley Enterprises Limited v. The Russian Federation; Yukos Universal Limited v. The Russian Federation; and Veteran Petroleum Limited v. The Russian Federation, in the arbitrations pursuant to the rules of the United Nations Commission on International Trade Law, Permanent Court of Arbitration, Cases Nos. AA226/AA227/AA228
- Testifying expert for defendant in Santa Clara Valley Housing Group, Inc. and Kristen M. Bowes, v. United States of America, United States District Court Northern District of California, Complaint for Refund of Internal Revenue Taxes, Case No. C08 05097.
- Testifying expert for defendant in John Hancock Life Insurance Company, v. Commissioner of Internal Revenue, United States Tax Court, Docket Nos. 6404-09, 7083-10, 7084-10.

Appendix B. Additional tables

Figure 73: List of the 25 companies comprising SIC 483 in fiscal year 2015

Beasley Broadcast Group	Nexstar Broadcasting
CBS	NTN Buzztime
Central European Media	Pandora Media
Cumulus Media	Radio One
Emmis Communications	Saga Communications
Entercom Communications	Salem Media
Entravision Communications	Sinclair Broadcast Group
E.W. Scripps	Sirius XM
Gray Television	Spanish Broadcasting System
iHeartMedia	Tegna Inc.
Liberty Media	Townsquare Media
Media General	Tribune Media
Mission Broadcasting	

Source: 10-K filings for SIC 483 via EDGAR filings

Figure 74: List of the 12 companies comprising SIC 4832 in fiscal year 2015

Beasley Broadcast Group	Radio One
Cumulus Media	Saga Communications
Emmis Communications	Salem Media
Entercom Communications	Sirius XM
iHeartMedia	Spanish Broadcasting System
Pandora Media	Townsquare Media

Source: 10-K filings for SIC 4832 via EDGAR filings

Figure 75: Sirius XM's budget vs. actuals for EOP subscribers, 2012-2015, in millions [RESTRICTED]

Budget	████	████	████	████
Actual	████	████	████	████
Better/(worse) vs budget	████	████	████	████
% difference	████	████	████	████

Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

Figure 76: Sirius XM's budget vs. actuals for Total revenue, 2012-2015, in \$ millions [RESTRICTED]

Budget	████	████	████	████
Actual	████	████	████	████
Better/(worse) vs budget	████	████	████	████
% difference	████	████	████	████

Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

Figure 77: Sirius XM's budget vs. actuals for Adjusted EBITDA, 2012-2015, in \$ millions [RESTRICTED]

Budget	████	████	████	████
Actual	████	████	████	████
Better/(worse) vs budget	████	████	████	████
% difference	████	████	████	████

Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

Figure 78: Sirius XM's budget vs. actuals for Net income²⁴¹, 2012-2015, in \$ millions [RESTRICTED]

Budget	████	████	████	████

²⁴¹ For 2012-13 Sirius XM's budget presentations track "Net income before debt charge" while for 2014-15 they track "Net income before debt charge and taxes." Because the focus of my analysis is the discrepancy between actuals and

Actual	■	■	■	■
Better/(worse) vs budget	■	■	■	■
% difference	■	■	■	■

Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

Figure 79: Sirius XM's budget vs. actuals for Free cash flow, 2012-2015, in \$ millions [RESTRICTED]

Budget	■	■	■	■
Actual	■	■	■	■
Better/(worse) vs budget	■	■	■	■
% difference	■	■	■	■

Source: 2013-2016 Sirius XM budgets (SXM_DIR_00021322, SXM_DIR_00021366, SXM_DIR_00021423, SXM_DIR_00021472)

Figure 80: Computation of the self-reported non-music-related portion of Sirius XM's revenues, based on 2014 data [RESTRICTED]

Line item		
A	Subscriber revenue, excluding connected vehicle (GAAP)	\$3,466
B	U.S. Music Royalty Fee	\$336
C=A+B	Revenue potentially subject to SDARS royalties	\$3,802
D	Gross revenue ²⁴²	■
E=D/C	Sirius XM self-reported non-music-related portion of revenue	■

Source: 2014 Sirius XM 10-K, Sirius XM statements to SoundExchange.

budgets, the slight change in methodology is irrelevant as for each given year the comparison is done on identical items.

²⁴² Excludes direct license and pre-72 revenue, estimated based on share of performances.

Figure 81: Computation of Reference revenue in Sirius XM's long-term forecast [RESTRICTED]

Subscription revenue (non-telematics)					
2009	████	██	████	████	████
2010	████	████	████	████	████
2011	████	████	████	████	████
2012	████	████	████	████	████
2013	████	████	████	████	████
2014	████	████	████	████	████
2015	████	████	████	████	████
2016	████	████	████	████	████
2017	████	████	████	████	████
2018	████	████	████	████	████
2019	████	████	████	████	████
2020	████	████	████	████	████

Source: SiriusXM Forecast – 2015 LRS plan (SXM_DIR_00020919).

Figure 82: Computation of Reference royalty rate in Sirius XM's long-term forecast [RESTRICTED]

SDARS royalties			
2009	██	████	██
2010	██	████	██
2011	██	████	██
2012	██	████	██
2013	██	████	██
2014	██	████	██
2015	██	████	████
2016	██	████	████
2017	██	████	████
2018	██	████	████
2019	██	████	████
2020	██	████	████

Source: Figure 59 and Figure 81.

²⁴³ As calculated in Figure 80.

Figure 83: Reconciliation of the line item programming royalties, in \$ million [RESTRICTED]

A	SDARS royalty payments to SX	
B	Direct license payments ²⁴⁴	
C	BES royalties	
D	CABSAT royalties	
E	Webcasting royalties	
F	Other royalty obligations (BMI, ASCAP, etc.)	
G=sum(A-F)	TOTAL	
H	Programming royalties	
I=G/H	Known portion of Programming royalties	75.1%

Source: Sirius XM Statements of Account to SoundExchange for SDARS, BES, CABSAT, and Webcasting; SXM_DIR_00021307, SXM_DIR_00021305, SXM_DIR_00021306, SXM_DIR_00021311; SXM_DIR_00020919

Figure 84: Calculation of May 2016 average direct license royalty rate, weighted by performances [RESTRICTED]

I			

Source: May 2016 Sirius XM Royalty Statement, SXM_DIR_00024465.

²⁴⁴ Payable amounts.

Figure 85: Calculation of May 2016 average direct license royalty rate, weighted by accrued royalties
[RESTRICTED]

[illegible]

Source: May 2016 Sirius XM Royalty Statement, SXM_DIR_00024465.

Appendix C. Additional detail on Thomson One data

- (3) Thomson One provides details behind the consensus estimates for revenue, EBITDA and net income. This information is presented separately by line item and year, and shows each of the tracked individual estimates, by analyst. As an example, Figure 86 presents the screenshot of the 2016 revenue estimate, by analyst.

Figure 86: Thomson One information on analyst forecasts of Sirius XM's 2016 revenue

Measure: Period: ☐ Create filtered mean from the last days

SIRIUS XM HOLDINGS INC (Non Per Share Data in USD MM) [View Analyst Coverage](#)

Revenue

Important Notices					Guidance			
DEC16 Estimates reflect adoption of FAS123(R)								
Estimate Summary								
	Ests	Mean	Hi	Low	Issuance Date	Guidance	Est At Ann	
Real Time:	16	4,999.19	5,024.80	4,961.02	Jul 26, 16	5,000.00	4,974.12	
Filtered/Preliminary Mean**:	17	4,995.23	5,024.80	4,932.00	Apr 28, 16	4,900.00	4,958.93	
30 Day Ago Mean:	17	4,997.62	5,027.07	4,961.02				
* Only selected brokers below are included in the filtered mean								
Surprise Summary								
	09/2015Q	12/2015Q	03/2016Q	06/2016Q	12/2015A			
Reported	1,171.53	1,197.96	1,201.01	1,235.57	4,577.31			
Surprise Mean	1,149.33	1,190.95	1,184.21	1,224.94	4,565.48			
Surprise (%)	1.93	0.59	1.42	0.87	0.26			

Estimate Detail

View:

** Filter	Broker	Analyst	Current	Date	Prior	Date	Review
<input checked="" type="checkbox"/>	BARRINGTON RESEARCH	GOSS J	4,961.02 ↑	Jul 27, 16	4,949.60	May 02, 16	Jul 27, 16
<input checked="" type="checkbox"/>	EVERCORE ISI	JAYANT V	5,024.80 ↑	Jul 26, 16	4,986.80	Jul 13, 16	Jul 26, 16
<input checked="" type="checkbox"/>	FBR CAPITAL MARKETS & CO.	CROCKETT B	5,015.00 ↑	Sep 02, 16	5,007.00	Jul 27, 16	Sep 02, 16
<input checked="" type="checkbox"/>	GABELLI & COMPANY	TINKER J	4,932.00 ↑	Apr 29, 16	4,931.00	Feb 03, 16	Jun 28, 16
<input checked="" type="checkbox"/>	MACQUARIE RESEARCH	YONG A	4,984.91 ↑	Aug 31, 16	4,980.23	Jul 27, 16	Aug 31, 16
<input checked="" type="checkbox"/>	PACIFIC CREST SECURITIES-KBCM	HARGREAVES A	4,983.00 ↓	Jul 26, 16	4,987.00	Apr 28, 16	Jul 26, 16
<input checked="" type="checkbox"/>	PIPER JAFFRAY	OLSON M	4,970.60 ↑	Jul 26, 16	4,947.94	May 03, 16	Jul 26, 16
<input checked="" type="checkbox"/>	PIVOTAL RESEARCH GROUP	WLODARCZAK J	4,990.00 ↑	Sep 30, 16	4,974.00	Jul 27, 16	Sep 30, 16
<input checked="" type="checkbox"/>	WUNDERLICH SECURITIES, INC.	HARRIGAN M	4,995.00 ↑	Sep 02, 16	4,993.90	Jul 27, 16	Sep 02, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	4,997.55 ↑	Jul 27, 16	4,966.80	May 10, 16	Jul 27, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,024.53 ↓	Oct 04, 16	5,027.07	Jul 26, 16	Oct 04, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,019.90 ↑	Jul 27, 16	4,962.10	May 01, 16	Sep 28, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,016.42 ↑	Jul 27, 16	4,975.07	Jul 15, 16	Sep 12, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	4,985.00 ↑	Jul 26, 16	4,965.00	May 02, 16	Sep 23, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,011.06 ↑	Aug 03, 16	5,011.04	Jul 27, 16	Sep 19, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,001.20 ↑	Jul 26, 16	4,955.50	Apr 28, 16	Aug 23, 16
<input checked="" type="checkbox"/>	UNDISCLOSED	UNDISCLOSED	5,007.00 ↑	Sep 09, 16	5,000.00	Jul 26, 16	Sep 15, 16

Source: Thomson One.

- (4) I cross-checked the data collected and summarized by Thomson One against the underlying analyst reports
- (5) Due to various contractual restrictions, Thomson One withholds the names of some of the financial institutions from which it collects estimates, and those are displayed as "UNDISCLOSED." Figure 87 provides Thomson One's listing of Wall Street analysts that offer research coverage of Sirius XM. I have shaded those institutions whose forecasts are individually

identified by Thomson One. It is therefore likely that the “UNDISCLOSED” estimates come from the banks that are not shaded below.

Figure 87: Thomson One list of institutions providing research coverage of Sirius XM (shaded rows denote reports that are specifically identified in the consensus estimate data)

BARCLAYS	KANNAN VENKATESHWAR
BARRINGTON RESEARCH	JAMES C GOSS
BOFA MERRILL LYNCH	JESSICA J REIF COHEN
CITI	JASON BAZINET
DEUTSCHE BANK RESEARCH	BRYAN D KRAFT
EVERCORE ISI	VIJAY JAYANT
FBR CAPITAL MARKETS & CO.	BARTON E CROCKETT
GABELLI & COMPANY	JOHN P TINKER
GOLDMAN SACHS & CO.	BRETT J FELDMAN
JPMORGAN	HILIP CUSICK
MACQUARIE RESEARCH	AMY YONG
MORGAN STANLEY	BENJAMIN D SWINBURNE
PACIFIC CREST SECURITIES-KBCM	ANDY HARGREAVES
PIPER JAFFRAY	MICHAEL J OLSON
PIVOTAL RESEARCH GROUP	JEFF D WLODARCZAK
RBC CAPITAL MARKETS	LEO J KULP
TELSEY ADVISORY GROUP	THOMAS W EAGAN
UBS (US)	LUCAS BINDER
WUNDERLICH SECURITIES, INC.	MATTHEW HARRIGAN

Source: Thomson One.

- (6) Figure 88 presents the consensus analyst forecast for ending subscribers.

Figure 88: Consensus forecast of Sirius XM's ending Subscribers, 2016-2020, in thousands

BARCLAYS	7/27/16	31,558	33,357	35,115	n/a	n/a	n/a
BARRINGTON RESEARCH	7/27/16	31,302	32,505	33,768	n/a	n/a	n/a
DEUTSCHE BANK RESEARCH	7/27/16	31,382	32,671	33,577	n/a	n/a	n/a
EVERCORE ISI	7/26/16	31,331	32,807	34,074	35,185	36,177	4.1%
GABELLI & COMPANY	7/27/16	31,033	32,621	34,075	35,442	36,755	4.4%
JPMORGAN	7/26/16	31,382	n/a	n/a	n/a	n/a	n/a
MACQUARIE RESEARCH	4/29/16	31,437	32,885	34,139	n/a	n/a	n/a
MORGAN STANLEY	7/27/16	31,474	32,848	34,014	n/a	n/a	n/a
PIVOTAL RESEARCH GROUP	7/27/16	31,465	32,814	33,987	n/a	n/a	n/a
RBC CAPITAL MARKETS	7/26/16	31,341	32,733	34,095	n/a	n/a	n/a
WUNDERLICH SECURITIES, INC.	9/2/16	31,312	32,960	34,329	35,537	36,617	4.4%
MEAN		31,365	32,820	34,117	35,388	36,516	4.3%
MEDIAN		31,382	32,811	34,075	35,442	36,617	4.4%
Median growth		6.0%	4.6%	3.9%	4.0%	3.3%	
# analysts		11	10	10	3	3	

Source: Thomson One.

- (7) Next, I analyze the consensus estimate forecast for Sirius XM's total revenue in Figure 89.

Figure 89: Consensus forecast of Sirius XM's Total revenue, 2016-2020, in \$ million

BARRINGTON RESEARCH	27-Jul-16	\$4,961	\$5,291	\$5,811	n/a	n/a	n/a
EVERCORE ISI	26-Jul-16	\$5,025	\$5,380	\$5,719	\$6,001	n/a	n/a
FBR CAPITAL MARKETS & CO.	2-Sep-16	\$5,015	\$5,313	\$5,604	\$5,888	\$6,156	6.1%
GABELLI & COMPANY	29-Apr-16	\$4,932	\$5,270	\$5,605	\$5,927	\$6,245	6.4%
MACQUARIE RESEARCH	31-Aug-16	\$4,985	\$5,314	\$5,635	n/a	n/a	n/a
PACIFIC CREST SECURITIES-KBCM	26-Jul-16	\$4,983	\$5,312	n/a	n/a	n/a	n/a
PIPER JAFFRAY	26-Jul-16	\$4,971	\$5,272	n/a	n/a	n/a	n/a
PIVOTAL RESEARCH GROUP	30-Sep-16	\$4,990	\$5,350	\$5,683	\$6,073	\$6,439	7.1%
WUNDERLICH SECURITIES, INC.	2-Sep-16	\$4,995	\$5,363	\$5,732	\$6,067	\$6,391	6.9%
UNDISCLOSED ²⁴⁵	n/a	\$4,998	\$5,362	\$5,725	\$5,821	\$6,050	n/a
UNDISCLOSED	n/a	\$5,025	\$5,372	\$5,602	\$5,823	n/a	n/a
UNDISCLOSED	n/a	\$5,020	\$5,336	\$5,585	n/a	n/a	n/a
UNDISCLOSED	n/a	\$5,016	\$5,370	\$5,563	n/a	n/a	n/a
UNDISCLOSED	n/a	\$4,985	\$5,287	\$5,712	n/a	n/a	n/a
UNDISCLOSED	n/a	\$5,011	\$5,421	\$5,635	n/a	n/a	n/a
UNDISCLOSED	n/a	\$5,001	\$5,296	\$5,633	n/a	n/a	n/a
UNDISCLOSED	n/a	\$5,007	\$5,305	n/a	n/a	n/a	n/a
MEAN		\$4,995	\$5,330	\$5,660	\$5,943	\$6,256	6.5%
MEDIAN		\$4,998	\$5,314	\$5,635	\$5,927	\$6,245	6.4%
Median growth		9.4%	6.3%	6.0%	5.2%	5.4%	
# analysts		17	17	14	7	5	

Source: Thomson One.

- (8) Next, I analyze the consensus estimate forecast for Sirius XM's Adjusted EBITDA in Figure 90.

²⁴⁵ As discussed, due to contractual limitations Thomson One lists some analyst estimates as coming from an UNDISCLOSED source. Due to the nature of how Thomson One reports the data it is impossible to verify whether the UNDISCLOSED entries belong to the same institution and each UNDISCLOSED row should not be thought of as an individual forecast. Therefore, I do not provide a CAGR for UNDISCLOSED rows because it would not be meaningful.

Figure 90: Consensus forecast of Sirius XM's Adjusted EBITDA, 2016-2020, in \$ million

BARRINGTON RESEARCH	27-Jul-16	\$1,840	\$2,001	\$2,375	n/a	n/a	n/a
EVERCORE ISI	26-Jul-16	\$1,842	\$2,063	\$2,254	\$2,399	\$2,526	8.8%
FBR CAPITAL MARKETS & CO.	27-Jul-16	\$1,846	\$1,996	\$2,140	\$2,278	\$2,406	7.7%
GABELLI & COMPANY	3-Feb-16	\$1,820	\$1,960	\$2,090	\$2,210	\$2,340	7.1%
MACQUARIE RESEARCH	31-Aug-16	\$1,841	\$2,023	\$2,206	n/a	n/a	n/a
PACIFIC CREST SECURITIES-KBCM	26-Jul-16	\$1,855	\$2,056	n/a	n/a	n/a	n/a
PIPER JAFFRAY	3-May-16	\$1,781	\$1,966	n/a	n/a	n/a	n/a
WUNDERLICH SECURITIES, INC.	2-Sep-16	\$1,822	\$2,065	\$2,280	\$2,461	\$2,626	9.6%
UNDISCLOSED ²⁴⁶	n/a	\$1,827	\$1,986	\$2,157	\$2,112	\$2,434	n/a
UNDISCLOSED	n/a	\$1,828	\$2,027	\$2,027	\$2,300	n/a	n/a
UNDISCLOSED	n/a	\$1,743	\$1,904	\$2,025	n/a	n/a	n/a
UNDISCLOSED	n/a	\$1,724	\$1,929	\$2,090	n/a	n/a	n/a
UNDISCLOSED	n/a	\$1,744	\$1,924	\$2,159	n/a	n/a	n/a
UNDISCLOSED	n/a	\$1,762	\$2,008	\$2,179	n/a	n/a	n/a
UNDISCLOSED	n/a	\$1,820	\$1,946	\$2,210	n/a	n/a	n/a
UNDISCLOSED	n/a	\$1,818	\$1,970	n/a	n/a	n/a	n/a
MEAN		\$1,807	\$1,989	\$2,169	\$2,293	\$2,466	8.3%
MEDIAN		\$1,821	\$1,991	\$2,159	\$2,289	\$2,434	8.0%
Median growth		9.8%	9.3%	8.5%	6.0%	6.3%	
# analysts		16	16	13	6	5	

Source: Thomson One.

- (9) Next, I analyze the consensus estimate forecast for Sirius XM's free cash flow per share in Figure 91.

²⁴⁶ As discussed, due to contractual limitations Thomson One lists some analyst estimates as coming from an UNDISCLOSED source. Due to the nature of how Thomson One reports the data it is impossible to verify whether the UNDISCLOSED entries belong to the same institution and each UNDISCLOSED row should not be thought of as an individual forecast. Therefore, I do not provide a CAGR for UNDISCLOSED rows because it would not be meaningful.

Figure 91: Consensus forecast of Sirius XM's Free cash flow per share, 2016-2020

		2016	2017	2018	2019	2020	
BARRINGTON RESEARCH	27-Jul-16	\$0.30	\$0.37	\$0.42	n/a	n/a	n/a
EVERCORE ISI	26-Jul-16	\$0.23	\$0.25	\$0.31	\$0.36	\$0.42	11.7%
FBR CAPITAL MARKETS & CO.	27-Jul-16	\$0.31	\$0.32	\$0.39	\$0.29	\$0.33	6.4%
PACIFIC CREST SECURITIES-KBCM	28-Apr-16	\$0.30	\$0.32	n/a	n/a	n/a	n/a
PIPER JAFFRAY	26-Jul-16	\$0.27	\$0.30	n/a	n/a	n/a	n/a
WUNDERLICH SECURITIES, INC.	27-Jul-16	\$0.30	\$0.37	\$0.53	\$0.39	\$0.42	11.7%
UNDISCLOSED ²⁴⁷	n/a	\$0.29	\$0.34	\$0.38	n/a	n/a	n/a
UNDISCLOSED	n/a	\$0.34	\$0.36	n/a	n/a	n/a	n/a
UNDISCLOSED	n/a	\$0.29	n/a	n/a	n/a	n/a	n/a
MEAN		\$0.29	\$0.33	\$0.41	\$0.35	\$0.39	10.0%
MEDIAN		\$0.30	\$0.33	\$0.39	\$0.36	\$0.42	11.7%
Median growth		24.0%	10.0%	18.2%	-7.7%	16.7%	
# analysts		9	8	5	3	3	

Source: Thomson One.

(10) Finally, I analyze the consensus estimate forecast for Sirius XM's net income in Figure 92.

²⁴⁷ As discussed, due to contractual limitations Thomson One lists some analyst estimates as coming from an UNDISCLOSED source. Due to the nature of how Thomson One reports the data it is impossible to verify whether the UNDISCLOSED entries belong to the same institution and each UNDISCLOSED row should not be thought of as an individual forecast. Therefore, I do not provide a CAGR for UNDISCLOSED rows because it would not be meaningful.

Figure 92: Consensus forecast of Sirius XM's Net income, 2016-2020, in \$ million

BARRINGTON RESEARCH	27-Jul-16	\$706	\$806	\$1,046	n/a	n/a	n/a
FBR CAPITAL MARKETS & CO.	2-Sep-16	\$696	\$760	\$820	\$878	\$929	12.8%
MACQUARIE RESEARCH	31-Aug-16	\$707	\$794	\$870	n/a	n/a	n/a
PACIFIC CREST SECURITIES-KBCM	26-Jul-16	\$715	\$815	n/a	n/a	n/a	n/a
PIPER JAFFRAY	26-Jul-16	\$684	\$787	n/a	n/a	n/a	n/a
PIVOTAL RESEARCH GROUP	30-Sep-16	\$696	\$827	\$925	\$1,062	\$1,189	18.5%
WUNDERLICH SECURITIES, INC.	2-Sep-16	\$705	\$861	\$958	\$1,049	\$1,110	16.8%
UNDISCLOSED ²⁴⁸	n/a	\$700	\$781	\$886	\$951	n/a	n/a
UNDISCLOSED	n/a	\$721	\$827	\$895	n/a	n/a	n/a
UNDISCLOSED	n/a	\$714	\$802	\$823	n/a	n/a	n/a
UNDISCLOSED	n/a	\$696	\$777	\$858	n/a	n/a	n/a
UNDISCLOSED	n/a	\$707	\$776	\$962	n/a	n/a	n/a
UNDISCLOSED	n/a	\$746	\$881	\$873	n/a	n/a	n/a
UNDISCLOSED	n/a	\$697	\$749	n/a	n/a	n/a	n/a
UNDISCLOSED	n/a	\$659	\$755	n/a	n/a	n/a	n/a
MEAN		\$703	\$800	\$902	\$985	\$1,076	16.1%
MEDIAN		\$705	\$794	\$886	\$1,000	\$1,110	16.8%
Median growth		38.4%	12.6%	11.6%	12.9%	11.0%	
# analysts		15	15	11	4	3	

Source: Thomson One.

²⁴⁸ As discussed, due to contractual limitations Thomson One lists some analyst estimates as coming from an UNDISCLOSED source. Due to the nature of how Thomson One reports the data it is impossible to verify whether the UNDISCLOSED entries belong to the same institution and each UNDISCLOSED row should not be thought of as an individual forecast. Therefore, I do not provide a CAGR for UNDISCLOSED rows because it would not be meaningful.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: October 19, 2016

Thomas S. Lys
Thomas S. Lys

**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)

WRITTEN DIRECT TESTIMONY OF

Jonathan Orszag

**Senior Managing Director
Compass Lexecon**

October, 2016

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I. Introduction and Qualifications

1. My name is Jonathan Orszag. I am a Senior Managing Director and member of the Executive Committee of Compass Lexecon, LLC, an economic consulting firm. My services have been retained by a variety of public-sector entities and private-sector firms ranging from small businesses to Fortune 500 companies. These engagements have involved a wide array of matters, from entertainment and telecommunications issues to issues affecting the sports and retail industries. I have provided testimony to administrative agencies, the U.S. Congress, U.S. courts, the European Court of First Instance, and other domestic and foreign regulatory bodies on a range of issues, including competition policy, industry structure, and fiscal policy.

2. Previously, I served as the Assistant to the U.S. Secretary of Commerce and Director of the Office of Policy and Strategic Planning and as an Economic Policy Advisor on President Clinton's National Economic Council. For my work at the White House, I was presented the Corporation for Enterprise Development's 1999 leadership award for "forging innovative public policies to expand economic opportunity in America."

3. I received a M.Sc. from Oxford University, which I attended as a Marshall Scholar. I graduated *summa cum laude* in economics from Princeton University, was elected to Phi Beta Kappa, and was named to the *USA Today* All-USA College Academic Team.

4. I have been active in the economics and public policy related to the distribution of content, including music content. Since leaving government, I have served as a consultant to a number of major music and video content distributors (*e.g.*, Entercom, DIRECTV, Comcast, Cablevision, EchoStar, Charter, Verizon) and music and video content providers (*e.g.*, Sony, BMG, Discovery, AMC Networks, Comcast, College Sports Television). I have worked on a number of mergers and/or acquisitions in the radio, music, and video distribution space, including the Entercom-Lincoln Financial Media merger; Comcast-Time Warner-Adelphia transaction; the Charter-Time Warner transaction; the proposed EchoStar-DIRECTV merger; the News Corp-DIRECTV merger; and other merger matters.

5. My full *curriculum vitae*, including a listing of my prior testimony, is included as Appendix A. The rate charged by Compass Lexecon for my work on this matter is \$1,050 per

hour. I have a financial interest in the overall profitability of Compass Lexecon, but I have no financial interest in the outcome of this case.

II. Summary of Testimony

A. Assignment

6. I have been retained by counsel for SoundExchange to evaluate certain economic and policy issues that form the foundation of the statutory factors governing the rate determination proceeding related to Sirius XM's access to sound recordings.¹ More specifically, I examine in this report the factors that should determine the license terms that govern Sirius XM's receipt of non-exclusive rights to transmit to its subscribers digital performances of copyrighted sound recordings. Such a license is compulsory – that is, sound recording copyright owners do not have the option to withhold from Sirius XM access to sound recordings.

7. The economic analyses and conclusions set forth in this report are based on my experience with the pricing of access to content in several industries, the relevant economic literature, and my knowledge of the music industry. Moreover, I examined and analyzed data on the royalty payments made by interactive streaming services to record companies, as well as the digital sound recording licenses entered into between record labels and non-statutory digital music distribution services.² I also gathered relevant information through interviews with executives at major record labels who play key roles in their respective companies' digital sound recording licensing programs.

B. Summary of Conclusions

8. A key economic underpinning of my work in this proceeding is that the 801(b)(1) 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

¹ See 17 U.S.C. § 801(b)(1). I will use "801(b)(1)" for a reference to the statutory factors in 17 U.S.C. § 801(b)(1).

² I have attached the agreements that I rely upon in my analysis as Exhibits 16-18 and 30-34. Exhibits 30-32 contain digital sound recording licenses between the benchmark services and the three major record companies, Sony, Universal, and Warner; Exhibits 33 and 43 contains digital license agreements for indies; and Exhibits 16-18 contain [REDACTED].

willing seller. Another perspective on this same point is the question of what would be the outcome of a negotiation between a willing buyer and a willing seller in a marketplace setting in which the compulsory license regime is not present? A rate so determined would reflect the value of sound recordings to Sirius XM's subscriber population, given the pricing, functionality, and availability of other channels to which consumers can turn in order to listen to music. Moreover, a rate so determined will provide copyright holders with compensation that represents a material share of the value of sound recordings to Sirius XM subscribers, for the simple reason that music represents a crucial component of satellite radio that attracts subscribers to the service, and helps the service to retain subscribers once acquired.

9. The framework I utilize to estimate a suitable royalty rate for Sirius XM begins with a study of the non-statutory channels of digital music distribution that reasonably can serve as benchmarks for the rate that would be reached voluntarily in a setting unencumbered by regulatory overhang. 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. The benchmark rates derived from interactive streaming services properly should be modified to account for relevant differences between interactive subscription services and satellite radio, subject to the 801(b)(1) criteria, in order to predict the outcome of hypothetical arm's length bargaining between the record labels and Sirius XM.

10. With interactive subscription services serving as the benchmark distribution channel, I employ two approaches to compute an appropriate royalty rate for Sirius XM. These approaches generate percentage-of-revenue royalty rates ranging from 22.12% to 24.08% and per-subscriber rates ranging from \$2.37 to \$2.58.

11. The bases for these conclusions are discussed at length in the remainder of this report. I should note my understanding that discovery is ongoing in this matter and I reserve the right to update the opinions and analyses set forth below.

III. Sound Economics and Application of the Section 801(b)(1) Statutory Factors

A. Introduction

12. A standard way in which economists estimate a reasonable royalty rate for the blanket license under consideration in this proceeding is by examining comparable rates generated through arm's length negotiations outside the purview of the compulsory license regime for which satellite radio qualifies.³ Rates yielded through such unfettered negotiations, *i.e.*, benchmark rates, may then require adjustments in order to satisfy the four policy objectives enumerated in 17 U.S.C. § 801(b)(1):

- a) To maximize the availability of creative works to the public;
- b) To afford the copyright owner a fair return for 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; and
- d) To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.

13. In other words, the first step in the analysis is to identify comparable benchmark rates, and then to ascertain whether these rates warrant adjustments in order to achieve compliance with the governing statutory criteria. As I discuss below, rates negotiated voluntarily in a setting free of regulatory overhang promote the first three policy objectives.

14. With regard to the final policy objective, it is my understanding that the factors that properly might trigger an adjustment to the benchmark rates are addressed comprehensively in the expert report of Dr. Thomas Lys.⁴ At this juncture, I will limit my own views on the fourth policy objective to the overarching conclusion that against the backdrop of economically

³ By "comparable," I mean the rates negotiated for rights that are roughly similar to the rights granted by the blanket license at issue in this proceeding.

⁴ Written Direct Testimony of Thomas Z. Lys, Ph.D, submitted October 19, 2016 ("Lys WDT").

sound competition policy, rate adjustments pursuant to the fourth factor should be confined to providing new and emerging services with temporary assistance in gaining consumer acceptance and traction in the marketplace. Under no circumstance should the fourth factor be invoked to shield an established service from the rigors of competition. Specifically, with respect to Sirius XM, given the position it has achieved in the marketplace as an entrenched and mainstream service,⁵ its consistent growth even in the face of price increases,⁶ its increasing profitability,⁷ and its public proclamations of expected financial success going forward,⁸ there exists no sound economic argument for employing the fourth statutory factor to adjust benchmark rates downward.

B. Factor One: To Maximize the Availability of Creative Works to the Public

15. Simply stated, market-based rates do not operate at cross-purposes with this objective. To the contrary, market-based rates are sufficiently high to incentivize copyright holders to create content, as reflected in content distributors' – and by extension consumers' –

⁵ See, e.g., James E. Meyer, CEO, Sirius XM, Q1 2016 Earnings Call Transcript 2 (April 28, 2016) (“We added 465,000 net new subscribers and crossed the 30 million subscriber mark, a number that few media companies in the United States or anywhere can match.”); James E. Meyer, CEO, Sirius XM, Q2 2016 Earnings Call Transcript 3 (July 26, 2016) (explaining that Sirius XM in the quarter “added more paid subscribers in the United States than any other public media company”); James E. Meyer, CEO, Sirius XM, Q4 2015 Earnings Call Transcript 3 (Feb. 2, 2016) (characterizing the company as one that has become “very successful” and that “generate[s] lots of excess cash”).

⁶ See generally Sirius XM Holdings Inc. Earnings Call Transcripts over the period 1Q2013 through 2Q2016, which note periodic price increases together with uninterrupted increases in revenues and subscribers. See also Sirius XM Holdings Inc. (SIRI), ITG Investment Research (March 28, 2016), SXM_DIR_00008725 ([REDACTED]).

⁷ See Lys WDT ¶¶ 51-112 (illustrating Sirius XM’s strong growth in EBIT, EBITDA, net income, and free cash flow).

⁸ See, e.g., James E. Meyer, CEO, Sirius XM, Q2 2016 Earnings Call Transcript (July 26, 2016) (stating that certain of the company’s operating metrics are indicative of “an extremely healthy business”); James E. Meyer, CEO, Sirius XM, Q4 2015 Earnings Call Transcript 2 (Feb. 2, 2015) (characterizing 2015 as a “remarkable year” for the company and states that “more of the same” should be expected for 2016). Sirius XM’s stock repurchase program offers further evidence of the company’s optimistic outlook and confidence in its ability to sustain its success going forward. See, e.g., Sirius XM Holdings Inc. Q2 2016 Earnings Call Transcript 6 (July 26, 2016) (stating that, in the first six months of 2016, the company repurchased roughly 261 million shares from the public markets).

willingness to pay for sound recordings. Likewise, market-based rates are not so high as to prevent content distributors from earning economic returns sufficiently attractive to induce the undertaking of the investments required to transmit content to consumers, to broaden their distribution networks, and to develop quality enhancements and a richer menu of features and functionality. In sum, the first policy objective is best served by licensing rates that are sufficiently lucrative to stimulate the creation of new sound recordings, but at the same time not so lucrative as to imperil the future prospects of distributors that have achieved acceptance among consumers. Market-based rates ably satisfy these conditions.

C. Factor Two: To Afford the Copyright Owner a Fair Return for His Creative Work and the Copyright User a Fair Income under Existing Economic Conditions

16. In order to analyze the second factor from an economic perspective, some context is required. The concept of “fairness” in the abstract is not well grounded in the fundamental principles of economics. An 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.⁹ A fair outcome in this proceeding, therefore, could be considered to be one where the rate aligns with the rates earned by record companies in distribution channels not subject to the compulsory licensing regime.

17. Importantly, the second objective should not be employed to install a floor under the rate of return earned by the content distributor. In fact, absent a demonstration that benchmark rates somehow have been inflated by the exercise of monopoly power,¹⁰ any reduction to benchmark rates in the name of “fairness” will amount to nothing more than a subsidy to Sirius XM that confers upon the company an unwarranted competitive advantage *vis-à-vis* rival distributors of sound recordings, and that weakens the incentives to create new sound

⁹ Later in this report, I consider the notion that the licensing of sound recording rights to interactive services is not characterized by effective competition. I also discuss the analytical steps one could implement to estimate the degree to which, if any, benchmark rates might be adjusted if the interactive subscription services were deemed not effectively competitive.

¹⁰ Again, I examine later in this report the hypothesis that benchmark rates have been elevated by the undue exercise of monopoly power.

recordings and to undertake investments in the distribution of sound recordings (which would, of course, contradict Factor One).

D. Factor Three: To Reflect the Relative Roles of the Copyright Owner and the Copyright User with Respect to Their Relative Creative and Technological Contributions, Cost, Risk, and Contribution to the Opening of New Markets for Creative Expression

18. Like the first two statutory factors, the objectives advanced by the third factor are best accomplished by licensing fees tied to rates negotiated voluntarily in market-based settings. From the standpoint of economically sound competition policy, the third statutory factor should not be applied so as to provide either Sirius XM or the record labels with a guaranteed minimum return on investments. This is the case irrespective of the magnitude of those investments and the extent to which such investments are sunk, *i.e.*, in the event of the firm's exit, they would not be recovered. For Sirius XM, which has poured substantial amounts of capital into its distribution network, the record companies, whose financing of the creation of sound recordings is similarly substantial, and the artists, whose opportunity cost of the time required to create sound recordings is difficult to quantify but assuredly considerable, such investments will be rewarded only insofar as they generate products and services that consumers find attractive relative to the available alternatives.

19. In no case should the third statutory factor be invoked in a way that one party is compelled to prop up the risk-adjusted return on investment of another. Sirius XM's fixed (and perhaps sunk) costs render this proposition no less valid. As an initial matter, while Sirius XM's contributions and costs, as those terms are used in the third statutory factor, are certainly significant, the contributions and costs of the record companies and recording artists should not be presumed any less significant. As a matter of sound economics and competition policy, it would be severely misguided to examine the contributions and costs of the record companies on an incremental basis, *i.e.*, to confine the analysis to the incremental contributions and costs associated with the transmission of sound recordings on Sirius XM's network. This is so for the simple reason that it would undermine the incentives of record companies to make the substantial and irreversible investments required to identify, develop, and promote new artists, as well as to fund the creation of new works by extant artists.

20. In addition, application of the third statutory factor should proceed with the clear understanding that music is essential to Sirius XM's success in the marketplace and its broad-based acceptance by consumers.¹¹ To be sure, Sirius XM provides programming expertise that enhances the listening experience of its subscribers, but without the sound recordings, the programming would cease to have value. Such is not the case for the sound recordings, which demonstrably have value in a variety of other channels that are in no way dependent on its distribution over Sirius XM's network.

21. Despite the foregoing discussion, if the Judges ultimately determine that Sirius XM's fixed cost structure might warrant an adjustment to benchmark rates, such an adjustment, in my view, should be evaluated under the rubric of the fourth policy objective, which allows for such an adjustment only if the proposed royalty rates would have a disruptive impact. On that issue, I defer to the testimony of Professor Thomas Lys, who concludes that Sirius XM's capital costs are the second smallest expense category in its cost of service structure, representing only 2.1% of Sirius XM's total revenue in 2015. According to Professor Lys, the company's capital costs are not expected to increase materially in the upcoming rate period.¹²

E. Conclusion

22. In sum, the determination of royalty rates in this proceeding should begin with an assessment of terms voluntarily negotiated between record labels and service providers in market settings free of the compulsory licensing regime that gives rise to this proceeding. In my view, such market-based rates align with the first three statutory criteria. In the remainder of my report, I present my examination of benchmark rates that support the reasonableness of the range of rates I put forward.

¹¹ Subsequently in my testimony, in paragraphs 48-53, I discuss the evidence demonstrating the importance of music to Sirius XM subscribers.

¹² Lys WDT ¶¶ 78-82.

IV. Market-Based Benchmark Rates

A. Introduction

23. The discussion above concludes that rates of compensation arising from voluntary negotiations in a competitive marketplace optimally promote both the 801(b)(1) policy goals and the economic welfare of all interested parties – record companies, artists, distributors of music content, and consumers. Consequently, such rates should feature prominently in the determination of appropriate rates payable by Sirius XM for the right to transmit digital sound recordings to its subscribers.

24. The rates of compensation that would arise from voluntary negotiations between record companies and Sirius XM can be determined from the rates observed in other channels of digital music distribution, after accounting for any relevant and material differences between satellite radio and the benchmark services under consideration. Fortunately, and as will be explained in detail later in this section, such differences manifest themselves through actual market prices, which reflect consumers' willingness-to-pay for any given service and hence the value consumers place on the attributes and functionality offered by a particular service. The undeniable appeal of a benchmark approach is that its foundation is actual market outcomes that necessarily uphold the very same objectives identified in the first three statutory criteria.

25. Importantly, the same dynamics that would be expected to shape negotiations in unregulated distribution channels, *i.e.*, in possible benchmark markets, likewise would be expected to exert the same influence in hypothetical arm's length dealings between Sirius XM and individual record labels. For present purposes, what this means is that rates voluntarily negotiated in unregulated channels are highly probative of the rate that would emerge from hypothetical voluntary negotiations between individual record labels and Sirius XM.

26. Along with the identification of a comparable benchmark service, determination of appropriate benchmark royalty rates requires selection of the particular form of royalty calculation, *i.e.*, the computational metric used to assess royalty obligations. Here, a per-performance compensation scheme (*i.e.*, payment based on the number of users who listen to a sound recording) appears infeasible for satellite radio, for the straightforward reason that satellite radio transmissions flow only in one direction – from the satellite to the listener. Because no

listener data are transmitted back to the satellite, it appears as though Sirius XM does not collect, in the ordinary course of business, the information it would need to calculate its royalty obligations based on a per-performance mechanism.

27. However, there are two viable alternatives to a per-performance scheme: percentage-of-revenue and per-subscriber. There are advantages and disadvantages to each. A percentage-of-revenue mechanism arguably is preferable because revenues are linked to consumers' willingness-to-pay for a service. However, utilizing a percentage-of-revenue metric raises issues concerning the appropriate definition of revenue, and may give rise to future disputes over the proper accounting for Sirius XM's revenues. A per-subscriber rate is easier to apply, particularly with respect to the free trials that Sirius XM offers potential subscribers (an issue that I discuss at Section V.C of my testimony). As a further consideration, a percentage-of-revenue rate will provide the sellers with a share of the upside should Sirius XM's average revenue per user rise over the term of the license, while a per-subscriber rate will insulate the sellers from the downside if Sirius XM's average revenues per user decline during the coming rate period. The marketplace agreements generally use both metrics (and often, where feasible, a per-play rate as well) and require the distribution service to pay under the metric that yields the highest royalties. For present purposes, I have calculated both per-subscriber and percentage-of-revenue rates in a fashion that yields economically equivalent results given Sirius XM's current business operations and financial performance.

B. Interactive Streaming Services as a Benchmark

28. I have concluded that the rate-setting process should begin by ascertaining the rates that would be negotiated in the hypothetical unregulated market for licensing sound recordings to Sirius XM, based on benchmark rates observed in other channels of digital music distribution. The process of selecting a benchmark service should be driven in large measure by the degree to which the benchmark service is comparable to satellite radio across pertinent dimensions. An additional important consideration is whether the ability exists to account for the material differences, if any, that are present.

29. Ultimately, I consider interactive subscription services to be the best available benchmark for satellite radio, due to the comparability of the two types of service along key

dimensions and the availability of reasonable methodologies with which to adjust for pertinent differences.

30. Importantly, there is no difference between interactive streaming services and satellite radio in terms of the music content they deliver to subscribers. Both types of service depend on access to the same sound recording rights controlled by the same copyright owners. While the two types of services differ with respect to the technological platforms they employ to transmit music content to subscribers, that fact on its own does not suggest that a hypothetical unfettered transaction between Sirius XM and a record label would yield terms of compensation that diverged significantly from the rates voluntarily negotiated between record labels and interactive streaming services. This situation is analogous to the video content distribution market, in which the technological platform (*i.e.*, satellite versus cable) does not appear to affect the value of video content distribution agreements (*i.e.*, the distribution deals for channels such as CNN, HBO, ESPN, etc.).

31. Sound recording rights are indisputably an indispensable input for both interactive streaming services and Sirius XM, which means that their demand for sound recording rights is derived from downstream consumer demand for their services. Sirius XM's own advertising and promotional efforts emphasize the critical role played by music content in attracting and retaining paid subscribers.¹³ As such, sound recording copyright holders should receive a material portion of the overall value of satellite radio service, as reflected in the prices paid by subscribers, just as they do for interactive music services. Of course, there are limits to the share of Sirius XM's overall value that record companies could acquire through voluntary negotiations. Sirius XM's elasticity of demand for sound recordings most certainly is not zero. Indeed, as the licensing rates for music content increase, Sirius XM would face stronger incentives both to increase subscription prices and to include more non-music content. However, such limits are attenuated by the relatively inelastic demand for Sirius XM's service, as reflected

¹³ For instance, Sirius XM includes as a primary sales pitch "Commercial-free music channels to fit your every mood. Hear all kinds of music, including channels for every decade." See Sirius XM, SiriusXM Select, <http://www.siriusxm.com/packages/sxmselect> (last visited Oct. 17, 2016).

in the company's recent price increases (both to headline rates¹⁴ and through the music royalty fee (MRF))¹⁵ and concomitant projections for continued growth and increasing profitability.¹⁶ Sirius XM's inelastic demand is also reflected in Professor Willig's estimates of Sirius XM's demand elasticity.¹⁷

32. The benchmark and target services are also similar in other key respects. Consumers of each type of service receive music content *via* digital transmission, and pay for that content on a subscription basis that provides unlimited usage. Moreover, both types of service offer mobile functionality, Sirius XM principally through in-vehicle receivers and interactive streaming through smartphones and other mobile devices. Finally, the services have increasingly converged, with interactive services offering so-called "lean-back" functionality, including playlists generated by the services, by third parties, and by the subscribers themselves, as well as algorithmic streams, akin to the passive listening experience that characterizes Sirius XM.¹⁸

33. I am aware that Sirius XM has negotiated direct licenses with certain independent record labels for the sound recording rights at issue in this case. For the reasons set forth in Section VI of my testimony, however, I do not believe those licenses offer useful evidence of the

¹⁴ See, e.g., Sirius XM, Subscription Rate Change Effective April 27, 2016, <http://www.siriusxm.com/2016rates/pricing> (last visited Oct. 17, 2016); Sirius XM, Subscription Rate Change Effective June 30, 2015, <http://www.siriusxm.com/2015rates/pricing> (last visited Oct. 17, 2016); Adjusted Monthly Subscription Rates Effective January 1, 2014, <http://www.siriusxm.com/2014rates/pricing> (last visited Oct. 17, 2016).

¹⁵ See Sirius XM, Summary of U.S. Music Royalty Fees by Package, <http://www.siriusxm.com/usmusicroyalty/chart> (last visited Oct. 17, 2016) (showing increases since 2015 to the MRF, by subscription package).

¹⁶ See, e.g., James E. Meyer, Sirius XM, Q2 2016 Earnings Call Transcript 3 (July 26, 2016) (referring to Sirius XM's business as "extremely healthy" and announcing record adjusted EBITDA for the quarter and increased guidance for full year 2016 results); James E. Meyer, CEO, Sirius XM, Q4 2015 Earnings Call Transcript 2 (Feb. 2, 2016) (characterizing 2015 as a "remarkable year" for Sirius XM and advising that in 2016 one should "expect more of the same").

¹⁷ Based on the results of a survey prepared by Professor Ravi Dhar, Professor Willig estimates Sirius XM's elasticity of demand as 0.8. Professor Willig's own econometric study of the price elasticity of demand for Sirius XM was corroborative, yielding an estimated range of 0.3 to 0.9. Written Direct Testimony of Robert D. Willig, submitted October 19, 2016, ¶ 44.

¹⁸ Written direct testimony of Michael Kushner, submitted October 19, 2016 ("Kushner WDT"), ¶¶ 59-60.

rates that would be negotiated in an unregulated market, and therefore conclude that the interactive market serves as the best benchmark.

C. The Judges' Analysis of the Interactive Streaming Services Benchmark in *Web IV*

34. In proposing interactive streaming services as an appropriate benchmark in this matter, I am well aware that I am not writing on a blank slate. Most importantly, for my purposes, the Judges considered this benchmark at length in the recent *Web IV* decision.¹⁹

35. To begin, the Judges in *Web IV* noted that the marketplace for sound recordings is segmented in a number of different ways, including:

- i) Market segmentation by willingness to pay;
- ii) Market segmentation by on-demand functionality;
- iii) Market segmentation by major or indie;
- iv) Complementary oligopoly power versus oligopoly market structure; and
- v) Custom pureplay webcasting versus simulcasting.²⁰

36. I have considered each element of the market segmentation described by the Judges in my analysis. I will discuss certain of these market segments further in later sections of this testimony, but here I will note briefly my conclusions with respect to each:

- i) Both the benchmark interactive streaming services and Sirius XM's service are sold on a subscription basis at a monthly price of \$9.99 (for interactive services) or more (for Sirius XM), and thus segmentation by willingness to pay does not present the issue in this case that it did in *Web IV*.
- ii) The benchmark interactive services offer on-demand functionality while Sirius XM's service does not. As described below, I adjust for this aspect of market segmentation in a manner I believe to be consistent with both sound economics and the Judges' approach in *Web IV*.
- iii) Although I base my actual rate calculations on agreements between the major record companies and interactive streaming services, extensive efforts were undertaken to determine the degree to which independent record companies are

¹⁹ Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings, 81 Fed. Reg. 26,316, 26,341-53 (May 2, 2016) [hereinafter *Web IV*].

²⁰ *Id.* at 26,334-35.

distributed by majors and therefore obtain the benefit of the majors' rates, and where they are not distributed by majors, whether independent record companies (directly or through Merlin or independent distribution companies) nevertheless obtain the same or very similar rates. I conclude that there is no material difference between the rates obtained by the majors and the independent record companies in the interactive streaming marketplace.

iv) I also discuss below whether the market for licensing sound recordings to interactive streaming services is effectively competitive. I conclude that 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 this market considerably more competitive than the Judges found based on the record in the *Web IV* case. Nevertheless, I adjust the benchmark rates downward, at least preliminarily (that is, pending the receipt of further discovery in this case), by a "competition" adjustment equal to an amount roughly comparable to the Judges' adjustment in *Web IV*.

v) Segmentation by custom pureplay webcasting versus simulcasting is not relevant to this case.

37. Important to my analysis is the concept of "ratio equivalency." As the Judges described it in *Web IV*, this concept "assume[s] equality between two ratios: (1) subscription revenues to royalties in the *interactive* market; and (2) subscription revenues to royalties in the *noninteractive* market."²¹ The Judges found this assumption to be warranted as a matter of economic theory, at least for subscription services.²²

38. I agree that the theory of approximate uniformity of rates across services is analytically sound. Moreover, it is well-supported as an empirical matter, as recent developments demonstrate. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

²¹ *Id.* at 26,344 (emphasis in original).

²² *See id.* at 26,344, 26,349.

[REDACTED]
[REDACTED]
[REDACTED].²³

39. In part, the Judges' acceptance of ratio equivalency was premised on the idea that the benchmark and target market services offer competing functionalities (apart from interactivity, for which an adjustment is made).²⁴ And that is the case here.

A. Subscribers to streaming services, whether interactive or noninteractive, are not tethered to their computers. Most streaming now takes place on mobile devices that can be used in a car. A [REDACTED]
[REDACTED]
[REDACTED]²⁵ According to [REDACTED]
[REDACTED].²⁶ And
[REDACTED]
[REDACTED].²⁷

[REDACTED] Moreover, much of the listening to subscription interactive services is so-called "lean-back" listening to playlists or programmed streams, consistent with in-car listening habits. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

²³ See SoundExchange Exhibits 16-18.

²⁴ *Web IV* at 26,349.

²⁵ SoundExchange Exhibit 6, Warner Music Group, Global Playlist Integration Update and Opportunities (Jan. 2015), at SoundX_000040416.

²⁶ SoundExchange Exhibit 23, Nielsen 2015 Music U.S. Report, at SoundX_000033811.

²⁷ SoundExchange Exhibit 13, UMG, All Partner Business Review (July 2016), at SoundX_000045676.

[REDACTED]²⁸

[REDACTED]
[REDACTED]²⁹

C. These trends have translated into growing use of streaming services, including interactive streaming services, in the car. The [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]³⁰ Similarly, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]³¹ And a [REDACTED]
[REDACTED]
[REDACTED]³²

D. The fact that on-demand services, such as Spotify, compete directly with Sirius XM is highlighted by Sirius XM's own assertions in a lawsuit it filed against one of its former programmers who left Sirius XM for a programming job at Spotify. In that lawsuit, Sirius XM stated that "Spotify aims to, and in fact does, compete directly with Sirius XM by offering and providing music and music entertainment services including curated music playlists . . .," and Spotify is "one of Sirius XM's key direct competitors."³³

40. Such evidence confirms that the conclusions drawn by the Judges in *Web IV* apply here as well: The benchmark services and the target service are sufficient substitutes from a functional perspective to warrant analysis based on ratio equivalency.

²⁸ SoundExchange Exhibit 24, MusicWatch, Playlisting 2016 Report, at SoundX_000106734.

²⁹ SoundExchange Exhibit 25, MusicWatch, Playlisting 2016, at SoundX_000106865.

³⁰ SoundExchange Exhibit 28, Ipsos In-Car Audio Study (Feb. 2015), at SoundX_000034822.

³¹ SoundExchange Exhibit 22, Edison Research & Triton Digital, The Infinite Dial (2016), at SoundX_000034493.

³² SoundExchange Exhibit 27, MusicWatch, Music Acquisition Monitor Q2 2015 Prepared for RIAA, at SoundX_000033362.

³³ Complaint ¶ 12, *Sirius XM Radio, Inc. v. Sebastian*, No. 650336/2016 (N.Y. Sup. Ct., N.Y. Cty. Jan. 21, 2016); Letter from Brett D. Jaffe to the Honorable Charles E. Ramos Regarding the Discovery Dispute on Commercial Division Rule 11A(B) (Apr. 13, 2016), available at <http://iapps.courts.state.ny.us/iscroll/SQLData.jsp?IndexNo=650336-2016&Submit2=Search>.

41. In summary, the Judges found the subscription interactive services benchmark to be probative of market rates in the target market where three conditions are met:

- a) “revenues in both markets are derived from subscription revenues and are thus reflective of buyers with a positive WTP for streamed music;
- b) 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
- c) A steering adjustment is made to eliminate the complementary oligopoly effect and therefore provide for an effectively competitive market price.”³⁴

42. Each of those conditions is satisfied here. In both markets, revenues are derived from subscribers with a positive willingness to pay. Both 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. And finally, my proposed rates contain a steering adjustment.

D. Using Percentage-of-Revenue Royalty Payments by Interactive Subscription Services to Calculate a Benchmark Rate: Approach One

43. I utilize two different approaches to generate an appropriate sound recording licensing rate for Sirius XM. Under the first, which I describe in this section, I begin with an examination of the actual royalty payments made by interactive subscription services to the record labels. These payments are made pursuant to voluntarily negotiated licensing agreements, and as such they are well-suited to serve as the starting point for determining rates in this proceeding, in light of the governing policy objectives. Next, I calculate the royalty payments of interactive subscription services as a percentage of their revenues. More specifically, I divide the monthly per-subscriber payment by the monthly price of the benchmark services.

44. A percentage-of-revenue rate obviates the need to account for the interactivity of the benchmark service, as the value of interactivity (as well as all other features and functions of the service) is incorporated into subscription prices, and thus service revenues (which are a

³⁴ 81 Fed. Reg. at 26,353.

function of price and number of subscribers). In other words, while the features and functionality of the benchmark service will impact its price, and by extension the subscription revenues on which the service's royalty obligation is measured, these features and functionality need not be accounted for separately in order to develop a percentage-of-revenue rate to apply to Sirius XM's subscription revenues.

45. I have, with the assistance of my staff, analyzed royalty payment data from the three major record companies – Sony, Universal Music Group (UMG), and Warner Music Group (WMG). These data cover, on a monthly basis from January 2014 through June 2016, the actual licensing fees paid by nine interactive subscription services. Those fees are determined by the licensing agreements between interactive services and record labels, and in particular [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].³⁵

46. In the table below, I present actual monthly per-subscriber royalty payments³⁶ made by a number of interactive subscription services to each of the three major record labels. These data produce a weighted average monthly per-subscriber payment of [REDACTED].³⁷

³⁵ See generally the agreements provided in Exhibits 30-32.

³⁶ In other words, I divide the actual monthly licensing fees paid by each service by the number of subscribers to the service. I include services that launched at some point during the period of review (*e.g.*, Apple Music), and services that shut down at some point during the period of review (*e.g.*, Rdio). I confine my analyses to data covering individual premium plans (*i.e.*, advertising free and on-demand offerings).

³⁷ Weighting is based on subscriber totals reported alongside the royalty payment data. Alternatively, if one were to use a simple (arithmetic) average, the result would be [REDACTED]. I use the weighted average for the purposes of my analysis because it represents the most conservative approach.

Table One: Actual Licensing Fees Per-Subscriber [RESTRICTED]

	Sony			UMG			WMG		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Apple Music	I			I			I		
Beats			I			I			I
Google Play									
Microsoft									
Rdio			I			I			I
Rhapsody									
Slacker									
Spotify									
TIDAL	I			I			I		

Source: Royalty payment data from Sony, UMG, and WMG.

47. For all of the interactive services in the above table, over the entire period covered, individual subscriptions have been offered at a monthly price of \$9.99. Using this price, the weighted average monthly per-subscriber payment of \$[] translates to a percentage-of-revenue equal to approximately []%.

48. Of course, this rate cannot be assigned to Sirius XM without first accounting for the fact that unlike interactive streaming services, which transmit only music content to subscribers, Sirius XM earns subscription revenues from the distribution of both music and non-music content. Consequently, 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. Based on the information described below, I conclude that at least 50 percent of the value of Sirius XM's service is attributable to the transmission of music.

49. Highly illuminating for this exercise is the fact that Sirius XM offers a package limited to non-music content (News, Sports, and Talk),³⁸ and a package that is heavily weighted toward music content (Mostly Music), and does not offer any of the company's most popular

³⁸ See Sirius XM, Sirius XM News, Sports & Talk, <http://www.siriusxm.com/packages/sxmnewssportstalk> (last visited Oct. 17, 2016).

non-music channels. These two packages are priced identically at \$10.99 per-month,³⁹ a finding that suggests the marginal consumer(s) of each package values music and non-music content, respectively, at roughly equivalent levels. It follows from there that for Sirius XM's hybrid packages, *i.e.*, packages that feature both music and non-music channels, 50% represents a reasonable estimate of the portion of Sirius XM's subscriber revenue accounted for by the distribution of sound recordings.⁴⁰

50. Additional relevant evidence suggests that a 50% valuation for music content is not only reasonable, but also likely conservative, *i.e.*, music content accounts for greater than one-half of the value of Sirius XM's service. In a survey prepared by Stefan Boedeker,⁴¹ respondents were asked several questions directed at their relative valuations of the music and non-music content available on Sirius XM. For each of these questions, the survey results indicate that music content contributes around 70% of the overall value of Sirius XM's service. For example, using a 100 point scale, respondents were asked to assign values to music and non-music content in terms of the importance of each to the decision to subscribe to Sirius XM.

³⁹ To estimate the contribution of music content to the overall value of Sirius XM's service, the appropriate analytical focus is on the marginal consumer – that is, the consumer whose valuation of music is just equal to the price of the service. Because infra-marginal consumers value music more highly, subscribers to the Mostly Music package, on average, value music more highly, perhaps substantially so. If one assumes, reasonably in my view, a uniform distribution of tastes and preferences across consumers, and for music and non-music content, the equivalent prices of the Mostly Music and non-music packages suggests that Sirius XM subscribers overall, on average, value music and non-music content at equivalent levels.

⁴⁰ This estimate might require a downward adjustment insofar as the non-music channels included in the Mostly Music package are valued positively by Mostly Music subscribers. I have seen no evidence to indicate that the non-music channels included in the Mostly Music package are relatively popular and thus might mandate a material downward adjustment to the 50% estimate of music's contribution to the total value of the Sirius XM service. Then again, it likely is not the case that the non-music channels contribute zero value to the Mostly Music package. On the other hand, Mostly Music subscribers are assessed a monthly music royalty fee of \$1.53 which takes the monthly subscription price to \$12.52. *See* Sirius XM, Summary of U.S. Music Royalty Fees by Package, <http://www.siriusxm.com/usmusicroyalty/chart> (last visited Oct. 17, 2016). Based on the information available to date, I consider it highly likely that omission of the music royalty fee more than offsets my assignment of zero value to the non-music channels included in the Mostly Music package. In other words, I believe my treatment of these two effects produces a conservative result. However, I reserve the right to alter my opinion should relevant data become available in the future.

⁴¹ Written Direct Testimony of Stefan Boedeker, submitted October 19, 2016 ("Boedeker WDT").

Overall, music content received a score of 72% (versus 28% for non-music content).⁴² Similarly, and again using a 100 point scale, respondents were asked to assign values to music and non-music content in terms of the importance of each to the decision to remain a subscriber to Sirius XM. Overall, music content received a score of around 71% (versus 29% for non-music content).⁴³ Finally, respondents were asked about the amount of time spent listening to music content and non-music content on Sirius XM. Consistent with the much higher valuations of music content obtained from the other questions, the survey found that roughly 71% of respondents' listening time on Sirius XM was devoted to music content.⁴⁴

51. In addition, surveys conducted by Sirius XM for its own internal business purposes indicate that music content, if anything, accounts for greater than 50% of the total value of the service. For example, [REDACTED]

[REDACTED]
[REDACTED].⁴⁵ [REDACTED]
[REDACTED]
[REDACTED].⁴⁶ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

⁴² *Id.* at ¶ 71.

⁴³ *Id.* at ¶ 72.

⁴⁴ *Id.* at ¶ 73.

⁴⁵ SoundExchange Exhibit 34, [REDACTED], at SXM_DIR_00023538-610.

⁴⁶ SoundExchange Exhibit 35, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

⁴⁷ SoundExchange Exhibit 37, Sirius XM, 2015 Customer Experience Survey Report, SXM_DIR_00024058.

[REDACTED]

[REDACTED]⁴⁸

52. Evidence in prior proceedings also confirms that music content represents at least 50 percent of the value of all content on the Sirius XM service. Expert testimony admitted in *SDARS I*, for instance, established that Sirius XM subscribers ascribe more than half of the value of the service's programming to music content. In that case, SoundExchange's expert Dr. Yoram Wind conducted a survey that "provide[d] strong evidence that consumers value satellite radio music programming *far more* than other programming formats (*e.g.*, talk, news, and sports) According to every measure of value in the survey, music generally proved *to be two to five times* as valuable as any other programming offering or feature of satellite radio."⁴⁹

53. Finally, in *SDARS II*, SiriusXM's own expert witness, Roger Noll, credited channels featuring sound recordings (*i.e.* music content) for 55% of the value of Sirius XM's programming.⁵⁰

54. Thus, even though there is evidence supporting a conclusion that music content represents considerably more than one-half the value of Sirius XM's blended service packages, I follow a conservative path and assign one-half the value of Sirius XM's blended service packages to music content. Such an estimate generates a percentage-of-revenue rate of [REDACTED]%.⁵¹ To obtain an equivalent per-subscriber rate, I apply the [REDACTED]% rate to the average revenue per

⁴⁸ *Id.*

⁴⁹ Written Direct Testimony of Yoram (Jerry) Wind, *In re* Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, No. 2006-1 CRB DSTRA at 2 (emphasis in original).

⁵⁰ SiriusXM Radio Inc.'s Proposed Findings of Fact, *In re* Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, No. 2006-1 CRB DSTRA, No. 2006-1 CRB DSTRA, at 86.

⁵¹ To recap the prior steps of the calculation, I begin with \$[REDACTED], which is the weighted average monthly per-subscriber royalty payment made by the benchmark interactive subscription services to the three major record labels. That payment equates approximately to [REDACTED]. Finally, to account for the fact that Sirius XM transmits both non-music content and music content, and that music content is conservatively estimated to account for 50% of the value of Sirius XM's service, I divide the [REDACTED] to arrive at a percentage-of-revenue rate of 28% for Sirius XM.

subscriber (referred to herein as “royalty-base ARPU”) of \$[REDACTED], as gross revenue is defined by the statutory license.⁵² This results in a per-subscriber rate of \$[REDACTED].

E. Estimating a Benchmark Rate that Specifically Accounts for Sirius XM’s Non-Interactivity: Approach Two

55. One clear and significant benefit of my first approach is that it avoids the need to account specifically for differences between the target and benchmark services. It is able to do so because a service’s revenues are a direct function of consumer prices, and those prices, as already explained, reasonably reflect how consumers value any given service’s set of attributes and functions. For example, if consumers for some reason downgrade their valuation of the attributes of one service relative to another service, economics would predict, *ceteris paribus*, a price decline for the now less attractive offering. The fact that music content now provides less value to the service (due to the service’s less desirable set of features) is automatically accounted for in a percentage-of-revenue rate, because application of that rate generates a reduced royalty burden when applied to a lower revenue base (caused by the price decline). Put another way, because prices reflect the different valuations consumers assign to different combinations of features and functions, percentage-of-revenue rates will likewise reflect such differences, given that the sound recordings distributed by the various services are identical.

56. With that said, a reasonable alternative methodology is to account directly for material differences in features and functionality as between interactive subscription services and Sirius XM. My second approach is based on such a methodology and proceeds on the premise that interactivity constitutes the only difference sufficiently important to justify an adjustment. The value of interactivity can be isolated by comparing the retail prices of interactive and non-interactive subscription services. This is so for the straightforward reason that these two categories of service differ only with respect to the feature of interest, *i.e.*, interactivity. I use three non-interactive subscription services⁵³ – Pandora One/Plus, Rhapsody (Napster) unRadio,

⁵² The details of this calculation are provided below in paragraph 59-60 and Table Three.

⁵³ In the course of my work I became aware of an additional non-interactive subscription service marketed under the name 8tracks Plus and available for a monthly price of \$2.99. See 8tracks, <http://8tracks.com/plus> (last visited Oct. 17, 2016). I do not include the 8tracks service in my analysis because play data furnished by 8tracks to

and Slacker Radio – to calculate a weighted average monthly retail price of \$4.91 for the service category. The details of that calculation are presented in the following table.

**Table Two: Non-Interactive Subscription Services Weighted Average Monthly Price
[RESTRICTED]**

	Price ⁵⁴	Subscribers ⁵⁵	Weight (Subs)	Weight (Price)
Pandora One/Plus	\$4.99	3,900,000		
Rhapsody (Napster) unRadio	\$4.99			
Slacker Radio	\$3.99			
TOTALS:		4,401,891	100%	\$4.91

57. Given the \$9.99 monthly retail price for interactive subscription services, a ratio of the two prices provides an interactivity adjustment of 2.04⁵⁶ (to account for the presence of interactivity), or 0.49⁵⁷ (to account for the absence of interactivity). I use the latter ratio of 0.49 to convert the interactive subscription services monthly per-subscriber rate of [REDACTED] to an equivalent rate for Sirius XM (which, unlike the benchmark services, is non-interactive). This calculation yields a per-subscriber rate of [REDACTED].

58. The final step is to calculate an equivalent percentage-of-revenue rate. This requires selection of the appropriate denominator, *i.e.*, the most suitable measure of Sirius XM's per-subscriber revenues. The company's posted prices represent one option; however, due to the various discounts extended to certain Sirius XM subscribers, using the list price would provide an inflated assessment of consumer valuations.⁵⁸ For this reason, I find this option unappealing.

SoundExchange indicates that the service's subscriber base is quite small. *See* 8tracks.com, 2015 Statement of Account (Jan. 21, 2016).

⁵⁴ *See* Pandora One, <http://www.pandora.com/one> (last visited Oct. 17, 2016); Select Plan, Napster, http://us.napster.com/pricing_b (last visited Oct. 17, 2016); Slacker Radio, <http://www.slacker.com/> (last visited Oct. 17, 2016).

⁵⁵ *See* Pandora Media, Inc., 2015 Form 10-K Annual Report 46; Rhapsody, Streaming Royalty Statement (Dec. 2015), SoundX_000044604; UMG, Monthly Payments and Fees from Slacker (Dec. 2015), SoundX_000044670.

⁵⁶ \$9.99/\$4.91.

⁵⁷ \$4.91/\$9.99.

⁵⁸ For example, Sirius XM's internal documents indicate that [REDACTED] [REDACTED] SiriusXM Forecast – 2015 LRS Plan, SXM_DIR_00020919. Sirius XM also offers reduced prices for family (*i.e.*, multiple user) accounts, for prepaid subscriptions (*e.g.*, paying for 12 months up front), and to control

However, this shortcoming can be cured by using the actual per-subscriber revenues received by Sirius XM.⁵⁹ Sirius XM reports publicly a monthly average revenue per-user (ARPU).

However, this figure includes a number of revenue sources on which Sirius XM pays no royalties to SoundExchange, including subscription revenues earned from non-music packages, revenues earned from the sale of advertising on non-music channels, equipment sales, and activations and other fees.⁶⁰

59. Fortunately, Sirius XM reports to SoundExchange on a monthly basis the revenues on which Sirius XM pays statutory royalties. In addition, in its SEC filings, Sirius XM reports its daily weighted average number of subscribers. Using these data, I am able to calculate what I will call the “royalty-base” ARPU, *i.e.*, the average revenue per-user (*i.e.*, subscriber) on which the statutory rate should be assessed.⁶¹ The table below illustrates (i) Sirius XM’s gross revenues for the first months of 2016, as reported to SoundExchange; (ii) Sirius XM’s reported daily weighted total subscribers for that time period; and (iii) the calculation of royalty-base ARPU from these figures.

subscriber cancellations and induce consumers who did not convert their trial subscriptions upon expiration to re-activate their radios.

⁵⁹ As I explain below, this figure is designed to estimate the company’s revenue per subscriber against which sound recording royalties will be calculated.

⁶⁰ *See, e.g.*, Sirius XM Holdings Inc., 2015 Form 10-K Annual Report 7.

⁶¹ Royalty-base ARPU represents my best estimate of the per-subscriber monthly revenues Sirius XM receives from the sale of its blended subscription packages. I acknowledge that the estimate falls short of caliper-like precision. First, subscription revenues in the numerator are not limited to blended packages; all packages offering more than incidental transmissions of music are in the data, including the Mostly Music package. Second, the weighted average number of subscribers figure pulled from Sirius XM’s public filings include subscribers to packages featuring non-music content only. I have no reason to believe that these two issues impact my calculation of royalty-base ARPU to a significant degree, or that on balance their effect is more than *de minimis*.

Table Three: Sirius XM “Royalty-Base ARPU” [RESTRICTED]

	Gross Revenues ⁶²	Daily Weighted Average Subscribers ⁶³	Royalty Base ARPU
	(A)	(B)	(A / B)
Jan-16			
Feb-16			
Mar-16			
Apr-16			
May-16			
Jun-16			
Total:		30,044,000	

60. As this table demonstrates, for the first six months of 2016, Sirius XM’s royalty-base ARPU is [REDACTED]. Given a per-subscriber rate of [REDACTED], my second approach produces a percentage-of-revenue rate of [REDACTED]%.

V. Possible Further Adjustments

A. Introduction

61. In this section, I consider a number of potential adjustments to the benchmark rates presented in the prior section.

B. Steering

62. Earlier in this report, when discussing the statutory factors, I noted briefly the possibility that the interactive subscription services benchmark might warrant an adjustment if it were determined that the benchmark marketplace was not effectively competitive. This same

⁶² I obtained monthly revenues from the monthly Statement of Account that Sirius XM provides to SoundExchange. Because the amount listed on Sirius XM’s Statements of Account includes a deduction for the portion of subscription revenues attributable to performances of pre-1972 sound recordings and the portion of subscription revenues attributable to performances of sound recordings subject to direct licenses, it was necessary to adjust the number upwards to calculate Sirius XM’s actual reported gross revenue. See *SDARS II* at 23072-73 (explaining that “revenue exclusion is not the proper means for addressing” pre-1972 and directly licensed sound recordings). I have provided these calculations in Appendix D.

⁶³ See Sirius XM Holdings Inc., Form 10-Q, at 36 (June 30, 2016). This figure includes self-pay subscriptions (subscriptions paid for by the end user) and paid promotional trial subscriptions (subscriptions free to the end user but for which Sirius XM receives compensation via its contracts with automobile OEMs).

issue arose during the recently concluded rate determination for webcasters, and for present purposes, a quick summary of those proceedings should prove useful.

63. In essence, the Judges in *Web IV* regarded the interactive subscription services marketplace as not effectively competitive because buyers in that marketplace (*i.e.*, the services) had no way to induce price competition among sellers (*i.e.*, the major labels). In the Judges' opinion, price competition was thwarted by the "must-have" status of each of the major labels, *i.e.*, an interactive service would be unable to achieve mainstream acceptance and success without access to the sound recordings controlled by each of the three major record companies. In addition, price competition could not be induced by steering, a practice whereby a service uses its ability to increase or decrease the intensity with which a particular label's repertoire is played in exchange for a lower royalty rate. According to the Judges' reasoning, interactive services could not engage in steering because the users of interactive services, and not the services themselves, dictate which sound recordings are played.

64. In the webcasting marketplace, however, the Judges concluded that the putative "must have" status of the major record labels did not preclude price competition due to the ability of webcasters to engage in steering.⁶⁴ Steering was considered feasible in webcasting because the services exercised ultimate control over the sound recordings transmitted to consumers. Thus, it was determined by the Judges that the interactive streaming services benchmark required a downward adjustment to account for the ability of services in the target market (webcasting) to induce price competition *via* steering (or the threat thereof).

65. Based on the foregoing discussion, pertinent questions to examine in this proceeding are whether a similar adjustment is warranted, and relatedly, how one might determine the appropriate magnitude. At this point in my analysis, I do not have sufficient data and information to render a definitive conclusion with respect to steering.

⁶⁴ The Judges found that the catalogues of the major record companies were "must-haves" for noninteractive as well as interactive services: "There appears to be a consensus that the repertoire of each of the three majors is a "must have" in order for a non-interactive service to be viable." *Web IV* at 26,373.

66. The Judges in *Web IV* determined that direct licenses in the target service market provided evidence from which to calculate the likely effects of steering on the interactive service benchmark rates.⁶⁵ Following that approach, I am familiar with the numerous licensing deals that Sirius XM has negotiated directly with certain record labels, and in particular that the rates in those deals are discounted *vis-à-vis* statutory rates. I understand that Thomas Lys has analyzed Sirius XM's direct deals and concluded that these deals, over the first six months of 2016, provide [REDACTED] from the statutory rate.⁶⁶

67. Unlike the direct licenses utilized by the Judges in *Web IV* as the basis for a steering adjustment, [REDACTED]
[REDACTED].⁶⁷ Moreover, according to Dr. Lys, the record companies that entered into direct licenses with Sirius XM may have received tangible economic benefits other than steering in return for agreeing to a discount from the statutory rate.⁶⁸ These benefits, discussed briefly below, and covered in detail by Professor Lys in his report, include (i) paying direct licensors on the basis of their share of performances, instead of their share of spins ("over-indexing"); (ii) direct payment of 100% of royalties to the label; (iii) payment of royalties for pre-1972 sound recordings; (iv) provision of advances; (v) more accurate payment by allowing the record company to provide a direct content feed and metadata; and (vi) the avoidance of the administrative fee paid to SoundExchange. Each of these benefits, which have nothing to do with steering, offers value to a record company.⁶⁹ In my view, therefore, the [REDACTED] discount represents the *maximum* plausible adjustment for steering.

68. Applied to the benchmark rates presented earlier, a [REDACTED] discount yields percentage-of-revenue rates of 22.15% and 24.08%, and per-subscriber rates of \$2.37 to \$2.58. To be clear, I employ a [REDACTED] "steering adjustment" subject to the caveat that I may propose a

⁶⁵ *Web IV* at 26,343, 26,404.

⁶⁶ Lys WDT ¶ 254.

⁶⁷ *Id.* ¶¶ 281-327.

⁶⁸ *Id.* ¶¶ 269, 281-327.

⁶⁹ *Id.* ¶ 268.

smaller (or no) adjustment in the future if newly available data and other evidence so justify. At this point, I simply will note that the entire difference between the statutory rate and the direct deal rates is defensible as an appropriate steering adjustment only if the entire difference reasonably can be linked to steering (either a promise to play a label's sound recordings more intensively or a promise not to disadvantage a label's sound recordings). Insofar as the discounted rates in the direct deals reflect other benefits provided by Sirius XM to licensors (labels),⁷⁰ a steering adjustment derived from the direct deals would need to be reduced (perhaps all the way to zero if the discounted rates were attributable in total to factors other than steering).⁷¹

69. An assessment of Sirius XM's direct deals, and what they tell us about Sirius XM's ability to steer, should of course recognize that the company's incentives to engage in steering are not boundless. Sirius XM quite likely can tinker here and there with its playlists without any discernible impact on listenership and demand for the service, but nontrivial shifts in playlist construction bring with them the risk that any cost savings achieved through steering will be more than offset by a diminution in the perceived quality of the service and a corresponding decline in subscriber demand.

70. Importantly, there are reasons to believe that Sirius XM's incentives to steer are weaker relative to the non-interactive streaming services, such as Pandora, that were involved in the *Web IV* proceeding. First and foremost is the value of an incremental subscriber to Sirius XM. In his written direct testimony, Thomas Lys estimates that a subscriber cancellation, on a yearly basis, removes around \$90 from the company's contribution to fixed costs and profits.⁷² I do not have the data and other information needed to estimate a similar figure for Pandora or the

⁷⁰ Similarly, insofar as a portion (or all) of the rate concessions were the result of Sirius XM exercising monopsony power, the full differential between the direct deals and the statutory rate should not be ascribed to steering.

⁷¹ To gauge whether and to what extent the discounted rates in the Sirius XM direct deals reflect steering or other factors, it presumably will be useful to analyze Sirius XM playlist data to determine how, if at all, the direct deals changed the intensity with which Sirius XM played the sound recordings of the corresponding labels. Stated differently, playlist data plausibly will shed light on the question of whether Sirius XM actually engaged in steering following consummation of the direct deals. Similarly, the negotiations files associated with the direct deals likely offer insights into the *quid pro quo* related to the discounted rates, *i.e.*, the benefits received by the labels in exchange for accepting a rate below the statutory level.

⁷² Lys WDT Figure 72.

other non-interactive subscription services, but suffice it to say that given their monthly prices of \$3.99 to \$4.99, a subscriber cancellation could not possibly have nearly the same financial impact, and the loss of a user of the ad-supported service would have a still smaller effect.

71. In addition, it seems likely that Pandora and other non-interactive streaming services would have stronger incentives to steer relative to Sirius XM because unlike Sirius XM, which can steer only by changing its programmed playlists that are transmitted nationwide and are available to all subscribers to music channels, Pandora and similar services can fine-tune playlists at the individual subscriber-level. Presumably this degree of specificity would allow non-interactive subscription services to target playlist adjustments so as to satisfy its steering obligations and at the same time minimize subscriber backlash.

72. Sirius XM's relatively weaker incentives to engage in steering appear to be confirmed by the fact that only a very small portion of the market has signed direct licenses with Sirius XM.⁷³ If steering represented an effective threat (or inducement, depending on one's point of view), one would expect Sirius XM's direct licensing program to have achieved substantially more traction in the marketplace. Sirius XM launched its direct licensing program many years ago, and the fact that it has attracted only a sliver of the market over that time period suggests that the threat of steering by Sirius XM is minimal at best.⁷⁴

73. Also relevant to an assessment of steering in this proceeding is the proposition that the interactive subscription services marketplace is not effectively competitive. The Judges in *Web IV* articulated their view that steering is the antidote for marketplace conditions that otherwise would prevent effective competition.⁷⁵ In the same discussion, the Judges equated steering with the ability of a licensee (*i.e.*, a service) to adjust, in response to the licensing rate, the intensity with which a given licensor's (*i.e.*, a label's) sound recordings are played.⁷⁶ Through this lens, the Judges concluded that the interactive subscription services marketplace is

⁷³ Lys WDT ¶ 279.

⁷⁴ See *infra* ¶ 111.

⁷⁵ *Web IV* at 26,367.

⁷⁶ *Id.*

not effectively competitive – simply stated, because subscribers, and not service providers, select the sound recordings that are transmitted by an interactive service.⁷⁷

74. As a threshold matter, while the foregoing reasoning is not without some intuitive appeal, 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 that marketplace. The ability of interactive services to influence directly and effectively which sound recordings to play has grown because an increasing percentage of the music streamed by interactive services consists of service-created playlists. Such influence over subscriber behavior properly is considered a form of steering. While subscribers to on-demand (*i.e.*, interactive) services ultimately select the sound recordings streamed by the service, an interactive service could engage in “steering” by guiding subscribers towards the selection of particular sound recordings.⁷⁸

75. Data pertaining to [REDACTED]
[REDACTED].⁷⁹ Thus, while subscribers far more often listen to tracks on their own playlists or the playlist of a friend or another subscriber, relative to playlists created by the service provider, the fact remains that service-created playlists account for a material portion of total plays – [REDACTED]. For this [REDACTED], the service has a clear ability to steer towards the sound recordings of a particular label (or labels).

76. Beyond directly determining via its own playlists which sound recordings are streamed, service-generated playlists indirectly influence the behavior of a larger pool of subscribers due to the possible multiplier effect that arises from a track’s placement on a

⁷⁷ *Id.* at 26,341, 26,343-44.

⁷⁸ The importance of influencing end-users’ music selection is noted in record label business documents. *See, e.g.*,
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

⁷⁹ *See* Harrison WDT ¶ 36.

service's playlist. That placement induces some subscribers to add the track to their own playlists, which are then shared with friends, and so on.⁸⁰ An interactive service provider can sway subscribers' selection of sound recordings through the construction of its playlists, both in terms of which sound recordings are included and the order in which they are assembled.⁸¹ In sum, interactive streaming services clearly have the wherewithal to exert some influence over which tracks subscribers play, and which tracks subscribers add to their own playlists.⁸²

77. Relatedly, record labels create their own playlists in the hopes of being featured prominently on the interactive streaming services and having their sound recordings added to subscriber-created playlists. The service ultimately decides whether a record label playlist is added, and to what degree it is featured.⁸³

⁸⁰ Record company documents recognize this multiplier effect. *See, e.g.*, Warner Music Group, Global Playlist Integration Update and Opportunities (Jan. 2015), SX000040382 ("Playlisting is a critical driver to increasing consumption on streaming services ... 15% of plays on Spotify are coming directly from non-personal playlists ... 40% of those plays are new discoveries by users (tracks that had never been played by a user before) ... Third-party playlisting is the most effective discovery feature on Spotify for getting users to add discovered tracks into their personal collections, exponentially increasing consumption."); Playlisting 2016, MusicWatch, SoundX000106745 (indicating that, for Spotify Premium and Apple Music, 30% to 40% of subscribers listen to service-generated playlists most or all of the time, with genre-based playlists most popular and current hits ranking second)

⁸¹ *See, e.g.*, Harrison WDT ¶ 36 ("Overall, for Spotify as much as 25 percent of plays come from playlists and algorithmic streams that the service controls."). Harrison further explains that for UMG's frontline releases, close to 40% of plays on Spotify are programmed by the service. *Id.* ¶ 37; *see also id.* ¶ 41 (Discussing Spotify's "Discover Weekly" playlist and the fact that "Labels vie not only to have their music featured on this playlist but also to have their music appear earlier in the order on this playlist, ...").

⁸² [REDACTED]

⁸³ Interview with Aaron Harrison, October 11, 2016.

78. A service also could steer subscribers to a given label's repertoire through other means: For example, one tool available for the service is the layout of the so-called user interface (*i.e.*, how sound recordings and artists are "merchandised") and similar features. The interactive services now actively recommend music to their subscribers, through, for example, the Spotify "Browse" option (which includes a "Discover" tab), the Spotify "Discover Weekly" playlist, the Apple "my new music mix" and a "my favorites mix," and other curated offerings of new music.⁸⁴

79. Casting further doubt on the proposition that the interactive services benchmark marketplace is not effectively competitive is the important, and increasingly critical, role played by the interactive services in the financial performance of the recording industry.⁸⁵ Simply stated, as industry fortunes hinge to a greater degree on the growth of subscription interactive streaming services, record labels will have more potent incentives to negotiate licensing rates that are remunerative for the record companies, but not so high as to jeopardize the mutually beneficial upward trajectory of interactive subscription services. Such a constraint is amplified by the rivalry among interactive streaming providers and other distribution channels that occurs downstream, *i.e.*, competition for subscribers. In their negotiations with interactive streaming services, record labels understand that higher licensing rates potentially hamstringing the services' ability to compete, for example by squeezing profits or by compelling subscription price increases that make interactive services less appealing to consumers. In sum, the level of royalties earned from subscription interactive streaming services create disincentives for the record companies from seeking excessive licensing rates that plausibly would force the services to increase subscription prices, which could jeopardize the significant momentum in the marketplace and the widespread acceptance the services have achieved among consumers.

C. Free Trials

80. Both the benchmark interactive subscription services and Sirius XM offer free trials through which consumers can use the respective services without charge for a certain

⁸⁴ Harrison WDT ¶¶ 41-42.

⁸⁵ See, e.g., <http://musically.com/2016/09/30/how-much-are-spotify-and-apple-music-driving-growth-in-the-us/> (interactive streaming services "hailed as a key driver for" growth in industry revenues.); Harrison WDT ¶ 34.

period of time. In order to apply accurately the above benchmark to Sirius XM, it is important to account for differences in how free trials are structured and utilized as between the benchmark and target services.

81. Although I understand that Sirius XM has not yet provided documents that would allow me to confirm the precise duration of its free trials, my analysis of the documents received thus far indicates that the duration of Sirius XM free trials materially exceeds the length of the free trials offered by the benchmark interactive services. Documents produced to date by Sirius XM indicate that the company's free trial subscriptions may run [REDACTED].⁸⁶ By comparison, for the benchmark interactive subscription services, free trials generally last no more than 30 days (*see* Table Four immediately below).

Table Four: Free Trials Offered Currently by Benchmark Services

Service	Length of Free Trial
Slacker	None ¹
Spotify	30 days ¹
Google Play	30 days ¹
Napster/Rhapsody	30 days ¹
Microsoft	30 days ¹
TIDAL	30 days ¹
Apple Music	3 months ¹

82. In the case of free trials by the benchmark interactive services, end users are not charged during the trial period and service providers receive no compensation during the trial period. By contrast, Sirius XM's business involves two types of free trials, which the company refers to internally as "paid promotions" or "unpaid promotions." As the terms suggest, the key distinction concerns whether Sirius XM receives compensation for the trial subscription. In the case of "paid promotions," Sirius XM offers free services to consumers, but receives compensation through its contracts with certain automobile manufacturers.⁸⁷ Because free trials

⁸⁶ See, e.g., SXM_DIR_00008514.

⁸⁷ Both types of promotions can be considered "free" trials insofar as they are free to the end user. Certain documents suggest that the duration for "paid promotions" is [REDACTED]. SXM_Direct_00008651; SXM_DIR_00009868.

based on “paid promotions” generate revenue, the compensation earned by Sirius XM for paid promotional trials is included in the revenue base on which statutory royalties are assessed. In the case of “unpaid promotions,” Sirius XM offers its services, and the rights owners’ content, free of charge to consumer and—as in the case of free trials by interactive services—receives no payment at all during the trial period. Because free trials based on “unpaid promotions” generate no revenue, unpaid promotional trials incur no royalty obligation under the current regulatory regime.

83. As Table Five illustrates, Sirius XM has [REDACTED]

[REDACTED]:

Table Five: Sirius XM Unpaid Promotional Subscribers [RESTRICTED]

Year	Number of Unpaid Promotions	Yr-over-Yr Growth of Unpaid Promotions
2013	[REDACTED]	[REDACTED]
2014	[REDACTED]	[REDACTED]
2015	[REDACTED]	[REDACTED]
2016 (Q1)	[REDACTED]	[REDACTED]

Source: SXM_DIR00007196

84. Sirius XM’s forecasts indicate [REDACTED]
[REDACTED].⁸⁹ Moreover, several of the documents produced by Sirius XM indicate that Sirius XM has [REDACTED]
[REDACTED]
[REDACTED].⁹⁰

85. As discussed below, voluntary agreements between benchmark interactive subscription services and record labels [REDACTED]
[REDACTED]. In my view, there is no sound economic basis for the

⁸⁸ This figure is based on a straight-line estimate of unpaid subscribers as of the end of 1Q2015, [REDACTED].

⁸⁹ SXM_DIR_0021497-98; SXM_DIR00007196.

⁹⁰ SXM_DIR_0021498; SXM_DIR_00005608; SXM_DIR_00008514; SXM_Dir_00007345-46; SXM_DIR_00009516.

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. Benchmark rates, and their application, should incorporate Sirius XM's free trial subscribers in a manner consistent with how free trial subscribers are handled under the licensing agreements between record labels and the benchmark interactive services.

86. In terms of projecting how free trial subscribers would be addressed in hypothetical voluntary negotiations between Sirius XM and a record label, I have examined the treatment of free trials in agreements between the major record companies and the benchmark interactive subscription services.⁹¹ My initial analysis focused on [REDACTED]. I consider these agreements highly probative, capturing the current considerations and objectives of the parties, extant and anticipated future competition, and the dynamics that would shape the

⁹¹ [REDACTED]

negotiations and final outcome of hypothetical arm's length bargaining between Sirius XM and a record company. The table below summarizes how each agreement specifically treats free trials:

Table Six: Free Trial Provisions in 2016 iHeart and Pandora Agreements [RESTRICTED]

	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

87. I also reviewed more broadly the free trial provisions in the agreements between each benchmark service and each major record company. [REDACTED]

92

88. As mentioned above, at this time I do not have complete information regarding Sirius XM's free trials—including, for instance, [REDACTED]
[REDACTED]—and I will revise as appropriate my proposal for the treatment of such trials upon receiving such information. However, it is clear at this stage, consistent with the unanimous treatment of free trials negotiated in the unregulated

92 [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].

sphere, that Sirius XM should be required to pay royalties on free trials that extend beyond 30 days.

89. Furthermore, I note that [REDACTED]

[REDACTED]. For a couple of reasons, I propose that the Judges also adopt a per-subscriber-based approach with respect to Sirius XM's free trials. First, although Sirius XM currently pays royalties under the statutory license based on a percentage-of-revenue rate, as discussed above, such a rate does not work in the context of unpaid promotions because such promotions do not generate revenues. Second, as addressed above, a per-performance metric is not possible because Sirius XM is apparently incapable of measuring the number of listeners tuning into its satellite service.

90. I note that if the Judges were to adopt a hybrid approach whereby a percentage-of-revenue metric is applied to paid trials pursuant to the statutory license, with a per-subscription rate used for unpaid trials, it would be necessary to guard against the possibility of opportunistic behavior by Sirius XM. In particular, Sirius XM readily could exploit the percentage-of-revenue mechanism and avoid much of its royalty obligation with respect to free trials, simply by shifting its unpaid promotions to paid promotions that require only nominal compensation from OEMs (and thus generate virtually no revenue). As described above, it appears that [REDACTED]

[REDACTED]. Upon obtaining more information from Sirius XM regarding its paid and unpaid promotions, it may be possible for me to suggest a solution to such possible abuse of a hybrid system. I note, however, that the appropriate treatment of free trials for Sirius XM's two types of free trials (paid promotional and unpaid promotional) and, in particular, the avoidance of possible exploitation by Sirius XM, may counsel in favor of adopting a per-subscriber rate for all subscribers, as opposed to adopting a hybrid approach that would maintain a percentage-of-revenue approach for non-trial subscribers.

91. At this time, I do not have sufficient data from Sirius XM regarding its free trials to determine whether application of the benchmark market would justify [REDACTED]

agreement above. However, it is clear that, consistent with all other services, Sirius XM should be required to pay such a per-subscription royalty for any free trial that exceeds one month.

92. To conclude, I readily acknowledge that free trials are a promotional vehicle that can be used to attract new subscribers to a service, and thereby may result in a benefit to rights holders. Such a benefit is what may incentivize a rightsholder to allow its sound recordings to be offered to consumers for a limited duration without the payment of any royalties—here, shown to be approximately one month in the interactive subscription services realm. However, as demonstrated by the agreements between rights holders and the benchmark interactive subscription services, which are negotiated in the free market, there naturally will be limits to the duration for which a rightsholder will allow its sound recordings to be offered without payment of any royalty.

D. Pre-1972 Sound Recordings

93. [REDACTED]

[REDACTED]. On the other hand, the Judges have concluded that the statutory license does not apply to sound recordings fixed prior to 1972 because they are generally outside the federal copyright system.⁹³

94. [REDACTED]

[REDACTED]. In particular, the present regulations provide that Sirius XM is required to calculate its royalty payment as a percentage of its total revenue and is permitted then to reduce its royalty payment by an amount proportional to the percentage of performances attributable to sound recordings fixed prior to 1972.⁹⁴

95. Whether the Judges adopt a statutory royalty rate that is assessed on a per-subscriber basis or a percentage-of-revenue basis, the current method of treatment for pre-1972

⁹³ See 17 U.S.C. § 301(c); 78 Fed. Reg. 23,073 (“pre-1972 recordings are not licensed under the statutory royalty regime”).

⁹⁴ The percentage of performances is calculated using data from Sirius XM’s webcasting service. See Written Direct Testimony of Jonathan Bender at 15 n.9; 37 C.F.R. § 382.12(d), (e).

sound recordings presumably would remain intact. In other words, Sirius XM would be allowed a deduction for the proportion of performances attributable to pre-1972 sound recordings. Consequently, there is no need to adjust benchmark rates to account for pre-1972 sound recordings.

E. Skips

96. In the *Web IV* proceedings, an adjustment to interactive streaming benchmark rates was required to account for the different treatment of skips⁹⁵ as between the benchmark and target services.⁹⁶ More specifically, whereas skips did not incur a royalty obligation for the interactive streaming services, skips were counted as royalty-bearing plays for the non-interactive services (*i.e.*, webcasters). Consequently, benchmark per-performance rates required a downward adjustment to reflect the fact that they would be applied to a larger universe of performances in the non-interactive realm, relative to the interactive streaming benchmark marketplace. In the instant proceeding, no such adjustment is needed. This is so for the simple reason that the whole notion of skips simply does not apply to satellite radio, where track performances play no part in determining Sirius XM's royalty obligation.

F. Promotion and Substitution Effects

97. Another potential source of adjustment concerns the promotion and substitution effects of the target and benchmark services. Promotion effects refer to the extent to which one type of service, say satellite radio, might stimulate demand for music in other distribution channels. On the flip side, substitution effects capture the extent to which time spent listening to music on satellite radio might cannibalize (*i.e.*, substitute for) the consumption of music *via* other channels of distribution.

⁹⁵ A "skip" refers to a partial performance of a song, *i.e.*, the user "skips" to the next song before completion of the current song. Typically, for services where partial performances can incur royalties, a royalty-bearing skip is any track that is played for at least a defined amount of time (*e.g.*, 30 seconds) before the user skips to the next track (or otherwise stops the current performance).

⁹⁶ *Web IV*, at 26,339.

98. Record companies, in their negotiations with distributors of sound recordings in any given channel, will factor in the degree to which end-user (consumer) purchases in that channel likely substitute for (*i.e.*, cannibalize) purchases in other music distribution channels.⁹⁷ At the same time, record companies also will take into account the expected promotional benefits of a particular channel, as reflected in the degree to which consumers' use of that channel tends to stimulate demand for music content in other distribution channels. For purposes of this proceeding, however, what matters is not the balance these two effects would strike in hypothetical negotiations between Sirius XM and individual record labels. Rather, the pertinent issue to examine is whether the balance of the two effects *vis-à-vis* Sirius XM likely differs in a significant way from the balance of the two effects *vis-à-vis* the benchmark service.

99. As the Judges have noted correctly in prior rate determinations, the balance of promotion and substitution effects engendered by a particular service will be reflected in (or baked into) the licensing rates it negotiates with sound recording copyright holders.⁹⁸ Thus, promotion and substitution effects compel an adjustment to benchmark rates only in circumstances where the balance of those effects in the benchmark marketplace are materially different than the balance in the target marketplace. In other words, the relevant issue is not whether satellite radio is, on balance, promotional, but rather whether the balance of promotion and substitution effects on satellite radio as compared to interactive subscription services is sufficiently different so as to justify an adjustment to the interactive subscription services benchmark rates.

100. Here, I understand that Professor George Ford, in his written direct testimony, discusses the data and information he used to assess whether differences in substitution and promotion effects as between satellite radio and interactive streaming might compel an adjustment to benchmark rates. His conclusion, as I understand it, is that the relative

⁹⁷ It should be clear that lower licensing fees likely will result in reduced retail prices and stronger consumer demand for a service. If that stronger demand to some degree siphons off demand in other channels where licensing fees are higher, record companies naturally and quite understandably will be concerned about the effect of the lower licensing fees on their profitability, and by extension their forward-looking capacity to fund the creation of new content.

⁹⁸ *Web IV* at 26,326.

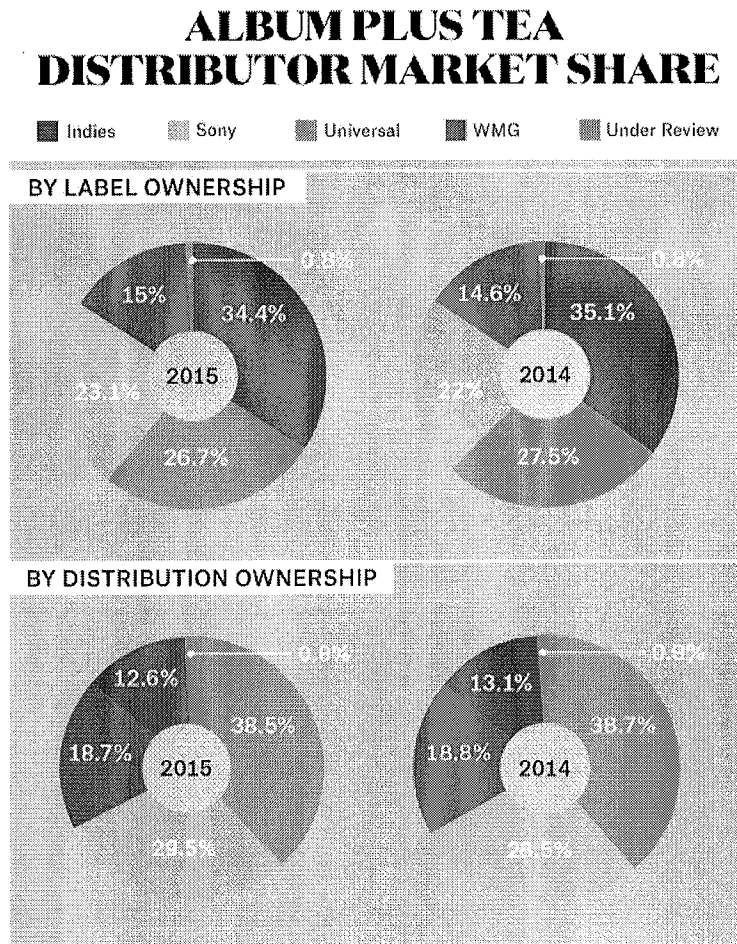
promotional effect of a particular service is a complex issue and not susceptible to reliable measurement with the data available. I further understand Dr. Ford to conclude that the available evidence pertaining to this issue does not support an adjustment to benchmark rates.

G. Independent Labels

101. As described above, my calculations of a benchmark rate rely upon actual royalties paid to the three major record companies, Sony, Universal, and Warner. However, one would be mistaken to assume that the same benchmark rate would not apply to hypothetical voluntary negotiations between Sirius XM and other (non-major) record companies. As I discuss below, because the majors distribute content for a large portion of independent record labels, the rate I have calculated reflects the rate that independent record labels would receive in the free market. Moreover, my analysis indicates that, [REDACTED]

[REDACTED]
[REDACTED].

102. First, it is important to understand that a significant majority of independent record labels distribute their sound recordings via the major record companies. Figure One, which is drawn from industry sources, shows that although independent record labels owned approximately 34.4% of sound recordings in 2015, almost two-thirds of those recordings, specifically 63.4% were distributed by the majors.

Figure One: Marketshare by Ownership and Distribution⁹⁹

103. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] This is confirmed by the testimony of Jeremy Sirota, who is a Senior Vice President of the Alternative Distribution Alliance (“ADA”)—the Warner-owned entity that distributes sound recordings for independent record labels. Mr. Sirota testifies

⁹⁹ Ed Christman, *U.S. Recording Industry 2015: Streams Double, Adele Dominates*, Billboard (Jan. 5, 2016).

that “an independent record label or artist that uses ADA as its distributor is distributed under the same streaming agreements, and according to the same terms, as a record label wholly owned by Warner.”¹⁰⁰

104. Indeed, I understand that [

[REDACTED] In other words, the benchmark I have calculated is derived based on royalties paid to majors and the great majority of royalties paid to independent record labels.

105. Second, my analysis indicates that

].¹⁰¹ Across the agreements reviewed, I found [

H. Non-Royalty Benefits

106. To conclude this section I will quickly note that the agreements between the benchmark interactive services and record companies provide to the record companies benefits in addition to royalty compensation, *i.e.*, benefits not available under a statutory license. These include:

¹⁰⁰ Written direct testimony of Jeremy Sirota, submitted October 19, 2016, at 3.

¹⁰¹ Written direct testimony of Bruce Iglauer, submitted October 19, 2016, at 13.

- Streaming services provide to the record companies the services' user data, which provides the record companies with important information they use to decide how to market and promote their artists;
- The negotiated agreements with streaming services require the services to provide various forms of marketing and promotional support;
- Under the statutory license, record companies arguably do not have the ability to withhold any content, while under the agreements negotiated with the streaming services, the record companies retain the right to provide certain content exclusively to services and to "window" their new releases; and
- In addition to the marketing and promotional benefits, some negotiated agreements give record companies access to the email addresses of users or subscribers, which the record companies use to send promotional material.¹⁰²

107. Based on the foregoing, an upward adjustment to benchmark rates clearly is justified. However, because quantification of the appropriate amount is not susceptible to accurate measurement, I take the conservative course and decline to adjust benchmark rates upward.

VI. The Suitability of Sirius XM's Direct Licenses as a Benchmark

108. In this section, I consider whether the direct licenses that Sirius XM has executed with various independent record labels ("direct licensors") might serve as a proper benchmark for the statutory license being determined in this proceeding. Aside from the possibility noted above that the difference between the statutory rate and the rate offered in direct licenses could represent the upper bound on a steering adjustment, I conclude that the direct licenses otherwise are of no utility for purposes of gauging the royalty rate that would be reached in hypothetical voluntary negotiations between Sirius XM and rights owners.

109. As an initial matter, Sirius XM's direct licenses are not probative of market-based rates. Sirius XM and direct licensors negotiated the terms of direct licenses under a regime where rights owners do not have the option of withholding a license to their sound recordings (due to the existence of the statutory license). Sirius XM thus entered negotiations knowing that

¹⁰² Harrison WDT ¶ 31.

it could obtain the potential licensor's entire repertoire at the statutory rate. This setting differs markedly from an unregulated market, in which the seller can elect not to license if the price offered by the buyer is deemed insufficient. In this setting, Sirius XM has no incentive to agree to a rate higher than the statutory rate, absent some other benefit conferred upon it, just as a direct licensor has no incentive to agree to a rate below the statutory level absent some other benefit conferred upon it.¹⁰³ Consequently, the rates in Sirius XM's direct licenses are anchored by the statutory rate, and under the facts of this case only reflect the degree to which certain record labels are willing to discount from the statutory rate in exchange for certain perceived benefits.

110. The conclusion above is consistent with the analysis of Professor Lys, who shows that the rates offered in direct licenses have tracked almost perfectly the statutory rate as the statutory rate has increased.¹⁰⁴

111. Even if one reasonably could treat the direct licenses as indicative of rates that would be reached in an unregulated marketplace (which would be a fundamental error for the reason discussed above), they would make a poor benchmark for several additional reasons. First, while it is my understanding that Sirius XM has provided a number of direct licenses in this proceeding, those licenses account for a tiny slice of the market. I understand that Professor Lys, for instance, finds that [REDACTED]

[REDACTED].¹⁰⁵

112. Furthermore, [REDACTED]
[REDACTED]. I understand that, according to
Sirius XM's records, [REDACTED]
[REDACTED]
[REDACTED].¹⁰⁷

¹⁰³ Lys WDT ¶¶ 256-269.

¹⁰⁴ See *id.* Figures 67-68.

¹⁰⁵ *Id.* ¶ 278.

¹⁰⁶ *Id.* ¶ 279.

¹⁰⁷ *Id.*

It would be unwise to set a rate for the entire industry based on agreements that represent such a small portion of the market, and [REDACTED].

113. The royalty rates found in direct licenses are of further dubious utility as a benchmark because of [REDACTED]. More specifically while [REDACTED]

[REDACTED]
[REDACTED].¹⁰⁸

114. Finally, and as alluded to earlier, it is my understanding that the direct licenses extend to record companies certain benefits that plausibly are *quid pro quo* for lower rates. These include:

- In most of Sirius XM's direct licenses, it agrees to pay the direct licensor under a structure that differs from, and has the potential to generate more royalties than, the statutory rate. In particular, Sirius XM agrees to pay royalties based on the direct licensor's share of performances on Sirius XM's webcasting service, instead of based on the licensor's share of plays or "spins," as SoundExchange does.¹⁰⁹ This creates the possibility of perceived benefits on the part of an indie that could incentivize it to accept a discounted rate and, as Professor Lys shows, in many cases provides actual benefits in the form of more royalties.
- I understand that in all of Sirius XM's direct licenses, it agrees to provide direct payment of 100% of the royalty to the direct licensor. In contrast, under the statutory license, SoundExchange is obligated to distribute 50% of collected performance royalties to the record companies and the other half to the artists. It is my understanding that, upon receipt of the full royalty payment, the directly licensed label may pay the artist share based on the terms of its agreement with the artist, which typically provide for less than 50% of royalties. Moreover, in addition to being entitled to a greater percentage of the royalty, labels are typically permitted by their agreements with artists to recoup certain

¹⁰⁸ *Id.* ¶ 280.

¹⁰⁹ A "play" or "spin" refers to one transmission of one song on Sirius XM's satellite radio service. A "performance" is one listen to one spin by one person. To illustrate, if Sirius XM broadcasts Parachute Woman by The Rolling Stones and 5,000 subscribers listen to the track on Sirius XM's webcasting service, that is one play/spin and 5,000 performances.

costs (advances, promotion, etc.) against the artist's share. As Professor Lys demonstrates, this can translate into direct value to the direct licensor.¹¹⁰

- I understand that Sirius XM's agreements provide several other potential benefits to direct licenses that could act as *quid pro quo* for a lower rate, including payment for pre-1972 sound recordings, specialized content feeds to maximize the accuracy of payments, royalty advances, and avoidance of SoundExchange's administrative fees.¹¹¹

115. As I have suggested above, these idiosyncratic benefits incentivize labels to enter direct licenses notwithstanding the availability of the statutory rate, because labels have the potential to earn more royalties than they would earn under the statutory rate, without any increase in the number of plays. These features of direct licenses further confirm that the decision to execute a direct license is made relative to the royalties that would be earned under the statutory license, and not representative of what would be negotiated in an unregulated market.

116. In sum, the direct licenses that Sirius XM signs with certain independent record companies represent a deeply flawed benchmark for determining a sound recording licensing rate in this proceeding.

VII. Conclusion


117. My two approaches yield percentage-of-revenue rates of 22.12% to 24.08% and per-subscriber rates ranging from \$2.37 to \$2.58. These rates reflect what I view as the maximum plausible adjustment to account for steering. I reserve the right to reconsider the magnitude of the steering adjustment, and to adjust upward my benchmark rates, once additional relevant evidence is forthcoming. In any case, my benchmark rates, as presented, support the reasonableness of SoundExchange's rate proposal

¹¹⁰ Lys ¶ 309.

¹¹¹ *Id.* ¶¶ 313-22.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: OCTOBER 13, 2016


Jonathan Orszag

Appendix A – Curriculum Vitae



CURRICULUM VITAE

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PROFESSIONAL EXPERIENCE:

- **Senior Managing Director**, Compass Lexecon (previously Competition Policy Associates, Inc. ("COMPASS")) and before that, Sebago Associates, Inc.), March 2000-Present. Manage economic consulting firm specializing in antitrust, economic policy, and litigation matters. Member of the firm's Executive Committee. Conduct economic and financial analysis on a wide range of complex issues involving mergers, litigation, public policy, and regulations for corporations and public-sector entities. Serve as expert witness in proceedings before U.S. and international courts and administrative agencies and the European Court of First Instance on competition policy issues, including industry structure, vertical relationships, and intellectual property rights.
- **Assistant to the Secretary and Director of the Office of Policy and Strategic Planning**, U.S. Department of Commerce (Washington, D.C.), March 1999-March 2000. Served as the Secretary of Commerce's chief policy adviser. Responsible for coordinating the development and implementation of policy initiatives within the Department. Worked on a wide range of issues, from implementing the steel loan guarantee program to telecommunications and e-commerce issues. Represented the Secretary of Commerce in meetings with other government officials and outside organizations, and testified before Congress on behalf of the Department on budget and Native American economic development issues.
- **Economic Policy Advisor**, National Economic Council, The White House (Washington, D.C.), August 1997-March 1999; Assistant Director, January 1996-November 1996. Coordinated policy processes on a wide range of issues, from Social Security reform to job training reform, unemployment insurance

reform, homeownership and low-income housing issues, the minimum wage, and Individual Development Accounts. Responsible for helping to coordinate the Administration's daily economic message and to promote (and defend) President Clinton's economic record.

- **Economics Teacher**, Phillips Exeter Academy Summer School (Exeter, New Hampshire), June 1997-August 1997. Taught introductory economics at Phillips Exeter Academy Summer School.
- **Economic Consultant**, James Carville (Washington, D.C.), August 1995-January 1996. Helped James Carville, President Clinton's 1992 campaign strategist, research and write his *New York Times* #1 best-selling book, *We're Right, They're Wrong: A Handbook for Spirited Progressives*.
- **Special Assistant to the Chief Economist**, U.S. Department of Labor, (Washington, D.C.), August 1994-August 1995. Served as an economic aide to the Chief Economist (Alan B. Krueger) and the Secretary of Labor (Robert B. Reich).

Volunteer Positions

- **Director of Policy Preparations for Vice Presidential Debate**, Gore-Lieberman Presidential Campaign, September 2000-October 2000. Oversaw policy preparations for Democratic Vice Presidential candidate before his debate with the Republican Vice Presidential candidate.
- **Weekly Commentator**, *Wall Street Journal Online*, September 2004-November 2004. Commented on economic issues during the 2004 presidential campaign. Topics of weekly commentary included jobs, health care, energy, trade, taxes, tort reform, appointments, and fiscal policy.

EDUCATION:

- Oxford University, M.Sc. in Economic and Social History, 1997
- Princeton University, A.B. *summa cum laude* in Economics, 1996
- Phillips Exeter Academy, graduate with High Honors, 1991

HONORS, PROFESSIONAL ASSOCIATIONS, AND APPOINTMENTS:

- Phi Beta Kappa, inducted June 1996
- Marshall Scholar, 1996
- *USA Today* All-USA College Academic Team, 1996
- Corporation for Enterprise Development Leadership Award for "Forging Innovative Public Policies to Expand Economic Opportunity in America," 1999
- *Who's Who in America*, 2001-Present; Also, *Who's Who in the World*; *Who's Who in Science and Engineering*; *Who's Who in Finance and Business*; and *Who's Who of Emerging Leaders*
- California Workforce Investment Board, 2000-2003
- California Governor's Technology Advisory Group, 2000-2003
- Adjunct Lecturer, University of Southern California (Los Angeles, CA), January 2002-June 2002.

- *Global Competition Review's* "40 under 40: The World's 40 Brightest Young Antitrust Lawyers and Economists," 2004
- *Global Competition Review's* "Best Young Competition Economists," 2006
- *The International Who's Who of Competition Economists*, 2007-Present
- LawDay Leading Competition Economics Experts, 2009-Present.
- Expert Guides, Best of the Best USA, 2011-Present.
- Fellow, University of Southern California's Center for Communication Law & Policy, 2007-2015.
- FTI Consulting Inc., Founders Award, 2008.
- Senior Fellow, Center for American Progress, 2009-2016.
- Board of Directors, Sebago Associates, Inc., 2000-2007; Competition Policy Associates, Inc., 2003-2006; The First Tee of Washington, DC, 2005-2011; Ibrix, Inc. (Sold to Hewlett-Packard), 2006-2007; JMP Securities, Inc. (NYSE: JMP), 2011-Present; Tiger Woods Foundation, Board of Governors, 2012-Present; Children's Golf Foundation, 2013-Present; Friends of the Global Fight Against AIDS, Tuberculosis, and Malaria, 2013-Present.
- Clinton Global Initiative, Member, 2008-2016; Grassroot Soccer, Ambassadors Council, 2010-Present; The First Tee, Trustee, 2013-Present.
- Member of the American Economic Association, the Econometric Society, the American Finance Association, and the United States Golf Association.

REPORTS, PAPERS, AND NOTES:

- "Toward a More Complete Treatment of Efficiencies in Merger Analysis," with Loren Smith, *Antitrust Source*, forthcoming.
- "State Involvement in a Market Economy: Principles to Guide Interventions and a Discussion about Network Industries," in *Antitrust in Emerging and Developing Countries*, edited by Eleanor Fox, Harry First, Nicolas Charbit, and Elisa Ramundo, *Concurrences Review*, 2016.
- "Tax Reform in The Bahamas: An Evaluation of Proposed Options," with David Kamin, Commissioned by the Commonwealth of The Bahamas, May 27, 2014.
- "The Impact of Federal Revenues from Limiting Participation in the FCC 600 MHz Spectrum Auction," with Philip Haile and Maya Meidan, Commissioned by AT&T, October 30, 2013.
- "The Definition of Small Business in the Marketplace Fairness Act of 2013," Commissioned by eBay, Inc., October 8, 2013.
- "The Benefits of Patent Settlements: New Survey Evidence on Factors Affecting Generic Drug Investment," with Bret Dickey, Commissioned by the Generic Pharmaceutical Association, July 23, 2013.
- "The Liftoff of Consumer Benefits from the Broadband Revolution," with Mark Dutz and Robert D. Willig, *Review of Network Economics*, Volume 11, Issue 4, Article 2, 2012.
- "Antitrust Guidelines for Private Purchasers Engaged in Value Purchasing of Health Care," with Tim Muris and Bilal Sayyed, Commissioned by Buying Value, July 2012.

- “The Economic Benefits of Pharmacy Benefit Managers,” with Kevin Green, Commissioned by Express Scripts and Medco, December 5, 2011.
- “An Analysis of the Benefits of Allowing Satellite Broadband Providers to Participate Directly in the Proposed CAF Reverse Auctions,” with Bryan Keating, Commissioned by ViaSat, Inc., April 18, 2011.
- “A Preliminary Economic Analysis of the Budgetary Effects of the Proposed Restrictions on ‘Reverse Payment’ Settlements,” with Bret Dickey and Robert D. Willig, August 10, 2010.
- “An Economic Assessment of Patent Settlements in the Pharmaceutical Industry,” with Bret Dickey and Laura Tyson, Volume 10, Issue 2, *Annals of Health Law*, Winter 2010.
- “An Economic Analysis of Consumer Harm from the Current Retransmission Consent Regime,” with Michael Katz and Theresa Sullivan, Commissioned by the National Cable & Telecommunications Association, DIRECTV, and DISH Network, November 12, 2009.
- “Intellectual Property and Innovation: New Evidence on the Relationship Between Patent Protection, Technology Transfer, and Innovation in Developing Countries,” with Mark Dutz and Antara Dutta, October 2009.
- “Intellectual Property and Innovation: A Literature Review of the Value of Patent Protection for Developing Countries,” with Mark Dutz and Antara Dutta, October 2009.
- “An Economic Perspective on the Antitrust Case Against Intel,” with Robert D. Willig and Gilad Levin, October 2009.
- “The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households,” with Mark Dutz and Robert D. Willig, July 2009.
- “An Economic Assessment of the Homeowners’ Defense Act of 2009,” with Doug Fontaine, July 2009.
- “A Preliminary Economic Analysis of FTC Chairman Leibowitz’s June 23rd Speech,” with Robert D. Willig, June 24, 2009.
- “Assessment of Microsoft’s Behaviour in the Browser Market,” with Assaf Eilat, Gilad Levin, Andrea Lofaro, and Jan Peter van der Veer, Submitted to the Commission of the European Communities, COMP/C-3/39.530, May 27, 2009.
- “An Economic Perspective on the Microsoft Internet Explorer Tying Case,” with Assaf Eilat, Gilad Levin, Andrea Lofaro, and Jan Peter van der Veer, Submitted to the Commission of the European Communities, COMP/C-3/39.530, April 24, 2009.
- “The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data,” with Mark Israel, February 2009.
- “An Econometric Analysis of the Matching Between Football Student Athletes and Colleges,” with Yair Eilat, Bryan Keating, and Robert D. Willig, January 2009.
- “An Economic Assessment of Regulating Credit Card Fees and Interest Rates,” with Susan H. Manning, October 2007.
- “An Assessment of the Competitive Effects of the SKY-Prime Merger: Lessons from the Recent News Corp.-DIRECTV Merger,” with Cristian Santesteban, Submitted to New Zealand Commerce Commission, January 23, 2006.
- “Closing the College Savings Gap,” with Peter R. Orszag and Jason Bordoff, November 2005.

- “Putting in Place An Effective Media Player and Media Server Remedy,” with Joseph E. Stiglitz, Submitted to the Korean Fair Trade Commission, October 10, 2005.
- “An Economic Analysis of Microsoft’s Tying of the Windows Media Player to the Windows Operating System and Its Impact on Consumers, Competition, and Innovation,” with Joseph E. Stiglitz, Submitted to the Korean Fair Trade Commission, September 12, 2005.
- “Economic Analyses of Microsoft’s Abusive Tie and Its Impact on Consumers, Competition, and Innovation,” with Joseph E. Stiglitz and Sangin Park, Submitted to the Korean Fair Trade Commission, September 12, 2005.
- “The Empirical Effects of Division II Intercollegiate Athletics,” with Peter R. Orszag, June 2005.
- “An Economic Analysis of Microsoft’s Abusive Tie and Its Impact on Consumers, Competition, and Innovation,” with Joseph E. Stiglitz and Jason Furman, Submitted to the European Court of First Instance, Case T-201/04 R, May 12, 2005.
- “The Physical Capital Stock Used in College Athletics,” with Peter R. Orszag, April 2005.
- “The Empirical Effects of Collegiate Athletic Spending: An Update,” with Peter R. Orszag, April 2005.
- “Putting in Place An Effective Media Player Remedy,” with Joseph E. Stiglitz, Submitted to the Commission of the European Communities, April 27, 2005.
- “The Empirical Effects of Collegiate Athletic Spending: An Interim Report,” with Robert E. Litan and Peter R. Orszag, the National Collegiate Athletic Association and Sebago Associates, Inc., August 2003 (reprinted in *The Business of Sports*, edited by Scott Rosner and Kenneth Shropshire (Jones and Bartlett Publishes, 2004)).
- “Learning and Earning: Working in College,” with Peter R. Orszag and Diane M. Whitmore, *Journal of Student Employment*, Volume IX, Number 1, June 2003.
- “The Impact of Asbestos Liabilities on Workers in Bankrupt Firms,” with Joseph E. Stiglitz and Peter R. Orszag, *Journal of Bankruptcy Law and Practice*, Volume 12, Issue No. 1, February 2003.
- “The Process of Economic Policy-Making During the Clinton Administration,” with Peter R. Orszag and Laura D. Tyson, in *American Economic Policy in the 1990s*, edited by Jeffrey Frankel and Peter R. Orszag (Cambridge, Massachusetts: MIT Press, 2002).
- “The Implications of the New Fannie Mae and Freddie Mac Risk-Based Capital Standard,” with Joseph E. Stiglitz and Peter R. Orszag, *Fannie Mae Papers*, Volume I, Issue 2, March 2002 (reprinted in *Housing Matters: Issues in American Housing Policy*).
- “Hispanics and the Current Economic Downturn: Will the Receding Tide Sink Hispanics?” with Alan B. Krueger, Pew Hispanic Center, January 2002.
- “Aging in America: A Policy Perspective,” with Jonathan Gruber and Peter R. Orszag, The Pew Charitable Trusts and Sebago Associates, Inc., January 2002.
- “An Economic Analysis of Spectrum Allocation and Advanced Wireless Services,” with Martin N. Baily, Peter R. Orszag, and Robert D. Willig, Cellular Telecommunications and Internet Association and Sebago Associates, Inc., October 2001.
- “A New Look at Incentive Effects and Golf Tournaments,” in *The Economics of Sports*, edited by Andrew Zimbalist (London: Edward Elgar Publishing, 2001). Original version in *Economics Letters*, 46, March 1994, p. 77-88.

- “Learning and Earning: Working in College,” with Peter R. Orszag and Diane M. Whitmore, UPromise, Inc. and Sebago Associates, Inc., August 2001.
- “The Impact of Potential Movie and Television Industry Strikes on the Los Angeles Economy,” with Ross C. DeVol, Joel Kotkin, Peter R. Orszag, Robert F. Wescott, and Perry Wong, The Milken Institute and Sebago Associates, Inc., April 19, 2001.
- “Would Raising IRA Contribution Limits Bolster Retirement Security for Lower- and Middle-Income Families?” with Peter R. Orszag, Center on Budget and Policy Priorities, April 2, 2001.
- “Computers in Schools: Domestic and International Perspectives,” California Technology, Trade, and Commerce Agency and Sebago Associates, Inc., March 2001.
- “The Impact of Paying for College on Family Finances,” with Laura D. Tyson, Joseph E. Stiglitz, and Peter R. Orszag, UPromise, Inc. and Sebago Associates, Inc., November 2000.
- “A Simple Analysis of Discarded Votes by Precinct in Palm Beach,” with Peter R. Orszag, Sebago Associates, Inc., November 10, 2000.
- “Analysis of Votes for Buchanan by Precinct within Palm Beach and Broward Counties,” with Peter R. Orszag, Sebago Associates, Inc., November 9, 2000.
- “A Statistical Analysis of the Palm Beach Vote,” with Peter R. Orszag, Sebago Associates, Inc., November 8, 2000.
- “The Role of Government in a Digital Age,” with Joseph E. Stiglitz and Peter R. Orszag, Computer and Communications Industry Association and Sebago Associates, Inc., October 2000.
- “Quantifying the Benefits of More Stringent Aircraft Noise Regulations,” with Peter R. Orszag, Northwest Airlines and Sebago Associates, Inc., October 2000.
- “All That Glitters Is Not Gold: The Feldstein-Liebman Analysis of Reforming Social Security with Individual Accounts,” with Peter R. Orszag, Center on Budget and Policy Priorities, April 26, 2000.
- “Would Raising IRA Contribution Limits Bolster Retirement Security For Lower- and Middle-Income Families or Is There a Better Way?” with Peter R. Orszag, Center on Budget and Policy Priorities, April 12, 2000.
- “The Economics of the U.S.-China Air Services Decision,” with Peter R. Orszag, and Diane M. Whitmore, United Parcel Service and Sebago Associates, Inc., March 2000.

OP-EDS/LETTERS TO THE EDITOR:

- “Hitting Budget Numbers May Be Up for Auction,” *Roll Call*, December 19, 2013.
- “Jack Welch Could Help Improve U.S. Jobs Data,” with Peter R. Orszag, *Bloomberg*, October 9, 2012.
- “Giving Credit Where Credit Is Due,” *The Hill*, December 2, 2011.
- “PBMs Save Us Billions,” *The Hill*, November 28, 2011.
- “Drug Patent Settlements,” with Robert D. Willig, *New York Times*, July 19, 2010.
- “Homeowners Defense Act Could Lower Insurance Premiums,” *Treasure Coast Palm*, September 24, 2009.

- “Katrina Teaches Us To Financially Prepare Today for the Catastrophe of Tomorrow,” *San Angelo Standard-Times*, September 23, 2009.
- “A Catastrophe Waiting To Happen,” *The Daily Citizen*, September 15, 2009.
- “Broadband: Now A ‘Necessity’,” *Multichannel News*, August 10, 2009.
- “Forget the Estate Tax: America Needs An Inheritance Tax,” *Ideas Primary*, January 23, 2008, available at <http://www.ideasprimary.com/?p=442>
- “Credit Where It’s Due,” *Wall Street Journal*, October 25, 2007.
- “Congress Grounds Delivery Competition,” Sebago Associates, Inc., April 17, 2003.
- “Paul O’Neill Doesn’t Cry for Argentina,” Sebago Associates, Inc., August 3, 2001.
- “Do You Recognize The Clinton West Wing in *The West Wing*?” *The Atlantic Monthly* Online, March 2001.

SPEECHES AND PRESENTATIONS:

- “Setting the Stage: State Involvement in A Market Economy,” Panelist at Concurrences Review and New York University School of Law Conference on “Antitrust in Emerging and Developing Economies: Africa, Brazil, China, India, Mexico...,” New York, NY, October 23, 2015.
- “Office Superstores: What Changed in 15 Years?” Panelist on ABA Section of Antitrust Law, Economics and Mergers & Acquisitions Committees, Washington, DC, January 6, 2014.
- “Five Bars: Spectrum Policy and the Future of the Digital Economy,” Panelist at Third Way Briefing, House of Representatives, Washington, DC, December 11, 2013.
- “An Economic Perspective on Reverse Payment Settlements in the Pharmaceutical Sector,” Speech to the Generic Pharmaceutical Association 2013 Annual Meeting, Orlando, Florida, February 21, 2013.
- “Navigating Our Economic Challenges and the Role of Public Policy,” Speech to the South Carolina Manufacturers Alliance Fourth Annual Textile Summit, Spartanburg, South Carolina, January 10, 2013.
- “Upward Price Pressure and Merger Analysis: What Is UPP’s Proper Role and How Can UPP Deal With Real-World Issues?” Presentation to Gilbert + Tobin, Sydney, Australia, December 4, 2012.
- “Obama’s Second Term: What It Means for the U.S. and World Economies,” FTI Consulting, Inc., Brisbane, Australia, December 3, 2012.
- “Merger Substance: How to Conduct a Proper Analysis of a Merger’s Competitive Effects, and How to Frame Related Legal Standards?” Panelist at Antitrust in Asia, American Bar Association, New Delhi, India, December 1, 2012
- “Financial Issues in College Sports,” Panelist at the Third Annual Sports Law Symposium: What is the Proper Role of Sports in Higher Education?, Institute of Sports Law and Ethics, Santa Clara University, September 6, 2012.
- “Pricing and Bundling of IT Products: Drawing The Line Between Lawful and Unlawful Behaviour,” Panelist on GCR Live’s Antitrust and Technology 2012, London, England, March 14, 2012.
- “The Role of Economic Evidence in Cartel Enforcement,” Speaker on ABA Section of International Law Teleconference, February 28, 2012.

- “Reverse Payment Settlements in the Pharmaceutical Industry,” Presentation to the House Energy and Commerce Committee Staff, July 15, 2011.
- “Increased Government Intervention: The Good, The Bad, and the Ugly,” Panelist, Association of Management Consulting Firms, New York, NY, December 2, 2010.
- “The Economic Challenges and Trade-Offs Facing the Obama Administration,” Remarks to RBS Citizens, Boston, MA, June 8, 2010.
- “Competition Policy As Innovation Policy,” Panelist, Computer & Communications Industry Association, Washington DC, October 27, 2009.
- “State of the Market: Regulatory Evolution and Policy,” Moderator, Youth, I.N.C. and Piper Jaffray, New York, NY, September 29, 2009.
- “The Empirical Effects of Collegiate Athletics,” Presentation to the NCAA Leadership Advisory Board, Detroit, Michigan, April 4, 2009.
- “The Economic Challenges and Trade-Offs Facing the Obama Administration,” Remarks to the Junior Capital Group, Proskauer Rose, LLP, New York, NY, February 10, 2009.
- “Managing Communications During Unprecedented Economic Times,” Panelist, The California Club, Los Angeles, CA, January 27, 2009.
- Presentation to the Computer & Communications Industry Association’s Antitrust Summit on Innovation and Competition Policy in High-Tech Markets, Washington DC, October 24, 2008.
- Presentation to the Center for American Progress Action Fund Session on the “Avoiding the Pitfalls of Credit Card Debt,” Washington, DC, February 25, 2008.
- “Distribution Fund Planning and Management: Lessons Learned from the Global Research Analyst Settlement,” with Francis McGovern, Presentation to the Securities and Exchange Commission, Washington, DC, January 31, 2006.
- “The Empirical Effects of Division II Intercollegiate Athletics,” Presentation to the National Collegiate Athletic Association 2006 Annual Convention, Indianapolis, Indiana, January 8, 2006.
- “Rules of the Game: Defining Antitrust Markets in Cases Involving Sports,” Presentation to the Wilmer, Cutler, Pickering, Hale & Dorr Antitrust Lunch, Washington, DC, December 8, 2005.
- “Competition Policy, Antitrust, and The High-Tech Economy,” Keynote Address to the Computer & Communications Industry Association TechSummit 2005, Laguna Beach, CA, October 26, 2005.
- “The Empirical Effects of Division II Intercollegiate Athletics,” Presentation to the Division II Chancellors and Presidents Summit, Orlando, FL, June 25, 2005.
- “The Empirical Effects of Collegiate Athletic Spending: An Update and Extension,” Presentation to the President’s Task Force on the Future of Intercollegiate Athletics, Tucson, AZ, June 9-10, 2005.
- “The Empirical Effects of Collegiate Athletic Spending: An Update and Extension,” Presentation to the NCAA Division I Board of Directors, Indianapolis, IN, April 28, 2005.
- “An Analysis of Division II Athletic Expenditures: Preliminary Findings,” Presentation to the NCAA Division II Board of Directors, Indianapolis, IN, April 28, 2005.
- “An Analysis of Division II Athletic Expenditures: An Overview of Study Design,” Presentation to the National Collegiate Athletic Association 2005 Annual Convention, Grapevine, Texas, January 8, 2005.

- “The Empirical Effects of Collegiate Athletic Spending: An Interim Report,” Presentation to the National Association of State Universities and Land Grant Colleges Annual Conference, November 17, 2003.
- “The Impact of Asbestos Liabilities on Workers in Bankrupt Firms,” *South Texas Law Review*, “Symposium: Asbestos Litigation,” Fall 2003.
- “The Impact of Asbestos Liabilities on Workers in Bankrupt Firms,” Presentation to the Conference on “Understanding Asbestos Litigation: The Genesis, Scope, and Impact,” U.S. Chamber of Commerce, Washington, DC, January 23, 2003.
- “The Process of Economic Policy-Making During the Clinton Administration,” Presentation to the Conference on “American Economic Policy in the 1990s,” Center for Business and Government, John F. Kennedy School of Government, and Harvard University, Cambridge, MA, June 29, 2001.
- “The Impact of Paying for College on Family Finances,” Presentation to the Conference on “Funding Excellent Schools and Colleges for All Students,” National Conference of State Legislatures, Savannah, Georgia, February 17, 2001.
- “China and the Internet,” Remarks on Entertainment and the Internet in China at the EMASIA 2000 Forum, The Asia Society, Los Angeles, CA, May 23, 2000.
- “Is It The Star or Just an Extra? The Role Government Plays in a Digital Economy,” Remarks on the Regulation of Global Electronic Commerce at the eCommerce and Global Business Forum, The Anderson School at UCLA and the University of Washington Business School, Santa Cruz, CA, May 18, 2000.
- “Lessons Learned from the Emergency Loan Guarantee Programs,” Keynote Address at the Government Guaranteed Lending 2000 Conference, Coleman Publishing, Inc., May 4, 2000.
- “Don’t Just Think, Believe,” Remarks to the Assembly of Phillips Exeter Academy, Exeter, New Hampshire, February 9, 1999.

TESTIMONY:

- *In Re National Collegiate Athletic Association Atheltic Grant-In-Aid Cap Antitrust Litigation*, United States District of Court for the Northern District of California, (Case: No. 4:14-md-2541-CW), (Expert Report: August 26, 2016; Deposition: September 28, 2016).
- *Review of Commodity, Boxcar, and TOFC/COFC Exemptions*, Docket No. EP 704 (Sub-No 1), Before Surface Transportation Board, with Mark Israel (Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016).
- *Division of Insurance Regulation v. Aetna, Inc. and Humana, Inc.*, In the Department of Insurance, Financial Institution, and Professional Registration, State of Missouri, (Case No. 160325191C), (Hearing Testimony: May 16, 2016).
- *Federal Trade Commision et al., v. Staples, Inc. and Office Depot, Inc.*, United States District Court for the District of Columbia, (Case: 1:15-cv-02115-EGS), (Expert Report: February 29, 2016; Deposition: March 14, 2016).
- *American Airlines, Inc. v. British Airways PLC; Iberia Lineas Aereas de Espana, and Finnair OYJ*, Before the American Arbitration Association, (Expert Report: December 16, 2015).
- *In the Matter of AT&T Mobility, LLC v. Iowa Wireless Services, LLC*, in File No. EB-15-MD-007,

Before the Federal Communications Commission (Declaration: October 21, 2015; Reply Declaration: February 5, 2016).

- *U.S. Department of Justice v. AB Electrolux; Electrolux North America, Inc.; and General Electric Company*, United States District Court for the District of Columbia, (Case: 1:15-cv-01039-EGS), (Expert Report: September 30, 2015; Rebuttal Report: October 20, 2015; Deposition: October 28, 2015; Supplemental Report: November 11, 2015; Trial Testimony: December 3-4, 2015).
- *Vijay Singh v. PGA Tour, Inc.*, Supreme Court of the State of New York (Index No. 651659/2013), (Expert Report: June 12, 2015; Deposition: August 20, 2015).
- *In re: Lightsquared Inc., et al.*, In the United States Bankruptcy Court for the Southern District of New York (Case No. 12-12080 (SCC)), (Expert Report: February 3, 2015; Deposition: February 23, 2015; Trial Testimony: March 12, 2015).
- *Armando Diaz et al v. San Juan Cable LLC* In The United States District Court for the District of Puerto Rico (Civil Action No: 14-1244-CCC), (Expert Report: December 5, 2014).
- *In the Matter of World Call Interconnect, Inc. v. AT&T Mobility LLC*, in File No. EB-14-MD-011, Before the Federal Communications Commission (Declaration: November 5, 2014).
- *In re Cablevision Consumer Litigation*, In The United States District Court for the Eastern District of New York (10-CV-4992 (JS) (AKT)) (Expert Report: July 18, 2014; Rebuttal Expert Report: September 11, 2014; Deposition: October 2, 2014).
- *Orbital Sciences Corporation v. United Launch Alliance, LLC, and RD Amross, LLC*, In the United States District Court for the Eastern District of Virginia (Civil No: 1:13-cv-00753 LMB/JFA), (Expert Report: February 28, 2014).
- *Puerto Rico Telephone Company, Inc. v. San Juan Cable LLC d/b/a OneLink Communications*, In the United States District Court for the District of Puerto Rico (Civil No: 11-2135 (GAG)), (Expert Report: December 11, 2013; Supplemental Report: December 23, 2013; Deposition: January 10, 2014).
- *Sky Angel U.S., LLC v. Discovery Communications, LLC, et al.* In the United States District Court of Maryland, Southern Division (Civil Action No. 8:13-cv-00031-DKC), (Expert Report: December 6, 2013; Deposition: January 31, 2014; Trial Testimony: November 23, 2015).
- *Oakley, Inc. vs. Nike, Inc. and Rory McIlroy*; In the United States District Court for the Central District of California (Case No. SACV12-02138 JVS-MLG), (Expert Report: November 26, 2013).
- *In re: Electronic Books Antitrust Litigation; The State of Texas, et al., v Penguin Group (USA), Inc., et al.*, In the United States District Court for the Southern District of New York (No. 11-md-02293 (DLC) and No. 12-cv-03394 (DLC)), (Declaration: November 15, 2013; Deposition: December 7, 2013; Sur-Reply Declaration: January 21, 2014).
- Hearing on “Pay-for-Delay Deals: Limiting Competition and Costing Consumers,” Testimony to the Senate Judiciary Committee, Subcommittee on Antitrust, Competition Policy, and Consumer Rights, July 23, 2013.
- *Federal Trade Commission v. Actavis, Inc., et al.*, Signatory, Brief of Antitrust Economists as *Amici Curiae* before the Supreme Court, No. 12-416, February 28, 2013.
- *VOOM HD Holding LLC v. EchoStar Satellite LLC*, In the Supreme Court of the State of New York, County of New York (Index No. 600292/08), (Expert Report: December 4, 2009; Deposition Testimony: March 5, 2010; Supplemental Expert Report: August 10, 2012; Supplemental Deposition Testimony: September 14, 2012; Jury Trial Testimony: October 11-12, 2012).

- *Hewlett-Packard Company v. Oracle Corporation*, In the Superior Court of the State of California, County of Santa Clara (Case No 1-11-CV-203163), (Expert Report: March 26, 2012; Rebuttal Report: April 9, 2012; Deposition Testimony: April 19, 2012; Supplemental Expert Report: December 10, 2012; Supplemental Deposition Testimony: February 5, 2013; Trial Testimony: March 18, 2013; Updates to Supplemental Expert Report: November 30, 2015; Supplemental Rebuttal Report: March 15, 2016; Supplemental Deposition Testimony: March 24, 2016, April 20, 2016; Jury Trial Testimony: June 20-21, 2016, June 28, 2016; Declaration: August 1, 2016).
- *In The Matter of Game Show Network, LLC v. Cablevision Systems Corporation*, in File No. CSR-8529-P, Before the Federal Communications Commission (Expert Report: December 12, 2011; Reply Declaration: February 9, 2012; Expert Report: December 14, 2012; Deposition Testimony: February 7, 2013, March 12, 2015; Direct Testimony: March 12, 2013; Supplemental Direct Testimony: March 19, 2013; Rebuttal Report: December 15, 2014; Complete Direct Testimony: June 1, 2015; Trial Testimony: July 20, 2015).
- Hearing on “The Express Scripts/Medco Merger: Cost Savings for Consumers or More Profits for the Middlemen?” Written Testimony to the Senate Judiciary Committee, Subcommittee on Antitrust, Competition Policy, and Consumer Rights, December 6, 2011.
- *In the Matter of Applications of AT&T Inc. and Deutsche Telekom AG For Consent To Assign or Transfer Control Licenses and Authorization*, in WT Docket No. 11-65, with Robert D. Willig and Jay Ezrielev, Submitted to the Federal Communications Commission, Commissioned by AT&T, June 9, 2011.
- *In The Matter of The Tennis Channel v. Comcast Cable Communications, LLC*, in File No. CSR-8258-P, Before the Federal Communications Commission (Declaration: February 11, 2010; Reply Declaration: April 13, 2010; Expert Report: February 25, 2011; Deposition Testimony: March 8, 2011; Written Direct Testimony: April 15, 2011; Rebuttal Declaration: April 26, 2011; Courtroom Testimony: April 27, 2011; Supplemental Deposition Testimony: May 1, 2011; Supplemental Rebuttal Declaration, May 12, 2011).
- “Response to Supplementary Comments of Hubert Horan,” Submitted to the Department of Transportation, *Joint Application of Delta Airlines, Inc.; Virgin Blue Airlines PTY LTD; Virgin Blue International Airlines PTY LTD d/b/a V Australia; Pacific Blue Airlines (NZ) LTD; and Pacific Blue Airlines (Aust) PTY LTD*, with Mark Israel, Bryan Keating, and Robert D. Willig, Docket DOT-OST-2009-0155, Commissioned by Delta Air Lines, October 22, 2010.
- “Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers,” Submitted to the Department of Transportation, *Joint Application of Delta Airlines, Inc.; Virgin Blue Airlines PTY LTD; Virgin Blue International Airlines PTY LTD d/b/a V Australia; Pacific Blue Airlines (NZ) LTD; and Pacific Blue Airlines (Aust) PTY LTD*, with Mark Israel, Bryan Keating, and Robert D. Willig, Docket DOT-OST-2009-0155, Commissioned by Delta Air Lines, October 13, 2010.
- *In the Matter of Implementation of Section 224 of the Act; A National Broadband Plan for Our Future*, with Allan Shampine, Submitted to the Federal Communications Commission (WC Docket No. 07-245; GN Docket No. 09-51), Commissioned by the Edison Electric Institute, Declaration Submitted on October 4, 2010; Supplemental Declaration, Submitted on December 14, 2010.
- *In Re: Cable Subscribership Survey For the Collection of Information Pursuant to Section 612(g) of the Communications Act*, with Michael Katz and Theresa Sullivan, Submitted to the Federal Communications Commission (MB Docket No. 07-269), Commissioned by the National Cable & Telecommunications Association, DIRECTV, and DISH Network, December 16, 2009.

- *Caroline Behrend, et al. vs. Comcast Corporation, et al.*, In the United States District Court for the Eastern District of Pennsylvania (Civil Action No. 03-6604), (Declaration: August 21, 2009; Deposition: September 29, 2009).
- *In The Matter of TCR Sports Broadcasting Holding, LLP d/b/a Mid-Atlantic Sports Network v. Comcast Corporation*, in MB Docket No. 08-214, File No. CSR-8001-P, Before the Federal Communications Commission (Declaration with Jay Ezrielev: July 31, 2008; Expert Report: March 19, 2009; Deposition Testimony: April 23, 2009; Courtroom Testimony: May 26, 2009; Reply Declaration: June 1, 2009).
- *In The Matter of NFL Enterprises LLC v. Comcast Cable Communications, LLC*, MB Docket No. 08-214, File No. CSR-7876-P, Before the Federal Communications Commission (Declaration with Jay Ezrielev: June 20, 2008; Expert Report: March 13, 2009; Deposition Testimony: April 1, 2009; Written Direct Testimony: April 6, 2009; Courtroom Testimony: April 16, 2009).
- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Centennial Communications Corp. to AT&T*, with Robert D. Willig and J. Loren Poulsen, Submitted to the Federal Communications Commission, Commissioned by AT&T, November 21, 2008.
- *In The Matter of Implementation of the Cable Television Consumer Protection and Competition Act of 1992; Development of Competition and Diversity in Video Programming Distribution: Section 628(c)(5) of the Communications Act; Sunset of Exclusive Contract Prohibition; Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements*, Filed in Conjunction With Reply Comments Submitted to the Federal Communications Commission (MB Docket No. 07-29; MB Docket No. 07-198), Commissioned by Discovery Communications, Inc., February 12, 2008.
- *In Re: Intel Corp. Microprocessor Antitrust Litigation; Phil Paul et al v. Intel Corporation*, In the United States District Court for the District of Delaware (MDL Docket No. 05-1717 (JJF) and C.A. No. 05-485 (JJF), (Declaration: August 10, 2007; Declaration: April 23, 2007).
- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Dobson Communications to AT&T*, with Robert D. Willig, Submitted to the Federal Communications Commission, Commissioned by AT&T, July 12, 2007.
- *Microsoft Corporation v. Commission of the European Communities*, European Court of First Instance, Case T-201/04 R, April 24-25, 2006.
- *In The Matter of Satellite Home Viewer Extension and Reauthorization Act of 1994*, with Jay Ezrielev, Submitted to the Library of Congress, Copyright Office (Docket No. RM 2005-07), Commissioned by EchoStar Satellite L.L.C., September 1, 2005.
- *In The Matter of Rainbow DBS Company, LLC, Assignor, and EchoStar Satellite L.L.C., Assignee, Consolidated Application for Consent to Assignment of Space Station and Earth Station Licenses, and related Special Temporary Authorization*, with Simon J. Wilkie, Submitted to the Federal Communications Commission (IB Docket No. 05-72), Commissioned by EchoStar Satellite L.L.C. and Rainbow DBS Company, LLC, April 12, 2005.
- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Western Wireless Corporation to ALLTEL Corporation*, with Robert D. Willig and Yair Eilat, Submitted to the Federal Communications Commission (WT Docket No. 05-50), Commissioned by ALLTEL Corporation and Western Wireless Corporation, March 29, 2005.
- *In The Matter of A La Carte and Themed Tier Programming and Pricing Options for Programming Distribution on Cable Television and Direct Broadcast Satellite Systems*, with Robert D. Willig and Jay Ezrielev, Filed in Conjunction With Comments Submitted to the Federal Communications

Commission (MB Docket No. 04-207), Commissioned by Discovery Communications, Inc., July 15, 2004.

- “An Economic Assessment of the Exclusive Contract Prohibition Between Vertically Integrated Cable Operators and Programmers,” with Peter R. Orszag and John M. Gale, Filed in Conjunction With Reply Comments Submitted to the Federal Communications Commission (CS Docket No. 01-290), Commissioned by EchoStar Satellite Corporation and DIRECTV, Inc., January 7, 2002
- Hearing on “The Department of Commerce Fiscal Year 2001 Budget and Its Native American Initiatives,” Testimony to the United States Senate Indian Affairs Committee, February 23, 2000.
- Hearing on “Testimony on S. 614: The Indian Tribal Regulatory Reform and Business Development Act,” Testimony to the United States Senate Indian Affairs Committee, May 19, 1999.

Appendix B - List of Reviewed Major Label Agreements

I reviewed license agreements that were entered into by nine interactive digital streaming services with major record labels that were in effect during some portion of the 2014 to 2016 time period. The following list identifies by service and record company the agreements that I reviewed. Copies of these agreements have been included as Exhibits 30-32

Apple Music

Sony Music Entertainment
Universal Music Group
Warner Music Group

Beats

Sony Music Entertainment
Universal Music Group
Warner Music Group

Google Play

Sony Music Entertainment
Universal Music Group
Warner Music Group

Microsoft Xbox

Sony Music Entertainment
Universal Music Group
Warner Music Group

Rdio

Sony Music Entertainment
Universal Music Group
Warner Music Group

Rhapsody

Sony Music Entertainment
Universal Music Group
Warner Music Group

Slacker

Sony Music Entertainment
Universal Music Group
Warner Music Group

Spotify

Sony Music Entertainment
Universal Music Group
Warner Music Group

TIDAL

Sony Music Entertainment
Universal Music Group
Warner Music Group

Appendix C - List of Reviewed Independent Label Agreements

I reviewed license agreements that were entered into by eight interactive digital streaming services with independent record labels that were in effect during some portion of the 2014 to 2016 time period. The following list identifies by service and record company the agreements that I reviewed. Copies of these agreements have been included as Exhibit 33 and 43.

Apple Music

Concord
DualTones
Orchard

Rdio

INGrooves
Merlin

Beats

Beggars
INGrooves
Merlin

Rhapsody

Beggars
INGrooves
Orchard

Google Play

Beggars
INGrooves
Merlin
Orchard

Slacker

INGrooves
Merlin
Orchard
Razor & Tie

Microsoft Xbox

Beggars
INGrooves
Orchard

Spotify

INGrooves
Merlin
Orchard

Appendix D - Sirius XM's Gross Revenue as Defined by Regulations

**Fig. D-1 – Calculation of Sirius XM's Gross Revenue as Defined by Regulations
[RESTRICTED]**

	(a) Gross Revenues	(b) Total Plays	(c) Pre-72 Plays	(d) Direct Plays	a/(1 - (c + d)/b) Adjusted Gross Revenues
Jan-16					
Feb-16					
Mar-16					
Apr-16					
May-16					
Jun-16					
1H2016 Totals:					

Daily Wtd Avg Subs: 30,044,000

Monthly

ARPU:

NOTES:

Gross revenues from Statement of Account for a Preexisting Satellite Digital Audio Radio Service (SDARS) - 2016 Monthly Liability

Performance data from monthly e-mails from Sirius XM to SoundExchange

Daily weighted average number of subscribers from Sirius XM Holdings Inc. Form 10-Q for QE June 30, 2016, at p. 31.

Monthly ARPU equals (Adjusted gross revenues/6)/Daily Wtd Avg Subs

Exhibits Sponsored by Jonathan Orszag

Exhibit No.	Description	Designation*
SX Ex. 013	[Redacted]	Restricted
SX Ex. 016	CD Containing Recently Executed Sony Music Entertainment Agreements with Pandora and iHeart Radio, Relied on in Orszag Testimony	Restricted
SX Ex. 017	CD Containing Recently Executed Universal Music Group Agreements with Pandora and iHeart Radio, Relied on in Orszag Testimony	Restricted
SX Ex. 018	CD Containing Recently Executed Warner Music Group Agreements with Pandora and iHeart Radio, Relied on in Orszag Testimony	Restricted
SX Ex. 022	Edison Research: The Infinite Dial 2016	Restricted
SX Ex. 023	Nielsen: 2015 Music U.S. Report	Restricted
SX Ex. 024	MusicWatch: Playlisting 2016 Report	Restricted
SX Ex. 025	MusicWatch: Playlisting 2016	Restricted
SX Ex. 027	MusicWatch: Music Acquisition Monitor Q2 2015 Prepared for RIAA	Restricted
SX Ex. 028	Ipsos: In-Car Audio Study, dated February, 2015	Restricted
SX Ex. 030	CD Containing Agreements Between Subscription Interactive Services and Sony Music Entertainment, Relied on in Orszag Testimony	Restricted
SX Ex. 031	CD Containing Agreements Between Subscription Interactive Services and Universal Music Group, Relied on in Orszag Testimony	Restricted

Exhibit No.	Description	Designation*
SX Ex. 032	CD Containing Agreements Between Subscription Interactive Services and Warner Music Group, Relied on in Orszag Testimony	Restricted
SX Ex. 033	CD Containing Agreements Between Subscription Interactive Services and Independent Record Companies or Distributors of Independent Record Companies, Relied on in Orszag Testimony	Restricted
SX Ex. 040	Warner Music Group: Digital Strategy, dated September, 2014	Restricted
SX Ex. 041	Warner Music Group: Global Playlist Integration Plan, dated October/November, 2014	Restricted
SX Ex. 042	Warner Music Group: Viral 50 Impact	Restricted
SX Ex. 043	CD Containing Agreements Between Subscription Interactive Services and The Orchard, Relied on in Orszag Testimony	Restricted

*Exhibits designated Restricted are omitted from this public version in their entirety.

**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)

WRITTEN DIRECT TESTIMONY OF

Paul Wazzan

**Berkeley Research Group, LLC
Managing Director and Head of Century City (Los Angeles) Office**

October, 2016

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I. Introduction and Qualifications

1. I am a Managing Director with Berkeley Research Group (“BRG”), a firm that provides analyses and consulting in matters involving economics, finance, and statistics. I received my Ph.D. in Finance from the Anderson Graduate School of Management at the University of California, Los Angeles in 1996. I received my B.A. in Economics from the University of California, Berkeley in 1989.
2. I have been an Adjunct Assistant Professor of Business and Economics at California State University, Los Angeles, and have also taught option pricing classes at the University of Southern California, Marshall School of Business.
3. I am President and CEO of Wazzan & Co. Investment LLC, a venture capital firm providing seed-level funding to various technology firms.
4. My research has been published in peer-reviewed economics journals and law reviews, and I have testified in a wide range of matters in federal, state and bankruptcy courts, the International Trade Commission, domestic and international arbitration proceedings, and in front of legislative bodies.
5. My analyses have covered a wide range of industries, including high-tech industries, such as aircraft and avionics, semiconductors, digital signal processors, computer peripherals; financial services; pharmaceuticals; basic manufacturing industries, such as automotive, mining, oil and gas, steel, food processing and distribution; and real estate.
6. I have provided financial, economic and statistical expertise in the areas of intellectual property (e.g., patent and trademark infringement, theft of trade secrets), antitrust and competition policy (e.g., market definition, merger analysis, predatory pricing, price-fixing, exclusionary conduct, price discrimination, attempted monopolization), finance (e.g., valuation, corporate finance, securities fraud/10b-5, option valuation, class certification, pricing of mortgage risk and MBS/CDOs, commodities price manipulation), complex damages, labor and employment (e.g., class certification, managerial misclassification, wage and hour, discrimination), and public policy. I also specialize in large scale (i.e., millions of

records) data analytics (e.g., data acquisition, database design and development and statistical/econometric analysis).

7. My curriculum vitae, including testimony provided in the last four years is attached as Appendix A. BRG is being compensated for my time in this matter at the rate of \$600 per hour.

II. Summary of Testimony

A. Assignment

8. It is my understanding that the purpose of this proceeding is to establish the rates and terms for digital audio transmissions made by preexisting subscription services (“PSS”) and satellite digital audio radio services (“SDARS”) under the statutory license provided by Section 114 of the Copyright Act, together with the making of ephemeral recordings necessary to facilitate such transmissions under the statutory license provided by Section 112(e) of the Copyright Act, during the period January 1, 2018 through December 31, 2022.
9. Counsel for SoundExchange asked me to provide an economic framework for establishing a statutory royalty rate in this proceeding for the PSS—i.e., certain services provided by Music Choice and Muzak.¹ My analysis does not address SDARS.
10. In performing my analysis, my staff and I have examined documents produced in this matter, as well as other documents provided by counsel or otherwise accessed through public records. I may use any of the evidence referred to above and any subsequently obtained documents or information, as well as summaries or exhibits based on these documents, as support for my opinions. If other relevant information becomes available, I may revise my report to incorporate or reflect this information. A list of the materials I have considered in connection with this assignment is included as Appendix B.

¹ A PSS is defined as “a service that performs sound recordings by means of noninteractive audio-only subscription digital audio transmissions, which was in existence and was making such transmissions to the public for a fee on or before July 31, 1998, and may include a limited number of sample channels representative of the subscription service that are made available on a nonsubscription basis in order to promote the subscription service.” 17 U.S.C. § 114(j)(11).

B. Summary of Conclusions

11. I begin the process of developing a framework for determining PSS rates with the basic economic concept that there are market based rewards to capital and labor.² In the present context, that implies that those with an economic stake in sound recording copyrights should be compensated for uses of their rights at rates consistent with marketplace outcomes. This basic economic concept is consistent with the benchmark approach commonly applied in establishing the royalty rates for statutory licenses.³ In employing a benchmarking approach, a benchmark market should be as comparable to the target market as practicable, and should not be affected by regulated rates if practicable. To the extent there are differences between the benchmark and target markets, appropriate adjustments should be made.⁴
12. Based on my review of previous proceedings, it appears that setting PSS rates has historically been challenging because of the relative lack of services sufficiently comparable to the PSS. That remains an issue today. As described further below, I have searched for suitable benchmarks to use in setting PSS rates, and identified no *marketplace* benchmark that is sufficiently comparable to the PSS to be used for this purpose, even with adjustment. However, the Judges are charged with setting regulated rates for other services that share similar characteristics with the PSS – that is, the television-based “new subscription services” subject to the rates in 37 C.F.R. Part 383 (which SoundExchange refers to as “CABSAT” services). I ultimately conclude that these regulated rates provide the best available proxy for a marketplace royalty for PSS, even though they are not a *marketplace benchmark*.

² See Hyun Soo Kwon, *Economic Theories of Low-Wage Work*, Journal of Human Behavior in the Social Environment 62 (2014). See generally Mona A. Elbannan, *The Capital Asset Pricing Model: An Overview of the Theory*, International Journal of Economics & Finance, Vol. 7, No. 1 (2015).

³ Roy J. Epstein & Paul Malherbe, *Reasonable Royalty Patent Infringement Damages after Uniloc*, AIPLA Quarterly Journal, Vol. 39, No. 1, at 8 (2011); Ilidio Lopes, *Intangible Assets Identification and Valuation – a Theoretical Framework Approach to the Portuguese Airlines Companies*, Electronic Journal of Knowledge Management, Vol. 5, Issue 2, at 196 (2007); Jody C. Bishop, *The Challenge of Valuing Intellectual Property Assets*, Northwestern Journal of Technology and Intellectual Property, Vol. 1, Issue 1, at 64 (Spring 2003).

⁴ *Id.*; Jeffrey A. Eisenach, *The Sound Recording Performance Right at a Crossroads: Will Market Rates Prevail?*, CommLaw Conspectus, Vol. 22, at 20 (2014).

I also consider the matter of ancillary Internet streaming by a PSS, because that activity is not encompassed within the rates in Part 383. I conclude that the most reasonable result would be to apply to the PSS the same statutory rates that would apply to ancillary Internet streaming by the services subject to the Part 383 rates.

13. The Section 801(b)(1) statutory objectives are aligned with a royalty rate determination that approximates the terms that would be arrived at through voluntary, arm's length transactions between a willing buyer and a willing seller. I recognize, however, that the 801(b) statutory standard has a "broader scope" than the "willing buyer/willing seller" standard that applies to certain other proceedings before the Judges.⁵ Thus, I also consider whether the Section 801(b) policy objectives "weigh in favor of divergence from the results indicated by the benchmark marketplace evidence."⁶ I conclude that they do not.
14. I understand SoundExchange will propose that, for their core service delivered to subscribers' television sets through cable and satellite television providers, PSS pay a monthly per-subscriber royalty of: \$0.0190 in 2018; \$0.0196 in 2019; \$0.0202 in 2020; \$0.0208 in 2021; and \$0.0214 in 2022. Because that is based on and consistent with my conclusions summarized above, I find these proposed rates to be economically justified and consistent with the policy directives set out in 17 U.S.C. § 801(b)(1).
15. I further understand SoundExchange will propose that, to the extent PSS engage in Internet streaming, they should pay per-performance royalties equivalent to those paid by commercial subscription webcasting services. Because that is based on and consistent with my conclusions summarized above, I find these proposed rates to be economically justified and consistent with the policy directives set out in 17 U.S.C. § 801(b)(1).

⁵ See Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Final Rule and Order, 73 Fed. Reg. 4080, 4088 (Jan. 24, 2008) [hereinafter *SDARS I*].

⁶ *Id.* at 4094.

III. The Section 801(b)(1) Policy Objectives

A. Introduction

16. In setting a rate for the statutory licenses, the Judges are asked to fashion a rate that complies with the four policy objectives enumerated in 17 U.S.C. § 801(b)(1):
 - a) To maximize the availability of creative works to the public;
 - b) To afford the copyright owner a fair return for 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; and
 - d) To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.
17. The statute, however, does not provide a formula or guidance on how to translate these policy goals into an actual dollar rate. In the *SDARS I* and *SDARS II* decisions, the Copyright Royalty Judges outlined a two-step procedure for setting rates. According to the *SDARS I* decision, the focus of the first step is identifying “comparable marketplace royalty rates” or “benchmarks,” which are “indicative of the prices that prevail for services purchasing similar music inputs for use in digital programming ultimately made available to consumers.”⁷ Similarly, the *SDARS II* decision states that “[w]here the determination standard is reasonable rates calculated to achieve the Section 801(b)(1) factors, the Judges have found market benchmarks, if any, to be a useful starting point.”⁸ The second step, according to the *SDARS I* decision, is determining whether the “[801(b)(1)] policy objectives weigh in favor of divergence from the results indicated by the benchmark

⁷ *SDARS I* at 4088.

⁸ Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Final Rule and Order, 78 Fed. Reg. 23,054, 23,056 (Apr. 17, 2013) [hereinafter *SDARS II*].

marketplace evidence.”⁹ Similarly, the *SDARS II* decision states that “the Judges determine whether adjustments to the rate indicated by the marketplace benchmarks, if any, are warranted and, if so, whether there is sufficient evidence in the record to support such adjustments.”¹⁰

18. One can summarize these objectives as the desire to derive (or approach) a free market rate¹¹ (albeit within a regulated structure) and to then consider whether certain policy objectives might warrant a deviation from that rate. It is generally understood in economics that free markets (and the resulting prices achieved) tend to produce the best outcomes in terms of efficiently allocating resources within an economy.¹² Setting prices too low, or too high, introduces frictions with wanted or (too often) unwanted consequences.¹³

B. Using Market-Based Rates is Consistent with Factors One through Three

19. I have reviewed the report of Jonathan Orszag, who explains why setting market-based rates is consistent with Section 801(b)(1) objectives one through three. I agree with his analysis.
20. To summarize briefly: The first policy objective is best served by rates that are sufficiently high to encourage artists and record companies to create new works, but at the same time not so high as to dissuade distributors from undertaking the investments necessary to distribute copyrighted recordings. Market-based rates satisfy these conditions. As to the second policy objective, “fairness” is satisfied by an outcome that arises through arm’s length dealings in the marketplace.¹⁴ The third statutory objective is also best satisfied by license fees that reflect marketplace

⁹ *SDARS I* at 4094.

¹⁰ *SDARS II* at 23,066.

¹¹ Richard Lipsey et al., *Economics* 431-32 (Harper & Row, 7th ed. 1984) [hereinafter Lipsey]; Hal R. Varian, *Intermediate Microeconomics, A Modern Approach* 301-02 (W.W. Norton & Co., 4th ed. 1987) [hereinafter Varian].

¹² *Id.*

¹³ Fiona M. Scott-Morton, *The Problems of Price Controls*, Health and Medicine 50-51 (Spring 2001); Varian 401-02; Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* 696-705 (Addison-Wesley 4th ed. 2005) [hereinafter Carlton & Perloff].

¹⁴ See *SDARS I* at 4095 (“[A] fair income is . . . consistent with reasonable market outcomes.”).

negotiations, because such negotiations are likely to reflect the respective contributions of copyright owners and users.

IV. Overview of Options for Benchmarks for Setting Royalty Rates for PSS

21. In *SDARS II*, the Judges emphasized that “the key characteristic of a good benchmark [is] comparability.”¹⁵ In employing a benchmarking approach, a benchmark market should be as comparable to the target market as practicable.¹⁶ For example, there should preferably be comparable *buyers* in the benchmark market and target market, as the Judges observed in *SDARS II*.¹⁷ However, if at all possible, a benchmark should not be affected by regulated rates, because such rates may not reflect a marketplace outcome. Adopting the logic endorsed by the Judges in *SDARS II*, a benchmark for setting royalty rates for PSS would preferably be one based on market transactions for licensing sound recording rights to services comparable to the PSS. To the extent there are differences between the benchmark and target markets, appropriate adjustments should be made.
22. Based on my review of the previous proceedings, it appears that setting PSS rates has historically been challenging because of the relative lack of services sufficiently comparable to the PSS. For example, relatively few digital music services have had the key characteristics of the PSS (e.g., that they are distributed by their providers only at wholesale, and distributed to end consumers only as a small part of a bundle). This difficulty appears to still exist.
23. Assuming that the Judges accept the premise that rates should approximate the likely outcome of marketplace negotiations (except to the extent that the 801(b)(1) policy objectives weigh in favor of divergence from such an outcome), we are faced

¹⁵ *SDARS II* at 23,058.

¹⁶ Jeffrey A. Eisenach, *The Sound Recording Performance Right at a Crossroads: Will Market Rates Prevail?*, *CommLaw Conspectus*, Vol. 22, at 20 (2014); Roy J. Epstein & Paul Malherbe, *Reasonable Royalty Patent Infringement Damages after Uniloc*, *AIPLA Quarterly Journal*, Vol. 39, No. 1, at 8 (2011).

¹⁷ *SDARS II* at 23,058; see also *SDARS I* at 4093 (explaining that the value of a performance right is derived from the “ultimate consumer markets”).

with limited and imperfect options against which to benchmark a market rate for PSS, including the following:

- Option 1: The current PSS rates, if they can be established to be indicative of the marketplace.
- Option 2: Direct licenses covering the use of sound recordings in a PSS (of which I am aware of only two), if they can be established to be more indicative of the marketplace for PSS than of the statutory rate or irrelevant factors.
- Option 3: Direct licenses covering the use of sound recordings in other types of services, if they can be established or adjusted to be indicative of the marketplace for PSS.
- Option 4: Other regulated rates, if they can be established or adjusted to be indicative of the marketplace for PSS.

24. These four options are discussed in greater detail in the following sections, but I provide a brief summary here:
- a. Option 1 does not provide a viable basis for approximating the result of marketplace negotiations for sound recording rights for a PSS, because the current statutory rate is derived from (1) royalty rates for musical works, which have been thoroughly discredited as an indicator of sound recording royalty rates, and (2) past policy judgments, including ones based on the marketplace for digital music services 20 years ago.¹⁸ The current statutory rate does not reflect the current marketplace for sound recordings at all.
 - b. Option 2 is not viable because the universe of agreements covering PSS that have been produced in discovery is meager, and more importantly, for the reasons provided below, the agreements cannot fairly be said to shed any meaningful light on marketplace outcomes for the licensing of sound recordings by record companies to a PSS.

¹⁸ See generally Comment, *Toward an Efficient Licensing and Rate-Setting Regime: Reconstructing §114(i) of the Copyright Act*, 125 Yale L.J. 1531, 1532 (2016).

- c. A version of Option 3 was rejected in *SDARS II*, and it is not apparent that the deficiencies found by the Judges with that approach can be remedied. As another version of Option 3, I considered direct license agreements that Sirius XM has produced in this proceeding, but I conclude that they do not provide a suitable benchmark for setting PSS rates.
- d. That leaves Option 4. While a regulated rate is not a *marketplace* benchmark, regulated rates for services comparable to the PSS that purport to reflect the marketplace provide an indication of a marketplace royalty for PSS. Such rates exist in 37 C.F.R. Part 383 (for television-based services) and Part 380 (for Internet streaming services). I conclude that looking to those rates provides the best available basis for setting PSS rates in this proceeding.

V. Currently Prevailing Rates Do Not Approximate the Result of Marketplace Negotiations Because They Are Derived from the Discredited Musical Works Benchmark and Past Policy Decisions

- 25. It is clear from a review of the history of PSS rate-setting that the current PSS rate is not a marketplace rate in any sense of that term, and does not provide any meaningful indication of what a market based royalty for sound recording rights for PSS might be.
- 26. The Digital Performance Right in Sound Recordings Act of 1995 amended Section 106 of the Copyright Act to give sound recording copyright owners an exclusive right to perform sound recordings publicly by means of digital audio transmissions, subject to certain limitations, including principally the statutory license in Section 114.¹⁹ The royalty rates and terms for the Section 114 statutory licenses were to be determined by voluntary negotiations among the parties and, where necessary, arbitration conducted under Chapter 8 of the Copyright Act.
- 27. The first proceeding to set Section 114 rates (“PSS I”) was conducted pursuant to the arbitration provision during 1996-1998. The RIAA represented the interests of sound recording copyright owners against three digital music service providers:

¹⁹ 17 U.S.C. §§ 106(6), 114.

Digital Cable Radio Associates (DCR) (the provider of the Music Choice service), Digital Music Express, Inc. (DMX), and Muzak, L.P. (the provider of the DishCD service).²⁰

28. Because the proceeding began very shortly after enactment of the statute creating the digital performance right, no market for licensing sound recording performance rights existed. Accordingly, the parties proposed widely divergent rates based on an array of varying and unsatisfying benchmarks.
29. RIAA requested a royalty rate set at 41.5% of a service's gross revenues, which was based on the purchase price of video programming by cable television networks.²¹
30. The services requested a rate of 0.5% to 2.0% of gross revenues.²² This was based on two benchmarks: (1) fees payable by Music Choice to two affiliated record companies based on their use of sound recordings within the context of a partnership agreement entered into before there was any statutory obligation to pay for the use of sound recordings; and (2) the license fees the services paid to performing rights organizations for use of the underlying musical works.²³
31. The Panel ultimately determined that the services should pay a royalty of 5% of gross revenues. It derived this rate from the services' benchmarks. The Panel rejected RIAA's proposed benchmark—the cost of programming for cable television networks—because it found that video programming was not an analogous product in a comparable marketplace, and because RIAA did not take into account what the Panel perceived to be a promotional benefit that flowed to the record companies from the play of their sound recordings on the services.²⁴

²⁰ Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings, 63 Fed. Reg. 25,394, 25,395 (May 8, 1998) [hereinafter *PSS I*].

²¹ *Id.* at 25,395-97; Report of the Copyright Arbitration Royalty Panel ¶ 33 [hereinafter Report].

²² *PSS I* at 25,395; Report ¶¶ 34-36.

²³ *PSS I* at 25,396; Report ¶ 124.

²⁴ *PSS I* at 25,396-97, 25,407-08; Report ¶¶ 126-150.

32. The Panel also was concerned about the nascent marketplace for digital music services and the participating services' precarious financial condition.²⁵ The services were then the only avenue available for consumers to access transmissions of music,²⁶ and the panel perceived that consumers would be denied access to digital music services if it set a rate that was not sustainable for services that were struggling to find a market. Accordingly, the panel concluded that policy considerations demanded that it set a "low" rate favoring the services.²⁷
33. The Register of Copyrights then reviewed the Panel's ruling and ultimately adopted a royalty rate of 6.5%. In doing so, the Register gave more consideration to the rates paid for musical works "because these rates represent an actual marketplace value for a public performance right in the digital arena, albeit not the digital performance right in sound recordings."²⁸
34. The Register concluded that Music Choice's payments to affiliated record companies based on its use of sound recordings "could not accurately reflect the marketplace value of the digital performance right since no such legal right existed at the time the rate was negotiated."²⁹ She elaborated on this point by saying that these license fees were "not a true marker for the value of the digital performance right."³⁰
35. In 2003, RIAA, the musicians' unions and the PSS reached a settlement of rates and terms for the use of sound recordings by the PSS for the period 2002-2007, which was adopted by the Librarian of Congress. The settled rates were just slightly

²⁵ *PSS I* at 25,406 (referring to concerns about the "continued existence" of the services), 25,407 ("it is far from clear whether the Services can survive"), 25,408 (services "need to increase [their] subscriber base just to reach a break-even point"); Report ¶ 198(A).

²⁶ *PSS I* at 25,407 (referring to the services "opening a new avenue for transmitting sound recordings to a larger and more diverse audience").

²⁷ *Id.* at 25,406; Report ¶ 198.

²⁸ *PSS I* at 25,409.

²⁹ *Id.* at 25,409-10.

³⁰ *Id.* at 25,410.

higher than the rate previously determined by the Register – 7% for 2002-2003 and 7.25% for 2004-2007.³¹

36. In 2007, during the next proceeding to determine PSS rates and terms (*SDARS I*), a settlement was again reached. That settlement continued the 7.25% rate for 2008-2011, and then provided another small increase, to 7.5%, for 2012.³²
37. In the most recent proceeding to determine PSS rates and terms (*SDARS II*), the Copyright Royalty Judges determined that the appropriate royalty rates for the PSS were 8% of gross revenues for 2013 and 8.5% for 2014 through 2017.³³
 - a. Music Choice requested a rate of 2.6% of gross revenues, based on its payments for musical works.³⁴ However, the Judges thoroughly rejected reliance on the musical works benchmark—in two different contexts.
 - b. First, the Judges rejected Music Choice’s legal argument that, because the *PSS I* determination relied on the musical works benchmark, the Judges were obligated to use that benchmark in the absence of a better, comparable benchmark.³⁵ The Judges noted that prior marketplace observations need not be given consideration in subsequent proceedings, that even the 1998 determination did not rely exclusively on the musical works benchmark, and that the 1998 decision was a product of limited information—i.e., only the musical works rate and the Music Choice partnership agreement.³⁶

³¹ Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings by Preexisting Subscription Services, 68 Fed. Reg. 4744 (Jan. 30, 2003); Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings by Preexisting Subscription Services, Final Rule, 68 Fed. Reg. 39,837 (July 3, 2003).

³² See Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, 72 Fed. Reg. 71,795, 71,796 (Dec. 19, 2007) (adopting rates set out in 72 Fed. Reg. 61,585); Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, 72 Fed. Reg. 61,585, 61,587 (Oct. 31, 2007).

³³ *SDARS II* at 23,061.

³⁴ *Id.* at 23,056.

³⁵ *Id.* at 23,055.

³⁶ *Id.*

- c. Then, the Judges rejected the musical works benchmark again because it was not probative of sound recording rates. They found that it lacked comparability to the target market because it did not involve the same buyers and sellers for the same rights.³⁷ This decision was consistent with prior decisions in webcasting rate proceedings that also rejected the use of musical works rates as a benchmark for sound recording royalties.³⁸
- d. SoundExchange requested a rate of 15% for 2013; 20% for 2014; 25% for 2015; 35% for 2016; and 45% for 2016. These rates were derived from an examination of over 2,000 marketplace agreements, representing a variety of rights licensed (portable and non-portable interactive subscription services, cellular ringtones/ringbacks, and digital downloads).³⁹ According to SoundExchange's expert, analysis of these agreements reflected a percentage-of-revenue rate of 70% for digital downloads, 43% to 50% for ringtones/ringbacks, and 50% to 60% for portable and non-portable interactive subscription webcasting, respectively.⁴⁰ The Judges also rejected this benchmark, finding that the marketplace agreements SoundExchange's expert analyzed concerned music products and services that were not comparable because the buyers were different from the target PSS market.⁴¹ The Judges also noted, as SoundExchange's expert had, that Music Choice had several distinct features, such as its distribution through cable systems and the bundling of Music Choice's services with multiple channels of video and other non-music programming, which decreased the comparability of the proposed benchmarks.⁴²

³⁷ *Id.* at 23,058.

³⁸ Digital Performance Right in Sound Recordings and Ephemeral Recordings, 76 Fed. Reg. 13,026, 13,038 (Mar. 9, 2011) ("*Web III*"); Digital Performance Right in Sound Recordings and Ephemeral Recordings, 72 Fed. Reg. 24,084, 24,094-95 (May 1, 2007) ("*Web II*"); Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings and Ephemeral Recordings, 67 Fed. Reg. 45,240, 45,246-47, 45,258-59 (July 8, 2002) ("*Web I*").

³⁹ *SDARS II* at 23,057.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

- e. The Judges were thus left with nothing other than the existing 7.5% royalty rate.⁴³ Because Music Choice planned an increase in usage, the Judges determined that a 1% upward adjustment of the rate compensating for the additional performances was appropriate to serve the Section 801(b)(1) objectives.⁴⁴
38. In rejecting the musical works benchmark in *SDARS II* and various webcasting proceedings, the Judges recognized that:
- [A] benchmark market should involve the same buyers and sellers for the same rights. However, the musical works market involves different sellers (performing rights societies versus record companies) selling different rights. The fact that a [PSS] needs performing rights to musical works and sound recordings to operate its service does not make the rights equivalent, nor does it say anything about the relative values of those rights.”⁴⁵
39. Empirically, where both sound recording and musical work performance rights apply and rate information is relatively available, sound recording rates are a significant multiple of musical work rates.⁴⁶ This is true for interactive streaming services (where sound recording royalty payments are almost five times the corresponding musical work payments)⁴⁷ and noninteractive streaming services (where sound recording performance royalty payments are approximately 13 times

⁴³ *Id.*

⁴⁴ *Id.* at 23,060.

⁴⁵ *Id.* at 23,058.

⁴⁶ The Judges have noted empirical evidence of differences between the sound recording and musical works markets. *Web II*, 72 Fed. Reg. at 24,095.

⁴⁷ Comments of Spotify USA Inc. in Copyright Office Docket No. 2014-03, at 13 (May 23, 2014), available at http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/Spotify_USA_Inc_MLS_2014.pdf (“Spotify USA Inc. currently pays around 70% of its revenue to rightsholders, with payments for the right to make available compositions receiving about 21% of the amount that the record labels get in accordance with the statutory rate”). When Spotify refers to the statutory rate, it appears that Spotify is referring to the all-in (performance and reproduction/distribution) rate for interactive streaming provided in the Judges’ “mechanical” rate regulations at 37 C.F.R. § 385.13(a)(3), (b)(2). To be clear, Spotify’s musical works data includes both performance royalties and reproduction/distribution royalties. However, the payments to sound recording copyright owners presumably do as well, so this reflects a reasonable comparison of the value of the sound recording and musical work rights involved.

the corresponding musical work payments).⁴⁸ Each of these comparisons involves at least one set of regulated rates, so these multiples do not necessarily reflect the marketplace either. Nonetheless, these large multiples are notable when compared with the PSS, where almost 20 years after the *PSS I* decision, the sound recording statutory royalty rate for the PSS is only about [] times Music Choice's effective musical work performance royalty rate.⁴⁹ These multiples provide yet another reason to doubt that the current PSS rates reflect the marketplace.

40. It should be clear from the foregoing that the current PSS rate is not a marketplace rate in any sense of that term. Although it was not *directly* based on the musical works rate, it was *indirectly* based primarily on that rate. After all, the 8.5% rate was derived from the then-existing rate based on the 801(b)(1) objectives. Although that rate was itself the product of two settlements, it represented only a modest increase over the original 1998 PSS rate, which was derived primarily from the musical works rate, and secondarily a policy decision to set a "low" rate

⁴⁸ Comments of ASCAP in Copyright Office Docket No. 2014-03, at 27-28 (May 23, 2014), available at http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/ASCAP_MLS_2014.pdf ("[I]n fiscal year 2013, Pandora paid to SoundExchange, the digital performance rights organization that collects and distributes royalties to record labels and recording artists for the use of sound recordings by digital services, thirteen times what it paid to songwriters and publishers for the same exact performances of their musical works (55.9% of total revenue for sound recordings but only 4.3% of its total revenue for musical works); see also *Broadcast Music, Inc. v. Pandora Media, Inc.*, 140 F. Supp. 3d 267 (S.D.N.Y. 2015) (setting BMI rate of 2.5% of revenues); *In re Pandora Media*, 6 F. Supp. 3d 317 (S.D.N.Y. 2014) (setting ASCAP rate of 1.85% of revenues), *aff'd* 785 F.3d 73 (2d Cir. 2015). I understand that Pandora has subsequently reached new agreements with ASCAP and BMI at undisclosed rates. Pandora Signs Licensing Agreements with ASCAP and BMI (Dec. 22, 2015), <https://www.ascap.com/press/2015/12-22-pandora-licenses-ascap-bmi.aspx>. However, because Pandora dropped its appeal of the BMI rate as part of that agreement, it seems unlikely that Pandora agreed to pay a higher rate than had just been determined by the rate court, at least in the short term.

⁴⁹ It appears that Music Choice's musical works royalty expense for its residential audio service is approximately [] of revenues. It pays ASCAP and BMI []. MC0000001-11, at MC0000003; MC0000015-26, at MC0000019. By comparing its recent ASCAP and BMI remittances (see MC0013833 and MC0013919) with its recent SoundExchange statements of account, I confirmed that Music Choice appears to be paying that percentage to ASCAP and BMI on a royalty base []. It also pays SESAC []. For the first half of 2016, Music Choice's residential audio service accounted for approximately [] of its total revenues. See MC0015577. Apportioning its SESAC royalties between its residential audio service and other services based on revenue, and then dividing by twice its residential service revenue from the first half of 2016, yields a SESAC royalty payment for 2016 of approximately [] of residential service revenue. Some part of the [] multiple noted above seems to be the result of the Register having overestimated the PSS musical works royalty in 1998. See *PSS I*, 63 Fed. Reg. at 25,409-10 (setting a 6.5% rate based primarily on musical works rates, and intending that the 6.5% rate be "less than the value of the performance rights of the musical compositions").

favoring the services based on the digital music environment and the services' financial condition in the late 1990s.

41. Rates contained in settlement agreements are not necessarily indicative of a market rate—*i.e.*, what a willing buyer and a willing seller would agree to. As one court has explained:

[M]any factors come into play in reaching and obtaining settlement and, as such, settlement payments could not be a reliable guide for computing the value of a reasonable royalty. For instance, a party may wish to avoid incurring attorney's fees or other litigation expenses. It may wish to avoid the distraction caused by litigation, or avoid the negative publicity which attends litigation. A party may value its privacy, and be willing to settle a case to preclude discovery into its affairs. A settlement may also more reflect the parties' perceptions of the true merits of the claim and not the true value of the claim, if the claim was in fact a valid one."⁵⁰

In short, there are many reasons why a settlement lacks reliability as to the true value of a royalty rate.⁵¹

42. Here, I believe that the 2003 and 2007 settlements must be viewed as anchored in the original *PSS I* decision, and thus more reflective of the parties' predictions of how the Judges would adjust that rate and other considerations such as those described above than of a marketplace royalty rate for the use of sound recordings in a PSS.
43. The Judges have recognized that the PSS rate should not be derived from the musical works rate. Because the current PSS rate is largely a function of musical works rates, along with policy-based decisions in *SDARS II* and *PSS I* (the latter of which were based on market conditions 20 years ago), it can in no way be said to reflect the marketplace for sound recordings today. Instead, we must look

⁵⁰ *Vardon Golf Co., Inc. v. BBMG Golf Ltd.*, 156 F.R.D. 641, 651 (N.D. Ill. 1994).

⁵¹ J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, Journal of Competition Law & Economics, vol. 9, no. 4, at 1005 (2013).

elsewhere if we wish to discern the market value of a license for the use of sound recordings in a PSS.

VI. Direct Licenses Covering PSS Do Not Provide a Reasonable Basis for Estimating the Fair Market Value of the Use of Sound Recordings in a PSS

44. In principle, the Judges could look to direct licenses conveying rights to publicly perform sound recordings in a PSS. However, from an economic perspective, one would expect direct licenses covering activity subject to a statutory license to be influenced by the statutory license, and hence not to be ideal benchmarks. For example, even though the Judges relied on such licenses in limited circumstances in the *Web IV* proceeding when they were at rates below the statutory rate,⁵² they recognized that the statutory rate would set a ceiling on rates under direct licenses.⁵³ Thus, any such agreements would have to be viewed cautiously.
45. In any event, it appears that few such licenses exist, and none of them that have been produced in discovery relates exclusively to a PSS. Counsel for SoundExchange has informed me that no direct licenses for the use of sound recordings in Music Choice's PSS were received in discovery. Muzak produced numerous agreements covering its business services, but only two that seem to cover its PSS in addition to its business service. The first license is between Muzak and [REDACTED] and dated January 30, 2012.⁵⁴ The second license is between Muzak and [REDACTED] and dated March 12, 2012.⁵⁵ These appear to be form contracts, so it is possible that other, similar licenses exist and that these were produced as representative of some larger population of similar agreements.

⁵² See *In re Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings (Web IV)*, 81 Fed. Reg. 26,329 (May 2, 2016).

⁵³ *Id.* at 26,330; see also *Mechanical and Digital Phonorecord Delivery Rate Determination Proceeding*, 74 Fed. Reg. 4510, 4520 (Jan. 26, 2009) (noting agreement that statutory mechanical rates function as a ceiling on negotiations).

⁵⁴ SoundExchange Exhibit 8 (MUZAK_DIR_00000056 to -063).

⁵⁵ SoundExchange Exhibit 9 (MUZAK_DIR_00000064 to -075).

However, even if there were others that were similar, these two Muzak agreements do not provide satisfactory benchmarks for many reasons:

- a. The licenses involve a tiny amount of repertoire from lesser-known artists who do not seem to be signed to any record label (since they are entering into the agreements in their individual capacity).⁵⁶ Thus, they do not involve the same record company sellers as in the hypothetical market.⁵⁷
- b. The licenses are [REDACTED], and so do not purport to provide royalty rates that would prevail in an ordinary-course commercial transaction.⁵⁸
- c. The licenses cover [REDACTED]
[REDACTED]
[REDACTED]).⁵⁹ Since Muzak is primarily a provider of business services,⁶⁰ the licenses do not tell us what the standalone value of rights for a consumer music service would be.
- d. The licenses include [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].
- e. The licenses contain a provision that has the effect of [REDACTED]
[REDACTED]

⁵⁶ MUZAK DIR 00000056 to -063 licenses ten sound recordings by [REDACTED]
[REDACTED]
[REDACTED]. MUZAK DIR 00000064 to -075 licenses seventeen sound recordings by [REDACTED]
[REDACTED].

⁵⁷ *Web I*, 67 Fed. Reg. at 45,244-45; *see also SDARS II*, 78 Fed. Reg. at 23,057.

⁵⁸ The preamble to both licenses state that they cover “participation in the promotion program described below.”

⁵⁹ *See* paragraph 1 of each license.

⁶⁰ *See* Ben Sisario, *Muzak, Background Music to Life, to Lose Its Name*, N.Y. Times (Feb. 4, 2013), http://www.nytimes.com/2013/02/05/business/muzak-background-music-to-life-to-lose-its-name.html?_r=0 (business music services generate about 90% of the revenues of Muzak’s parent company Mood Media); Muzak LLC, Form 10-K Annual Report (2002).

⁶¹ *See* paragraph 1 of each license.

[REDACTED].⁶² This provision seems to make the agreements essentially a nullity.

- f. The licenses are over four years old.
 - g. The [REDACTED] license provides for a royalty rate of [REDACTED].⁶³ Assuming that Muzak's musical work performance royalties are similar to Music Choice's, the [REDACTED] rate was probably viewed by Muzak mostly as a discount from the ephemeral (reproduction) royalty rate that would otherwise apply to its business establishment service (10% ephemeral royalty for statutory services at the time,⁶⁴ plus musical work performance royalties). For Muzak's PSS, the [REDACTED] rate is likely [REDACTED] to the statutory rate for sound recording performance in effect at the time the agreement was entered into (7.5%) plus the musical works rate (again assuming that Muzak's musical work performance royalties are similar to Music Choice's). This agreement should be viewed as more reflective of the statutory rates, or the economics of the business service, than as an indication of marketplace royalties for the performance of sound recordings in a PSS.
 - h. The royalty payments for the license from [REDACTED]
[REDACTED], and so do not necessarily tell us anything about the PSS service.⁶⁵
46. From the foregoing I conclude that none of the agreements I have seen in connection with this proceeding conveying rights to use of sound recordings in a PSS has applicability as a benchmark indicator of PSS rates.
47. Further, the absence of direct license agreements for the PSS is notable. If the statutory rate was above market, one would expect to see the marketplace respond with direct license agreements at lower rates. If the statutory rate was below market, however, one would expect to see no agreements, because services would

⁶² See paragraph 5 of each license.

⁶³ SoundExchange Exhibit 8, ¶ 2(a).

⁶⁴ Determination of Rates and Terms for Business Establishment Services, 73 Fed. Reg. 16,199, 16,200 (Mar. 27, 2008).

⁶⁵ SoundExchange Exhibit 9, ¶ 1.

be motivated to rely on the statutory license.⁶⁶ They would not tend to seek, and licensors would not be motivated to grant, licenses at lower rates. Thus, the absence of agreements suggests that the PSS statutory rate is likely below market.

VII. The Judges Have Found That Other Types of Services with More Robust Licensing Markets Are Not Sufficiently Comparable to the PSS

48. In *SDARS II*, Dr. George Ford proposed relying on four robust licensing markets that he found to provide useful indications of what market rates for PSS likely would be: “portable and non-portable subscription interactive webcasting, ringtones/ringbacks, and digital downloads.”⁶⁷ He acknowledged that “the PSS provide a service of a somewhat distinctive nature,” given that they “do not offer services directly to consumers” and that they “are also somewhat unique in that their service is bundled with vast quantities of video content.”⁶⁸ Nevertheless, he believed it was possible to use certain “marketplace agreements as benchmarks in order to establish a zone of reasonableness for revenue-based royalty fees.”⁶⁹
49. The Judges rejected these benchmarks, explaining: “The buyers are different from the target [PSS] market; thus the key characteristic of a good benchmark—comparability—is not present.”⁷⁰ Moreover, the Judges noted that “Music Choice has several distinct features, such as its intermediary role between cable systems and subscribers and the bundling of Music Choice’s services with multiple channels of video and other non-music programming, which significantly dim the possibility of market comparators. In the absence of some rational, reasoned adjustment to

⁶⁶ Thomas M. Lenard & Lawrence J. White, *Moving Music Licensing Into the Digital Era: More Competition and Less Regulation*, Technology Policy Institute 2, 11 (Dec. 2015).

⁶⁷ *SDARS II* at 23,058.

⁶⁸ See George Ford Written Direct Testimony 12-13.

⁶⁹ *Id.* at 13.

⁷⁰ *SDARS II* at 23,058.

make the music agreements data more comparable to the PSS market, the Judges find its probative value in this proceeding of only marginal value.”⁷¹

50. Dr. Ford was not wrong to note that the PSS pay royalties at a rate that is conspicuously lower than the rate applicable to any other type of service. That is an obvious result of the history of the PSS rate, including both its roots in the musical works rate and the decision in 1998 to set a “low” rate favoring the services. Nonetheless, it is not apparent how one might adjust the benchmarks Dr. Ford proposed to address the concerns of the Judges, such as the lack of comparability between these other types of services and the PSS and thereby derive a specific rate from the benchmarks.

VIII. Direct Licenses Entered into by Sirius XM Do Not Provide a Reasonable Basis for Estimating the Fair Market Value of the Use of Sound Recordings in a PSS

51. Counsel for SoundExchange provided me a set of direct licenses produced by Sirius XM,⁷² as well as the report of Dr. Thomas Lys, which analyzes those direct licenses in detail.
52. Like the providers of the PSS, Sirius XM provides several different types of services. Of course, it is first and foremost the provider of an SDARS. However, it also provides a business music service,⁷³ Internet streaming,⁷⁴ and music channels delivered as part of Dish satellite television packages.⁷⁵ The vast majority of the Sirius XM direct licenses cover all these different types of services (and the rest just cover SDARS).

⁷¹ *Id.*; see also *SDARS I* at 4089 (“The Music Choice audio service is included as a part of a bundle of primarily audio-visually oriented services (i.e., television channels) offered over cable television systems to cable television subscribers at fixed locations, while the SDARS music channels are a substantial part of purely audio services provided to subscribers over devices designed in large part to compete with terrestrial radio in terms of equivalent mobility.”).

⁷² More than [REDACTED] such licenses were provided.

⁷³ Sirius XM, Our Music’s Just Good Business, <https://www.siriusxm.com/siriusxmforbusiness/services> (last visited Oct. 11, 2016).

⁷⁴ Sirius XM, What You Love. Anywhere, <https://m.siriusxm.com/streaming> (last visited Oct. 11, 2016).

⁷⁵ Dish, Satellite Music, <http://www.dish.com/music/> (last visited Oct. 11, 2016).

53. As described further below, the Dish music channels provided by Sirius XM are like the PSS, in that they share with the PSS the characteristics the Judges found in *SDARS II* would be important in a benchmark for PSS: delivery through intermediary television system providers and the bundling of the music service with multiple channels of video and other non-music programming.⁷⁶ I understand that Sirius XM's service provided through Dish is classified for statutory license purposes as a "new subscription service" or "NSS" delivered through cable and satellite television providers, and is subject to statutory royalty rates in 37 C.F.R. Part 383. I further understand that SoundExchange refers to such services as "CABSAT" services (shorthand for cable/satellite), to distinguish them from subscription webcasting services that are also classified as "new subscription services" but are subject to statutory royalty rates in 37 C.F.R. Part 380.
54. A direct license for a CABSAT service could potentially be used as a benchmark for setting PSS rates. As in the case of a direct license for a PSS, such a license would not be an *ideal* benchmark from an economic perspective, because one would expect it to be influenced by the statutory license. However, because most of Sirius XM's direct licenses include use of sound recordings in a CABSAT service, I nonetheless considered whether Sirius XM's direct licenses might provide useful information about the marketplace value of the use of recordings in a PSS.
55. As an initial matter, Sirius XM's CABSAT service is tiny compared with its SDARS. Counsel for SoundExchange provided me copies of Sirius XM's 2015 end-of-year statements of account for its SDARS and CABSAT service. For 2015, Sirius XM reported to SoundExchange [REDACTED] in "gross revenues" for its SDARS.⁷⁷ Counsel for SoundExchange informs me that such number as reported on Sirius XM's 2015 SDARS statement of account actually reflects a reduction of

⁷⁶ *SDARS II* at 23,058.

⁷⁷ Statement of Account for a Preexisting Satellite Digital Audio Radio Service (SDARS) – 2015 Monthly Liability (February 16, 2016) (SoundExchange Exhibit 14).

approximately [REDACTED] based on its use of direct-licensed recordings and pre-1972 recordings, and other exclusions from actual revenue, so its pre-deduction revenue from providing its SDARS in 2015 was at least about [REDACTED]. By contrast, Sirius XM reported only [REDACTED] in 2015 revenue from its CABSAT service.⁷⁸ I have no information as to whether such revenue was reduced in the same manner as for computation of Sirius XM's SDARS royalties. Nonetheless, it is clear that by any measure, Sirius XM's CABSAT generates less than [REDACTED] as much revenue as its SDARS.

56. Because Sirius XM's CABSAT business constitutes such a small part of Sirius XM's overall business, its direct licenses for sound recording rights covering its whole suite of service offerings cannot be understood as specifically reflecting the economics of the CABSAT service. If anything, they must overwhelmingly reflect the economics of the SDARS business.
57. Moreover, Dr. Lys identified various problems in using these direct licenses as a benchmark even for Sirius XM's SDARS. He concluded that the royalty rates in the agreements are unrelated to the underlying market value of the rights conveyed in those agreements, and that the actual market value of those rights cannot be inferred from the direct license agreements. I agree with this analysis. Dr. Lys also noted that the total pool of direct licensees is of limited consequence to Sirius XM's royalty obligations, and a substantial portion of the direct license agreements are of no consequence at all.
58. For these reasons, I conclude that Sirius XM's direct licenses do not provide a useful benchmark for setting PSS rates.

IX. The Regulated Rates in Part 383 Provide the Best Available Basis for Estimating the Fair Market Value of the Use of Sound Recordings in a PSS

59. CABSAT services such as Sirius XM's CABSAT service discussed above are the services of which I am aware that are most like the core service of each PSS. In

⁷⁸ Statement of Account for a New Subscription Service (CABSAT) – 2015 Monthly Liability (February 16, 2016) (SoundExchange Exhibit 15).

each case, what is provided is a service delivered to the television sets of consumers through their cable or satellite provider (referred to as a “multichannel video programming distributor” or “MVPD”) as part of a subscription bundle consisting overwhelmingly of television programming. PSS and CABSAT services are similarly-situated buyers of sound recording rights, because both create audio music channels incorporating the licensed sound recordings and sell them to MVPDs, who in turn resell those channels to consumers as part of subscription bundles.

60. As noted above, the CABSAT services are “new subscription services” covered by the rates in 37 C.F.R. Part 383. An NSS is defined in the Copyright Act as “a service that performs sound recordings by means of noninteractive subscription digital audio transmissions and that is not a preexisting subscription service or a preexisting satellite digital audio radio service.”⁷⁹ The particular subset of NSS subject to the CABSAT rates in Part 383 are defined in 37 C.F.R. § 383.2(f) as:

a non-interactive (consistent with the definition of “interactive service” in 17 U.S.C. § 114(j)(7)) audio-only subscription service (including accompanying information and graphics related to the audio) that is transmitted to residential subscribers of a television service through a Provider which is marketed as and is in fact primarily a video service where:

1. Subscribers do not pay a separate fee for audio channels.
2. The audio channels are delivered by digital audio transmissions through a technology that is incapable of tracking the individual sound recordings received by any particular consumer.
3. However, paragraph (f)(2) of this section shall not apply to the Licensee’s current contracts with Providers that are in effect as of the effective date of this part if such Providers become capable in the future of tracking the individual sound recordings received by any particular consumer, provided that the audio channels continued to be delivered to

⁷⁹ 17 U.S.C. § 114(j)(8).

Subscribers by digital audio transmissions and the Licensee remains incapable of tracking the individual sound recordings received by any particular consumer.

61. The term Provider is defined in 37 C.F.R. § 383.2(e) as: “a ‘multichannel video programming distributor’ as that term is defined in 47 CFR 76.1000(e); notwithstanding such definition, for purposes of this part, a Provider shall include only a distributor of programming to televisions, such as a cable or satellite television provider.”
62. According to payment data provided by SoundExchange, CABSAT services that have paid statutory royalties in recent years are Sirius XM, Stingray Music (formerly Galaxie), and DMX (before its service was effectively merged into Muzak as of May 1, 2014). As explained in greater detail below, these businesses provide essentially the same services as the PSS, are distributed through the same distribution channels, and compete with each other:
 - a. In addition to its SDARS, Sirius XM provides approximately 70 music channels through the Dish Network, which had roughly 14 million subscribers in 2015.⁸⁰ Premium service subscribers get the satellite radio channels as part of their packages.⁸¹ Sirius XM also provides a business music service⁸² and makes some of its channels available for Internet streaming.⁸³
 - b. Stingray Music is a Canadian digital pay television audio service owned and operated by Stingray Digital. It has approximately 50 music channels⁸⁴ that are available to television service subscribers of several cable and IPTV providers in

⁸⁰ Dish, <http://www.dish.com/music/> (last visited Oct. 10, 2016).

⁸¹ Dish, Select the Package that’s right for you, <http://www.dish.com/packages/> (last visited Oct. 10, 2016); Satellite Solutions, <http://www.satellitesolutions.com/dishnetwork/channels-sirius-xm-satellite-radio.asp> (last visited Oct. 10, 2016).

⁸² Sirius XM, Our Music’s Just Good Business, <https://www.siriusxm.com/siriusxmforbusiness> (last visited Oct. 10, 2016).

⁸³ Sirius XM, Streaming, <https://m.siriusxm.com/streaming> (last visited Oct. 10, 2016).

⁸⁴ Stingray Music, Channels, http://music.stingray.com/en_US/channels (last visited Oct. 10, 2016).

- the United States.⁸⁵ Like Sirius XM, it also provides a business service,⁸⁶ as well as Internet streams to individuals who subscribe to television services providing Stingray Music.⁸⁷
- c. Before it was effectively absorbed into Muzak as of May 1, 2014, DMX provided approximately 100 music channels through various MVPDs, but principally in the form of the SonicTap service provided through DirecTV.⁸⁸ Muzak appears still to provide at least 55 audio channels through DirecTV.⁸⁹
 - d. Muzak also continues to provide 32 music channels through its historic DishCD service.⁹⁰ Its parent company Mood Media is primarily a provider of business music service.⁹¹
 - e. Music Choice provides 75 audio channels through various MVPDs,⁹² along with a business service⁹³ and streaming to subscribers of the cable services that carry its channels, through a family of apps⁹⁴ and a web portal.

⁸⁵ Stingray Music, How to Get Stingray Music, http://music.stingray.com/en_US/about/subscribe (last visited Oct. 10, 2016).

⁸⁶ Stingray Music, Music for Business, http://music.stingray.com/en_US/about/enterprise (last visited Oct. 10, 2016).

⁸⁷ Stingray Music, Stingray Music Mobile, http://music.stingray.com/en_US/mobile (last visited Oct. 10, 2016). SoundExchange tells me that Stingray has separately paid webcasting royalties to SoundExchange for its streaming.

⁸⁸ See Rebuttal Testimony of Gregory S. Crawford, *In re* Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2011-1 CRB PSS/Satellite II (July 2, 2012) ¶ 110, available at https://www.loc.gov/crb/proceedings/2011-1/rps/music_choice_crawford.pdf (“Crawford Testimony”).

⁸⁹ Find Your Groove with the Music Channels on Satellite TV, <http://www.satellite-reviews.net/compare/satellite-music> (last visited Oct. 10, 2016).

⁹⁰ Choose Your Package and Order Dish TV!, <http://www.getsatellite.com/Satellite-TV-Packages/music/DishCD/> (last visited Oct. 10, 2016); DISH CD (32 Music Channels), <http://www.satellitesolutions.com/dishnetwork/channels-dish-cd-music-channels.asp> (last visited Oct. 10, 2016).

⁹¹ Ben Sisario, *Muzak, Background Music to Life, to Lose Its Name*, N.Y. Times (Feb. 4, 2013), http://www.nytimes.com/2013/02/05/business/muzak-background-music-to-life-to-lose-its-name.html?_r=0 (business music services generate about 90% of the revenues of Mood Media).

⁹² Music Choice, Music Channels, <https://www.musicchoice.com/> (last visited Oct. 10, 2016).

⁹³ Music Choice, MC for Business, <http://corporate.musicchoice.com/about-us/mc-business/> (last visited Oct. 10, 2016).

⁹⁴ Music Choice, Download the App, <http://app.musicchoice.com/>; Music Choice, iTunes Preview, <https://itunes.apple.com/us/app/music-choice/id573887614?mt=8>; Music Choice for iPad, <https://itunes.apple.com/us/app/music-choice-for-ipad/id621427918?mt=8>; Google Play – Music Choice, <https://play.google.com/store/apps/details?id=com.music.choice&hl=en>.

- f. The PSS and the CABSAT services have the same functional characteristics (noninteractive audio channels included in cable and satellite TV packages), and all offer wide selections of audio channels that include multiple channels in popular genres. Music Choice's expert in *SDARS II* (when DMX was a CABSAT service) expressly acknowledged that Muzak is "like DMX."⁹⁵
- g. The PSS and the CABSAT services compete for the same MVPD wholesale buyers. Sirius XM's CABSAT service is distributed by Dish Network just like Muzak's PSS. Sirius XM provided audio channels to DirecTV until it was replaced by DMX.⁹⁶ Now, Muzak is providing DirecTV's music channels. Music Choice has complained publicly about facing increasing competition from other providers of music channels to MVPDs,⁹⁷ which presumably means the CABSAT services.
- h. Stingray bought Music Choice's European affiliate in 2011,⁹⁸ and Stingray now operates it as Music Choice International.⁹⁹ In the U.S., the two companies are direct competitors. A 2015 Music Choice document [REDACTED]¹⁰⁰ Similarly, Music Choice documents dated 2013 and 2014 [REDACTED]¹⁰¹ In 2014, Stingray replaced Music Choice as the provider of music channels on the AT&T U-verse service, and now the two companies are in patent litigation with

⁹⁵ Crawford Testimony at ¶ 112.

⁹⁶ Crawford Testimony at ¶ 113.

⁹⁷ Comments of Music Choice in Copyright Office Docket No. 2014-03, at 2 (May 23, 2014), *available at* http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/Music_Choice_MLS_2014.pdf.

⁹⁸ Julian Clover, Music Choice Europe Sold for a Song, *Broadband TV News* (Apr. 4, 2011), <http://www.broadbandtvnews.com/2011/04/04/music-choice-europe-sold-for-a-song/>.

⁹⁹ Stingray Digital, Our Properties, <http://demo.stingray.com/en/our-properties/music-choice.php> (last visited October 15, 2016).

¹⁰⁰ *See, e.g.*, MC0000586 to -625, -621.

¹⁰¹ MC0002925 to -950, -927; MC0003099 to -129, -104.

each other.¹⁰² Music Choice's press release announcing its patent suit specifically refers to competition from Stingray.¹⁰³

63. Under the statutory license, CABSAT services pay scheduled per-subscriber rates during the current CABSAT rate period. For stand-alone contracts, the per subscriber rates increase every year by approximately 3%: 2016 (\$0.0179); 2017 (\$0.0185); 2018 (\$0.0190); 2019 (\$0.0196), and 2020 (\$0.0202).¹⁰⁴
64. These are not *marketplace* benchmarks, because they are regulated rates. However, the applicable rate standard is the willing buyer/willing seller standard under 17 U.S.C. § 114(f)(2). Thus, they purport to be fair market rates. While the PSS rates must be viewed as anchored in the musical works benchmark and reflective of the policy-based determinations in *PSS I* and *SDARS II*, these rates are more likely to be indicative of rates that might be agreed to in marketplace transaction between a sound recording copyright owner and the provider of a PSS.
65. I conclude that the CABSAT rates are the best available proxy for a market based royalty for PSS.
66. I further considered whether the difference between PSS and CABSAT rates might be explained by the number of channels provided, and whether any adjustment to the CABSAT rates might be appropriate based on differences in the number of channels provided by the PSS and CABSAT services. However, as set forth above, there appears to be no clear linkage between PSS and CABSAT status and rates and the number of channels provided. The largest providers of each type of service (Music Choice and Sirius XM) each provide similar numbers of channels (75 and 70), while the number of channels provided by others has varied widely. Music Choice and Stingray compete directly, and Music Choice offers more channels than

¹⁰² Kent Gibbons, *Music Choice Sues Rival Stingray Digital over Patents*, Multichannel News (June 6, 2016), <http://www.multichannel.com/news/networks/music-choice-sues-rival-stingray-digital-over-patents/405445>.

¹⁰³ Music Choice, *Music Choice Sues Stingray for Patent Infringement* (Jun. 6, 2016) ("Stingray must compete fairly"), available at <http://corporate.musicchoice.com/about-us/press-room/press-article/music-choice-sues-stingray-patent-infringement/>.

¹⁰⁴ A separate rate is provided for CABSAT service provided pursuant to bundled contracts, which are those contracts between a licensee and a provider, such as a cable or satellite television provider, in which the service is not the only content licensed by the licensee to the provider. [REDACTED]

Stingray. While a larger number of channels may provide some advantage to a service, that does not seem to be a critical consideration once a service provides the several dozen channels that allow it to cover a wide selection of genres of music, and provide depth of coverage in popular genres. Accordingly, it does not appear that the CABSAT rates are a function of the number of channels provided, or that it is necessary to adjust the CABSAT rates to account for any difference in the number of channels provided.

X. The Regulated Rates in Part 380 Provide a Reasonable Basis for Estimating the Fair Market Value of the Use of Sound Recordings in Internet Transmissions Made as Part of a PSS

67. As described above, I understand that, among the PSS, at least Music Choice provides Internet simulcasts of its channels to subscribers of the MVPDs that distribute Music Choice.
68. SoundExchange informs me that Music Choice does not pay separately for its Internet streaming or report it to SoundExchange, because it takes the position that such streaming is part of its PSS.
69. I do not have an opinion on the legal question whether Music Choice's Internet streaming is properly considered part of its PSS, and so subject to rates to be determined in this proceeding.
70. However, as an economic matter, I believe that Music Choice's Internet streaming should be valued separately from its television-based service. As described above, the CABSAT rates in Part 383 are quite clearly limited to a service "transmitted to residential subscribers of a television service" through an MVPD using "a technology that is incapable of tracking the individual sound recordings received by any particular consumer." Internet streaming is something else, because streams are typically transmitted to devices other than televisions, over the public Internet. Because Internet transmissions are made on a one-to-one basis, Internet performances can be counted.
71. Thus, it is clear that a provider of a CABSAT service that wished to simulcast its channels over the Internet in reliance on the statutory license could not pay only the

CABSAT rates in Part 383; it would need to pay for its Internet streaming at the rates in Part 380. *See* 37 C.F.R. § 380.7 (defining Licensee as an entity providing an Internet streaming service).

72. SoundExchange informs me that Sirius XM and Stingray have done just that. Each provides a CABSAT service (among other things), and also has paid SoundExchange royalties pursuant to Part 380 for its Internet simulcasts.
73. As in the case of the CABSAT rates themselves, the Part 380 streaming rates are not a *marketplace* benchmark, because they are regulated rates. However, reproducing the economic analysis from *Web IV* seems unwarranted for an ancillary activity of the PSS, and the Part 380 rates were recently determined by the Judges under the willing buyer/willing seller standard and thus purport to be fair market rates. In the absence of any apparent marketplace benchmark for the value of the use of sound recordings ancillary to a PSS or CABSAT, if one accepts that the CABSAT rates in Part 383 provide the best available approximation of a market based royalty for the core PSS television-based service, it follows that the Part 380 rates that would be paid for Internet streaming ancillary to such a service must provide a reasonable approximation of a market royalty for Internet streaming ancillary to the core PSS television-based service.

XI. Application of the Section 801(b)(1) Objectives

74. The Judges' prior decisions teach that in cases subject to the 801(b)(1) rate standard, after estimating a marketplace royalty, it is necessary to consider whether any adjustment based on the 801(b)(1) objectives is necessary.
75. The first three objectives address issues that are accounted for in market prices.¹⁰⁵ That is, the market will tend to ensure an efficient amount of availability, provide a reasonable return and income, and reward contributions based on their market value.¹⁰⁶ Accordingly, the Judges have held that an adjustment based on these factors is warranted only when the benchmark market and the hypothetical target market under the statutory license are different in ways relevant to these objectives.

¹⁰⁵ *See SDARS I* at 4094-95.

¹⁰⁶ Lipsey 431-432; and Varian 301-302.

Thus, in this case, the relevant inquiry is whether the target market (PSS) is different from the benchmark market (CABSAT and webcasting) in ways that require an adjustment. I conclude that no such adjustment based on the first three factors is warranted here.

76. *To maximize the availability of creative works to the public:* PSS and CABSAT services (along with Internet simulcasting by PSS and CABSAT services) appear to provide equivalent availability of creative works to consumers. Moreover, payment of CABSAT royalties for the core PSS television-based service, and payment of webcasting rates for any ancillary streaming (as in the case of simulcasting by a CABSAT service), would cause both CABSAT services and PSS to contribute equally to the creation of new recordings.
77. In *PSS I*, the panel was persuaded that PSS substantially increased availability of recordings because they offered diverse programming at a time when no other digital music services were in the market.¹⁰⁷ However, the panel also recognized that “a future Panel may reach an entirely different result based on the then-current economic state of the industry.”¹⁰⁸ In fact, the market has changed greatly in 20 years. Consumers can access similarly-diverse selections of channels through many different types of noninteractive services (webcasting, SDARS, CABSAT) and even more diverse selections of recordings through on-demand services. While it may be that PSS once contributed uniquely to the availability of recordings, they are now just one of many sources from which consumers may access recordings. Conversely, low PSS rates have a negative effect on availability, because of opportunity costs to copyright owners, and greater competition for other services including CABSAT. Adopting the CABSAT rates for PSS is fully consistent with the first objective; lower rates would be inconsistent with that objective.
78. *To afford the copyright owner a fair return for his creative work and the copyright user a fair income under existing economic conditions:* In *SDARS I*, the Judges

¹⁰⁷ Report ¶ 121-122.

¹⁰⁸ *Id.* ¶ 202.

assigned an economic meaning to fairness, stating that “a fair income is . . . consistent with reasonable market outcomes.”¹⁰⁹ Use of CABSAT and webcasting rates for PSS is consistent with this statutory objective, as the CABSAT and webcasting rates purport to approximate a marketplace rate. Conversely, continuing to offer below-market rates to PSS based on the musical works benchmark and past policy decisions, including ones based on market conditions in the 1990s, seems manifestly contrary to any reasonable effort to approximate existing economic conditions.

79. *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:* PSS and the CABSAT services have similar roles and make similar contributions, in that they all provide essentially the same service, as described above. Notably, Music Choice’s wholesale distribution model seems to be relatively inexpensive to operate. Between 2013 and 2016, it spent less than [REDACTED] of revenue on property and equipment.¹¹⁰
80. By way of comparison, Sirius XM’s capital expenditures were 3% of its total revenues in 2015,¹¹¹ and Pandora spent 2.8% of its total revenues on capital expenditures during the same period.¹¹²
81. Copyright owners perform the same roles with respect to both CABSAT services and PSS – creating, marketing and distributing the recordings that the services monetize to attract an audience. No adjustment is required based on this objective.

¹⁰⁹ See *SDARS I* at 4095.

¹¹⁰ MC0003199, MC0003211, MC0015577.

¹¹¹ Sirius XM 2015 CapEx ÷ Total Revenue = \$134.892 ÷ \$4,570.1 = 3.0%. See Sirius XM Holdings, Inc. 2015 10-K Annual Report.

¹¹² Pandora 2015 CapEx ÷ Total Revenue = \$32.1 ÷ \$1,164.0 = 2.8%. See Pandora Media, Inc. 2015 10-K Annual Report.

However, it is notable that in contrast to all the services, record companies spend over 20% of their revenue on artists & repertoire and marketing.¹¹³

82. *To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices:* This factor reflects a policy judgment that changes in statutory rates should be implemented in a manner that does not “directly produce[] an adverse impact that is substantial, immediate and irreversible in the short-run” and that “threaten[s] the viability of the music delivery service currently offered to consumers under this license.”¹¹⁴ This fourth factor is different from the previous three in that it appears on its face to be counter-market (but in actuality is not). Actual economic markets do not shield competitors from competition nor are they designed to avoid disruption.¹¹⁵ Consider the various industries that no longer exist as a result of competitive forces (e.g., the horse and buggy as popular means of transportation).¹¹⁶ In short, market forces constantly act to produce the types of impact this factor could be construed as seeking to limit. However, we know that the rate setting process is intended to generate rates that approach those that would be observed in an unregulated free market. Consequently, I take this factor to mean simply that caution should be exercised in the rate setting process so as not to harm the market (in the long or short term) by artificially setting the rate too low or too high. I note that the Judges have phased in rate increases when they have thought that was justified as a matter of policy.
83. Economic theory indicates that artificially low prices can be just as harmful as artificially high prices and that numerous frictions can be introduced as a result.¹¹⁷

¹¹³ IFPI, Our Industry – How Record Labels Invest, <http://www.ifpi.org/how-record-labels-invest.php>.

¹¹⁴ *SDARS I* at 4097.

¹¹⁵ Carlton & Perloff 78-79; Geroski et al., *Founding Conditions and the Survival of New Firms*, Strategic Management Journal, Vol. 31, at 514 (2010).

¹¹⁶ Victor D.S. Paulino & Gael Le Hir, *Industry Structure and Disruptive Innovations: The Satellite Industry*, Journal of Innovation Economics & Management 37-39 (2016); Dunne et al., *Patterns of Firm Entry and Exit in the U.S. Manufacturing Industries*, RAND Journal of Economics, Vol. 19, No. 4, at 507-08 (Winter 1988).

¹¹⁷ Fiona M. Scott-Morton, *The Problems of Price Controls*, Health and Medicine 50-51 (Spring 2001); Varian 401-02; Carlton & Perloff 696-706.

For example, if pharmaceutical drug prices are regulated to artificially low levels, innovation will likely decrease thereby leading to fewer beneficial drugs being developed.¹¹⁸ Similarly if the price of a product is artificially too high (e.g., as a result of taxation) then sales of those products will diminish thereby disrupting that industry.¹¹⁹

84. I have three further observations relevant to this factor. First, low PSS rates distort competition between PSS and CABSAT services and thus themselves have a disruptive impact on the structure of the industries involved. For example, DMX was for many years a CABSAT until Muzak assumed its business and began paying PSS rates for distribution through DirecTV and other MVPDs previously served by DMX. In a free market, this would be viewed as successful competition by a lower-cost provider. However, it appears that this was instead the triumph of a competitor able to operate with a subsidized cost structure due to below-market rates under the statutory license. Similarly, Stingray seems to be having some success competing against Music Choice despite paying the higher CABSAT royalties. It is inconsistent with sound competition policy to advantage Music Choice in this competition through a low rate.
85. Second, if the Judges conclude that it might be appropriate as a policy matter to set rates lower than what a free market would otherwise dictate (here approximated by the CABSAT and webcasting rates) it should be understood that doing so would have three effects: (1) it would undermine the first objective of maximizing the availability of creative works to the public because it would provide less of an incentive to artists to engage in creative endeavors; (2) it would undermine the second objective by resulting in a lower return to the copyright owner and a lower income to the copyright user; and (3) it would be in tension with the third objective—reflecting the relative roles of the copyright owner and user—which,

¹¹⁸ John E. Calfee, *Pharmaceutical Price Controls and Patient Welfare*, American College of Physicians-American Society of Internal Medicine, 1060-61 (2001); Marie Salter, *Reference Pricing: An Effective Model for the U.S. Pharmaceutical Industry?*, Northwestern Journal of International Law & Business, Vol. 35, Issue 2, at 432-33 (Summer 2015).

¹¹⁹ Fiona M. Scott-Morton, *The Problems of Price Controls*, Health and Medicine 50-51 (Spring 2001); Varian 401-402; Carlton & Perloff 696-706.

like the first two objectives, is best achieved with a marketplace rate for the reasons provided in Part III.B of my testimony. Thus, it seems most consistent with balancing the objectives to move toward a marketplace rate over a relatively short term.

86. Finally, the Judges have held that no service is assured of a statutory royalty rate that will allow it to operate profitably.¹²⁰ If the PSS cannot, by some combination of lower profits, higher prices, reduced expenses, or subsidy from other lines of business operate their services while paying marketplace prices for the inputs used in their services, the economically-appropriate result is that other providers who can do so (such as the CABSAT services) should be allowed to do so. In other words, the rate setting process is not intended to introduce protectionist artificial market frictions in the sense that non-competitive participants are subsidized and allowed to continue to exist in the long term. Rather it is intended to approximate market rates, in the absence of a free market, so that supply and demand will reach a pareto-optimal equilibrium. This is best achieved with a market rate.

XII. SoundExchange's Rate Proposal

87. Counsel for SoundExchange has informed me that, based on my analysis above, SoundExchange will propose rates for the core PSS television-based service that are equivalent to the CABSAT standalone rates for 2018-2020 (the last year for which CABSAT rates have been set), and rates of \$.0208 in 2021 and \$.0214 in 2022. These latter rates continue the approximately 3% annual step increases in the CABSAT rates.
88. Likewise based on my analysis above, I understand that SoundExchange will propose rates for any ancillary Internet simulcasting of PSS channels that are tied to the appropriate rates in Part 380 (subscription webcasting by a commercial webcaster).
89. For the reasons explained above, I believe that these rates are a reasonable approximation of market royalties for the PSS and consistent with the 801(b)(1) objectives.

¹²⁰ *SDARS I* at 4095; *SDARS II* at 23,067.

90. I considered whether it would be appropriate to convert these rates to a percentage, because that is the rate structure that has previously applied to PSS. However, due to peculiarities in Music Choice's pricing, I conclude that adopting the CABSAT per subscriber rates is more likely to relate the rates to the value of the music used.
91. Music Choice is majority owned by cable companies—including Comcast, Cox, and Time Warner Cable¹²¹—and it charges [REDACTED] to these providers, as is shown below. And while some of these partners are larger cable companies, [REDACTED]
[REDACTED]
[REDACTED]. Thus, it is not clear that the partner prices are the result of arms-length marketplace transactions.

Table1: Selected Partner Rates [RESTRICTED]¹²²

Entity	Total Subs (in thousands)	Rate in 12/14	Rate in 12/15	Rate in 12/16	Rate in 12/17	Rate in 12/18	Rate in 12/19	Rate in 12/20	Rate in 12/21
Comcast Cable Communications, LLC	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Time Warner Cable Enterprises, LLC	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Cox Communications, Inc.	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
AVERAGE		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table 2: Selected Non-Partner Rates

Entity	Total Subs (in thousands)	Rate in 12/14	Rate in 12/15	Rate in 12/16	Rate in 12/17	Rate in 12/18	Rate in 12/19	Rate in 12/20	Rate in 12/21
Verizon Services Corp.	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Charter Communications Holding Company	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
CSC Holdings, Inc.	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
AVERAGE		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

¹²¹ See SoundExchange Exhibit 19 (MC0003241).

¹²² See MC0015580. These charts reflect rates for the largest (in terms of numbers of subscribers) of three partners and three non-partners with which Music Choice had contracts for the entire period.

COMPARISON TO PARTNER RATES									
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92. In *SDARS II*, the Judges ruled that because what were perceived as record company partners of Music Choice own one quarter of the company, “it is not unreasonable to assume that the record label owners would serve as a counterweight to the affiliated cable systems.”¹²³ There are two entities that could conceivably be perceived as record company partners: Sony Digital Radio, Inc. and EMI Music Publishing Top Twenty, Inc.¹²⁴ A document produced by Music Choice in this proceeding indicates that both entities have a 12.6% voting interest in Music Choice through an intermediate entity SWE Cable Radio Company.¹²⁵
- a. Sony Digital Radio, Inc. is a subsidiary of Sony Corporation of America (“SCA”),¹²⁶ along with Sony Music Entertainment (Sony’s recorded music company).¹²⁷ SCA has several other subsidiaries that compete in a variety of industries, including electronics and mobile (Sony Electronics, Sony Mobile Communications), film and television (Sony Pictures Entertainment), games (Sony Interactive Entertainment), and digital services (Sony DADC).¹²⁸ One of its many diversified offerings is a television service called PlayStation Vue.¹²⁹ While these companies are all under the SCA corporate umbrella, they are separate, stand-alone businesses that operate independently of each other. For example, the slides accompanying a Sony corporate strategy meeting dated June

¹²³ *SDARS II* at 23,061.

¹²⁴ The Music Choice partners with Warner in their name appear to be related to Time Warner Cable or Time Warner Inc., two separate companies that have both been separate from Warner Music Group for more than a decade.

¹²⁵ See SoundExchange Exhibit 19 (MC0003241).

¹²⁶ Music Choice, About Us, <http://corporate.musicchoice.com/about-us/> (last visited Oct. 10, 2012).

¹²⁷ Sony, Our Businesses, http://www.sony.com/en_us/SCA/who-we-are/our-businesses.html#music (last visited Oct. 10, 2012).

¹²⁸ *Id.*

¹²⁹ PlayStation Vue, Better TV Starts Now, <https://www.playstation.com/en-us/network/vue/> (last visited Oct. 10, 2012).

29, 2016 state that a key strategy is to achieve “[g]reater autonomy at business units with a focus on shareholder value.”¹³⁰ Based on the foregoing, and without any insight into the full scope of Music Choice’s relations with its partners and the boardroom dynamics, it seems unreasonable to *assume* that SCA is using its influence over SWE Cable Radio Company to act as a counterweight to any pricing influence that affiliated cable systems may exert on Music Choice.

- b. EMI Music Publishing Top Twenty, Inc. is part of the EMI Music Publishing group of companies,¹³¹ which was purchased in 2012 by an investor group including SCA, the estate of Michael Jackson and various financial investors. EMI Music Publishing is now administered by Sony/ATV Music Publishing, which was a joint venture between SCA and the estate of Michael Jackson until SCA recently bought out the estate’s interest (although the estate retained its interest in EMI Music Publishing).¹³² Obviously a music publisher is not a record company, and as with the other SCA affiliate having an indirect interest in Music Choice, given the various interests involved, it seems unreasonable to *assume* that EMI Music Publishing, Sony/ATV or SCA is using its influence over SWE Cable Radio Company to act as a counterweight to any pricing influence that Music Choice’s affiliated cable systems may exert.

- 93. In view of the foregoing, it at least seems plausible that Music Choice may be charging non-arm’s-length prices to its cable company partners. Charging a per-user fee is more likely to approximate rates achieved through the marketplace.

XIII. Conclusion

- 94. Absent overriding social considerations (e.g., everyone should own a home and therefore interest rates for certain income-defined demographic groups will qualify

¹³⁰ Sony, Corporate Strategy, <http://www.sony.net/SonyInfo/IR/strategy/index.html> (last visited Oct. 14, 2016).

¹³¹ Music Choice, About Us, <http://corporate.musicchoice.com/about-us/> (last visited Oct. 10, 2012).

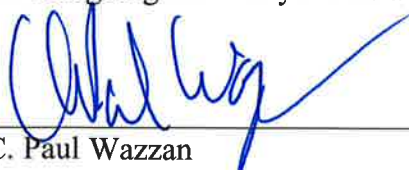
¹³² Ed Christman, Updated: Sony-Led Group Closes Purchase of EMI Music Publishing, *Billboard*, <http://www.billboard.com/biz/articles/news/publishing/1084866/updated-sony-led-group-closes-purchase-of-emi-music-publishing> (June 29, 2012); Ed Christman, Sony Finalizes Acquisition of Michael Jackson Estate’s Stake in Sony/ATV Publishing, *Billboard*, <http://www.billboard.com/biz/articles/news/publishing/7526545/sony-finalizes-acquisition-of-michael-jackson-estates-stake-in> (Sept. 30, 2016).

for subsidized loans made by the government) free markets tend to produce the best outcomes for consumers.¹³³ In the current context, market-based pricing would produce the proper incentives to motivate optimum music production, distribution and consumption. Based on the analysis provided above, I have determined that SoundExchange's proposed rates are the closest thing to an observable market rate, and that the objectives of the Judges with respect to rate setting would best be served by these market-proximate rates.

¹³³ Lipsey 431-432; Varian 301-302.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: 10/19/2016



C. Paul Wazzan

Appendix A

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BIO/SUMMARY

C. Paul Wazzan, Ph.D. heads the Firm's Century City (Los Angeles) office. Dr. Wazzan specializes in providing financial, economic and statistical expertise in the following areas:

- Complex damages,
- Finance (e.g., valuation, corporate finance, securities fraud/10b5, option valuation, class certification, pricing of mortgage risk and MBS/CDOs, commodities price manipulation)
- Intellectual property (e.g., patent and trademark infringement, theft of trade secrets)
- Labor and employment (e.g., class certification, managerial misclassification, wage and hour, discrimination)
- Antitrust and competition policy (e.g., market definition, merger analysis, predatory pricing, price-fixing, exclusionary conduct, price discrimination, attempted monopolization)
- Public policy

Dr. Wazzan also specializes in large-scale (i.e., millions of records) data analytics (e.g., data acquisition, database design and development and statistical/econometric analysis).

Dr. Wazzan's analyses have covered a wide range of industries, including basic manufacturing (e.g., automotive, mining, oil and gas, steel, food processing and distribution), high-tech (e.g., aircraft and avionics, semiconductors, digital signal processors, computer peripherals), real estate (e.g., appropriate interest rates in bankruptcy settings, lending discrimination), financial services (e.g., banking, metals and other commodities trading, organized financial markets), and pharmaceuticals (e.g., pricing of proteins, drugs and the modeling of expected sales).

Dr. Wazzan's research has been published in peer reviewed economics journals and law reviews, and he has testified in a wide range of matters in federal, state, and bankruptcy Courts, the International Trade Commission, domestic and international arbitration proceedings, and in front of legislative bodies. In addition, his testimony has been featured and relied upon in published judicial decisions.

Dr. Wazzan is president and CEO of Wazzan & Co. Investment LLC, a venture capital firm providing seed-level funding to firms specializing in semiconductor, optical networking, bio-mechanical, bio-medical, and related technologies.

Dr. Wazzan has been an adjunct assistant professor of business and economics at California State University, Los Angeles and has also taught MBA classes at the University of Southern California, Marshall School of Business.

EDUCATION

Ph.D., Finance	University of California, Los Angeles, Anderson Graduate School of Management, 1996
B.A., Economics	University of California, Berkeley, 1989

PRESENT POSITIONS

Berkeley Research Group, LLC, Managing director and head of Century City (Los Angeles) office
Wazzan & Co. Investment, LLC, President and CEO

LITIGATION EXPERT RETENTIONS (client underlined)

Joseph P. Ausikaitis, derivatively on behalf of Masimo Corp. v. Joe Kiani, Steven J. Barker, Robert Coleman, Jack Laserohn, Sanford Fitch, Jon Coleman, Mark P. DeRaad, Rick Fishel, Yongsam Lee and Anand Sampath, and Masimo Corp.
U.S. District Court, District of Delaware. September 2014: Report, October 2014: Deposition.

Federal Deposit Insurance Corporation, as Receiver for Pacific Coast National Bank v. Michael S. Hahn, Colin M. Forkner, Michael V. Cummings, Richard W. Grinyer, Stanley M. Cruse, and David L. Adams
U.S. District Court, Central District of California. August 2014: Report, November 2014: Deposition.

Starr International Company, Inc. et al. v. United States of America
U.S. Court of Federal Claims. February 2014: Report, April 2014: Report, May 2014: Deposition, October 2014: Trial.

VFS Financing, Inc. v. Stacey L. Gonfiantini et al.
U.S. District Court, District of Nevada. September 2013: Report, October 2013: Report, November 2013: Deposition.

Stryker Corporation v. Joseph P. Errico, Thomas J. Errico, James D. Ralph, Warburg Pincus Private Equity VII, L.P. Vertical Fund I, L.P., Vertical Fund Physicians' Fellowship Partners, LLC
State of Michigan, Ninth Judicial Circuit, Kalamazoo County, Civil Division. August 2013: Report, October 2013: Report, November 2013: Deposition.

Glovia Sociedad Anomina v. Universal Surface Technology et al.
Superior Court of the State of California, County of Los Angeles. May 2013: Deposition.

Kenneth Barton v. RPost International Ltd. et al.
Superior Court of the State of California, County of Los Angeles. Appointed by the Court as an independent expert pursuant to Evidence Code Section 730, March 2013: Report, April 2013: Trial.

U.S. Bank National Association v. PHL Variable Insurance Company
U.S. District Court, Central District of California, Western Division. February 2013: Report.

In re: Desert Inn Management Company, Ltd.
U.S. Bankruptcy Court for the District of Nevada. Retained by Debtor, Desert Inn Management Co. Ltd., February 2013: Report, February 2013: Deposition.

Sonoma Tires, Inc. v. Big O Tires LLC
U.S. District Court, Northern District of California. January 2013: Report.

Frontier Hot Oil, LLC. v. Parka Inc. et al.
District Court, Larimer County Colorado. August 2012: Report, October 2012: Report, Deposition, March 2013: Trial.

Margaret McCarthy v. Goldline International, Inc.
JAMS Arbitration, Santa Monica, CA. August 2012: Deposition.

Ecotality, Inc v. California Public Utilities Commission et al.
Court of Appeal for the State of California, First Appellate District, Division Two, May 2012: Declaration, June 2012: Declaration.

Stephen J. and Linda L. Rogers v. The United States
U.S. Court of Federal Claims. January 2012: Declaration.

Cable, LLC v. Petroleum Pressure Surveys, Inc.
District Court, Logan County, Colorado. January 2012: Report.

Dorothy L. Biery et al. and Jerramy and Erin Pankratz et al. v. United States of America
U.S. Court of Federal Claims, December 2011: Declaration, February 2012: Report, March 2012: Deposition, May 2012: Report.

Best Buy Stores, L.P. v. Manteca Lifestyle Center, LLC
U.S. District Court, Eastern District of California, Sacramento Division. August 2011: Report, October 2011: Deposition.

In Re: The Preserve, LLC

U.S. Bankruptcy Court, Central District of California, Los Angeles Division. Retained by Lender/Plaintiff Point Center Financial, Inc., June 2011: Report, August 2011: Deposition, August 2011: Trial.

In the Matter of: Certain Video Game Systems and Controllers; Investigation No. 337-TA-743; U.S. International Trade Commission, Washington, DC. Retained by plaintiff, Motiva, LLC, May 2011: Report, June 2011: Deposition, August 2011: Trial.

PRU/SKS Brannan Associates, LLC. v. CA, Inc., Computer Associates International, Inc., Platinum Technology Inc., Platinum Technology International, Inc.

Superior Court of the State of California, for the County of San Francisco. November 2010: Deposition.

International Accessories Corporation v. Biasia Francesco S.p.A.

International Arbitration Association (Milan, Italy). October 2010: Report.

Opal Jones, Claudia A. Caldwell, Kalina Thomas, Vincent Jones, and C. Renae Walker Jones, et.al. v. Wells Fargo Bank, N.A. Wells Fargo Home Mortgage Inc.

Superior Court of the State of California, for the County of Los Angeles. May 2010: Report.

Frontier Energy Holding Group, LLC v. John L. Suprock; PCS Business Brokers, LLC

U.S. District Court, District of New Mexico. March 2010: Report, July 2010: Deposition.

In Re: Caviata Attached Homes, LLC

U.S. Bankruptcy Court, District of Nevada. Retained by Debtor/Defendant Caviata Attached Homes, LLC, February 2010: Report, February 2010: Deposition, March 2010: Trial.

Star News Building, LLC v. Glabman Furniture, Inc. et al.

Superior Court of the State of California, for the County of Los Angeles. February 2010: Report, February 2010: Deposition.

David Loera et al. v. Akal Security Inc.

Superior Court of the State of California, in and for the County of Imperial, November 2009: Deposition.

Anna's Linen Overtime Cases

Superior Court of the State of California, for the County of Orange, Central Justice Center. Retained by Defendant Anna's Linen, November 2009: Report, December 2009: Deposition.

California National Bank v. 501 Grant Street Partners, LLC

Court of the Common Pleas of Allegheny County, Pennsylvania. June 2009: Report.

FemPharm Pty Ltd. v. Vivus, Inc.

JAMS Arbitration (Reference No. 1100052964). January 2009: Arbitration.

In Re Mortgages Ltd.

U.S. Bankruptcy Court for the District of Arizona. Retained by Creditors Rightpath Limited Development Group, LLC and Maryland Way Partners, LLC, August 2008: Declaration.

WKN Windkraft Nord USA, Inc. v. Wind Energy System Technology, LLC et al.

Superior Court of the State of California, County of San Diego. July 2008: Report.

Stamps.com, Inc. v Endicia, Inc. and PSI Systems, Inc.

U.S. District Court, Central District of California. May 2008: Report, December 2008: Deposition.

Herman T. Guerrero and Jesus T. Guerrero, as Trustees of the Guerrero Family Trust et al. v. Kinki Nippon Tourist Co., Ltd., Saipan Hotel Corporation, Pacific Development Inc. et al.

Superior Court for the Commonwealth of the Northern Mariana Islands. April 2008: Report, July 2008: Deposition.

Ruth Oates v. City of Los Angeles, Board of Public Works

U.S. District Court, Central District of California. April 2008: Report.

Nissani v. Long Beach Motors et al.

Superior Court of the State of California, County of Los Angeles, Central District. March 2008: Report, April 2008: Deposition.

United States of America v. Frederick S. Schiff

U.S. District Court, District of New Jersey. Retained by Plaintiff United States of America, Department of Justice, U.S. Attorney's Office, State of New Jersey, February 2008: Report, March 2008: Hearing.

First National Mortgage Company v. Federal Realty Investment Trust

U.S. District Court, Northern District of California. January 2008: Report.

United States of America v. Mark D. Lay

U.S. District Court, Northern District of Ohio, Eastern Division. Retained by Plaintiff United States of America, Department of Justice, U.S. Attorney's Office, State of Ohio, October 2007: Report.

Edward D. Ekstrom and Juliet M. Ekstrom-Anderson v. Trend Micro Kabushiki Kaisha

Third District Judicial Court for Salt Lake County. August 2007: Report.

Karl Sapper & Son, Inc. v. Chalmers-Randolph, LLC

Superior Court of the State of California, County of Los Angeles, Central District. February 2007: Report, July 2007: Deposition, February 2008: Trial.

James Vlahos and Nicholas Vlahos v. International Baking Company, Inc. and Sara Lee Fresh Inc.

Superior Court of the State of California, for the County of San Mateo. December 2006: Deposition.

In Re Copper Antitrust Litigation

U.S. District Court, Western District of Wisconsin. Retained by Defendant J.P. Morgan Chase & Company, and Morgan Guaranty Trust Company of New York, November 2006: Report, December 2006: Deposition.

Richard Cavanaugh v. Unisource Worldwide Inc.

U.S. District Court, Eastern District of California, Fresno Division. October 2006: Report, January 2007: Deposition.

VCode Holdings, Inc. and VData LLC v. Adidas America Inc., Advanced Micro Devices, Inc., Boston Scientific Corp., Stamps.com Inc., Hitachi Global Storage Technologies (Thailand), Ltd., and Hitachi Global Storage Technologies, Inc.

U.S. District Court, District of Minnesota. March 2006: Report.

Joseph C. Canouse v. True Religion Apparel, Inc.

U.S. District Court, Central District of California, Western Division. October 2005: Report, December 2005: Report, February 2006: Deposition.

Rita F. Oliai v. Coram Healthcare Corporation

U.S. District Court, Central District of California. May 2005: Report, August 2005: Deposition, October 2005: Trial.

Foundstone Inc. v. Jassen Glaser; Eric Caso; Michael Morton and Dan Kuykendall

American Arbitration Association, Arbitration Tribunal. February 2004: Report.

Scott William Curry v. AXT, Inc.

U.S. District Court, Central District of California. January 2004: Report.

Walter Brashier et al. v. KPMG LLP

Court of Common Pleas, State of South Carolina, County of Greenville. September 2003: Report.

Joseph J. Jacoboni v. KPMG LLP

U.S. District Court for the Middle District of Florida, Orlando Division. August 2003: Report.

Scott E. Barmer v. Lincoln Financial Advisors Corp.

Superior Court of the State of California, County of San Francisco. January 2003: Report.

Ernest H. Sponzilli v. Regents of the University of California et al.

Superior Court of the State of California, County of Los Angeles. October 1998: Report, October 1998: Deposition.

PUBLICATIONS

- (1) "Public Policy by Settlement of Litigation: A Case Study," *California Journal of Politics and Policy* 0:0, ISSN (Online) 1944-4370, ISSN (Print) 2194-6132, DOI: 10.1515/cjpp-2013-0035, January 2014
- (2) "Patent Exhaustion," *Palgrave Encyclopedia of Strategic Management*, David Teece and Mie Augier (eds.), Palgrave Macmillan Publishers, October 2013
- (3) "Capital Structure," *Palgrave Encyclopedia of Strategic Management*, David Teece and Mie Augier (eds.), Palgrave Macmillan Publishers, October 2013
- (4) "A Review of the 2011 and 2013 Digital Television Energy Efficiency Regulations Developed and Adopted by the California Energy Commission," *California Journal of Politics and Policy* 3:1, Article 22, 2011
- (5) "Determining the Appropriate Interest Rate Under *Till* in a Bankruptcy Case," *California Journal of Bankruptcy* 31:2, 2011
- (6) "Allocating Costs in Ninth Circuit Predatory Pricing Cases: Marsann Co. v. Brammall, Inc. and its Problematic Progeny, *Inglis v. Continental Baking* and *Thales v. Matsushita*," *Antitrust Bulletin* 54:3, Fall 2009
- (7) "Predatory Pricing and the Allocation of Costs in the Ninth Circuit," *Antitrust Litigator* 7:3, Antitrust Litigation Committee, Section of Litigation, American Bar Association, Summer 2008
- (8) "The Effects of *KSR v. Teleflex* on Patent Licensing Costs," *UCLA Journal of Law and Technology* 11:2, Spring 2007
- (9) "Consideration of Design Around Solutions in Determining Patent Damages," *IP Remedies*, Intellectual Property Litigation Newsletter, American Bar Association, Section of Litigation, November 2007
- (10) "Junk Forecasts in the Courtroom? Assessing the 'S' Curve Approach to Calculating Damages," *Journal of Forensic Economics* 19:3, 2007
- (11) "An Economic Analysis of the Impact of Pay-for-Performance Initiatives on Physicians, Patients and Insurance Providers," *Indiana Health Law Review* 3:2, University of Indiana School of Law, 2006
- (12) "An Economic Assessment of Damage Caps in Medical Malpractice Litigation Imposed by State Laws and the Implications for Federal Policy and Law," *Health Matrix: Journal of Law-Medicine* 16:2, Case Western Reserve University School of Law, 2006
- (13) "Controlling Medical Malpractice Insurance Costs – Congressional Act or Voter Proposition?" *Indiana Health Law Review* 3:1, University of Indiana School of Law, 2006
- (14) "Statistical Analysis and Interpretation of Data Commonly Used in Employment Litigation," *Duquesne Business Law Journal* 8:1, Duquesne University School of Law, Spring 2006
- (15) "Simple Statistics for Employment Law Practitioners," *Employer-Employee Relations Committee Newsletter*, American Bar Association, Tort Trial and Insurance Practice Section, Fall/Winter 2005
- (16) "The Statistical Analysis and Interpretation of Survey Data in Wage and Hour Litigation," in *Wage-Hour Class Actions: How to Bring, Defend and Resolve Them*, Los Angeles County Bar Association, Labor & Employment Law Section, 2005
- (17) "Reasonable Royalty: Countering Claims of Non-Profitability," *Perspectives* 2:1, January 2001

- (18) "The Effect of Socially Activist Investment Policies on the Financial Markets," *Journal of Business* 72:1, January 1999
- (19) "The Correlation Between Market Liquidity and Information-Based Trading," UCLA Department of Finance, 1996
- (20) "The Impact of Earnings Announcements on Market Liquidity and Price Discovery: An Intraday, Multi-Market Analysis," UCLA Department of Finance, 1996

TESTIMONY AND WRITTEN SUBMISSIONS TO REGULATORY ENTITIES

"A Critique of the Regulations on Battery Charging Systems Proposed by the California Energy Commission," November 21, 2011. Study filed with the California Energy Commission.

California State Senate, before the Energy, Utilities and Communications Committee, on SB 1198; An act to amend Section 25213 of the Public Resources Code, relating to energy. April 20, 2010. Testimony.

California State Assembly, Committee on Utilities and Commerce, hearing regarding the California Energy Commission's Proposed Energy Efficiency Standards for Televisions. October 21, 2009. Testimony.

California Energy Commission, Proposed Amendments to Appliance Efficiency Regulations, California Code of Regulations, Title 20, Sections 1601 through 1607, Docket Number 09-AAER-1C. October 13, 2009. Testimony.

"A Review of the 'December 2008 Draft Efficiency Standards for Televisions' Proposed by the California Energy Commission," March 23, 2009. Study filed with the California Energy Commission.

"A Review of Canadian Private-Sector Lawyer Income," prepared for the Canadian Superior Courts Judges Association, and included in Submission of the Canadian Superior Courts Judges Association and the Canadian Judicial Council to the 2007 Judicial Compensation and Benefits Commission. December 13, 2007. Filed study.

ACADEMIC POSITIONS

California State University, Los Angeles, College of Business and Economics, 2007–2008
Marshall School of Business, University of Southern California, 2001

AWARDS

1999 Moskowitz Prize for outstanding research in the field of socially responsible investing. Awarded by Social Investment Forum/Center for Responsible Business, U.C. Berkeley Haas School of Business

PAST AND PRESENT PROFESSIONAL ACTIVITIES

Founder and editor of the *BRG Review*. The *Review* is published twice a year and was established by Dr. Wazzan to present original research and analysis on topics of interest to a variety of audiences, including economists, accountants, legal scholars, and industry leaders.

American Finance Association

American Economic Association

Venture Finance Institute, Claremont Graduate University: Referee

SELECTED CONSULTING EXPERIENCE

Securities, Valuation, and Corporate Finance

- Computed option values for publicly and privately held firms.
- Analyzed the business and stock price impact of tender offers.
- Analyzed the stock price impact of gaining or losing investment bank analyst coverage.
- Conducted solvency analyses using option-based and accounting-based models.
- Evaluated damages sustained due to artificially imposed capital constraints.
- Evaluated the stock price impact of negative public announcements and news including the temporary and permanent stock price impact of SEC-imposed trading halts.
- 409A valuation.
- Evaluated the nature and impact of exchange traded commodities/metals futures and forward transactions including hedging strategies and techniques. Evaluated allegations of commodities market manipulation and insider trading.
- Analyzed the potential profitability of off-shore tax strategies.
- Analyzed foreign currency hedging strategies and markets in connection with commodities metals trading.
- 10b5 analyses.
- Evaluated commodities price impacts due to selected transactions on the London Metals Exchange and COMEX markets.
- Class certification.
- Estimation of “just compensation” for the value of real estate properties taken by the federal government through operation of the *Trails Act*.

Real Estate, Mortgage Backed Securities, Lending, and Risk

- Evaluation and pricing of mortgage risk and appropriate interest rates
- Evaluated mortgage terms in alleged predatory lending context
- Analysis of FICO scores, analysis of how scores are computed, which variables predominate, and how these scores are used with respect to lending and rates
- Analyzed the economic significance of structured and off-balance sheet finance transactions from both a general point of view and with respect to specific transactions
- Analysis of appropriate interest rate in cram-down bankruptcy setting (following Till methodology)
- Determination as to whether loan covenants are being breached
- Valuation of partnership holdings in real estate transaction disputes, including alleged expropriation of minority shareholders
- Forensic analysis as to bank solvency, and ability to fund made loans, in the context of commercial real estate development and construction
- Analysis of lost profits from tenant default
- Valuation of real estate options

Commercial Damages

- Analyzed of damages as a result of business interruption in various industries, including: steel, software/internet commerce and railroad/truck shipping
- Analysis of damages from alleged breach of contract
- Analysis of damages from alleged breach of fiduciary duties
- Analysis of damages from alleged fraud
- Analysis of damages from alleged construction defects

Labor Economics

- Computed damages resulting from alleged wrongful termination
- Conducted class certification analyses in “wage and hour” litigation in industries including food service, retailing, and lab technicians
- Conducted damage analyses in “wage and hour” litigation including statistical analysis of survey results
- Conducted statistical and econometric analyses in disparate impact matters (including use of data from U.S. Census Bureau, U.S. Bureau of Labor Statistics, and others)
- Conducted statistical and econometric analyses in alleged age, race, and gender discrimination, including EEOC matters

Intellectual Property

- Conducted financial and economic valuation of patent infringement damages, including lost profits and reasonable royalties analyses, in a wide range of industries including semiconductors, oil-field services, chemical compounds, aerospace, medical systems, avionics, semiconductor capital equipment, automated manufacturing, software, and 3D computer graphics systems
- Conducted financial and economic valuation of damages arising from theft of trade secrets in a wide range of industries including authored literature, semiconductors, software, and semiconductor capital equipment
- Analysis of antitrust counterclaims
- Market definition

Antitrust Economics and Competition Policy

- Class certification
- Analysis of the competitive impact of mergers or joint ventures in various industries including satellite communications, multi-channel video programming distribution, petroleum refining, bio-agricultural products, lead-acid batteries, broadcast radio, credit cards, and aerospace
- Predatory pricing
- Price fixing
- Collusion
- Vertical and horizontal restraints
- Market definition

Statistics, Econometrics, Large-Scale Data Analytics

- The application of econometric and statistical models to a variety of areas including class certification, complex litigation, damages, market power, and economic impact studies
- Random sampling
- Point estimation
- Construction of confidence intervals
- Determinations of appropriate sample sizes
- Analysis of large (i.e., millions of records) datasets (e.g., intraday securities data, commodities exchange futures transactions).
- Data acquisition
- Database design and development

Life Sciences Economics/Healthcare

- Valuation of startup firms and new technologies
- Patent portfolio valuation
- Pharmaceutical price modeling
- Damages calculations from infringement actions

- Public policy (e.g., analysis of legislative impacts on the cost and provision of health care; analysis of the impact of pay-for-performance legislation)
- Analysis of lost profits as a result of government actions (e.g., FDA decisions) affecting domestic and worldwide pharmaceutical sales of specific products
- Investigations determining how claims were documented, coded, priced, and/or paid
- Econometric analyses of pharmaceutical pricing (including use of IMS Health and related data)

Appendix B

Reports and Testimony

Report of the Copyright Arbitration Royalty Panel.

Comments of Spotify USA Inc. in Copyright Office Docket No. 2014-03, at 13 (May 23, 2014), *available at* http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/Spotify_USA_Inc_MLS_2014.pdf.

Comments of ASCAP in Copyright Office Docket No. 2014-03, at 27-28 (May 23, 2014), *available at* http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/ASCAP_MLS_2014.pdf.

George Ford Written Direct Testimony.

Rebuttal Testimony of Gregory S. Crawford, *In re* Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2011-1 CRB PSS/Satellite II (July 2, 2012) ¶ 110, *available at* https://www.loc.gov/crb/proceedings/2011-1/rps/music_choice_crawford.pdf.

Comments of Music Choice in Copyright Office Docket No. 2014-03, at 2 (May 23, 2014), *available at* http://www.copyright.gov/policy/musiclicensingstudy/comments/Docket2014_3/Music_Choice_MLS_2014.pdf.

Legal Materials

17 U.S.C. § 801(b)(1)

17 U.S.C. § 114

17 U.S.C. § 106(6)

37 C.F.R. § 385.13

Broadcast Music, Inc. v. Pandora Media, Inc., 140 F. Supp. 3d 267 (S.D.N.Y. 2015).

In re Pandora Media, 6 F. Supp. 3d 317 (S.D.N.Y. 2014), *aff'd* 785 F.3d 73 (2d Cir. 2015).

Vardon Golf Co., Inc. v. BBMG Golf Ltd., 156 F.R.D. 641 (N.D. Ill. 1994).

Produced Documents

MC0000001-11

MC0000015-26

MC0013833

MC0013919

MC0015577

MC0000586

MC0002925

MC0003099

MC0003199

MC0003211

MC0015577

MC0015580

Websites

[REDACTED]
[REDACTED]
[REDACTED]

Sirius XM, Our Music's Just Good Business,
<https://www.siriusxm.com/siriusxmforbusiness/services> (last visited Oct. 11, 2016).

Sirius XM, What You Love. Anywhere, <https://m.siriusxm.com/streaming> (last visited Oct. 11, 2016).

Dish, Satellite Music, <http://www.dish.com/music/> (last visited Oct. 11, 2016).

Dish, <http://www.dish.com/music/> (last visited Oct. 10, 2016).

Dish, Select the Package that's right for you, <http://www.dish.com/packages/> (last visited Oct. 10, 2016).

Satellite Solutions, <http://www.satellitesolutions.com/dishnetwork/channels-sirius-xm-satellite-radio.asp> (last visited Oct. 10, 2016).

Sirius XM, Streaming, <https://m.siriusxm.com/streaming> (last visited Oct. 10, 2016).

Stingray Music, Channels, http://music.stingray.com/en_US/channels (last visited Oct. 10, 2016).

Stingray Music, How to Get Stingray Music, http://music.stingray.com/en_US/about/subscribe (last visited Oct. 10, 2016).

Stingray Music, Music for Business, http://music.stingray.com/en_US/about/enterprise (last visited Oct. 10, 2016).

Stingray Music, Stingray Music Mobile, http://music.stingray.com/en_US/mobile (last visited Oct. 10, 2016).

Find Your Groove with the Music Channels on Satellite TV, <http://www.satellite-reviews.net/compare/satellite-music> (last visited Oct. 10, 2016).

Choose Your Package and Order Dish TV!, <http://www.getsatellite.com/Satellite-TV-Packages/music/DishCD/> (last visited Oct. 10, 2016).

DISH CD (32 Music Channels), <http://www.satellitesolutions.com/dishnetwork/channels-dish-cd-music-channels.asp> (last visited Oct. 10, 2016).

Music Choice, Music Channels, <https://www.musicchoice.com/> (last visited Oct. 10, 2016).

Music Choice, MC for Business, <http://corporate.musicchoice.com/about-us/mc-business/> (last visited Oct. 10, 2016).

Music Choice, Download the App, <http://app.musicchoice.com/>.

Music Choice, iTunes Preview, <https://itunes.apple.com/us/app/music-choice/id573887614?mt=8>.

Music Choice for iPad, <https://itunes.apple.com/us/app/music-choice-for-ipad/id621427918?mt=8>.

Google Play – Music Choice,
<https://play.google.com/store/apps/details?id=com.music.choice&hl=en>.

Stingray Digital, Our Properties, <http://demo.stingray.com/en/our-properties/music-choice.php> (last visited October 15, 2016).

Ben Sisario, *Muzak, Background Music to Life, to Lose Its Name*, N.Y. Times (Feb. 4, 2013), http://www.nytimes.com/2013/02/05/business/muzak-background-music-to-life-to-lose-its-name.html?_r=0.

Julian Clover, Music Choice Europe Sold for a Song, Broadband TV News (Apr. 4, 2011), <http://www.broadbandtvnews.com/2011/04/04/music-choice-europe-sold-for-a-song/>.

Kent Gibbons, *Music Choice Sues Rival Stingray Digital over Patents*, Multichannel News (June 6, 2016), <http://www.multichannel.com/news/networks/music-choice-sues-rival-stingray-digital-over-patents/405445>.

Music Choice, Music Choice Sues Stingray for Patent Infringement (Jun. 6, 2016) (“Stingray must compete fairly”), *available at* <http://corporate.musicchoice.com/about-us/press-room/press-article/music-choice-sues-stingray-patent-infringement/>.

IFPI, Our Industry – How Record Labels Invest, <http://www.ifpi.org/how-record-labels-invest.php>.

Music Choice, About Us, <http://corporate.musicchoice.com/about-us/> (last visited Oct. 12, 2012).

Sony, Corporate Strategy, <http://www.sony.net/SonyInfo/IR/strategy/index.html> (last visited Oct. 14, 2016).

PlayStation Vue, Better TV Starts Now, <https://www.playstation.com/en-us/network/vue/> (last visited Oct. 10, 2012).

Ed Christman, Updated: Sony-Led Group Closes Purchase of EMI Music Publishing, *Billboard*, <http://www.billboard.com/biz/articles/news/publishing/1084866/updated-sony-led-group-closes-purchase-of-emi-music-publishing> (June 29, 2012).

Ed Christman, Sony Finalizes Acquisition of Michael Jackson Estate's Stake in Sony/ATV Publishing, *Billboard*, <http://www.billboard.com/biz/articles/news/publishing/7526545/sony-finalizes-acquisition-of-michael-jackson-estates-stake-in> (Sept. 30, 2016).

Pandora Signs Licensing Agreements with ASCAP and BMI (Dec. 22, 2015), <https://www.ascap.com/press/2015/12-22-pandora-licenses-ascap-bmi.aspx>.

Books and Academic Journal Articles

Mona A. Elbannan, *The Capital Asset Pricing Model: An Overview of the Theory*, *International Journal of Economics & Finance*, Vol. 7, No. 1, at 216-28 (2015).

Hyun Soo Kwon, *Economic Theories of Low-Wage Work*, *Journal of Human Behavior in the Social Environment* 62 (2014).

Roy J. Epstein & Paul Malherbe, *Reasonable Royalty Patent Infringement Damages after Uniloc*, *AIPLA Quarterly Journal*, Vol. 39, No. 1, at 8 (2011).

Ilidio Lopes, *Intangible Assets Identification and Valuation – a Theoretical Framework Approach to the Portuguese Airlines Companies*, *Electronic Journal of Knowledge Management*, Vol. 5, Issue 2, at 196 (2007).

Jody C. Bishop, *The Challenge of Valuing Intellectual Property Assets*, *Northwestern Journal of Technology and Intellectual Property*, Vol. 1, Issue 1, at 64 (Spring 2003).

Jeffrey A. Eisenach, *The Sound Recording Performance Right at a Crossroads: Will Market Rates Prevail?*, *CommLaw Conspectus*, Vol. 22, at 20 (2014).

Richard Lipsey et al., *Economics* 431-32 (Harper & Row, 7th ed. 1984).

Hal R. Varian, *Intermediate Microeconomics, A Modern Approach* 301-02 (W.W. Norton & Co., 4th ed. 1987).

Fiona M. Scott-Morton, *The Problems of Price Controls*, *Health and Medicine* 50-51 (Spring 2001).

Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* 696-705 (Addison-Wesley 4th ed. 2005).

Comment, *Toward an Efficient Licensing and Rate-Setting Regime: Reconstructing §114(i) of the Copyright Act*, 125 *Yale L.J.* 1531, 1532 (2016).

J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, *Journal of Competition Law & Economics*, vol. 9, no. 4, at 1005 (2013).

Thomas M. Lenard & Lawrence J. White, *Moving Music Licensing Into the Digital Era: More Competition and Less Regulation*, Technology Policy Institute 2, 11 (Dec. 2015).

Geroski et al., *Founding Conditions and the Survival of New Firms*, Strategic Management Journal, Vol. 31, at 514 (2010).

Victor D.S. Paulino & Gael Le Hir, *Industry Structure and Disruptive Innovations: The Satellite Industry*, Journal of Innovation Economics & Management 37-39 (2016).

Dunne et al., *Patterns of Firm Entry and Exit in the U.S. Manufacturing Industries*, RAND Journal of Economics, Vol. 19, No. 4, at 507-08 (Winter 1988).

Fiona M. Scott-Morton, *The Problems of Price Controls*, Health and Medicine 50-51 (Spring 2001).

John E. Calfee, *Pharmaceutical Price Controls and Patient Welfare*, American College of Physicians-American Society of Internal Medicine, 1060-61 (2001).

Marie Salter, *Reference Pricing: An Effective Model for the U.S. Pharmaceutical Industry?*, Northwestern Journal of International Law & Business, Vol. 35, Issue 2, at 432-33 (Summer 2015).

Public Financial Statements

Muzak LLC, Form 10-K Annual Report (2002).

Sirius XM Holdings, Inc., Form 10-K Annual Report (2015).

Pandora Media, Inc., Form 10-K Annual Report (2015).

Miscellaneous

Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Final Rule and Order, 73 Fed. Reg. 4080 (Jan. 24, 2008).

Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Final Rule and Order, 78 Fed. Reg. 23,054 (Apr. 17, 2013).

Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings by Preexisting Subscription Services, 68 Fed. Reg. 4744 (Jan. 30, 2003).

Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings by Preexisting Subscription Services, Final Rule, 68 Fed. Reg. 39,837 (July 3, 2003).

Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, 72 Fed. Reg. 71,795 (Dec. 19, 2007).

Adjustment of Rates and Terms for Preexisting Subscription and Satellite Digital Audio Radio Services, 72 Fed. Reg. 61,585 (Oct. 31, 2007).

Digital Performance Right in Sound Recordings and Ephemeral Recordings, 76 Fed. Reg. 13,026 (Mar. 9, 2011).

Digital Performance Right in Sound Recordings and Ephemeral Recordings, 72 Fed. Reg. 24,084 (May 1, 2007).

Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings and Ephemeral Recordings, 67 Fed. Reg. 45,240 (July 8, 2002).

In re Determination of Royalty Rates and Terms for Ephemeral Recording and Webcasting Digital Performance of Sound Recordings (*Web IV*), 81 Fed. Reg. 26,329 (May 2, 2016).

Mechanical and Digital Phonorecord Delivery Rate Determination Proceeding, 74 Fed. Reg. 4510 (Jan. 26, 2009).

Determination of Rates and Terms for Business Establishment Services, 73 Fed. Reg. 16,199 (Mar. 27, 2008).

Exhibits Sponsored by Paul Wazzan

Exhibit No.	Description	Designation*
SX Ex. 008	[Redacted]	Restricted
SX Ex. 009	[Redacted]	Restricted
SX Ex. 014	Statement of Account for a Preexisting Satellite Digital Audio Radio Service (SDARS) – 2015 Monthly Liability, dated February 16, 2016	Restricted
SX Ex. 015	Statement of Account for a New Subscription Service (CABSAT) – 2015 Monthly Liability, dated February 16, 2016	Restricted
SX Ex. 019	Music Choice Ownership Chart	Restricted

*Exhibits designated Restricted are omitted from this public version in their entirety.

**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)

WRITTEN DIRECT TESTIMONY OF

Robert Willig

**Professor of Economics and Public Affairs, Emeritus
Princeton University**

October, 2016

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I. Introduction and Qualifications

1. My name is Robert D. Willig. I am Professor Emeritus of Economics and Public Affairs at Princeton University, where I held a joint appointment in the Economics Department and at the Woodrow Wilson School of Public and International Affairs since 1978. Previously, I was a Supervisor in the Economics Research Department of Bell Laboratories. My teaching and research have specialized in the fields of industrial organization, government-business relations, and social welfare theory. I served as Deputy Assistant Attorney General for Economics in the Antitrust Division of the U.S. Department of Justice from 1989 to 1991, and in that capacity served as the Division's Chief Economist. I have authored some 80 articles in the economics literature and am the author of *Welfare Analysis of Policies Affecting Prices and Products* and *Contestable Markets and the Theory of Industry Structure* (with W. Baumol and J. Panzar). I am also a co-editor of *The Handbook of Industrial Organization*, which summarizes the state of economic thinking on the structure of industries and the nature of competition among firms, and have served on the editorial boards of the *American Economic Review*, the *Journal of Industrial Economics*, and the *MIT Press Series on Regulation*. I am an elected Fellow of the *Econometric Society* and was an associate of *The Center for International Studies*.

2. I have appeared as an expert witness before Congress, federal and state courts, federal administrative agencies, and state public utility commissions on subjects involving intellectual property rights, competition, regulation, and antitrust. I have also served as a consultant to the Federal Trade Commission, the U.S. Department of Justice, and many leading corporations on antitrust, regulation, intellectual property and policy issues.

3. I have spent a significant portion of my career studying, consulting and testifying as an expert on many different aspects of the economics of unregulated and regulated pricing, the economics of intellectual property and the distribution of rights to its access. I have substantial consulting experience working on music industry issues including the merger of BMG and Sony, other potential control transactions involving major labels and music publishers, and regulatory treatment of the musical work performing rights organizations.

4. My full curriculum vitae and a listing of my prior testimony are included as Attachment 1. The rate charged by Compass Lexecon for my work on this matter is \$1,450 per hour. I have a financial interest in the overall profitability of Compass Lexecon, but I have no financial interest in the outcome of this case.

5. I have been retained by counsel for SoundExchange to analyze from the perspective of economics how to apply the policy factors enumerated in 17 U.S.C. §801(b)(1), which govern the determination of royalty rates applicable to Sirius XM's use of sound recordings under the statutory license provided at Sections 114 and 112(e) of the Copyright Act. The license at issue in this proceeding provides Sirius XM with non-exclusive rights to transmit digital performances of copyrighted sound recordings to its subscribers, and make the “ephemeral” reproductions necessary to do so. This license is compulsory in that sound recording copyright owners cannot withhold access to sound recordings from Sirius XM. Below, I shall present several different approaches to determining statutory royalty rates under this license, and bring data to bear on them in order to shed light on the concomitant quantification of the royalty rates at issue.¹

¹ I am aware that rates will also be set in this proceeding for the so-called “preexisting subscription services” or “PSS” that are among the services providing music channels to cable and satellite television providers. The cable and satellite music services, including the PSS, are obviously very different from Sirius XM’s satellite radio service, as shown by the low proportion of Sirius XM subscribers who would use such services if they were to leave Sirius

6. In conducting my analyses and formulating my conclusions I relied on my career-long experience with the economic theory, economic literature, empirical study and regulated and unregulated practices of pricing products and the services of assets including intellectual property. In applying this background to the matter at hand, I was benefitted by my prior knowledge of the music industry. I reviewed and analyzed data on the historical roles played by the various modes of music distribution, as well as the royalty payments they made to the owners of the copyrights on sound recordings. I studied data on the dynamic course of the changes in the number of Sirius XM subscribers, and to what extent they responded to price changes, along with Sirius XM financial data. I examined and analyzed the results of surveys of consumers of music distribution that were recently conducted under the supervision of Professor Ravi Dhar, and produced in this matter. I conducted interviews with executives at major record companies who are centrally involved with the licensing of sound recordings to digital music distribution services, and reviewed their written direct testimony.

7. I conclude that both public interest pricing principles and market-based profit-maximizing behavior suggest a substantial increase in the sound recording royalties paid by Sirius XM, to a level from \$2.55 to \$3.94 per subscriber per month. Importantly, the recording industry is changing rapidly, and just within the past several years the industry has seen an accelerating shift from the sale of physical products and digital downloads to distribution of sound recordings through streaming services. The royalties obtained by record companies from subscription interactive services through marketplace negotiations are significant, but other streaming services – that are subject to statutory licenses or other legal constraints – pay far

XM due to an elevated price (see Table 2). I did not attempt to calculate the opportunity costs associated with the use of sound recordings by the PSS and do not draw any other conclusions about the PSS in my report.

lower royalties and to some degree cannibalize subscriptions to interactive services. In an unregulated marketplace one would expect the record companies to account for the opportunity costs associated with the services that pay lower royalties and negotiate increases. Public interest pricing principles, which are consistent with the statutory standard in this case, suggest the same result. “Ramsey pricing” maximizes consumer welfare by allocating higher fees to those users of the common assets that value those assets the most (or who, correspondingly, have relatively low price elasticity of demand). Under these principles, too, Sirius SM should pay an increased share of the cost of creating sound recordings.

II. Economics Underlying the Section 801(b)(1) Objectives

8. The following four policy objectives govern rate-setting for the blanket license at issue in this proceeding and are set forth in 17 U.S.C. §801(b)(1):

- (a). To maximize the availability of creative works to the public;
- (b). To afford the copyright owner a fair return for his 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; and
- (d). To minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.

9. Throughout my report, I confine my attention to policy objectives (a), (b), and (c) of these statutory objectives, since I understand that policy objective (d) is the focus of attention in the testimony of Dr. Thomas Lys. I understand that the Section 801(b)(1) objectives, and particularly objectives (a) through (c), are viewed as consistent with the development of a royalty

rate that would be reached by the parties in an unregulated marketplace setting, *i.e.*, one free of the applicable compulsory licensing regime. Such a rate would reflect the value of sound recordings to Sirius XM subscribers, given the pricing and availability of other channels of distribution through which consumers are able to listen to music, and the resulting value to Sirius XM itself from the demand for subscriptions to its services that performances of sound recordings create. Such a rate would also reflect any direct costs and any opportunity costs borne by the copyright owners in having their works used under the statutory license.

10. Estimating royalty rates that would be reached by the parties in an unregulated marketplace setting is somewhat challenging since there is no direct evidence on what rates might be negotiated between Sirius XM and copyright owners in an arms' length setting for access to a major record company's entire catalog of music for use on Sirius XM's satellite radio service. I am aware that Sirius XM has negotiated direct licenses with certain independent record companies. However, I understand from the testimony of Dr. Thomas Lys that the royalty rates in those agreements appear to be directly related to the statutory rate, and largely reflect discounts from that statutory rate to which the licensors likely agreed in order to obtain certain economic benefits not available under the statutory license. Moreover, the direct licenses represent a very small and likely unrepresentative portion of the market. Due to the small market share represented by direct licenses and the fact that the statutory license serves as a cap on the rates that Sirius XM would agree to pay, little or nothing can be gleaned about market rates from these agreements. Consequently, it is necessary to develop an appropriate benchmark or other analytic framework that could serve as a basis for estimating the royalty rates that are economically consistent with the statutory criteria.

11. One approach is to update the already accepted benchmarking of the royalty rate for Sirius XM with the royalty rates that were actually negotiated for the non-statutory interactive subscription services.² Here, consideration must be given to what adjustments to the benchmark rates are appropriate to reflect any significant differences between the benchmark deals and those that are imagined to apply to Sirius XM in the but-for world without regulation. I understand that this approach is explicated and quantified in the testimony of Jonathan Orszag.³

12. In my testimony, I bring several complementary perspectives from economics to bear on the issue of the determination of the royalty rate for Sirius XM.

A. Public Interest (Ramsey) Pricing

13. The “public interest pricing,” or “Ramsey pricing,” perspective arises from the fundamental economic issue of how to price various products or services whose supply draws on common assets in a fashion that maximizes consumer welfare, while providing sufficient net revenues to meet an overall financial target.⁴ This is relevant to the determination of the different royalties that would be charged to different modes of distribution of sound recordings, since their supply draws on the common pool of sound recordings, for which sufficient total compensation is required to enable and motivate their creation. This financial element is consistent with the Section 801(b)(1) objective that calls for affording the copyright owner a fair

² See *In the Matter of Determination of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services*, 73 Fed. Reg. 4080 (January 2008).

³ See Written Direct Testimony of Jonathan Orszag, October 19, 2016.

⁴ Ramsey pricing is frequently employed as an analytic framework for such applications as various sales taxes levied to raise sufficient revenue to meet a government financial target, prices for various telecommunications services that all are enabled by the same underlying electronic network, and prices for various railroad services that all make use of the same track infrastructure. See, e.g., Dennis W. Carlton and Randal C. Picker, *Economic Regulation and its Reform: What Have We Learned*, National Bureau of Economic Research, Nancy L. Rose (Ed.), University of Chicago Press, 2014, Chapter 1; Baumol, William J., *Ramsey pricing*, The New Palgrave Dictionary of Economics, Second Edition, Eds. Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan, 2008.

return for his creative work. The defining objective of Ramsey pricing is the maximization of consumer welfare, and this is an economic concept fully consistent with the portions of the Section 801(b)(1) criteria that call for the maximization of the availability of creative works to the public, and affording the copyright user a fair income under existing economic conditions. Because Ramsey pricing mandates the maximization of consumer welfare subject to the raising of sufficient net revenue for the creation of the common assets (here, the sound recordings), it accomplishes by its very definition the needed balance between the demand and supply sides of the markets it addresses, and in this manner is fully consistent with policy objective (c) of Section 801(b)(1). Later in this report, I shall discuss some of the fundamental properties of Ramsey pricing and apply them quantitatively to the determination of the royalty rate for Sirius XM.

B. Efficient Component Pricing Rule (ECPR)

14. Another related perspective is termed the “efficient component pricing rule” (“ECPR”), which 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 by would-be competitors of the owner of the necessary assets.⁵ This perspective can be somewhat relevant here since the statutory royalty at issue can be construed as the price of access to the copyrights protecting the sound recordings, and since the various modes of distribution of the sound recordings do compete with each other to various extents. ECPR is designed to provide access to needed common assets in a fashion that

⁵ Access to electrical transmission lines, telecommunications networks and railroad track infrastructure are examples where ECPR has been applied as an analytic framework. See, e.g., William J. Baumol and J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, *The Yale Journal on Regulation*, Vol. 11: 171, 1994.

promotes efficient utilization of them, while maintaining the already determined level of contribution to the investment costs of the common assets. Thus, by its very design, ECPR is arguably consistent with the policy objectives (a), (b) and (c) of Section 801(b)(1). However, here, in view of their statutory availability, complaints about anticompetitive foreclosure of access to the copyrights would be unjustified, and therefore the ECPR perspective is only partially relevant to the determination of the royalty rate for Sirius XM.

C. Unregulated Profit-Maximizing Pricing

15. The third perspective that I will apply below is the basic economic logic of unregulated profit-maximizing pricing, as well as economic theory of bargaining over pricing, as is characteristic of pricing in an unregulated marketplace setting. As was accepted in the SDARS II decision, this perspective is consistent with policy objectives (a), (b) and (c) of Section 801(b)(1). This perspective is also consistent with reliance on the accepted benchmarking of the royalty rate for Sirius XM using the royalty rates that were actually negotiated for the non-statutory interactive subscription services, since the copyright owners can be safely assumed to have made every attempt to price to maximize their profit in that unregulated marketplace setting. Here, instead of relying on comparisons with the rates that were actually negotiated, I focus on the elements of economic logic that govern the levels of profit-maximizing prices, and quantify them by means of econometric and survey-based empirical analysis.

III. The Recent History of Compensation to Creators of Sound Recordings

16. The quantifications that I apply to the determination of the royalty rate for Sirius XM through the economic perspectives just introduced can be best understood against the

backdrop of the recent history of the compensation to creators of sound recordings. The modern history of the distribution of popular music is characterized by waves of dramatic change, driven by technological changes, having important implications for the financial support of music creation.

17. Until about 2003, essentially all of the distribution of music via modes that provided compensation to the creators of the sound recordings was effected physically with products such as CDs, tapes, and vinyl records - see Figure 1 below. (Of course, throughout the twenty year history illustrated in Figures 1 – 4, music has also been distributed via terrestrial radio, but its usage has been omitted from these Figures because, by law, terrestrial radio stations have provided no royalties or other forms of compensation to the creators of the sound recordings that they perform.⁶) Figure 2 shows that physical distribution declined precipitously in the volume of music distributed beginning around 1999, despite still being the only form of distribution that provided compensation to the creators of the sound recordings. By 2003, volume distributed physically and distributed by any mode that provided compensation to the creators of the sound recordings had dropped by approximately 30% compared to its peak level in 1999. As exhibited in Figure 3, the amount of compensation to the creators of sound recordings also dropped precipitously between 1999 and 2003. It has been widely reported that these drops in compensation and volume can be attributed to “piracy” of music via digital file sharing that became rampant at around the time that the original Napster file-sharing service was

⁶ The figures depicting distributed volumes measure volume in units of album-equivalents based on the industry standard approach: 1 album equals 10 individual tracks (singles) and this is equivalent to 1,500 songs streamed (“performances”). (See, *e.g.*, “2015 Nielsen Music U.S. Report,” The Nielsen Company, page 7.) The figures showing compensation to creators of sound recordings employ data on creator compensation per unit for each mode and then apply them to the volume data by distribution mode.

introduced in 1999.⁷ Such piracy provided no compensation to creators of sound recordings (so the volume involved is omitted from Figures 1-4), and it is generally accepted that this “free” distribution of music, which infringed creators’ copyrights, acted as a strong substitute for legal distribution that would have otherwise provided compensation.

18. A new phase in the recent history of the distribution of recorded music kicked off when the opening of Apple’s iTunes music store in April 2003 began to facilitate and stimulate legal downloading of digital music files for a price that was shared between the online music store and the owners of the copyrights on the sound recording.⁸ Between then and about 2010, legal downloading of music files grew rapidly, substituting for the sale of physical recordings. As illustrated in Figure 1, by 2010 legal downloads represented about a one-third and still growing share of the total volume of compensatory distribution of music, and the absolute amount of legal downloading continued to grow through 2012.

19. This trend was important to the movement of total compensation to the creators of sound recordings. As shown in Figures 3 and 4, by 2012, when compensation to creators from legal downloads reached its peak level, it had grown to provide about 50% of the industry total. This striking uptrend was the only encouraging element in the dynamics of total compensation to creators in an otherwise gloomy era: as illustrated in Figure 3, the plunge due to the advent of piracy was never substantially reversed, the macroeconomic downturn in 2007-2009 took its toll on volume and compensation, and physical sales continued to be cannibalized by piracy as well as by legal downloads. The reason that the advent and vigorous growth of legal downloads was

⁷ See, e.g., “Scope of the Problem,” Recording Industry Association of America (RIAA), http://www.riaa.com/physicalpiracy.php?content_selector=piracy-online-scope-of-the-problem; and Liebowitz, Stan J., “How much of the decline in sound recording sales is due to file-sharing?” *Journal of Cultural Economics*, 38:3 (2014).

⁸ See, e.g., “Apple Launches the iTunes Music Store,” Apple press release, April 28, 2003.

important and promising for compensation was that creators were paid a relatively healthy level of compensation: on average an estimated \$7.67 per album-equivalent, or \$0.0051 per performance (invoking the industry standard that 1,500 performances is equivalent to the sale of one album).⁹

20. The current dramatic shift in the industry toward streaming showed its first signs of major importance by about 2010, when its new growth trend took off. Streaming entails not just different services or stores for distribution, and not just an electronic instead of a physical medium, but rather a shift from ownership of a file or a physical medium to access to the ability to hear music. Sirius XM is in this category, and while it preexisted the 2010 timeframe, its growth since then is consistent with the overall trend away from ownership in favor of purchase of access. The ownership modes of physical media and legal downloads together made up over 70% of the volume of music distributed through compensatory modes in 2010, as shown in Figure 1, while by 2016 the access streaming modes had together more than doubled their collective share to about 67%. It was no surprise that the physical mode of distribution continued its longer term rate of decline, but the reversal of the growth trend in paid downloads was surely a dramatic and unexpected development, doubtless a consequence of the rush to streaming. As depicted in Figures 1 and 2, what had been an encouraging uptrend in both downloads' volume and share of volume turned into a decline early in 2013.

21. The change to streaming has been costly for the creators of sound recordings. The substitution of streaming distribution of music for paid downloading has significantly reduced total creator compensation, even as it has not reduced the total volume of music

⁹ This is the value for 2015; values for earlier years are generally slightly higher when adjusted for inflation (2015\$) – ranging from \$7.55 to \$8.43 (excluding a higher value in the first year, which had low volumes).

distributed. The simple reason is that the levels of the royalties for the creators of the sound recordings from most of the streaming services, including Sirius XM, are distinctly low relative to the level of creator compensation from paid downloads. As discussed in the testimony of Aaron Harrison,¹⁰ the royalties that the record companies obtain from some of the streaming services are regulated, or, in the case of YouTube, impacted by the Digital Millennium Copyright Act. Strikingly, an exception is paid interactive services, for which the royalty rate negotiated in an unregulated market is higher. 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.

¹⁰ Written Direct Testimony of Aaron Harrison, October 19, 2016, ¶¶ 15-16.

Figure 1. Music Industry Shares of Distribution Via Modes that Provided Compensation to the Creators of the Sound Recordings [RESTRICTED]



Figure 2. Volumes of Music Industry Distribution that Provided Compensation to the Creators of the Sound Recordings (Number of Album-Equivalents) [RESTRICTED]

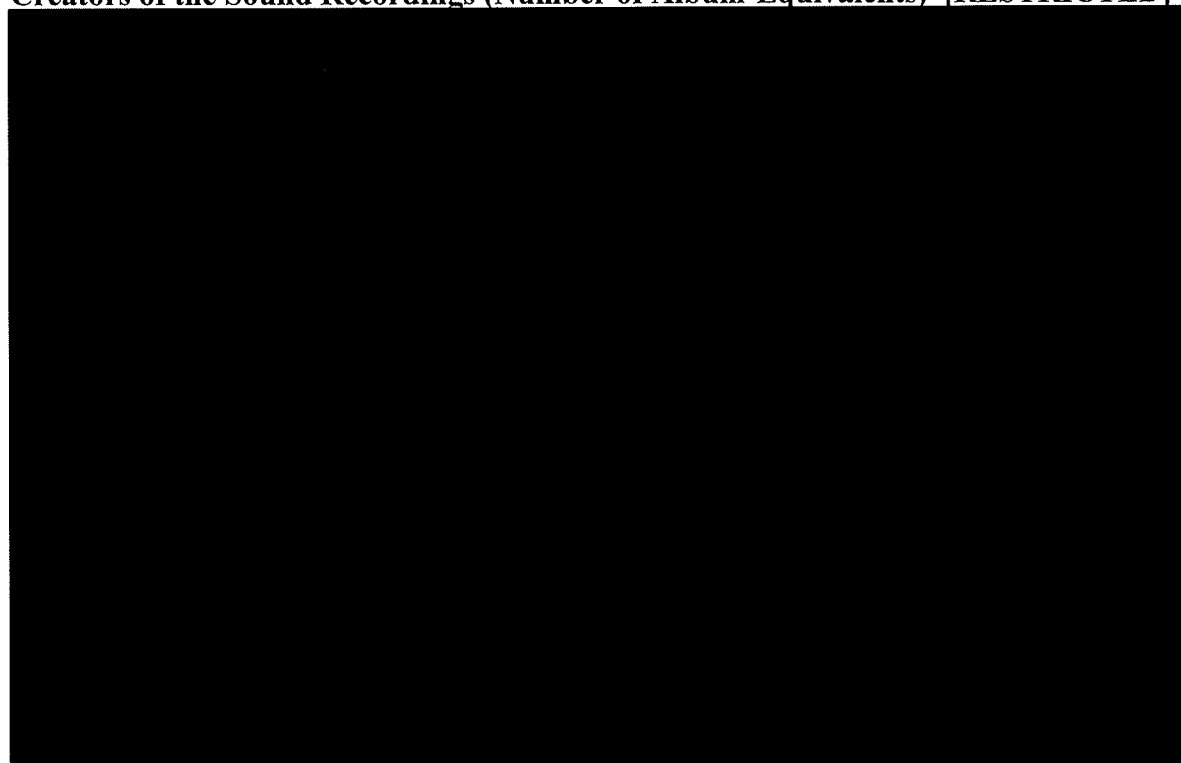


Figure 3. Compensation to Creators of Sound Recordings by Mode of Distribution (millions \$2015, based on royalties and revenue shares) [RESTRICTED]



Figure 4. Shares of Compensation to Creators of Sound Recordings by Mode of Distribution [RESTRICTED]



IV. The Creator Compensation Shortfall Due to the Switch to Streaming and Insufficient Royalty Rates

22. In this section, I describe my analysis to determine how much creator compensation was lost in 2016 as a result of the movement toward streaming and away from paid download modes of music distribution since 2010, given the current levels of royalties and other forms of creator compensation in each distribution mode. The first step of this analysis entails assessing the levels of creator compensation for the various modes of distribution in terms of a common unit of measurement. For the purpose of assessing how overall compensation levels have changed in relation to music consumption, I use “performances” to provide a unit of measurement.

23. For paid downloads, the creator compensation per performance is estimated to be \$0.0051, since the compensation to the creators for the sale of an album in this mode of distribution is \$7.67,¹¹ which equals \$0.0051 when divided by the 1,500 performances, the industry standard for converting between performances and album-equivalents. For paid interactive streaming services, [REDACTED]
[REDACTED]
[REDACTED]. For all other streaming services, the level of compensation received by the creators is considerably lower than the compensation received for the sale of a digital download album, calculated on a per-performance basis. The middle three rows of Table 1 display these calculations for all the services in question, and Appendix B provides the underlying details.

¹¹ According to RIAA data for 2015, the average price for paid (permanent) downloads was \$10.96 per album-equivalent in 2015, and the typical iTunes deal provides 70% of the sales price to the label and the recording artist.

24. Of course, the impact on creator compensation of the move toward streaming and away from paid downloads depends on the extent to which the various streaming services actually did substitute for paid downloads, and what was the total size of the overall movement. I apply econometric regression analysis to estimate the impact of increases in the total number of streaming performances on the number of album-equivalents that are purchased as file downloads. 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 the common unit of number of performances.¹² I then ran a linear regression of total monthly paid downloads, measured in album equivalents, against total streaming performances (lagged one month), a time trend (to capture the independent growth of downloads regardless of streaming), and GDP (to capture impacts of general economic conditions).¹³

25. The regression shows clear substitution between streaming and downloads: the estimated coefficient on streaming performances is -0.0005738 and is highly statistically significant. This implies that every additional streaming performance is associated with a reduction in downloaded album-equivalents of 0.0005738. Application of the standard

¹² It would be impossible to reliably estimate the *individual* impacts of each individual streaming service on legal downloads for several reasons. First, the strong correlation in the growth of the different streaming services creates an acute multi-collinearity problem for econometric analysis that does not allow evaluating the *separate* effect on downloads of each streaming service or service type. (See, for example, Peter Kennedy, *A Guide to Econometrics*, Sixth Edition, Wiley-Blackwell, p. 193). Second, it is likely that the demands for the different streaming services are interrelated through their own substitution effects with each other, so that if one service were to experience an idiosyncratic movement in its demand, that would engender reactions in the demands for other services, whose impacts on paid downloading would then become intermixed with the substitution effect from the first service. That is, if we were to disaggregate the streaming variable into its components and include them separately in the regression (or run a separate regression for each), their coefficients would not be expected to be very meaningful or stable. There are just insufficient available variables to play the roles of exogenous instruments that would be drivers of either supply or demand for the many individual interrelated services.

¹³ See Appendix E for further details on this regression analysis.

calibration that 1,500 performances are equivalent to an album-equivalent implies that each streaming performance reduces the number of paid downloaded performance-equivalents by 0.8607. These findings are consistent with published reports and studies.¹⁴

26. Table 1 below estimates, based on the available data and the econometric analysis presented above, the loss in creator compensation caused by the increase in streaming since 2010. Each column of the Table shows, for different categories of streaming services, each category's added annual streamed performances,¹⁵ its level of 2016 creator compensation per performance, and the corresponding increase in annual creator compensation before accounting for the negative impacts from cannibalization or substitution. The subtotal column shows that the sum across the streaming services of the increased annual streamed performances is 614 billion performances, and that the sum of the myopic additions to creator compensation is \$1.89 billion. The downloads column displays the key regression estimated coefficient of 0.8607, which, when multiplied by the total added annual streamed performances of 614 billion, yields the estimate of a corresponding reduction in the equivalent number of paid downloaded performances of 528 billion. Since the creator compensation from paid downloads is \$0.0051 per performance, this reduction in annual paid downloads causes a gross loss of (528 billion performances) x (\$0.0051 per performance) = \$2.70 billion, and the net loss of creator compensation of \$2.70 billion – \$1.89 billion = \$813 million.

27. 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.

¹⁴ See, e.g., "Streaming Reaches Flood Stage: Does Spotify Stimulate or Depress Music Sales," Luis Aguiar and Joel Waldfogel, JRC Technical Papers, European Commission, 2015; "The Death of Music Sales," Derek Thompson, The Atlantic, January 25, 2015.

¹⁵ See Appendix A for documentation of the music distribution dataset. Figures for 1H2016 are annualized (doubled).

Table 1. Calculation of Sound Recordings' Creator Compensation Shortfall in 2016 due to Increased Streaming [RESTRICTED]



28. Figures 5 and 6 illustrate the dynamic situation. The left hand panel of Figure 5 shows the actual levels of distribution volumes of the modes that contribute to creator compensation from 2009 to 2016, while the right hand panel shows what those levels of volume would have been in a but-for world where the streaming services had not increased their activity levels above the actual levels of 2010. Most strikingly, without the streaming increases, it is expected that the volume of paid downloads would not have stopped growing and begun to decline around 2012-2013, but would have instead continued along its prior growth path and provided a clear majority of the distributed volume by 2016. Of course, there is nothing inherently wrong with listeners' evident taste for the streaming modes of distribution, and it is interesting (though not dispositive) that the actual scenario shows more total volume of music distributed than would have been the case in the but-for world without streaming increasing past 2010.

29. What is wrong here, however, shows up in Figure 6, which provides the dynamic comparison of actual and but-for levels of creator compensation. Even though the actual scenario has *more* music distributed, it provides some \$800 million *less* annual creator compensation than the but-for world. As streaming services advance in popularity, they create

substitution away from paid downloads, and that can be beneficial for social welfare so long as the pricing of the rights to perform the recordings via streaming amply covers the costs of the creators *including* the opportunity costs of what would be creator compensation from the alternative modes. But what this analysis shows is that the rush to streaming cannibalized paid downloads in a manner that was destructive to creator compensation due to pricing of the copyrights for many streaming services that was significantly insufficient to cover the creator's opportunity costs comprised of what they could have earned from next best alternative modes of distribution. In short, the streaming services as a whole have not been paying their way.

30. As I shall discuss below, the principle that prices should amply cover the applicable marginal or incremental costs, inclusive of opportunity costs, is important for the public interest and social welfare, generally and especially in dynamic markets where choices among rival technologies and modes of distribution are significant. This is so under public interest regulation, and also so in the context of unregulated markets where self-interested profit maximization can serve the public well.

Figure 5. Volumes of Distribution Comparing Actual Levels on the Left and But-For Levels on the Right [RESTRICTED]



Figure 6. Creator Compensation Comparing Actual Levels on the Left and But-For Levels on the Right [RESTRICTED]



V. Economic Pricing Principles Applied to Royalties for Sirius XM

A. Public Interest (or Ramsey) Pricing

31. As I introduced at the outset of this report, the “public interest pricing,” or “Ramsey pricing,” perspective arises from the fundamental economic issue of how to price various products or services whose supply draws on common assets in a fashion that maximizes consumer welfare, while providing sufficient net revenues to meet an overall financial target. Here, economics could frame the issues at hand as what should guide the determination of the various different levels of royalties to be paid to the creators of sound recordings by the various different modes of distribution of the same recordings, and what should set an overall financial target? In view of the complexities of the many dimensions of the financing of the music industry, and in view of the limited scope of the instant proceedings, it seems best to relate any overall financial target to the overall creator compensation by the modes of streaming distribution. It would be infeasible and economically inappropriate to target streaming royalties at replacing the creator compensation that has been lost to piracy. In contrast, it would be feasible and entirely appropriate to target streaming royalties as a whole to curing the ongoing

shortfall in creator compensation that has been caused by the rush to streaming, when the levels of royalties are insufficient to cover the opportunity costs of the copyright owners.

32. Economic theory has well established quantitative guideposts for “Ramsey prices;” *i.e.*, those prices that maximize consumer welfare subject to meeting a financial target. Most succinctly, Ramsey prices for the various users of the common assets have percentage price-cost margins that are inversely proportional to the own price elasticities of demand for the using services. So, first and most basic is the implication that the Ramsey prices – the socially optimal prices given the need to meet the financial target – are larger than the applicable costs, so that there are margins at all. The applicable costs in this context are marginal or incremental in concept, and of course include any opportunity costs. So, before moving on to any complexities, it is worthwhile to emphasize this proposition: Public interest royalties paid by a distribution mode in the present context should at least cover the opportunity cost, *i.e.*, the additional creator compensation that would result from other modes of distribution if the music were not licensed to the mode in question.

33. The most important complexity is recognizing that public interest royalties should be larger than opportunity costs to a greater degree the smaller is the price elasticity of demand for the use of the license in the distribution mode in question. This principle has common sense as well as economic theory behind it. First, services with low price elasticity of demand tend to be more valuable to their users, because that value is why demand is less sensitive to price. Accordingly, Ramsey pricing is often termed “value of service pricing,” since it asks for more contribution to reaching the financial target from those users of the common assets that value their use the most. Second, services with low price elasticity of demand will contract less in reaction to higher prices, so that higher prices will have a less consequential distorting impact on

the usage decisions made by distribution modes and their consumers. 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 of 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.

34. The principles of public interest pricing mandate that the pricing analyst consider with empirical tools levels of applicable incremental costs including opportunity costs, as well as levels of price elasticity of demand. Below, after discussion of additional economic frameworks for assessments of prices, I describe the empirical analyses I have done for these purposes. I will explain that the empirical evidence indicates that music has a greater opportunity cost in its use by Sirius XM than it has in its use by subscription interactive services. I will also explain my finding that the available evidence indicates that the price elasticity of demand for the use of music by Sirius XM is currently smaller than it is for subscription interactive services. It follows that the public interest level of royalty for Sirius XM should have an equal or larger margin relative to opportunity costs than subscription interactive services, provided that the comparative levels of price elasticity of demand do not substantially shift.

B. Efficient Component Pricing Rule (ECPR)

35. As I introduced earlier, ECPR 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 by would-be competitors of the owner of the necessary assets. To illustrate the idea, imagine that owners of copyrights on sound

recordings formed a joint venture with a large subscription interactive service, and proceeded to refuse to negotiate reasonably over access to the music for any competitive distributor. An antitrust court might invoke ECPR as a cure for the anticompetitive effect of the refusal to deal by prescribing that the copyrights be licensed to at least some competitors at rates that assured that an efficient entrant could succeed in the market. The ECPR rates would be calculated by adding on to the direct cost of providing access the opportunity cost of the competitive entry; *i.e.* the margin on the competitive business that the copyright owners would lose if the entrant won that business away. In short, ECPR prescribes rates for access equal to direct plus competitive opportunity costs, in part as a reaction to anticompetitive practices that attempted to extend the owner's monopoly power over the needed assets to broader potentially competitive markets.

36. The most salient lesson of ECPR for the matter at hand is that the most confining pricing remedy for attempted monopolization through refusals of access to needed assets is prescribing that prices equal direct plus competitive opportunity costs. Thus, while there is no need for such remedies in the marketplace at issue here, at the extreme minimum royalties should be permitted to cover direct plus opportunity costs. As I showed earlier in this report, that has not been the case for royalties paid by the totality of streaming services – they did not pay enough to cover the opportunity cost of the cannibalized creator compensation from paid downloads. Going forward, royalties should be allowed to equal and exceed direct plus opportunity costs.

C. Unregulated Profit-Maximizing Pricing

37. The perspective of unregulated profit-maximizing pricing, and bargaining over pricing, as is characteristic of pricing in an unregulated marketplace setting, is a rich source of guideposts for price determination. First, and obviously, a profit maximizing firm will not price

below its opportunity costs because it can earn more by availing itself of its other opportunities! Second, like a firm following the precepts of Ramsey pricing, a profit-maximizing firm will set its margin above its marginal or incremental cost to a greater level the smaller is its own price elasticity of demand. Thus, under this pricing standard, a copyright owner should be permitted to charge royalties higher than those set with an unregulated benchmark firm, if the sales to the regulated firm have a higher applicable cost and a lower applicable elasticity of demand. Based on my empirical analyses, I believe that this is the case for the comparison between sales of licenses to Sirius XM relative to sales of licenses to interactive subscription services.

38. Another scenario for an unregulated profit-maximizing firm is to bargain over pricing with its potential customer. Economics has developed and applied the theory of the Nash Bargaining Solution, which attempts to characterize the features of the outcomes of bilateral bargaining. It holds that each of the two parties to a bargaining process has a fallback valuation that would apply in the event that no agreement is reached. The surplus created by a successful agreement is the joint profit from the agreement less the sum of the parties' fallback values. The Bargaining Solution holds that a fair outcome of the negotiation over the gains from agreement will accord to each party its fallback value plus one half of the surplus created by the deal. Here, the copyright owner's fallback value is the opportunity cost of not deploying the license to the distributor. Thus, here too, under the Nash Bargaining Solution, the copyright owner will earn more from an agreement than the opportunity cost, which acts as an extreme floor on its return. To the extent the agreement creates total value so that the surplus is positive, the licensor's return will be larger than its opportunity cost.

VI. Empirical Analysis of Opportunity Costs of Creator Compensation Cannibalization

39. All of the pricing perspectives that I have discussed here agreed that appropriate royalties would exceed the opportunity costs of creator compensation lost through cannibalization from the competitive access to the music. Consequently, I have undertaken an analysis to quantify the size of the opportunity cost of access to the music by Sirius XM. This is just the first element of the quantification of guideposts from economics for the determination of the royalty.

40. The analysis of the opportunity cost was built up from results of a survey of a representative panel that obtained responses from hundreds of subscribers to Sirius XM, paid interactive services (*e.g.*, Spotify and Apple) and paid non-interactive services (*e.g.*, Pandora One). The respondents were asked if they would discontinue their service with questions that kept moving the price point up until the respondent answered “yes.” Then the respondents were asked what they would do about access to music as a result of stopping their current service, with a layering of questions about alternatives. Some pertinent details of the survey design and responses are provided in Appendix B to this report. The survey was conducted under the direction of Professor Ravi Dhar and thoroughly described in his report.¹⁶ The construction of the opportunity cost figures from the survey results is summarized in Table 2 below.

41. The Table indicates that 31% of the respondents who were paying subscribers to Sirius XM answered that if they were to leave Sirius XM due to an elevated price, they would join a paid interactive service and 15% answered that they would join a paid- non-interactive service. Of the remaining such respondents, 36% indicated that they would buy more CDs and

¹⁶ See Written Direct Testimony of Professor Ravi Dhar, October 19, 2016.

downloads, comprising just 10% of their positive answers about their various choices. Nearly one-third of the responses from these remaining respondents indicated choice of forms of consumption that have no creator compensation (*e.g.*, terrestrial radio, playing their existing collection of owned music, etc.). Table 2 shows for each of the destination choices an associated figure for its creator compensation per subscriber per month, and these range from a high of \$[REDACTED] for paid-interactive to zero for terrestrial radio and cable music channels.¹⁷ The Table shows the weighting of these levels of creator compensation per subscriber per month by the prevalence of those choices among the respondents who said they would exit their current mode due to a hypothesized price rise. The resulting weighted average level of the creator compensation per subscriber per month can be logically interpreted as the creator compensation opportunity cost of according access to the sound recordings. This opportunity cost for creators to provide access to Sirius XM is \$2.55 per subscriber per month. Most of that opportunity cost arises from substitution between Sirius XM and paid-interactive and paid-non-interactive services.

¹⁷ The creator compensation per subscriber per month figures for non-paid services and physical/downloads are based on the average number of performances per subscriber per month for the existing service.

Table 2. Creator Compensation Cannibalization Based on Survey Responses
[RESTRICTED]



42. This is an empirical finding with a great deal of significance for the determination of the Sirius XM royalty. Consequently, I was able to test and confirm it econometrically. Sorting out econometrically the various two-way relationships among the various streaming services is impossible to accomplish without instrumental variables that relate to the supply or demand of each separate service. The only streaming service in this case for which proper instrumental variables are available, to the best of my knowledge, is paid Sirius XM. The number of Sirius XM subscribers is impacted by (i) the price of the service and by (ii) the number of car purchasers granted promotional trial service. Both of these can be employed as instrumental variables reliably to determine how paid Sirius XM subscribership affects the extent of use of other paid streaming services.

43. To make this assessment, I regress the aggregate use of all paid streaming services except Sirius XM as the dependent variable and the use of paid Sirius XM as the explanatory variable, instrumented by Sirius XM price and the average number of promotional Sirius XM subscribers over the last 6 months (both lagged by one quarter). I include as controls a time

trend and GDP. Both of the instruments obtain the expected signs: price reduces the number of paid Sirius XM subscribers and the number of promotional Sirius XM subscribers increases it. The estimated coefficient on the use of Sirius XM is -1.259, implying that one paid Sirius XM performance substitutes for 1.259 other paid streaming performances. The lower bound of the confidence interval is -0.743, implying that with 95% level of confidence, the Sirius XM substitution effect is at least 74.3%.¹⁸ Thus, the econometrics confirm the key result of the survey that the creator compensation opportunity cost of Sirius XM access to the music is substantial, largely arising from cannibalization of paid streaming services which have the largest level of creator compensation.

44. The survey also enables calculation of price elasticities of demand for the distribution services. Taken just above Sirius XM's ARPU of about \$[REDACTED], its price elasticity of demand from the survey answers is 0.8, while that for Apple/Spotify just above their price point of \$9.99 is 1.7.¹⁹ I also undertook a careful econometric study of the price elasticity of demand for Sirius XM (detailed in Appendix D), and found that it corroborates the finding of the survey for Sirius XM, with a range of estimates from 0.3 to 0.9 depending on the time frame of the measured response to a price change. The price elasticity of demand for music performances distributed through one of these services is the price elasticity of demand for subscriptions to the service, multiplied by the music's cost share of the total downstream price, provided that the number of music performances is proportional to the number of subscribers. Thus, with this proviso, given an estimated price elasticity of demand of 0.8 for Sirius XM subscriptions, and a [REDACTED] = .09 music's cost share of price, the elasticity of demand for music performances at

¹⁸ See Appendix F for further details of this econometric analysis.

¹⁹ See Appendix C for further details of this calculation.

Sirius XM is $.09 \times .8 = .072$. In contrast, the corresponding elasticity of demand for music performances at Apple/Spotify is [REDACTED]. Of course, it may be the case that there is inaccuracy in the assumption that the number of music performances is proportional to the number of subscribers, inasmuch as the programmers of the distribution services limit the performances of music in response to its pricing.²⁰ Nevertheless, this empirical evidence is persuasive that the elasticity of demand for music is larger at Apple/Spotify than it is at Sirius XM.

VII. The Appropriate Royalty for Sirius XM

45. All the economic theory articulated in this report, and all the empirical analyses, unambiguously conclude that the royalty should significantly exceed the absolute minimum level of the current opportunity cost of \$2.55 per subscriber per month. This is the amount of compensation that the sound recording creators lose from the alternative distribution modes due to Sirius XM's distribution of the sound recordings itself. With lower royalties than that, like the current level of \$[REDACTED] per subscriber per month, Sirius XM is a net drain on the financing of sound recording creation, to say nothing of not paying its fair share.

46. There are several important reasons why the opportunity cost figure of \$2.55 is too low for the appropriate royalty for Sirius XM. First, the opportunity cost to creators of Sirius XM's distribution of the sound recordings is apt to grow significantly from that level during the next few years. Most of the current opportunity cost arises from cannibalization of interactive streaming services – namely \$1.78 out of the total \$2.55, or 70%, according to Table 2. Currently the volume and distribution share of paid interactive streaming services are growing

²⁰ The issue of the extent to which this is the case, and the extent to which it is systematically different among distribution modes is discussed in the testimony of Jonathan Orszag.

very fast, as shown in Figures 1 and 2 above, and as their growth rate continues, the opportunity cost of music at Sirius XM is apt to grow apace. For example, if the diversion ratio from Sirius XM to paid interactive streaming services were to grow from its current level of 31% to 45%, with the rise coming from the current diversion to modes with zero creator compensation, then the opportunity cost would rise from \$2.55 to \$3.36. Increases like this would not be surprising since the share of paid interactive streaming, among compensatory modes, has doubled in each of the last two years.

47. Application of the Nash Bargaining Solution yields an appropriate royalty rate for Sirius XM that is significantly above opportunity cost. As discussed above, this solution models the fair outcome of unregulated-market bargaining over the total earnings enabled by a hypothetical agreement for Sirius XM to have the non-exclusive performance license for all sound recordings. The indicated fair outcome of the negotiations over the agreement is for the parties to each earn what they would have earned absent the agreement, plus one half of the surplus created by the agreement.

48. To apply that here, I estimate the total earnings from an agreement between Sirius XM and the copyright owners to be, per subscriber-month, the relevant ARPU of \$[REDACTED] less the variable costs, excluding the royalties at issue since they are at once a cost to Sirius XM and an equal amount of revenues to the copyright owners (and therefore they cancel each other out when calculating total surplus). The variable costs are reported to be about [REDACTED]% of ARPU,²¹ inclusive of the \$[REDACTED] royalty payments. So the variable costs without the royalties at issue are approximately [REDACTED]. The total earnings therefore are [REDACTED]

²¹ Variable costs are \$[REDACTED] billion in 2015 (see Written Direct Testimony of Thomas Z. Lys, Ph.D., October 19, 2016, Figure 14); revenue (for ARPU) is \$[REDACTED] billion in 2015 (see Appendix B).

[REDACTED]. To estimate earnings absent an agreement, I refer to the survey finding that approximately 70% of Sirius XM subscribers would cease to subscribe in the absence of the music programming.²² The earnings of Sirius XM, per original subscriber per month, would fall to the ARPU of \$[REDACTED] less the variable cost of \$[REDACTED] times the 30% of the original subscribers who would remain. This comes to \$[REDACTED]. Absent an agreement, the owners of the music copyrights would earn the opportunity costs of the sound recordings being performed on Sirius XM, which is the estimated \$2.55 figure derived above from the survey evidence. Consequently, the surplus from the agreement is \$2.78; *i.e.* the total earnings of \$[REDACTED] from the agreement, less \$2.55 (the earnings of the copyright owners absent the agreement), and \$[REDACTED] (the earnings of Sirius XM absent the agreement)].

49. The bottom line from the perspective of the Nash Bargaining Solution is that the music copyright owners would earn from the agreement their opportunity cost per subscriber-month of \$2.55, plus one half of the \$2.78 surplus created by the agreement (*i.e.*, \$1.39), for a total of \$3.94 per subscriber-month.

50. It 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. Sirius XM's margin can be calculated from the results found in Table 2: [REDACTED]. It would take a royalty of \$[REDACTED] per subscriber per month for Sirius XM to yield the same margin as that paid by the interactive streaming services.²³ Of course, a move from the current royalty of \$[REDACTED] to

²² See Written Direct Testimony of Stefan Boedeker, October 19, 2016, at ¶¶ 14.d, 77.

²³ Calculated as [REDACTED].

\$[REDACTED] is too jolting and uncertain to be practically contemplated, but it does however follow logically from economic principles and from the policy criteria (a), (b) and (c) of Section 801(b)(1).

VIII. Conclusion

51. In sum, I conclude that a substantial increase in the Sirius XM royalty is warranted, and that it should significantly exceed its current opportunity cost level of \$2.55 per subscriber per month. This opportunity cost is apt to rise significantly in the near future due to the growth in demand for paid interactive streaming services. The Nash Bargaining Solution, which provides for a fair split of the surplus created by Sirius XM's license of the sound recordings, indicates a royalty level of \$3.94 per subscriber per month, based on the current level of the opportunity cost. And this guidepost is well under the levels indicated by quantifying the public-interest pricing approach and by taking seriously the perspective of profit maximization, guided by the benchmark of paid interactive streaming services.

I declare under penalty of perjury that the foregoing testimony is true and correct.

Date: 10/19/2016

Robert Willig
Robert Willig

Appendix A - Dataset Documentation

This appendix documents the variables and assumptions I have relied upon in measuring historical, monthly music distribution by mode, for Jan-2004 through Jun-2016. In addition to data regarding distribution, my analysis relies upon various “macro” variables – inflation, gross domestic product (GDP), and personal disposable income, which are also discussed below.¹ Based on the information below, I was able to analyze historical distribution of music by mode on a monthly, quarterly, and annual basis. Using annual data, I was able to extend my analysis back to 1997 for purposes of showing the longer-term trend in distribution.²

Music Distribution Variables

1. Physical and Downloads

For physical sales and downloads, I relied upon data from Nielsen measuring sales volume (number of units) on a monthly basis from July 2004 through June 2016. That data was broken down into the following categories: physical albums, physical singles, permanent download albums, and permanent download singles.

Because such data was not available on a monthly basis prior to July 2004, I estimated values for Jan-2004 through Jun-2004 as follows:

- I obtained full year numbers for 2004 for physical albums, download albums, and download singles from Nielsen’s 2005 annual press release.³ I estimated the total physical singles for 2004, which was not reported in the annual press release, by multiplying the total physical albums in 2004 by the ratio of singles to albums in 2005.
- For each of these categories, I assigned the total for 1H2004 to be the annual total for 2004 less the total for 2H2004 (which was available from Nielsen’s monthly data).
- I then divided the total for 1H2004 across Jan-2004 to Jul-2004 (the latter of which was reported in Nielsen’s monthly data) assuming linear growth.

¹ As I indicate below, data for certain variables was available only on a quarterly basis; in such cases, the quarterly data were divided evenly across the corresponding months.

² For the period prior to 2004, physical sales were the only relevant category, of those discussed below.

³ See “Nielsen SoundScan & BDS 2005 Year-End Music Industry Report,” January 4, 2006.

I then converted singles to album-equivalents using the industry standard approach of 1 album equals 10 singles,⁴ yielding physical album-equivalents and download album-equivalents.

2. Sirius XM (“SXM”)

Because I understand that Sirius XM does not have the ability to monitor listening to its satellite radio service, data regarding the actual number of performances are not available.⁵ As such, data are estimated as described below.

First, the number of SXM subscribers by quarter was obtained from public reports (10K/10Qs).⁶ Subscriber counts for Sirius and XM are aggregated for quarters prior to merger. The average number of subscribers in each quarter was set equal to the average of the beginning and ending values (per the public reports). Figures for self-paid subscribers (“SXM-Paid”) and paid promotional subscribers (“SXM-Promo”) are tracked separately.⁷

Second, I estimated performances per subscriber-month as follows (see Figure A-1):

- SXM internal documents provide [REDACTED].
- Time spent listening to SXM radio outside of vehicle per week is estimated as the product of: (a) total time listening to SXM outside of vehicle (from SXM internal document); and (b) percentage of listening outside of vehicle that is on radio (as opposed to SXM’s webcasting service), which is assumed to be 50% radio. This results in [REDACTED] hours per week.
- Total time listening to SXM radio is sum of in-vehicle and outside-of-vehicle time ([REDACTED] hours per week).
- Total listening time is then split between music and non-music listening. Survey results show that music accounts for 71.25% of the listening,⁹ yielding [REDACTED] hours per week listening to music on SXM radio.

⁴ See, e.g., “2015 Nielsen Music U.S. Report,” The Nielsen Company, page 7.

⁵ SXM’s webcasting service is counted under the webcasting category discussed below.

⁶ See Sirius and XM (pre-merger) and Sirius XM (post-merger) 10Q and 10K filings for 2003Q1 through 2016Q2.

⁷ Deployment of SXM in rental cars is excluded.

⁸ See Nielsen Custom Study for SiriusXM, Fall 2015 (SXM_DIR_00023668-725), at 671; and 2015 Customer Experience Survey (SXM_DIR_00023726-889), at 836 and 881.

⁹ See Written Direct Testimony of Stefan Boedeker, October 19, 2016.

- The number of songs broadcast per hour per channel is estimated as follows. Royalty statements for SXM's webcasting service provide aggregate tuning hours by month for 2006-2007 and then provide number of performances by month for 2008-2016. Dividing number of performances in Jan-2008 by number aggregate tuning hours in Dec-2007 yields [REDACTED] songs per hour. For current purposes, I assume that [REDACTED].
- The result of the above is [REDACTED].

Finally, the number of performances for each month in each quarter is calculated as the product of: (a) the average number of subscribers in the quarter; and (b) the number of performances per subscriber-month ([REDACTED]). (Subscribers/performances are spread evenly over the months in each quarter.)

3. Interactive-Paid, Interactive-Ad-Supported, Video

Royalty statements from [REDACTED]
[REDACTED]
[REDACTED]. Such royalty statements are monthly and cover the period Jan-2004 through Jun-2016. Data are aggregated across services/plans for each service type (Interactive-Paid, Interactive-Ad-Supported, and video) to determine the total subscribers and performances for each category in each month, as well as the weighted-average royalty rate.

4. Non-Interactive-Paid, Non-Interactive-Ad-Supported (Webcasting)

SoundExchange records provide royalty payments (allocations) and performances by month for Jan-2006 through June-2016. Data are broken by rate category – categories are aggregated into two groups: Non-Interactive-Paid and Non-Interactive-Ad-Supported.

Using this data, I calculated the total performances for each group for each month.

Because SoundExchange data do not include performances that are excluded under the statutory license (pre-72 works and direct agreements), I scaled the total performances up to account for these exclusions, based on the rates for such exclusions in the data reported by SXM to SoundExchange – [REDACTED].

¹⁰ Data for number of subscribers to video services is not included in the dataset.

Macro Variables

5. Consumer price index

Data were obtained from the U.S. Department of Labor, Bureau of Labor Statistics (<http://www.bls.gov/cpi/data.htm>). The series selected was: all areas, all items, seasonally adjusted (available monthly). The source data series is defined as 1982-1984=100; the source data were scaled to create a series with 2015=100, which is used to convert nominal dollar values to 2015\$.

6. Gross domestic product

Data were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis (<http://www.bea.gov/national/index.htm#gdp>). The series selected was: seasonally adjusted, current year dollars (available quarterly).

7. Personal disposable income

Data were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis (<http://www.bea.gov/national/nipaweb/DownSS2.asp>, Section 2). The series selected was: seasonally adjusted, current year dollars (available quarterly).

Other Data

8. RIAA revenue data

The Recording Industry Association of America (RIAA) provides annual data on revenue and units sold by distribution mode for 1973-2015. This dataset is publically available on the RIAA website.¹¹

9. RIAA financial data

The RIAA financial data provide a breakdown of revenue and cost for the major record companies from 1991 to 2014. In terms of the “raw” RIAA data (i.e., prior to adjustment discussed below), creator compensation consists of the following line items:

- Artist Royalties from Licensing
- Artist Royalties (non-licensing)
- Advances & Recording Costs (net)¹²

¹¹ See RIAA, U.S. Sales Database, <https://www.riaa.com/u-s-sales-database/>.

¹² “Advances & Recording Costs (net)” consists of advances to artists that were not recouped – i.e., the work did not earn enough royalties to pay off the advance. The record labels write-off this amount and the artists keep it (not required to pay back). As such, this is another form of creator compensation. Generally, the record companies pay

- Net income (profits) for the record labels¹³

In addition to the above, the following needs to be added to creator compensation. SoundExchange distributions are dispersed as follows: (i) half are sent to record labels and (ii) half are sent directly to the artists. The former (i) is captured in the RIAA financial data, but the latter (ii) is not. As such, we need to add (ii) in determining the total creator compensation. The RIAA has provided data on SoundExchange distributions to the major record labels, and since the split is 50/50, this is also the amount that was paid directly to the artists (ii).

10. SXM churn, conversion rates, and pricing

Data for SXM's churn (percentage of self-pay subscribers leaving per month) and conversion rate (percentage of expiring promo customers converting to self-pay) on a quarterly basis for 4Q2007 through 2Q2016 were obtained from SXM SEC filings. For 2010-2015, SXM did not report churn or conversion for the 4th quarter. As such, the 4th quarter values for each year were estimated from the reported values for the annual (average) and the first three quarters of the year.

In addition, announced changes in the price of SMX's service were tracked over time for 2007Q4 onward. The following prices were applicable to this period:

- Price was \$12.95 as of 4Q2007¹⁴
- Price was changed to \$13.49 effective 1/1/2012¹⁵
- Price was changed to \$14.99 effective 1/1/2014¹⁶
- Price was changed to \$15.99 effective 4/27/2016¹⁷

for recording costs in advance and then recoup those. In theory, out-of-pocket expenses for the artists, including recording costs and other incremental costs of producing the content, should be subtracted from the "total compensation" – however, we do not have information on such costs.

¹³ Note: mechanical royalties are not included in this calculation. Also, these data include compensation related to ringtones – there is insufficient detail to back out such compensation from the total.

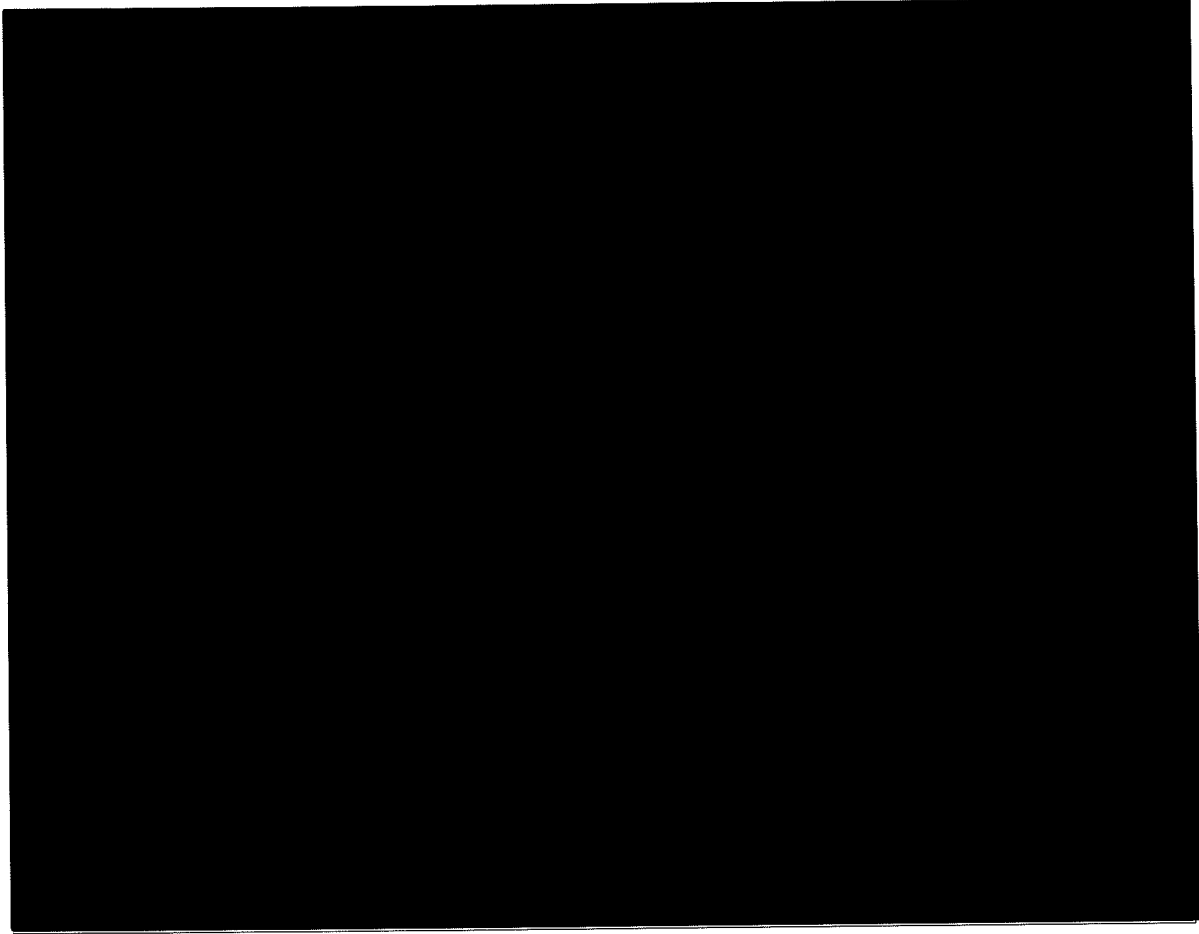
¹⁴ See Sirius XM 2008 10K.

¹⁵ See <http://seekingalpha.com/article/293725-sirius-xm-announces-price-increase>.

¹⁶ See <http://www.nasdaq.com/aspx/call-transcript.aspx?StoryID=1768392&Title=sirius-xm-rad>.

¹⁷ See <http://rainnews.com/sirius-xm-announces-price-hikes/>.

Figure A-1 – Estimation of SXM Performances per Subscriber-Month [RESTRICTED]



Appendix B - Supporting Details for Analysis of Creator Compensation Cannibalization

This appendix provides details of the calculations underlying the analysis of creator compensation cannibalization. The appendix is organized into the following sections:

- Structure of survey responses
- Calculation of alternative music distribution mix
- Calculation of creator compensation per unit for each alternative form of music distribution
- Calculation of creator compensation cannibalization

Structure of survey responses

The survey initially identifies each respondent's current service and then asks if he/she would cancel that service based on a series of hypothetical prices for the service.¹ If the respondent indicates that he/she would cancel that service at one of the hypothetical price levels, then the survey proceeds to ask about what alternative forms of music the respondent would consume instead of his/her current service. The questions about such alternatives are structured in three levels, as described below.

- **Level 1.** Level 1 asks whether the respondent would switch to an alternative paid subscription service. For current SXM subscribers, the alternative paid subscription services are Paid-Interactive (*e.g.*, Apple/Spotify) and Paid-Non-Interactive (*e.g.*, Pandora One).² For Paid-Interactive, the alternative services are SXM and Paid-Non-Interactive; and for Paid-Non-Interactive, the alternative services are SXM and Paid-Interactive. If the respondent indicates that he/she would choose one of the alternative paid subscription services, the questioning stops; otherwise, it proceeds to Level 2.
- **Level 2.** Level 2 asks whether the respondent would increase his/her purchases of CDs/downloads and/or increase his/her consumption of music from sources that are free. This level also has the option to choose "Other." In this level, the respondent can choose one or more options, or choose "Don't Know/Unsure" or "None of the Above." If the respondent indicates that he/she would increase consumption of free music, then the questioning proceeds to Level 3; otherwise, it stops.

¹ The description in this section is based on: Written Direct Testimony of Professor Ravi Dhar, October 19, 2016.

² In Level 1, the respondent can select only one option.

- **Level 3.** Level 3 asks the respondent to identify the forms of free music for which he/she would increase consumption. The respondent is presented with the following nine options (and can choose one or more):
 - Ad-supported, non-interactive (*e.g.*, Pandora)
 - Ad-supported, interactive (Spotify free)
 - Music videos (*e.g.*, YouTube)
 - Music channels on cable/satellite TV service
 - Terrestrial radio
 - File sharing/free downloads
 - Borrow CDs, etc.
 - Existing collection of owned music
 - Other³

Calculation of Alternative Music Distribution Mix

For each current service category, the following calculations are performed to determine the mix of alternative modes of music distribution that would be consumed (after dropping the current service). For ease of exposition, the calculations are described using SXM-Paid as the current service (as an example); calculations for other services follow the same structure. The discussion below refers to the calculations for SXM-Paid that are shown in Figure B-1. (Corresponding calculations for the other services are provided in Figures B-2, B-3, and B-4.)

- First, identify the set of respondents who indicate that: (i) they would drop SXM-Paid in response to one of the price levels, and (ii) do not select “Don’t Know/Unsure” in Level 1. For SXM-Paid, there are 355 such respondents.
- Each of these 355 respondents is then allocated to the alternative forms of music consumption using their individual responses to Levels 1, 2, and 3 (as applicable). That is, the calculation is done at the level of the individual responses, and then aggregated to determine the average across the group.
- The initial allocation is based on Level 1 responses
 - For SXM-Paid, 110 respondents (31% of the 355) indicated that they would switch to a Paid-Interactive service and 54 respondents (15% of the 355) indicated that they would switch to a Paid-Non-Interactive service. Since Level 1 only allows one option to be selected, these 164 respondents are each assigned 100% to their selected alternative.

³ There is also a “Don’t Know/Unsure” option.

- The other 191 respondents (who indicated that they would not purchase a paid subscription service) then proceed to Level 2.
- The allocation proceeds based on Level 2 responses as follows:
 - Identify respondents who selected “Don’t Know/Unsure” in Level 2. It is assumed that the mix for such respondents is the same as the mix for the ones who did respond. For SXM-Paid, there is one such respondent.
 - For the ones who did respond (190 in total), there are three possibilities for the number of options that were selected (“Yes”) in Level 2:
 - Choose just one option. For SXM-Paid, 123 of the respondents fall in this group, choosing: purchase CDs/downloads only (5), free music only (104), other only (10), or none of the above (4) – such respondents are assigned 100% to their chosen option.
 - Choose two options. For SXM-Paid, 67 of the respondents fall in this group, choosing: purchase CDs/downloads and listen to free music (62); purchase CDs/downloads and other (1); free music and other (4). These respondents are assigned 50% to each of their chosen options.
 - Choose three options. Respondents could pick all three options – purchase CDs/downloads, listen to free music, and other. In that case, one-third would be assigned to each option. However, none of the SXM-Paid respondents in the sample picked all three options.
 - The above results in allocations as follows (sums to 191):
 - Purchase CDs/downloads: $(5 \times 100\% + 63 \times 50\%) \times (191/190) = 36.7$
 - Free music: $(104 \times 100\% + 66 \times 50\%) \times (191/190) = 137.7$
 - Other: $(10 \times 100\% + 5 \times 50\%) \times (191/190) = 12.6$
 - None: $(4 \times 100\%) \times (191/190) = 4.0$
- Finally, the allocation to free music identified above (137.7) is divided into the alternative forms of free music based on the responses to Level 3 as follows:
 - Identify respondents to Level 3 who chose “Don’t Know/Unsure” – again, those are allocated based on the average mix for the other respondents to this level. In the case of SXM-Paid, there was one respondent who chose “Don’t Know/Unsure” in Level 3.
 - In Level 3, each respondent who does not select “Don’t Know/Unsure” can select among nine options – choosing one or more. For each such respondent,

the amount that is carried to Level 3 (either 100%, 50%, or 33.3%, depending on the response to Level 2) is then allocated proportionally to all options selected in Level 3.

- For example, if a respondent chooses Ad-Supported-Interactive, terrestrial radio, and borrow CDs, then each one of these categories gets one-third of the amount to be allocated.
- After Level 3 is complete, all of the respondents (355) have been allocated to the various categories. The corresponding percentages (totaling 100%) are calculated. For example, 31% is allocated to Paid-Interactive, 15% to paid-non-interactive, 10% to purchase CDs/downloads, 4% to ad-supported non-interactive, etc.

Calculation of Creator Compensation per Unit for Each Alternative Form of Music Distribution

The next step is to determine the creator compensation per unit for each alternative distribution mode. This is done based on the structure of customer payments and creator compensation applicable to each form of distribution, as described below.

1. Paid-Interactive

Customers pay a monthly fee, and creators received a portion of that fee. Creator compensation is not tied to the amount of usage by the customer (number of performances). For such service, the creator compensation per unit is set equal to the weighted-average per sub-month rate for 1H2016 based on [REDACTED]

[REDACTED]. [REDACTED]
[REDACTED]
[REDACTED].

2. Paid-Non-Interactive

Here, we use the terms of [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].

3. SXM

⁴ See "Written Direct Testimony of Aaron Harrison," Senior Vice President, Business & Legal Affairs, Global Digital Business, UMG Recordings, Inc., October 19, 2016.

SXM pays creators a percentage of its gross revenue. SoundExchange provided data for SXM's reported revenue for royalty purposes by month for 2015 and 1H2016. Using this data, I "grossed-up" the revenue reported by Sirius XM to account for exclusions that SXM had taken based on (a) pre-1972 recordings (about [REDACTED]% in 1H2016) and (b) direct licenses (about [REDACTED]% in 1H2016). The total grossed-up revenue is divided by the average number of subscribers (self-pay and paid-promo) in 1H2016 to obtain average revenue per (paid) subscriber-month of \$[REDACTED]. Pursuant to *SDARS II*, the SXM royalty rate for 2016 is 10.5%. As such, the creator compensation rate for SXM is \$[REDACTED] per subscriber-month.⁵

4. Purchase CDs/downloads

The RIAA reports sales – dollars and units – for physical forms of music (CDs and LPs) as well as downloads, broken down between albums and singles. The individual track data is converted to album equivalents – using the industry approach of 10 songs equal one album. The physical and digital downloads are then combined, resulting in an overall weighted-average price of \$12.13 per album-equivalent for 2015.

Creator compensation is assumed to be [REDACTED]% for physical and 70% for permanent downloads,⁶ resulting in a weighted-average rate of [REDACTED]% for 2015. This results in weighted-average creator compensation of \$[REDACTED] per album-equivalent. Based on the industry standard conversion of 1,500 streams equals one album,⁷ this amounts to creator compensation of \$[REDACTED] per performance for physical/downloads combined.

The table below provides a breakdown of the above calculations between physical and downloads.

⁵ This rate is applied to both self-pay (SXM-Paid) and promotional (SXM-Promo). I do not have data to break the ARPU out separately for those categories.

⁶ Creator compensation percentage for physical is weighted-average from RIAA financial data for 1991-2003 (period when essentially all sales were physical); value for downloads is based on standard terms for Apple iTunes sales (70/30 split between content provider and Apple).

⁷ See, e.g., "2015 Nielsen Music U.S. Report," The Nielsen Company, page 7.

**Figure B-1 – Breakdown of creator compensation calculations for physical and downloads
[RESTRICED]**



Finally, it is assumed that the number of albums purchased by the respondent is equal to the equivalent of the average number of songs listened to on SXM, again based on the industry standard conversion of 1,500 streams equals one album. As calculated above, SXM users are estimated to listen to an average of [REDACTED] songs per month, which is equivalent to [REDACTED] albums. This results in creator compensation per subscriber-month equal to \$[REDACTED] for physical/downloads combined.

5. Level 2 “Other” and “None of the Above”

Creator compensation is assumed to be zero for these responses.

6. Ad-supported interactive

Creator compensation is set to the weighted-average per-performance rate for 1H2016 based on [REDACTED]. It is assumed that a respondent listens to the same number of songs on alternative services as he/she did on SXM ([REDACTED] per month, as previously discussed). As such, creator compensation is [REDACTED] per sub-month.

7. Ad-Supported non-interactive

The per-performance royalty rate for "non-subscription" webcasting (non-interactive) in 1H2016 is \$0.0017 per performance. However, such royalties are not paid on pre-72 recordings and, as such, this rate is reduced by 13.3% to \$0.0015 per performance. It is again assumed that a respondent listens to the same number of songs on alternative services as he/she did on SXM ([REDACTED] per month, as previously discussed). As such, creator compensation is [REDACTED] per sub-month.

8. Music video

The weighted-average per-performance rate for 1H2016 based on [REDACTED]. It is again assumed that a respondent listens to the same number of songs

on alternative services as he/she did on SXM ([REDACTED] per month). As such, creator compensation is [REDACTED] per sub-month.

9. Cable/satellite music channels

For this option, the respondent is assumed to use an existing cable/satellite TV subscription. Our understanding is that compensation for music channels on cable/satellite TV is not tied to the amount that the subscriber actually listens to those channels. As such, the incremental creator compensation for this option is zero.

10. All Others

All other options – terrestrial radio, borrow CDs, etc. – have zero incremental creator compensation, by definition.

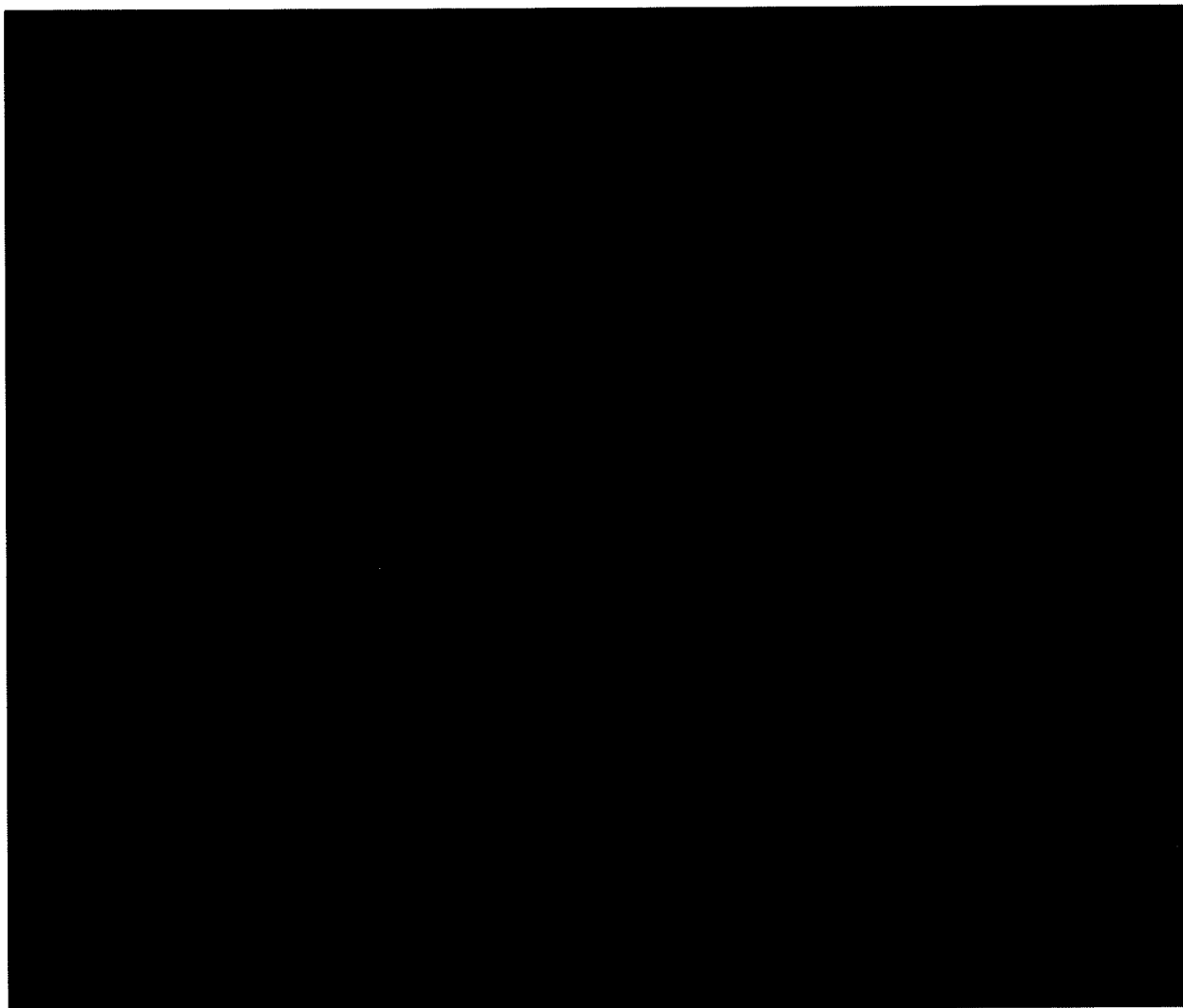
Note: as described above, the number of performances for each respondent over the alternative modes is assumed to equal the average number of performances for the current service. For SXM, the number of performances is [REDACTED] per subscriber-month. For the Paid-Interactive, the average performances per subscriber-month is based on [REDACTED], which provide number of subscribers and total number of performances. The weighted-average for 1H2016 is [REDACTED] performances per subscriber-month for Paid-Interactive. For Paid-Non-Interactive, the average performances per subscriber month is calculated as the weighted-average based on the combination of: (a) Pandora royalty statements (provided by SoundExchange), and (b) UMG royalty statements for direct licenses. The resulting value for Paid-Non-Interactive in 1H2016 is [REDACTED] performances per subscriber-month.

Calculation of Creator Compensation Cannibalization

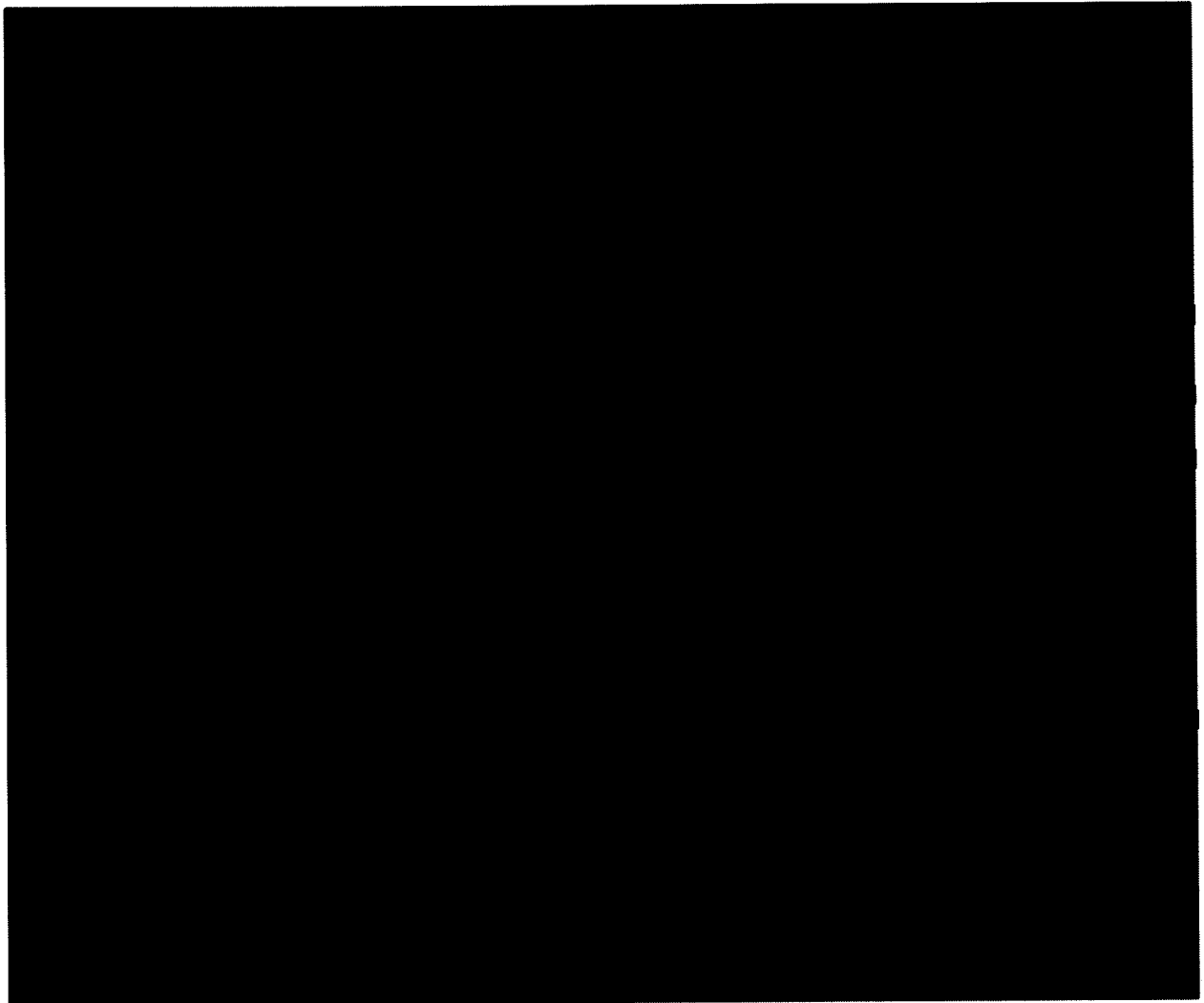
The final step is to determine the creator compensation cannibalization as the weighted-average creator compensation for the alternative modes, with the weights based on the mix of alternative forms of distribution for each existing service.

The results for each of the four current services are shown in the tables on subsequent pages.

**Figure B-2 – Estimation of Creator Compensation Based on Survey Responses for
Subscribers Leaving: SXM-Paid [RESTRICTED]**



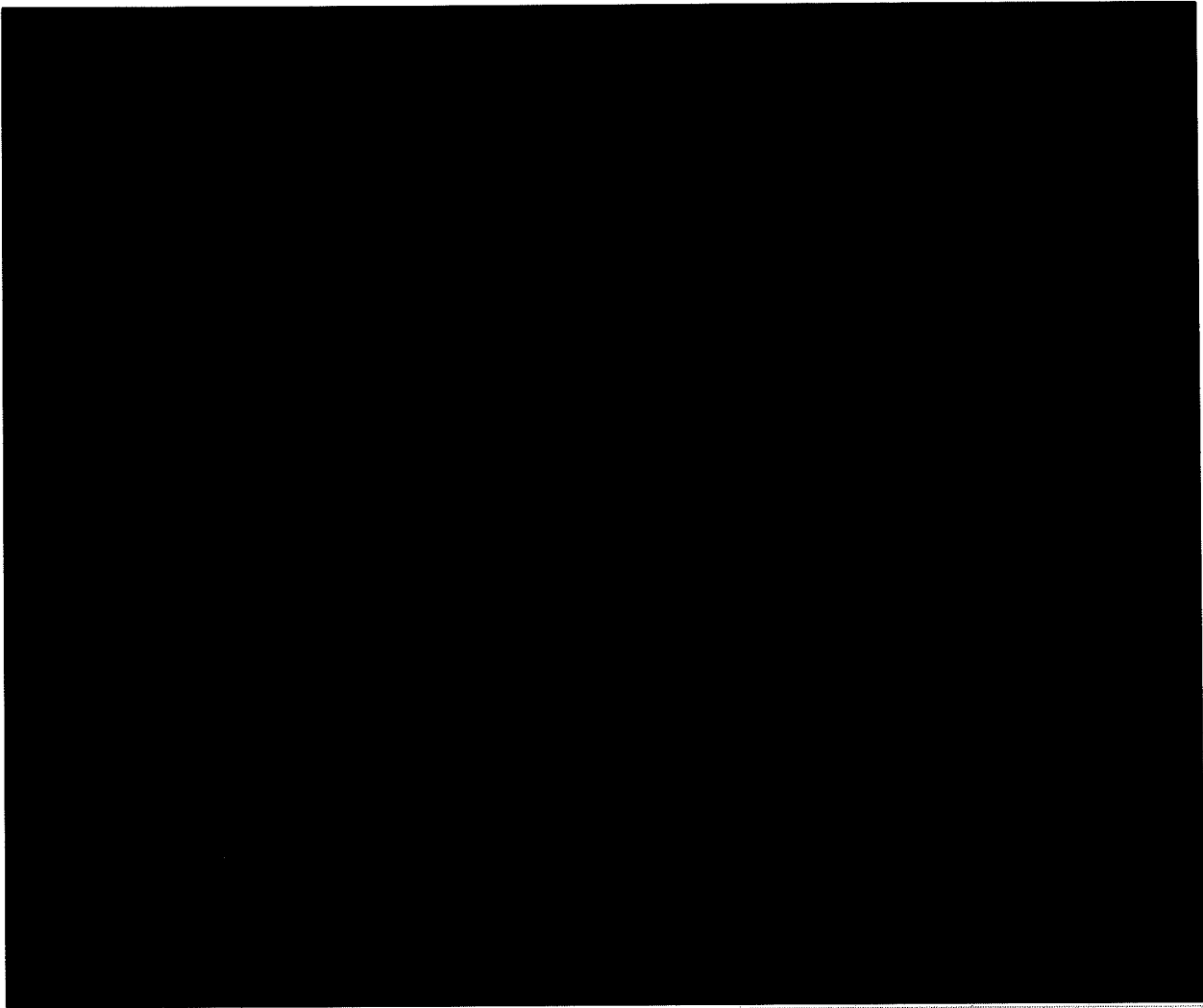
**Figure B-3 – Estimation of Creator Compensation Based on Survey Responses for
Subscribers Leaving: SXM-Promo [RESTRICTED]**



**Figure B-4 – Estimation of Creator Compensation Based on Survey Responses for
Subscribers Leaving: Paid-Interactive [RESTRICTED]**



**Figure B-5 - Estimation of Creator Compensation Based on Survey Responses for
Subscribers Leaving: Paid-Non-Interactive [RESTRICTED]**



Appendix C - Supporting Details for Calculation of Demand Elasticities from Survey Responses

This appendix provides details of the calculations underlying the demand elasticities based on the survey responses. The calculations described herein are shown in Figure C-1 below.

As discussed in Appendix B, the survey asked whether respondents would cancel their existing service at increasing price points. For SXM, the price points ranged from \$11.49 to \$20.49 per month, with increments of \$1.50 per month. For Apple and Spotify, the price points ranged from \$6.99 to \$12.99, with increments of \$1.00 per month. For Pandora One, the price points ranged from \$3.49 to \$6.49, with increments of \$0.50 per month. At each price point, the respondent has the following options: (a) continue service, (b) cancel service, or (c) don't know/unsure. If option (b) is chosen, the questioning stops. If options (a) and (c) are chosen, the questioning continues to the next price point (up to the maximum level indicated earlier). The survey then defines the “switch point” as the price at which the respondent chooses (b), if any.

Figure C-1 shows the distribution of switch point by level for each service. For example, there are 509 SXP-Paid subscribers in the sample. Of these, 82 said that they would drop the service at a price of \$11.49, 43 said that they would drop at a price of \$12.99, etc., with 121 indicating that they would not drop the service at the maximum point of \$20.49. From this switch point information, the number of subscribers remaining at each price step can be calculated. For example, at a price of \$11.49, there would be $509 - 82 = 427$ subscribers remaining. And, at a price of \$12.99, there would be $427 - 43 = 384$ subscribers remaining. Figure C-1 shows these calculations for each service and each price point.

Finally, the elasticity can be calculated by comparing the prices and quantities at two different price points. That is, the elasticity of demand is equal to the absolute value of the percentage change in quantity (delta-Q) divided by the percentage change in price (delta-P). For SXM, the relevant price step is \$11.49 to \$12.99 (as discussed, the ARPU for SXM is [REDACTED]). The relevant price step for Apple/Spotify is \$9.99 to \$10.99 and the relevant price step for Pandora One is \$4.99 to \$5.49. As shown in Figure C-1, the corresponding elasticities of demand are 0.8 for SXM-Paid, 1.7 for Apple/Spotify, and 1.3 for Pandora One.⁴⁸

Note that, following the survey approach, this analysis treats “Don't Know/Unsure” responses as being equivalent to “Continue” the existing service. That is, if a respondent says that he/she would “Continue” SXM at \$11.49 and \$12.99, was “Unsure” at \$14.49, and would cancel the service at \$15.99, the switch point is defined as \$15.99. (This approach is used for

⁴⁸ As shown in Figure C-1, the results for Apple and Spotify individually are very similar.

Apple/Spotify and Pandora One as well.) An alternative approach is to drop all respondents who indicated “Don’t Know/Unsure” at any price step. The right hand side of figure C-1 shows the calculation of the elasticities using the subset of respondents without any “Don’t Know/Unsure” responses, which is about 70-80% of all responses (percentage varies with service). As seen in Figure C-1, the results are not materially different in this case: the elasticities for SXM-Paid and Apple/Spotify are again 0.8 and 1.7, respectively, while the elasticity for Pandora One drops from 1.3 to 1.1.

Figure C-1. Calculation of Elasticity of Demand Based on Survey

	All Responses						Responses with no "Unsure"					
	SXM Paid	SXM Trial	Apple	Spotify	Apple/ Spotify	Pandora One	SXM Paid	SXM Trial	Apple	Spotify	Apple/ Spotify	Pandora One
Total in Sample	509	503	265	239	504	499	345	375	207	181	388	404
Price by Level												
1	11.49	11.49	6.99	6.99	6.99	3.49	11.49	11.49	6.99	6.99	6.99	3.49
2	12.99	12.99	7.99	7.99	7.99	3.99	12.99	12.99	7.99	7.99	7.99	3.99
3	14.49	14.49	8.99	8.99	8.99	4.49	14.49	14.49	8.99	8.99	8.99	4.49
4	15.99	15.99	9.99	9.99	9.99	4.99	15.99	15.99	9.99	9.99	9.99	4.99
5	17.49	17.49	10.99	10.99	10.99	5.49	17.49	17.49	10.99	10.99	10.99	5.49
6	18.99	18.99	11.99	11.99	11.99	5.99	18.99	18.99	11.99	11.99	11.99	5.99
7	20.49	20.49	12.99	12.99	12.99	6.49	20.49	20.49	12.99	12.99	12.99	6.49
Switching by Level												
1	82	151	12	8	20	22	82	151	12	8	20	22
2	43	42	12	17	29	18	28	20	11	15	26	17
3	71	85	19	14	33	42	50	44	14	9	23	36
4	50	40	17	14	31	21	30	17	8	11	19	17
5	80	27	36	31	67	50	38	19	30	22	52	34
6	24	18	18	19	37	21	11	12	10	9	19	8
7	38	16	15	14	29	35	17	9	7	8	15	24
NA	121	124	136	122	258	290	89	103	115	99	214	246
Quantity by Level												
0	509	503	265	239	504	499	345	375	207	181	388	404
1	427	352	253	231	484	477	263	224	195	173	368	382
2	384	310	241	214	455	459	235	204	184	158	342	365
3	313	225	222	200	422	417	185	160	170	149	319	329
4	263	185	205	186	391	396	155	143	162	138	300	312
5	183	158	169	155	324	346	117	124	132	116	248	278
6	159	140	151	136	287	325	106	112	122	107	229	270
7	121	124	136	122	258	290	89	103	115	99	214	246
Elasticity Price Step												
Lower	1	1	4	4	4	4	1	1	4	4	4	4
Upper	2	2	5	5	5	5	2	2	5	5	5	5
Delta Price												
Price-1	11.49	11.49	9.99	9.99	9.99	4.99	11.49	11.49	9.99	9.99	9.99	4.99
Price-2	12.99	12.99	10.99	10.99	10.99	5.49	12.99	12.99	10.99	10.99	10.99	5.49
Delta%	13.1%	13.1%	10.0%	10.0%	10.0%	10.0%	13.1%	13.1%	10.0%	10.0%	10.0%	10.0%
Delta Quantity												
Quant-1	427	352	205	186	391	396	263	224	162	138	300	312
Quant-2	384	310	169	155	324	346	235	204	132	116	248	278
Delta%	-10.1%	-11.9%	-17.6%	-16.7%	-17.1%	-12.6%	-10.6%	-8.9%	-18.5%	-15.9%	-17.3%	-10.9%
Elasticity (absolute value)	0.8	0.9	1.8	1.7	1.7	1.3	0.8	0.7	1.9	1.6	1.7	1.1

Appendix D - Econometric Methodology for Calculating SXM Own-Price Elasticity

Overview of Methodology

To evaluate the own-price elasticity of paid Sirius XM (SXM) service, I use quarterly data from Q3 2007 to Q2 2016. The data records SXM subscription prices, subscriber counts (broken down by promotional subscribers and paid subscribers), the churn rate, and the conversion ratio (or “take rate”) of expired promotional subscribers.

In theory, the change in the number of paid SXM subscribers from quarter to quarter may be determined by several factors: the churn rate of previous quarter’s subscribers, the number of promotional subscribers in the previous quarter, and the conversion rate of previous quarter’s promotional subscribers.⁴⁹ The number of promotional subscribers is not expected to be affected by the price, and therefore to calculate price elasticity it is necessary to evaluate how price affects the churn and conversion rates.

In the case of churn, I find that it has not changed throughout the period, despite price changes that occurred: it was 1.9% on average both before and after the largest price change that occurred in Q1 2012.⁵⁰

Therefore, price elasticity manifests itself through price’s effect on the conversion rate: when price increases, it is expected to reduce the conversion rate, and this will reduce the number of SXM subscribers over time. Evaluating the reduction in subscribers as a result of an assumed price increase allows me to estimate SXM’s own price elasticity. This estimate involves several steps, described below.

First, I estimate the relationship between conversion rates and price by running a regression of conversion rate against the log of price. I find a statistically significant effect of price on conversion regardless of whether the conversion rate is measured in percentage points (a coefficient of -0.369) or in percentages, using a log transformation (a coefficient of -0.841). These estimates allow me to predict the “but-for” conversion rate if the price of SXM were to increase by a certain percentage, say 1%.

⁴⁹ In addition, it is possible that there are new subscribers who joined that are not “converted” promotional subscribers. I do not have data on the number of these subscribers, but I understand that it is relatively small.

⁵⁰ This is confirmed by running a regression of churn rate against price: the coefficient on price is not statistically significant.

Second, I calculate the projected future number of subscribers without a price increase. This requires predicting future values for the quarterly numbers of promotional contract expirations, churn and conversion rates. To predict future quarterly numbers of promotional contract expirations, I calculate the historical path of contract expirations, and project this path into the future using a regression of expirations against time trend. For churn and conversion rates, I assume the future values are equal to the average values in the last year for which data is available. After obtaining these estimates, I am able to simulate the projected future number of subscribers without a price increase.

Third, I project the “but-for” future number of subscribers assuming a price increase. I do so by performing the same calculation as in the above step, but instead of assuming that the conversion rate in the last year will remain the same in the future, I use the “but-for” conversion rate from the first step (*i.e.*, assuming a 1% price increase).

Finally, having calculated the projected number of SXM subscribers with and without a price increase, I can compare the two at each point in time. By definition, own price elasticity is then the absolute value of the ratio between (i) the percentage difference between actual and but-for subscribers, and (ii) the assumed percentage “but-for” price increase (of 1%).⁵¹

Since the effect of price on the conversion rate has a cumulative effect, the gap between the actual and “but-for” subscriber paths, and therefore own-price elasticity, increases over time. However, after several years the effect plateaus.

Results

The table below shows the (arithmetic rather than the absolute value) own-price elasticity when evaluated in Q4 in different years, for the percentage point and percentage models:

Q4 of year:	% points model	% model
2017	-0.33	-0.29
2018	-0.48	-0.43
2019	-0.59	-0.53
2020	-0.68	-0.60
2021	-0.74	-0.66
2022	-0.79	-0.70
2023	-0.83	-0.74
2024	-0.85	-0.76
2025	-0.87	-0.78
2026	-0.89	-0.79

⁵¹ The assumed price increase does not have a material effect on the measured elasticity.

Data Used

- Quarterly data from Q3 2007 to Q2 2016
- Main variables:
 - Price: One significant price change in Q1 2012 (from \$12.95 to \$14.49) and one minor one in Q1 2014 (from \$14.49 to \$14.99)
 - Total subscribers, broken down by promotion and paid
 - Monthly churn rate: not much change over time
 - Conversion ratio of promotional subscribers into paid subscribers
- Sources: see Appendix A

Detailed Methodology***First Step***

- *Estimate relationship between conversion rate and price*

Option 1: Conversion rate measured in % points (linear-log model): coefficient is -0.369 and statistically significant

Source	SS	df	MS	Number of obs	=	36
Model	.021772464	1	.021772464	F(1, 34)	=	45.89
Residual	.016131842	34	.000474466	Prob > F	=	0.0000
				R-squared	=	0.5744
				Adj R-squared	=	0.5619
Total	.037904306	35	.00108298	Root MSE	=	.02178

conversion	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
l_price	-.3688185	.0544454	-6.77	0.000	-.4794649	-.2581721
_cons	1.412137	.1430579	9.87	0.000	1.121408	1.702866

Option 2: Conversion rate measured in % (log-log model): coefficient is -0.841 and statistically significant.

Source	SS	df	MS	Number of obs	=	36
				F(1, 34)	=	47.46
Model	.113285599	1	.113285599	Prob > F	=	0.0000
Residual	.081161474	34	.002387102	R-squared	=	0.5826
				Adj R-squared	=	0.5703
Total	.194447072	35	.005555631	Root MSE	=	.04886

l_conv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
l_price	-.841291	.1221221	-6.89	0.000	-1.089473	-.5931089
_cons	1.393758	.3208816	4.34	0.000	.741648	2.045868

- *Estimate relationship between churn rate and price*

Option 1: Churn rate measured in % points (linear-log model): coefficient is statistically insignificant

Source	SS	df	MS	Number of obs	=	36
				F(1, 34)	=	1.27
Model	4.5444e-06	1	4.5444e-06	Prob > F	=	0.2678
Residual	.000121761	34	3.5812e-06	R-squared	=	0.0360
				Adj R-squared	=	0.0076
Total	.000126306	35	3.6087e-06	Root MSE	=	.00189

churn	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
l_price	-.0053284	.0047301	-1.13	0.268	-.0149412	.0042844
_cons	.0328573	.0124287	2.64	0.012	.0075992	.0581153

Option 2: Churn rate measured in % (log-log model): coefficient is statistically insignificant

Source	SS	df	MS	Number of obs	=	36
Model	.009583296	1	.009583296	F(1, 34)	=	1.10
Residual	.29575047	34	.008698543	Prob > F	=	0.3013
				R-squared	=	0.0314
				Adj R-squared	=	0.0029
Total	.305333765	35	.008723822	Root MSE	=	.09327

l_churn	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
l_price	-.2446901	.2331214	-1.05	0.301	-.7184497	.2290696
_cons	-3.332367	.6125374	-5.44	0.000	-4.577193	-2.087541

Second Step

Project future subscribers w/o price increase by following these steps

- *Project future expirations as follows:*
 - Back out historical quarterly expirations as: $((\text{paid subs}) - (\text{last quarter paid subs}) * (1 - 3 * \text{monthly churn rate})) / (\text{conversion ratio})$
 - Run a regression of expirations on time:

Source	SS	df	MS	Number of obs	=	34
Model	16722563.2	1	16722563.2	F(1, 32)	=	141.71
Residual	3776224.75	32	118007.024	Prob > F	=	0.0000
				R-squared	=	0.8158
				Adj R-squared	=	0.8100
Total	20498787.9	33	621175.391	Root MSE	=	343.52

exp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
time	71.48445	6.005015	11.90	0.000	59.25264	83.71627
_cons	1801.913	131.0828	13.75	0.000	1534.906	2068.919

- Use regression coefficients to predict promotional contract expirations in future quarters
- *Calculate average churn and conversion rates in last year of data*
- *Project future path of subscribers (subs) in each period iteratively as:*

$(\text{Paid subs in quarter } t) = (\text{Paid subs in quarter } t-1) * (1 - 3 * \text{average monthly churn rate in last year}) + (\text{average conversion rate in last year}) * (\text{predicted expirations})$

Third Step

- Project but-for future subs w/ 1% price increase:

Option 1: Churn rate measured in % points:

$(\text{But-for paid subs in quarter } t) = (\text{But-for paid subs in quarter } t-1) * (1 - 3 * \text{average monthly churn rate in last year}) + ((\text{average conversion rate in last year}) - 0.369 * \text{Log}(1.01)) * (\text{predicted expirations})$

Option 2: Churn rate measured in %:

$(\text{But-for paid subs in quarter } t) = (\text{But-for paid subs in quarter } t-1) * (1 - 3 * \text{average monthly churn rate in last year}) + (\text{average conversion rate in last year}) * \text{Exp}(-0.841 * \text{Log}(1.01)) * (\text{predicted expirations})$

Fourth Step

Calculate future difference in % between projected future subscribers and but-for subs:

$(\text{but-for subs} - \text{predicted subs}) / \text{predicted subs} * 100$

Appendix E - Econometric Methodology for Calculating Substitution Between Streaming and Downloads

I use for this analysis the data described in Appendix A, for the January 2004 to June 2016 time period.

I run an OLS regression of downloaded album equivalents (*downloads_alb*) on:

- *all_plays_l1*: All streaming options combined based on plays (lagged one month). This includes: paid and promotional Sirius XM, interactive streaming, webcasting (non-interactive), video, subscription services and ad supported services
- *time*: a time trend to account for download's but-for trend
- *gdp*: GDP

The results are presented below. The coefficient on “all plays_l1” represents the change in album downloads when the number of streamed plays increases by one. Results are statistically significant for all runs.

Baseline run

Source	SS	df	MS	Number of obs	=	149
Model	4658.56634	3	1552.85545	F(3, 145)	=	164.33
Residual	1370.18774	145	9.44957065	Prob > F	=	0.0000
				R-squared	=	0.7727
				Adj R-squared	=	0.7680
Total	6028.75408	148	40.7348249	Root MSE	=	3.074

downloads_~b	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
all_plays_l1	-.0005738	.0000594	-9.66	0.000	-.0006912	-.0004565
time	.3683771	.0316134	11.65	0.000	.3058945	.4308597
gdp	.0004054	.0009091	0.45	0.656	-.0013914	.0022021
_cons	-4.139661	11.46839	-0.36	0.719	-26.80646	18.52714

Robustness test: Dropping GDP

Source	SS	df	MS	Number of obs	=	149
Model	4656.68755	2	2328.34378	F(2, 146)	=	247.76
Residual	1372.06653	146	9.39771597	Prob > F	=	0.0000
				R-squared	=	0.7724
				Adj R-squared	=	0.7693
Total	6028.75408	148	40.7348249	Root MSE	=	3.0656

downloads_~b	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
all_plays_l1	-.0005593	.0000495	-11.29	0.000	-.0006572	-.0004615
time	.3774044	.0242137	15.59	0.000	.3295497	.4252591
_cons	.9657162	.6521446	1.48	0.141	-.3231469	2.254579

Robustness test: Replacing GDP by Personal Disposable Income

Source	SS	df	MS	Number of obs	=	149
Model	4677.7754	3	1559.25847	F(3, 145)	=	167.35
Residual	1350.97868	145	9.31709435	Prob > F	=	0.0000
				R-squared	=	0.7759
				Adj R-squared	=	0.7713
Total	6028.75408	148	40.7348249	Root MSE	=	3.0524

downloads_~b	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
all_plays_l1	-.0005771	.0000507	-11.38	0.000	-.0006773	-.0004769
time	.3183585	.0460614	6.91	0.000	.22732	.409397
pdi	.0020692	.0013754	1.50	0.135	-.0006492	.0047877
_cons	-17.62921	12.37704	-1.42	0.156	-42.09194	6.833522

Robustness test: Replacing lagged streaming by contemporaneous streaming

Source	SS	df	MS	Number of obs	=	150
				F(3, 146)	=	155.45
Model	4716.65017	3	1572.21672	Prob > F	=	0.0000
Residual	1476.63142	146	10.1139138	R-squared	=	0.7616
				Adj R-squared	=	0.7567
Total	6193.28159	149	41.5656482	Root MSE	=	3.1802

downloads_~b	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
all_plays	-.0005384	.0000601	-8.96	0.000	-.0006572	-.0004196
time	.3640973	.0327337	11.12	0.000	.2994042	.4287905
gdp	.0001497	.0009271	0.16	0.872	-.0016825	.001982
_cons	-.6335402	11.6659	-0.05	0.957	-23.68939	22.42231

Appendix F - Econometric Methodology for Calculating Substitution Between SXM and Streaming

I use for this analysis the quarterly data described in Appendix A, for the Q1 2004 to Q2 2016 time period. (This analysis is run on quarterly data because SXM subscriber data are only available by quarter.)

I run a 2SLS regression of paid interactive and non-interactive streaming plays (*streaming_paid_plays*) on:

- *sxm_paid_plays*: SXM paid plays. Because this variable may be jointly determined with *streaming_paid_plays*, it needs to be instrumented for. I use as instruments:
 - o *Psxm_l1*: SXM price, lagged one period.
 - o *sxm_promo_plays_6months_l1*: Number of plays by SXM promotional subscribers in the two earlier quarters. (Note that the result are identical if I use the number of promotional *subscribers* instead of promotional number of *plays*).
- *time*: a time trend to account for download's but-for trend
- *gdp*: GDP

The results of the first stage (“auxiliary”) regression are presented below. All instrumental variables are significant and get the expected sign.

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

<i>sxm_paid_plays</i>	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
<i>time</i>	350.124	63.92865	5.48	0.000	221.1996	479.0484
<i>gdp</i>	1.340656	.6321482	2.12	0.040	.0658074	2.615504
<i>Psxm_l1</i>	-1611.354	477.9852	-3.37	0.002	-2575.303	-647.4053
<i>sxm_promo_plays_6months_l1</i>	.9804164	.107978	9.08	0.000	.7626581	1.198175
<i>_cons</i>	8512.646	6402.14	1.33	0.191	-4398.5	21423.79

The results of the main (“second stage”) regressions are presented below. The coefficient on “sxm_paid_plays” represents the change in streaming plays (excluding SXM) when SXM paid plays increases by one. Results are statistically significant for all runs.

Baseline regression

Source	SS	df	MS	Number of obs	=	48
Model	4.9036e+09	3	1.6345e+09	F(3, 44)	=	109.89
Residual	653902492	44	14861420.3	Prob > F	=	0.0000
				R-squared	=	0.8823
				Adj R-squared	=	0.8743
Total	5.5575e+09	47	118245264	Root MSE	=	3855.1

streaming_pa~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sxm_paid_plays	-1.258636	.2558425	-4.92	0.000	-1.774253	-.7430196
time	416.1768	258.3779	1.61	0.114	-104.5496	936.9032
gdp	10.25095	1.715973	5.97	0.000	6.79263	13.70926
_cons	-124671	20962.18	-5.95	0.000	-166917.5	-82424.47

Instrumented: sxm_paid_plays
Instruments: time gdp Psxm_l1 sxm_promo_plays_6months_l1

Robustness test: Dropping GDP

Source	SS	df	MS	Number of obs	=	48
Model	4.3672e+09	2	2.1836e+09	F(2, 45)	=	84.29
Residual	1.1903e+09	45	26451294.8	Prob > F	=	0.0000
				R-squared	=	0.7858
				Adj R-squared	=	0.7763
Total	5.5575e+09	47	118245264	Root MSE	=	5143.1

streaming_pa~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sxm_paid_plays	-1.225387	.3420954	-3.58	0.001	-1.914403	-.5363718
time	1582.721	260.7279	6.07	0.000	1057.588	2107.854
_cons	1286.284	3311.017	0.39	0.699	-5382.447	7955.016

Instrumented: sxm_paid_plays
Instruments: time Psxm_l1 sxm_promo_plays_6months_l1

Robustness test: Replacing GDP by Personal Disposable Income

Source	SS	df	MS	Number of obs	=	48
				F(3, 44)	=	70.78
Model	4.5853e+09	3	1.5284e+09	Prob > F	=	0.0000
Residual	972235942	44	22096271.4	R-squared	=	0.8251
				Adj R-squared	=	0.8131
Total	5.5575e+09	47	118245264	Root MSE	=	4700.7

streaming_pa~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sxm_paid_plays	-1.666744	.3447517	-4.83	0.000	-2.361545	-.9719425
time	515.4137	368.7737	1.40	0.169	-227.8009	1258.628
pdi	14.38038	4.067002	3.54	0.001	6.183879	22.57689
_cons	-123068.1	35083.39	-3.51	0.001	-193774	-52362.16

Instrumented: sxm_paid_plays

Instruments: 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(3, 45)	=	111.18
Model	4.9609e+09	3	1.6536e+09	Prob > F	=	0.0000
Residual	667016585	45	14822590.8	R-squared	=	0.8815
				Adj R-squared	=	0.8736
Total	5.6279e+09	48	117247261	Root MSE	=	3850

streaming_pa~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sxm_paid_plays	-1.325071	.2413127	-5.49	0.000	-1.8111	-.8390423
time	472.6272	247.1091	1.91	0.062	-25.07608	970.3304
gdp	10.13268	1.708214	5.93	0.000	6.692158	13.5732
_cons	-122416.8	20729.7	-5.91	0.000	-164168.5	-80664.99

Instrumented: sxm_paid_plays

Instruments: time gdp Psxm sxm_promo_plays_6months

Robustness test: Replacing 6 month promo plays instrument by 3 months promo plays

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs	=	49
Model	4.9593e+09	3	1.6531e+09	F(3, 45)	=	111.12
Residual	668579037	45	14857311.9	Prob > F	=	0.0000
				R-squared	=	0.8812
				Adj R-squared	=	0.8733
Total	5.6279e+09	48	117247261	Root MSE	=	3854.5

streaming_pa~s	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sxm_paid_plays	-1.344814	.2427869	-5.54	0.000	-1.833812	-.8558159
time	484.4941	247.8195	1.96	0.057	-14.63994	983.6282
gdp	10.15984	1.710533	5.94	0.000	6.714648	13.60503
_cons	-122594.2	20755.09	-5.91	0.000	-164397.1	-80791.32

Instrumented: sxm_paid_plays

Instruments: time gdp Psxm_l1 sxm_promo_plays_l1

Attachment 1 - Curriculum Vitae of Robert D. Willig

October, 2016

Curriculum Vitae

Name: **Robert D. Willig**

Address: 220 Ridgeview Road, Princeton, New Jersey 08540

Birth: 1/16/47; Brooklyn, New York

Marital Status: Married, four children

Education: Ph.D. Economics, Stanford University, 1973
Dissertation: Welfare Analysis of Policies
Affecting Prices and Products.
Advisor: James Rosse

M.S. Operations Research, Stanford University, 1968.

A.B. Mathematics, Harvard University, 1967.

Professional Positions:

Professor of Economics and Public Affairs, Emeritus, Princeton University, 7/2016 –

Professor of Economics and Public Affairs, Princeton University, 7/1978 - 6/2016.

Principal External Advisor, Infrastructure Program, Inter-American Development Bank, 6/97-8/98.

Deputy Assistant Attorney General, U.S. Department of Justice, 1989-1991.

Supervisor, Economics Research Department, Bell Laboratories, 1977-1978.

Visiting Lecturer (with rank of Associate Professor), Department of Economics and Woodrow Wilson School, Princeton University, 1977-78 (part time).

Economics Research Department, Bell Laboratories, 1973-77.

Lecturer, Economics Department, Stanford University, 1971-73.

Other Professional Activities

ABA Section of Antitrust Law Economics Task Force, 2010-2012

Advisory Committee, Compass Lexecon 2010 -

OECD Advisory Council for Mexican Economic Reform, 2008 - 2009

Senior Consultant, Compass Lexecon, 2008 -

Director, Competition Policy Associates, Inc., 2003-2005

Advisory Bd., Electronic Journal of I.O. and Regulation Abstracts, 1996-2008.

Advisory Board, Journal of Network Industries, 2004-2010.

Visiting Faculty Member (occasional), International Program on Privatization and Regulatory Reform, Harvard Institute for International Development, 1996-2000.

Member, National Research Council Highway Cost Allocation Study Review Committee, 1995-98.

Member, Defense Science Board Task Force on the Antitrust Aspects of Defense Industry Consolidation, 1993-94.

Editorial Board, Utilities Policy, 1990-2001.

Leif Johanson Lecturer, University of Oslo, November 1988.

Member, New Jersey Governor's Task Force on Market-Based Pricing of Electricity, 1987-89.

Co-editor, Handbook of Industrial Organization, 1984-89.

Associate Editor, Journal of Industrial Economics, 1984-89.

Director, Consultants in Industry Economics, Inc., 1983-89, 1991-94.

Fellow, Econometric Society, 1981-.

Organizing Committee, Carnegie-Mellon-N.S.F. Conference on Regulation, 1985.

Board of Editors, American Economic Review, 1980-83.

Nominating Committee, American Economic Association, 1980-1981.

Research Advisory Committee, American Enterprise Institute, 1980-1986.

Editorial Board, M.I.T. Press Series on Government Regulation of Economic Activity, 1979-93.

Program Committee, 1980 World Congress of the Econometric Society.

Program Committee, Econometric Society, 1979, 1981, 1985.

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 1981.

Principal Investigator, NSF grant SOC79-0327, 1979-80; NSF grant 285-6041, 1980-82; NSF grant SES-8038866, 1983-84, 1985-86.

Aspen Task Force on the Future of the Postal Service, 1978-80.

Organizing Committee of Sixth Annual Telecommunications Policy Research Conference, 1977-78.

Visiting Fellow, University of Warwick, July 1977.

Institute for Mathematical Studies in the Social Sciences, Stanford University, 1975.

Published Articles and Book Chapters:

"Unilateral Competitive Effects" (with Bryan Keating), in The Oxford Handbook on International Antitrust Economics, (Roger D. Blair and D. Daniel Sokol, eds.), Oxford University Press, 2014.

"Activating Actavis: A More Complete Story" (with Barry C. Harris, Kevin M. Murphy, and Matthew B. Wright), Antitrust, vol. 28, No. 2 (Spring), 2014.

"Reverse Payments' in Settlements of Patent Litigation: Split Opinions on Schering-Plough's K-Dur (2005 and 2012)" (with John P. Bigelow), in The Antitrust Revolution (Sixth Edition), (J. Kwoka and Laurence White, eds.), Oxford University Press, 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)" (with Mark Israel, Bryan Keating and Daniel Rubinfeld), in The Antitrust Revolution (Sixth Edition), (J. Kwoka and Laurence White, eds.), Oxford University Press, 2013.

"Airline Network Effects and Consumer Welfare" (with Bryan Keating, Mark Israel and Daniel Rubinfeld), Review of Network Economics, published online November 2013.

"The Liftoff of Consumer Benefits from the Broadband Revolution" (with Mark Dutz and Jon Orszag), Review of Network Economics (2012) vol. 11, issue 4, article 2.

"Competition and innovation-driven inclusive growth" (with Mark Dutz, Ioannis Kessides and Stephen O'Connell), in Promoting Inclusive Growth: Challenges and Policies, Luiz de Mello and Mark Dutz (eds.), OECD, 2011.

"Unilateral Competitive Effects of Mergers: Upward Pricing Pressure, Product Quality, and Other Extensions," Review of Industrial Organization (2011) 39:19–38.

"Antitrust and Patent Settlements: The Pharmaceutical Cases," (with John Bigelow) in The Antitrust Revolution (Fifth Edition), John Kwoka and Lawrence White (eds.), 2009.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," (with J. Ordovery) reprinted in Economics of Antitrust Law, Benjamin Klein (ed.), Edward Elgar, 2008.

"On the Antitrust Treatment of Production Joint Ventures," (with Carl Shapiro) reprinted in Economics of Antitrust Law, Benjamin Klein (ed.), Edward Elgar, 2008.

"Consumer's Surplus Without Apology," reprinted in Applied Welfare Economics, Richard Just, Darrel Hueth and Andrew Schmitz (eds.), Edward Elgar, 2008; reprinted in Readings in Social Welfare: Theory and Policy, Robert E. Kuenne (ed.), Blackwell, 2000, pp. 86-97; reprinted in Readings in Microeconomic Theory, M. M. La Manna (ed.), Dryden Press, 1997, pp. 201-212.

"The Risk of Contagion from Multi-Market Contact," (with Charles Thomas), The International Journal of Industrial Organization, Vol. 24, Issue 6 (Nov. 2006), pp 1157 – 1184.

"Pareto-Superior Nonlinear Outlay Schedules," reprinted in The Economics of Public Utilities, Ray Rees (ed.), Edward Elgar, 2006; reprinted in The Economics of Price Discrimination, G. Norman, (ed.), Edward Elgar, 1999.

"Economic Effects of Antidumping Policy," reprinted in The WTO and Anti-Dumping, Douglas Nelson (ed.), Edward Elgar, 2005.

"Merger Analysis, Industrial Organization Theory and the Merger Guidelines," reprinted in Antitrust and Competition Policy, Andrew Kleit (ed.) Edward Elgar, 2005

"Antitrust Policy Towards Agreements That Settle Patent Litigation," (with John Bigelow), Antitrust Bulletin, Fall 2004, pp. 655-698.

"Economies of Scope," (with John Panzar), reprinted in The Economics of Business Strategy, John Kay (ed.), Edward Elgar, 2003.

"Panel on Substantive Standards for Mergers and the Role of Efficiencies," in International

Antitrust Law & Policy, Barry E. Hawk (ed.), Juris Publishing, 2003.

“Practical Rules for Pricing Access in Telecommunications,” (with J. Ordovery) in Second Generation Reforms in Infrastructure Services, F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

“Comments on Antitrust Policy in the Clinton Administration,” in American Economic Policy in the 1990s, J. Frankel and P. Orszag (eds.), MIT Press, 2002.

“Entrepreneurship, Access Policy and Economic Development: Lessons from Industrial Organization,” (with M. Dutz and J. Ordovery), European Economic Review, (44)4-6 (2000), pp. 739-747.

"Public Versus Regulated Private Enterprise," reprinted in Privatization in Developing Countries, P. Cook and C. Kirkpatrick (eds.), Edward Elgar, 2000.

“Deregulation v. the Legal Culture: Panel Discussion,” in Is the Telecommunications Act of 1996 Broken?, G. Sidak (ed.), AEI Press, 1999.

“Economic Principles to Guide Post-Privatization Governance,” in Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

“Access and Bundling in High-Technology Markets,” (with J. A. Ordovery), in Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace, J. A. Eisenach and T. Lenard (eds.), Kluwer, 1999.

“Competitive Rail Regulation Rules: Should Price Ceilings Constrain Final Products or Inputs?,” (With W. J. Baumol), Journal of Transport Economics and Policy, Vol. 33, Part 1, pp. 1-11.

“Economic Effects of Antidumping Policy,” Brookings Trade Forum: 1998, 19-41.

“Interview With Economist Robert D. Willig,” Antitrust, Vol. 11, No. 2, Spring 1997, pp.11-15.

“Parity Pricing and its Critics: A Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors,” (with W. J. Baumol and J. A. Ordovery), Yale Journal on Regulation, Vol. 14, No. 1, Winter 1997, pp. 145-164.

“Restructuring Regulation of the Rail Industry,” (with Ioannis Kessides), in Private Sector, Quarterly No. 4, September 1995, pp. 5 - 8. Reprinted in Viewpoint, October, 1995, The World Bank. Reprinted in Private Sector, special edition: Infrastructure, June 1996.

“Competition and Regulation in the Railroad Industry,” (with Ioannis Kessides), in Regulatory Policies and Reform: A Comparative Perspective, C. Frischtak (ed.), World Bank, 1996.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), reprinted in The

Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 95-130.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), reprinted in The Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 245-260.

"Economists' View: The Department of Justice Draft Guidelines for the Licensing and Acquisition of Intellectual Property," (with J. Ordover), Antitrust, V. 9, No. 2 (spring 1995), 29-36.

"Public Versus Regulated Private Enterprise," in Proceedings of the World Bank Annual Conference on Development Economics 1993, L. Summers (ed.), The World Bank, 1994.

"Economics and the 1992 Merger Guidelines: A Brief Survey," (with J. Ordover), Review of Industrial Organization, V. 8, No. 2, (1993), pp. 139-150.

"The Role of Sunk Costs in the 1992 Guidelines' Entry Analysis," Antitrust, V. 6, No. 3 (summer 1992).

"Antitrust Lessons from the Airlines Industry: The DOJ Experience," Antitrust Law Journal, V. 60, No. 2 (1992).

"William J. Baumol," (with E. E. Bailey), in New Horizons in Economic Thought: Appraisals of Leading Economists, W. J. Samuels (ed.), Edward Elgar, 1992.

"Anti-Monopoly Policies and Institutions," in The Emergence of Market Economies in Eastern Europe, Christopher Clague and Gordon Rausser (eds.), Basil Blackwell, 1992.

"Economics and the 1992 Merger Guidelines," (with Janusz Ordover), in Collaborations Among Competitors: Antitrust Policy and Economics, Eleanor Fox and James Halverson (eds.), American Bar Association, 1992.

"On the Antitrust Treatment of Production Joint Ventures," (with Carl Shapiro), reprinted in Collaborations Among Competitors: Antitrust Policy and Economics, Eleanor Fox and James Halverson (eds.), American Bar Association, 1992.

"Merger Analysis, Industrial Organization Theory, and Merger Guidelines," Brookings Papers on Economic Activity -- Microeconomics 1991, pp. 281-332.

"On the Antitrust Treatment of Production Joint Ventures," (with C. Shapiro), Journal of Economic Perspectives, Vol. 4, No. 3, Summer 1990, pp. 113-130.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), in The Political Economy of Public Sector Reform and Privatization, E.N. Suleiman and J. Waterbury (eds.), Westview Press, Inc., 1990, pp. 55-87.

"Contestable Market Theory and Regulatory Reform," in Telecommunications Deregulation: Market Power and Cost Allocation, J.R. Allison and D.L. Thomas (eds.), Ballinger, 1990.

"Address To The Section," Antitrust Law Section Symposium, New York State Bar Association, 1990.

"Price Caps: A Rational Means to Protect Telecommunications Consumers and Competition," (with W. Baumol), Review of Business, Vol. 10, No. 4, Spring 1989, pp. 3-8.

"U.S.-Japanese VER: A Case Study from a Competition Policy Perspective," (with M. Dutz) in The Costs of Restricting Imports, The Automobile Industry. OECD, 1988.

"Contestable Markets," in The New Palgrave: A Dictionary of Economics, J. Eatwell, M. Milgate, and P. Newman (eds.), 1987.

"Do Entry Conditions Vary Across Markets: Comments," Brookings Papers on Economic Activity, 3 - 1987, pp. 872-877.

"Railroad Deregulation: Using Competition as a Guide," (with W. Baumol), Regulation, January/February 1987, Vol. 11, No. 1, pp. 28-36.

"How Arbitrary is 'Arbitrary'? - or, Toward the Deserved Demise of Full Cost Allocation," (with W. Baumol and M. Koehn), Public Utilities Fortnightly, September 1987, Vol. 120, No. 5, pp. 16-22.

"Contestability: Developments Since the Book," (with W. Baumol), Oxford Economic Papers, December 1986, pp. 9-36.

"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation," in Proceedings from the Telecommunications Deregulation Forum; Karl Eller Center; 1986.

"Perspectives on Mergers and World Competition," (with J. Ordover), in Antitrust and Regulation, R.E. Grieson (ed.), Lexington, 1986.

"On the Theory of Perfectly Contestable Markets," (with J. Panzar and W. Baumol), in New Developments in The Analysis of Market Structure, J. Stiglitz and F. Mathewson (eds.), MIT Press, 1986.

"InterLATA Capacity Growth and Market Competition," (with C. Shapiro), in Telecommunications and Equity: Policy Research Issues, J. Miller (ed.), North Holland, 1986.

"Corporate Governance and Market Structure," in Economic Policy in Theory and Practice, A. Razin and E. Sadka (eds.), Macmillan Press, 1986.

"Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers," (with J. Ordover), Journal of Law and Economics, Vol 28(2), May 1985, pp. 311-334.

"Non-Price Anticompetitive Behavior by Dominant Firms Toward the Producers of Complementary Products," (with J. Ordover and A. Sykes), in Antitrust and Regulation, F.M. Fisher (ed.), MIT Press, 1985.

"Telephones and Computers: The Costs of Artificial Separation," (with W. Baumol), Regulation, March/April 1985.

"Transfer Principles in Income Redistribution," (with P. Fishburn), Journal of Public Economics, 25 (1984), pp. 1-6.

"Market Structure and Government Intervention in Access Markets," in Telecommunications Access and Public Policy, A. Baughcam and G. Faulhaber (eds.), 1984.

"Pricing Issues in the Deregulation of Railroad Rates," (with W. Baumol), in Economic Analysis of Regulated Markets: European and U. S. Perspectives, J. Finsinger (ed.), 1983.

"Local Telephone Pricing in a Competitive Environment," (with J. Ordover), in Telecommunications Regulation Today and Tomorrow, E. Noam (ed.), Harcourt Brace Jovanovich, 1983.

"Economics and Postal Pricing Policy," (with B. Owen), in The Future of the Postal Service, J. Fleishman (ed.), Praeger, 1983.

"Selected Aspects of the Welfare Economics of Postal Pricing," in Telecommunications Policy Annual, Praeger, 1987.

"The Case for Freeing AT&T" (with M. Katz), Regulation, July-Aug. 1983, pp. 43-52.

"Predatory Systems Rivalry: A Reply" (with J. Ordover and A. Sykes), Columbia Law Review, Vol. 83, June 1983, pp. 1150-1166. Reprinted in Corporate Counsel's Handbook - 1984.

"Sector Differentiated Capital Taxation with Imperfect Competition and Interindustry Flows," Journal of Public Economics, Vol. 21, 1983.

"Contestable Markets: An Uprising in the Theory of Industry Structure: Reply," (with W.J. Baumol and J.C. Panzar), American Economic Review, Vol. 73, No. 3, June 1983, pp. 491-496.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," (with J. Ordover), California Law Review, Vol. 71, No. 2, March 1983, pp. 535-574. Reprinted in

Antitrust Policy in Transition: The Convergence of Law and Economics, E.M. Fox and J.T. Halverson (eds.), 1984.

"Intertemporal Failures of the Invisible Hand: Theory and Implications for International Market Dominance," (with W.J. Baumol), Indian Economic Review, Vol. XVI, Nos. 1 and 2, January-June 1981, pp. 1-12.

"Unfair International Trade Practices," (with J. Ordover and A. Sykes), Journal of International Law and Politics, Vol. 15, No. 2, winter 1983, pp. 323-337.

"Journals as Shared Goods: Reply," (with J. Ordover), American Economic Review, V. 72, No. 3, June 1982, pp. 603-607.

"Herfindahl Concentration, Rivalry, and Mergers," (with J. Ordover and A. Sykes), Harvard Law Review, V. 95, No. 8, June 1982, pp. 1857-1875.

"An Economic Definition of Predation: Pricing and Product Innovation," (with J. Ordover), Yale Law Journal, Vol. 90: 473, December 1981, pp. 1-44.

"Fixed Costs, Sunk Costs, Entry Barriers, and the Sustainability of Monopoly," (with W. Baumol), Quarterly Journal of Economics, Vol. 96, No. 3, August 1981, pp. 405-432.

"Social Welfare Dominance," American Economic Review, Vol. 71, No. 2, May 1981, pp. 200-204.

"Economies of Scope," (with J. Panzar), American Economic Review, Vol. 72, No. 2, May 1981, pp. 268-272.

"Income-Distribution Concerns in Regulatory Policymaking," (with E.E. Bailey) in Studies in Public Regulation (G. Fromm, ed.), MIT Press, Cambridge, 1981, pp. 79-118.

"An Economic Definition of Predatory Product Innovation," (with J. Ordover), in Strategic Predation and Antitrust Analysis, S. Salop (ed.), 1981.

"What Can Markets Control?" in Perspectives on Postal Service Issues, R. Sherman (ed.), American Enterprise Institute, 1980.

"Pricing Decisions and the Regulatory Process," in Proceedings of the 1979 Rate Symposium on Problems of Regulated Industries, University of Missouri-Columbia Extension Publications, 1980, pp. 379-388.

"The Theory of Network Access Pricing," in Issues in Public Utility Regulation, H.M. Trebing (ed.), MSU Public Utilities Papers, 1979.

"Customer Equity and Local Measured Service," in Perspectives on Local Measured Service, J. Baude, et al. (ed.), 1979, pp. 71-80.

"The Role of Information in Designing Social Policy Towards Externalities," (with J. Ordover), Journal of Public Economics, V. 12, 1979, pp. 271-299.

"Economies of Scale and the Profitability of Marginal-Cost Pricing: Reply," (with J. Panzar), Quarterly Journal of Economics, Vol. 93, No. 4, November 1979, pp. 743-4.

"Theoretical Determinants of the Industrial Demand for Electricity by Time of Day," (with J. Panzar) Journal of Econometrics, V. 9, 1979, pp. 193-207.

"Industry Performance Gradient Indexes," (with R. Dansby), American Economic Review, V. 69, No. 3, June 1979, pp. 249-260.

"The Economic Gradient Method," (with E. Bailey), American Economic Review, Vol. 69, No. 2, May 1979, pp. 96-101.

"Multiproduct Technology and Market Structure," American Economic Review, Vol. 69, No. 2, May 1979, pp. 346-351.

"Consumer's Surplus Without Apology: Reply," American Economic Review, Vol. 69, No. 3, June 1979, pp. 469-474.

"Decisions with Estimation Uncertainty," (with R. Klein, D. Sibley, and L. Rafsky), Econometrica, V. 46, No. 6, November 1978, pp. 1363-1388.

"Incremental Consumer's Surplus and Hedonic Price Adjustment," Journal of Economic Theory, V. 17, No. 2, April 1978, pp. 227-253.

"Recent Theoretical Developments in Financial Theory: Discussion," The Journal of Finance, V. 33, No. 3, June 1978, pp. 792-794.

"The Optimal Provision of Journals Qua Sometimes Shared Goods," (with J. Ordover), American Economic Review, V. 68, No. 3, June 1978, pp. 324-338.

"On the Comparative Statics of a Competitive Industry With Infra-marginal Firms," (with J. Panzar), American Economic Review, V. 68, No. 3, June 1978, pp. 474-478.

"Pareto Superior Nonlinear Outlay Schedules," Bell Journal of Economics, Vol. 9, No. 1, Spring 1978, pp. 56-69.

"Predatoriness and Discriminatory Pricing," in The Economics of Anti-Trust: Course of Study Materials, American Law Institute-American Bar Association, 1978.

"Economies of Scale in Multi-Output Production," (with J. Panzar), Quarterly Journal of Economics, V. 91, No. 3, August 1977, pp. 481-494.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), American Economic Review, V. 67, No. 3, June 1977, pp. 350-365.

"Free Entry and the Sustainability of Natural Monopoly," (with J. Panzar), Bell Journal of Economics, Spring 1977, pp. 1-22.

"Risk Invariance and Ordinally Additive Utility Functions," Econometrica, V. 45, No. 3, April 1977, pp. 621-640.

"Ramsey-Optimal Pricing of Long Distance Telephone Services," (with E. Bailey), in Pricing in Regulated Industries, Theory and Application, J. Wenders (ed.), Mountain State Telephone and Telegraph Co., 1977, pp. 68-97.

"Network Externalities and Optimal Telecommunications Pricing: A Preliminary Sketch," (with R. Klein), in Proceedings of Fifth Annual Telecommunications Policy Research Conference, Volume II, NTIS, 1977, pp. 475-505.

"Otsenka ekonomicheskoi effektivnosti proizvodstvennoi informatsii" ["The Evaluation of the Economic Benefits of Productive Information"] in Doklady Sovetskikh i Amerikanskikh Spetsialistov Predstavlennye na Pervyi Sovetsko-Amerikanskii Simpozium po Ekonomicheskoi Effektivnosti Informat sionnogo Obsluzhivaniia [Papers of Soviet and American Specialists Presented at the First Soviet- American Symposium on Costs and Benefits of Information Services], All Soviet Scientific Technical Information Center, Moscow, 1976.

"Vindication of a 'Common Mistake' in Welfare Economics," (with J. Panzar), Journal of Political Economy, V. 84, No. 6, December 1976, pp. 1361-1364.

"Consumer's Surplus Without Apology," American Economic Review, V. 66, No. 4, September 1976, pp. 589-597.

Books

Second Generation Reforms in Infrastructure Services, F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

Handbook of Industrial Organization, (edited with R. Schmalensee), North Holland Press, Volumes 1 and 2, 1989.

Contestable Markets and the Theory of Industry Structure, (with W.J. Baumol and J.C. Panzar), Harcourt Brace Jovanovich, 1982. Second Edition, 1989.

Welfare Analysis of Policies Affecting Prices and Products, Garland Press, 1980.

Unpublished Papers and Reports:

“Brief of Leading Economists as Amici Curiae in Support of Respondents,” In the Supreme Court of the United States; Douglas R. M. Nazarian, et al, v. PPL Energyplus, LLC, et al. and CPV Maryland, LLC, v. PPL Energyplus, LLC, et al.; On Writ of Certiorari to the US Court of Appeals for the Fourth Circuit; Nos. 14-614, 14-623; January 19, 2016.

“Technological change and labor market segmentation in the developing world: Evidence from Brazil,” (with Dutz, Mark, Lucas Ferreira-Mation, and Stephen O’Connell), 2015 Background Paper for the 2016 World Bank’s World Development Report.

“Brief for Amici Curiae J. Gregory Sidak, Robert D. Willig, David J. Teece, and Keith N. Hylton, Scholars and Experts in Antitrust Economics in Support of Defendants-Appellants and Supporting Reversal,” 15-1672 In the United States Court of Appeals for the Second Circuit; United States of America, et al., v. American Express Company, et al., 8/10/2015.

"Commentary on Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets" (with Nauman Ilias, Bryan Keating, and Paolo Ramezzana), under revision for Review of Industrial Organization.

"Recommendations for Excessive-Share Limits in the Surfclam and Ocean Quahog Fisheries" (with Glenn Mitchell and Steven Peterson), Report to National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council, 5/23/2011.

"Public Comments on the 2010 Draft Horizontal Merger Guidelines," paper posted to Federal Trade Commission website, 6/4/2010

"An Econometric Analysis of the Matching Between Football Student-Athletes and Colleges," (with Yair Eilat, Bryan Keating and Jon Orszag)

Supreme Court Amicus Brief Regarding Morgan Stanley Capital Group Inc. v. Public Utility District No. 1 of Snohomish County, Washington, (co-authored), AEI-Brookings Joint Center Brief No. 07-02, 12/2/07

“(Allegedly) Monopolizing Tying Via Product Innovation,” statement before the Department of Justice/Federal Trade Commission Section 2 Hearings, November 1, 2006.

“Assessment of U.S. Merger Enforcement Policy,” statement before the Antitrust Modernization Commission, 11/17/05.

“Investment is Appropriately Stimulated by TELRIC,” in Pricing Based on Economic Cost, 12/2003.

“Brief of Amici Curiae Economics Professors, re Verizon v. Trinko, In the Supreme Court of the U.S.,” (with W.J. Baumol, J.O. Ordoover and F.R. Warren-Boulton), 7/25/2003.

“Stimulating Investment and the Telecommunications Act of 1996,” (with J. Bigelow, W. Lehr and S. Levinson), 2002.

“An Economic Analysis of Spectrum Allocation and Advanced Wireless Services,” (with Martin N. Baily, Peter R. Orszag, and Jonathan M. Orszag), 2002

“Effective Deregulation of Residential Electric Service,” 2001

“Anticompetitive Forced Rail Access” (with W. J. Baumol), 2000

“The Scope of Competition in Telecommunications” (with B. Douglas Bernheim), 1998 “Why Do Christie and Schultz Infer Collusion From Their Data? (with Alan Kleidon), 1995.

"Demonopolization," (with Sally Van Siclen), OECD Vienna Seminar Paper, 1993.

"Economic Analysis of Section 337: The Balance Between Intellectual Property Protection and Protectionism," (with J. Ordoover) 1990.

"The Effects of Capped NTS Charges on Long Distance Competition," (with M. Katz).

"Discussion of Regulatory Mechanism Design in the Presence of Research Innovation, and Spillover Effects," 1987.

"Industry Economic Analysis in the Legal Arena," 1987.

"Deregulation of Long Distance Telephone Services: A Public Interest Assessment," (with M. Katz).

"Competition-Related Trade Issues," report prepared for OECD.

"Herfindahl Concentration Index," (with J. Ordoover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, March 1981.

"Market Power and Market Definition," (with J. Ordoover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, May 1981.

"The Continuing Need for and National Benefits Derived from the REA Telephone Loan Programs - An Economic Assessment," 1981.

"The Economics of Equipment Leasing: Costing and Pricing," 1980.

"Rail Deregulation and the Financial Problems of the U.S. Railroad Industry," (with W.J. Baumol), report prepared under contract to Conrail, 1979.

"Price Indexes and Intertemporal Welfare," Bell Laboratories Economics Discussion Paper, 1974.

"Consumer's Surplus: A Rigorous Cookbook," Technical Report #98, Economics Series, I.M.S.S.S., Stanford University, 1973.

"An Economic-Demographic Model of the Housing Sector," (with B. Hickman and M. Hinz), Center for Research in Economic Growth, Stanford University, 1973.

Invited Conference Presentations:

George Mason Law Review Annual Antitrust Symposium: Antitrust in an Interconnected World
"GUPPI and the Safe Harbor" 2016

Competition Law & Policy Institute of New Zealand Annual Workshop
"Merger Analysis Keynote" 2015

Economic Studies at Brookings: Railroads, Policy and the Economy
"The Industry Perspective" 2015

Georgetown University McDonough School of Business Railroad Economics Symposium
"The Role of Economic Theory in the 'Deregulated' Rail Industry" 2015

Brazilian School of Economics and Finance (FGV EPGE) Seminario
"Public Interest Regulation: Lessons from Railroads" 2015

NYU School of Law Conference on the Fiftieth Anniversary of United States v. Philadelphia
National Bank: The Past, Present and Future of Merger Law
"Discussion with Agency Economists" 2013

Brookings Institution Conference on The Economics of the Airline Industry
"Airline Network Effects and Consumer Welfare" 2012

AGEP Public Policy Conference on Pharmaceutical Industry Economics, Regulation and Legal
Issues; Law and Economics Center, George Mason University School of Law
"Pharmaceutical Brand-Generic Disputes" 2012

U.S.-EU Alliance Study Peer Review Conferences
"Review of Cooperative Agreements in Transatlantic Airline Markets" 2012

"The Research Agenda Ahead"	2012
Antitrust in the High Tech Sector Conference "Developments in Merger Enforcement"	2012
Georgetown Center for Business and Public Policy, Conference on the Evolution of Regulation "Reflections on Regulation"	2011
Antitrust Forum, New York State Bar Association "Upward Price Pressure, Market Definition and Supply Mobility"	2011
American Bar Association, Antitrust Section, Annual Convention "The New Merger Guidelines' Analytic Highlights"	2011
OECD and World Bank Conference on Challenges and Policies for Promoting Inclusive Growth "Inclusive Growth From Competition and Innovation"	2011
Villanova School of Business Executive MBA Conference "Airline Network Effects, Competition and Consumer Welfare"	2011
NYU School of Law Conference on Critical Directions in Antitrust "Unilateral Competitive Effects"	2010
Conf. on the State of European Competition Law and Enforcement in a Transatlantic Context "Recent Developments in Merger Control"	2010
Center on Regulation and Competition, Universidad de Chile Law School "Economic Regulation and the Limits of Antitrust Law"	2010
Center on Regulation and Competition, Universidad de Chile Law School "Merger Policy and Guidelines Revision"	2010
Faculty of Economics, Universidad de Chile "Network Effects in Airlines Markets"	2010
Georgetown Law Global Antitrust Enforcement Symposium "New US Merger Guidelines"	2010
FTI London Financial Services Conference "Competition and Regulatory Reform"	2010
NY State Bar Association Annual Antitrust Conference "New Media Competition Policy"	2009
Antitrust Law Spring Meeting of the ABA	

“Antitrust and the Failing Economy Defense”	2009
Georgetown Law Global Antitrust Enforcement Symposium “Mergers: New Enforcement Attitudes in a Time of Economic Challenge”	2009
Phoenix Center US Telecoms Symposium “Assessment of Competition in the Wireless Industry”	2009
FTC and DOJ Horizontal Merger Guidelines Workshop “Direct Evidence is No Magic Bullet”	2009
Northwestern Law Research Symposium: Antitrust Economics and Competition Policy "Discussion of Antitrust Evaluation of Horizontal Mergers"	2008
Inside Counsel Super-Conference "Navigating Mixed Signals under Section 2 of the Sherman Act"	2008
Federal Trade Commission Workshop on Unilateral Effects in Mergers "Best Evidence and Market Definition"	2008
European Policy Forum, Rules for Growth: Telecommunications Regulatory Reform “What Kind of Regulation For Business Services?”	2007
Japanese Competition Policy Research Center, Symposium on M&A and Competition Policy “Merger Policy Going Forward With Economics and the Economy”	2007
Federal Trade Commission and Department of Justice Section 2 Hearings “Section 2 Policy and Economic Analytic Methodologies”	2007
Pennsylvania Bar Institute, Antitrust Law Committee CLE “The Economics of Resale Price Maintenance and Class Certification”	2007
Pennsylvania Bar Institute, Antitrust Law Committee CLE “Antitrust Class Certification – An Economist’s Perspective”	2007
Fordham Competition Law Institute, International Competition Economics Training Seminar “Monopolization and Abuse of Dominance”	2007
Canadian Bar Association Annual Fall Conference on Competition Law “Economic Tools for the Competition Lawyer”	2007
Conference on Managing Litigation and Business Risk in Multi-jurisdiction Antitrust Matters “Economic Analysis in Multi-jurisdictional Merger Control”	2007
World Bank Conference on Structuring Regulatory Frameworks for Dynamic and Competitive	

South Eastern European Markets “The Roles of Government Regulation in a Dynamic Economy”	2006
Department of Justice/Federal Trade Commission Section 2 Hearings “(Allegedly) Monopolizing Tying Via Product Innovation”	2006
Fordham Competition Law Institute, Competition Law Seminar “Monopolization and Abuse of Dominance”	2006
Practicing Law Institute on Intellectual Property Antitrust “Relevant Markets for Intellectual Property Antitrust”	2006
PLI Annual Antitrust Law Institute “Cutting Edge Issues in Economics”	2006
World Bank’s Knowledge Economy Forum V “Innovation, Growth and Competition”	2006
Charles University Seminar Series “The Dangers of Over-Ambitious Antitrust Regulation”	2006
NY State Bar Association Antitrust Law Section Annual Meeting “Efficient Integration or Illegal Monopolization?”	2006
World Bank Seminar “The Dangers of Over-Ambitious Regulation”	2005
ABA Section of Antitrust Law 2005 Fall Forum “Is There a Gap Between the Guidelines and Agency Practice?”	2005
Hearing of Antitrust Modernization Commission “Assessment of U.S. Merger Enforcement Policy”	2005
LEAR Conference on Advances in the Economics of Competition Law “Exclusionary Pricing Practices”	2005
Annual Antitrust Law Institute “Cutting Edge Issues in Economics”	2005
PRIOR Symposium on States and Stem Cells “Assessing the Economics of State Stem Cell Programs”	2005
ABA Section of Antitrust Law – AALS Scholars Showcase “Distinguishing Anticompetitive Conduct”	2005
Allied Social Science Associations National Convention	

“Antitrust in the New Economy”	2005
ABA Section of Antitrust Law 2004 Fall Forum	
“Advances in Economic Analysis of Antitrust”	2004
Phoenix Center State Regulator Retreat	
“Regulatory Policy for the Telecommunications Revolution”	2004
OECD Competition Committee	
“Use of Economic Evidence in Merger Control”	2004
Justice Department/Federal Trade Commission Joint Workshop	
“Merger Enforcement”	2004
Phoenix Center Annual U.S. Telecoms Symposium	
“Incumbent Market Power”	2003
Center for Economic Policy Studies Symposium on Troubled Industries	
“What Role for Government in Telecommunications?”	2003
Princeton Workshop on Price Risk and the Future of the Electric Markets	
“The Structure of the Electricity Markets”	2003
2003 Antitrust Conference	
“International Competition Policy and Trade Policy”	2003
International Industrial Organization Conference	
“Intellectual Property System Reform”	2003
ABA Section of Antitrust Law 2002 Fall Forum	
“Competition, Regulation and Pharmaceuticals”	2002

Fordham Conference on International Antitrust Law and Policy	
“Substantive Standards for Mergers and the Role of Efficiencies”	2002
Department of Justice Telecom Workshop	
“Stimulating Investment and the Telecommunications Act of 1996”	2002
Department of Commerce Conference on the State of the Telecom Sector	
“Stimulating Investment and the Telecommunications Act of 1996”	2002
Law and Public Affairs Conference on the Future of Internet Regulation	
“Open Access and Competition Policy Principles”	2002
Center for Economic Policy Studies Symposium on Energy Policy	
“The Future of Power Supply”	2002
The Conference Board: Antitrust Issues in Today’s Economy	
“The 1982 Merger Guidelines at 20”	2002
Federal Energy Regulatory Commission Workshop	
“Effective Deregulation of Residential Electric Service”	2001
IPEA International Seminar on Regulation and Competition	
“Electricity Markets: Deregulation of Residential Service”	2001
“Lessons for Brazil from Abroad”	2001
ABA Antitrust Law Section Task Force Conference	
“Time, Change, and Materiality for Monopolization Analyses”	2001
Harvard University Conference on American Economic Policy in the 1990s	
“Comments on Antitrust Policy in the Clinton Administration”	2001
Tel-Aviv Workshop on Industrial Organization and Anti-Trust	
“The Risk of Contagion from Multimarket Contact”	2001
2001 Antitrust Conference	
“Collusion Cases: Cutting Edge or Over the Edge?”	2001
“Dys-regulation of California Electricity”	2001
FTC Public Workshop on Competition Policy for E-Commerce	
“Necessary Conditions for Cooperation to be Problematic”	2001
HIID International Workshop on Infrastructure Policy	
“Infrastructure Privatization and Regulation”	2000
Villa Mondragone International Economic Seminar	
“Competition Policy for Network and Internet Markets”	2000

New Developments in Railroad Economics: Infrastructure Investment and Access Policies “Railroad Access, Regulation, and Market Structure”	2000
The Multilateral Trading System at the Millennium “Efficiency Gains From Further Liberalization”	2000
Singapore – World Bank Symposium on Competition Law and Policy “Policy Towards Cartels and Collusion”	2000
CEPS: Is It a New World?: Economic Surprises of the Last Decade “The Internet and E-Commerce”	2000
Cutting Edge Antitrust: Issues and Enforcement Policies “The Direction of Antitrust Entering the New Millennium”	2000
The Conference Board: Antitrust Issues in Today’s Economy “Antitrust Analysis of Industries With Network Effects”	1999
CEPS: New Directions in Antitrust “Antitrust in a High-Tech World”	1999
World Bank Meeting on Competition and Regulatory Policies for Development “Economic Principles to Guide Post-Privatization Governance”	1999
1999 Antitrust Conference “Antitrust and the Pace of Technological Development” “Restructuring the Electric Utility Industry”	1999 1999
HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance “Privatization and Post-Privatization Regulation of Natural Monopolies”	1999
The Federalist Society: Telecommunications Deregulation: Promises Made, Potential Lost? “Grading the Regulators”	1999
Inter-American Development Bank: Second Generation Issues In the Reform Of Public Services “Post-Privatization Governance” “Issues Surrounding Access Arrangements”	1999 1999
Economic Development Institute of the World Bank -- Program on Competition Policy “Policy Towards Horizontal Mergers”	1998
Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of	

Justice	
“Market Definition in Antitrust Analysis”	1998
HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance	
“Infrastructure Architecture and Regulation: Railroads”	1998
EU Committee Competition Conference – Market Power	
“US/EC Perspective on Market Definition”	1998
Federal Trade Commission Roundtable	
“Antitrust Policy for Joint Ventures”	1998
1998 Antitrust Conference	
“Communications Mergers”	1998
The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly	
Access and Bundling in High-Technology Markets	1998
FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation	
The Role of Economic Evidence and Testimony	1997
FTC Hearings on Classical Market Power in Joint Ventures	
Microeconomic Analysis and Guideline	1997
World Bank Economists --Week IV Keynote	
Making Markets More Effective With Competition Policy	1997
Brookings Trade Policy Forum	
Competition Policy and Antidumping: The Economic Effects	1997
University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020	
Microeconomics, Privatization, and Vertical Integration	1997
ABA Section of Antitrust Law Conference on The Telecommunications Industry	
Current Economic Issues in Telecommunications	1997
Antitrust 1998: The Annual Briefing	
The Re-Emergence of Distribution Issues	1997
Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean	
Economic Principles to Guide Post-Privatization Governance	1997

Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East	
Privatization: Methods and Pricing Issues	1997
American Enterprise Institute for Public Policy Research Conference	
Discussion of Local Competition and Legal Culture	1997
Harvard Program on Global Reform and Privatization of Public Enterprises	
“Infrastructure Privatization and Regulation: Freight”	1997
World Bank Competition Policy Workshop	
“Competition Policy for Entrepreneurship and Growth”	1997
Eastern Economics Association Paul Samuelson Lecture	
“Bottleneck Access in Regulation and Competition Policy”	1997
ABA Annual Meeting, Section of Antitrust Law	
“Antitrust in the 21st Century: The Efficiencies Guidelines”	1997
Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities	
“Regulation: Theoretical Context and Advantages vs. Disadvantages”	1997
The FCC: New Priorities and Future Directions	
“Competition in the Telecommunications Industry”	1997
American Enterprise Institute Studies in Telecommunications Deregulation	
“The Scope of Competition in Telecommunications”	1996
George Mason Law Review Symposium on Antitrust in the Information Revolution	
“Introduction to the Economic Theory of Antitrust and Information”	1996
Korean Telecommunications Public Lecture	
“Market Opening and Fair Competition”	1996
Korea Telecommunications Forum	
“Desirable Interconnection Policy in a Competitive Market”	1996
European Association for Research in Industrial Economics Annual Conference	
“Bottleneck Access: Regulation and Competition Policy”	1996
Harvard Program on Global Reform and Privatization of Public Enterprises	
“Railroad and Other Infrastructure Privatization”	1996

FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry “The Scope of Telecommunications Competition”	1996
Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection “The Economics of Interconnection”	1996
World Bank Seminar on Experiences with Corporatization “Strategic Directions of Privatization”	1996
FCC Economic Forum on the Economics of Interconnection Lessons from Other Industries	1996
ABA Annual Meeting, Section of Antitrust Law The Integration, Disintegration, and Reintegration of the Entertainment Industry	1996
Conference Board: 1996 Antitrust Conference How Economics Influences Antitrust and Vice Versa	1996
Antitrust 1996: A Special Briefing Joint Ventures and Strategic Alliances	1996
New York State Bar Association Section of Antitrust Law Winter Meeting Commentary on Horizontal Effects Issues	1996
FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age Vertical Issues for Networks and Standards	1995
Wharton Seminar on Applied Microeconomics Access Policies with Imperfect Regulation	1995
Antitrust 1996, Washington D.C. Assessing Joint Ventures for Diminution of Competition	1995
ABA Annual Meeting, Section of Antitrust Law Refusals to Deal -- Economic Tests for Competitive Harm	1995
FTC Seminar on Antitrust Enforcement Analysis Diagnosing Collusion Possibilities	1995
Philadelphia Bar Education Center: Antitrust Fundamentals Antitrust--The Underlying Economics	1995
Vanderbilt University Conference on Financial Markets	

Why Do Christie and Schultz Infer Collusion From Their Data?	1995
ABA Section of Antitrust Law Chair=s Showcase Program Discussion of Telecommunications Competition Policy	1995
Conference Board: 1995 Antitrust Conference Analysis of Mergers and Joint Ventures	1995
ABA Conference on The New Antitrust: Policy of the '90s Antitrust on the Super Highways/Super Airways	1994
ITC Hearings on The Economic Effects of Outstanding Title VII Orders "The Economic Impacts of Antidumping Policies"	1994
OECD Working Conference on Trade and Competition Policy "Empirical Evidence on The Nature of Anti-dumping Actions"	1994
Antitrust 1995, Washington D.C. "Rigorous Antitrust Standards for Distribution Arrangements"	1994
ABA -- Georgetown Law Center: Post Chicago-Economics: New Theories - New Cases? "Economic Foundations for Vertical Merger Guidelines"	1994
Conference Board: Antitrust Issues in Today's Economy "New Democrats, Old Agencies: Competition Law and Policy"	1994
Federal Reserve Board Distinguished Economist Series "Regulated Private Enterprise Versus Public Enterprise"	1994
Institut d'Etudes Politiques de Paris "Lectures on Competition Policy and Privatization"	1993
Canadian Bureau of Competition Policy Academic Seminar Series, Toronto. "Public Versus Regulated Private Enterprise"	1993
CEPS Symposium on The Clinton Administration: A Preliminary Report Card "Policy Towards Business"	1993
Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY "Discussion of Deregulation of Networks: What Has Worked and What Hasn't"	1993
World Bank Annual Conference on Development Economics "Public Versus Regulated Private Enterprise"	1993

Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process	
"The Economics of Current Issues in Telecommunications Regulation"	1992
"The Role of Markets in Presently Regulated Industries"	1992
The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY	
"Antitrust in the Global Economy"	1992
"Monopoly Issues for the '90s"	1993
Columbia University Seminar on Applied Economic Theory, New York, NY	
"Economic Rationales for the Scope of Privatization"	1992
Howrey & Simon Conference on Antitrust Developments, Washington, DC	
"Competitive Effects of Concern in the Merger Guidelines"	1992
Arnold & Porter Colloquium on Merger Enforcement, Washington, DC	
"The Economic Foundations of the Merger Guidelines"	1992
American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA	
"Applying the 1992 Merger Guidelines"	1992
OECD Competition Policy Meeting, Paris, France	
"The Economic Impacts of Antidumping Policy"	1992
Center for Public Choice Lecture Series, George Mason University Arlington, VA	
"The Economic Impacts of Antidumping Policy"	1992
Brookings Institution Microeconomics Panel, Washington, DC,	
"Discussion of the Evolution of Industry Structure"	1992
AT&T Conference on Antitrust Essentials	
"Antitrust Standards for Mergers and Joint Ventures"	1991
ABA Institute on The Cutting Edge of Antitrust: Market Power	
"Assessing and Proving Market Power: Barriers to Entry"	1991
Second Annual Workshop of the Competition Law and Policy Institute of New Zealand	
"Merger Analysis, Industrial Organization Theory, and Merger Guidelines"	1991
"Exclusive Dealing and the <u>Fisher & Paykel</u> Case"	1991
Special Seminar of the New Zealand Treasury	
"Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly"	1991

Public Seminar of the Australian Trade Practices Commission "Antitrust Issues of the 1990's"	1991
National Association of Attorneys General Antitrust Seminar "Antitrust Economics"	1991
District of Columbia Bar's 1991 Annual Convention "Administrative and Judicial Trends in Federal Antitrust Enforcement"	1991
ABA Spring Meeting "Antitrust Lessons From the Airline Industry"	1991
Conference on The Transition to a Market Economy - Institutional Aspects "Anti-Monopoly Policies and Institutions"	1991
Conference Board's Thirtieth Antitrust Conference "Antitrust Issues in Today's Economy"	1991
American Association for the Advancement of Science Annual Meeting "Methodologies for Economic Analysis of Mergers"	1991
General Seminar, Johns Hopkins University "Economic Rationales for the Scope of Privatization"	1991
Capitol Economics Speakers Series "Economics of Merger Guidelines"	1991
CRA Conference on Antitrust Issues in Regulated Industries "Enforcement Priorities and Economic Principles"	1990
Pepper Hamilton & Scheetz Anniversary Colloquium "New Developments in Antitrust Economics"	1990
PLI Program on Federal Antitrust Enforcement in the 90's "The Antitrust Agenda of the 90's"	1990
FTC Distinguished Speakers Seminar "The Evolving Merger Guidelines"	1990
The World Bank Speakers Series "The Role of Antitrust Policy in an Open Economy"	1990
Seminar of the Secretary of Commerce and Industrial Development of Mexico "Transitions to a Market Economy"	1990

Southern Economics Association	
"Entry in Antitrust Analysis of Mergers"	1990
"Discussion of Strategic Investment and Timing of Entry"	1990
American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries	
"Discussion of Network Problems and Solutions"	1990
American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition	
"Law and Economics Framework for Analysis"	1990
Banco Nacional de Desenvolvimento Economico Social Lecture	
"Competition Policy: Harnessing Private Interests for the Public Interest"	1990
Western Economics Association Annual Meetings	
"New Directions in Antitrust from a New Administration"	1990
"New Directions in Merger Enforcement: The View from Washington"	1990
Woodrow Wilson School Alumni Colloquium	
"Microeconomic Policy Analysis and Antitrust--Washington 1990"	1990
Arnold & Porter Lecture Series	
"Advocating Competition"	1991
"Antitrust Enforcement"	1990
ABA Antitrust Section Convention	
"Recent Developments in Market Definition and Merger Analysis"	1990
Federal Bar Association	
"Joint Production Legislation: Competitive Necessity or Cartel Shield?"	1990
Pew Charitable Trusts Conference	
"Economics and National Security"	1990
ABA Antitrust Section Midwinter Council Meeting	
"Fine-tuning the Merger Guidelines"	1990
"The State of the Antitrust Division"	1991
International Telecommunications Society Conference	
"Discussion of the Impact of Telecommunications in the UK"	1989
The Economists of New Jersey Conference	
"Recent Perspectives on Regulation"	1989

Conference on Current Issues Challenging the Regulatory Process	
"Innovative Pricing and Regulatory Reform"	1989
"Competitive Wheeling"	1989
Conference Board: Antitrust Issues in Today's Economy	
"Foreign Trade Issues and Antitrust"	1989
McKinsey & Co. Mini-MBA Conference	
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior"	1989
	1994
Olin Conference on Regulatory Mechanism Design	
"Revolutions in Regulatory Theory and Practice: Exploring The Gap"	1989
University of Dundee Conference on Industrial Organization and Strategic Behavior	
"Mergers in Differentiated Product Industries"	1988
Leif Johanson Lectures at the University of Oslo	
"Normative Issues in Industrial Organization"	1988
Mergers and Competitiveness: Spain Facing the EEC	
"Merger Policy"	1988
"R&D Joint Ventures"	1988
New Dimensions in Pricing Electricity	
"Competitive Pricing and Regulatory Reform"	1988
Program for Integrating Economics and National Security: Second Annual Colloquium	
"Arming Decisions Under Asymmetric Information"	1988
European Association for Research in Industrial Economics	
"U.S. Railroad Deregulation and the Public Interest"	1987
"Economic Rationales for the Scope of Privatization"	1989
"Discussion of Licensing of Innovations"	1990
Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change	
"Discussion of Regulatory Mechanism Design in the Presence of Research, Innovation, and Spillover Effects"	1987
Special Brookings Papers Meeting	
"Discussion of Empirical Approaches to Strategic Behavior"	1987
"New Merger Guidelines"	1990
Deregulation or Regulation for Telecommunications in the 1990's	
"How Effective are State and Federal Regulations?"	1987

Conference Board Roundtable on Antitrust	
"Research and Production Joint Ventures"	1990
"Intellectual Property and Antitrust"	1987
Current Issues in Telephone Regulation	
"Economic Approaches to Market Dominance: Applicability of Contestable Markets"	1987
Harvard Business School Forum on Telecommunications	
"Regulation of Information Services"	1987
The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market	
"Why Reinvent the Wheel?"	1986
World Bank Seminar on Frontiers of Economics	
"What Every Economist Should Know About Contestable Markets"	1986
Bell Communications Research Conference on Regulation and Information	
"Fuzzy Regulatory Rules"	1986
Karl Eller Center Forum on Telecommunications	
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation"	1986
Railroad Accounting Principles Board Colloquium	
"Contestable Market Theory and ICC Regulation"	1986
Canadian Embassy Conference on Current Issues in Canadian -- U.S. Trade and Investment	
"Regulatory Revolution in the Infrastructure Industries"	1985
Eagleton Institute Conference on Telecommunications in Transition	
"Industry in Transition: Economic and Public Policy Overview"	1985
Brown University Citicorp Lecture	
"Logic of Regulation and Deregulation"	1985
Columbia University Communications Research Forum	
"Long Distance Competition Policy"	1985
American Enterprise Institute Public Policy Week	
"The Political Economy of Regulatory Reform"	1984
MIT Communications Forum	
"Deregulation of AT&T Communications"	1984

Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference "Potential Uses of The File"	1984
Federal Bar Association Symposium on Joint Ventures "The Economics of Joint Venture Assessment"	1984
Hoover Institute Conference on Antitrust "Antitrust for High-Technology Industries"	1984
NSF Workshop on Predation and Industrial Targeting "Current Economic Analysis of Predatory Practices"	1983
The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future "Contestability As A Guide for Regulation and Deregulation"	1984
University of Pennsylvania Economics Day Symposium "Contestability and Competition: Guides for Regulation and Deregulation"	1984
Pinhas Sapir Conference on Economic Policy in Theory and Practice "Corporate Governance and Market Structure"	1984
Centre of Planning and Economic Research of Greece "Issues About Industrial Deregulation"	1984
	"Contestability: New Research Agenda" 1984
Hebrew and Tel Aviv Universities Conference on Public Economics "Social Welfare Dominance Extended and Applied to Excise Taxation"	1983
NBER Conference on Industrial Organization and International Trade "Perspectives on Horizontal Mergers in World Markets"	1983
Workshop on Local Access: Strategies for Public Policy "Market Structure and Government Intervention in Access Markets"	1982
NBER Conference on Strategic Behavior and International Trade "Industrial Strategy with Committed Firms: Discussion"	1982
Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks "Local Pricing in a Competitive Environment"	1982
International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure	

"Theory of Contestability"	1982
"Product Dev., Investment, and the Evolution of Market Structures"	1982
N.Y.U. Conference on Competition and World Markets: Law and Economics	
"Competition and Trade Policy--International Predation"	1982
CNRS-ISPE-NBER Conference on the Taxation of Capital	
"Welfare Effects of Investment Under Imperfect Competition"	1982
Internationales Institut für Management und Verwaltung Regulation Conference	
"Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies"	1981
NBER-Kellogg Graduate School of Management Conference on the	
Econometrics of Market Models with Imperfect Competition	
"Discussion of Measurement of Monopoly Behavior: An	
Application to the Cigarette Industry"	1981
The Peterkin Lecture at Rice University	
"Deregulation: Ideology or Logic?"	1981
FTC Seminar on Antitrust Analysis	
"Viewpoints on Horizontal Mergers	1982
"Predation as a Tactical Inducement for Exit"	1980
NBER Conference on Industrial Organization and Public Policy	
"An Economic Definition of Predation"	1980
The Center for Advanced Studies in Managerial Economics Conference on The Economics of	
Telecommunication	
"Pricing Local Service as an Input"	1980
Aspen Institute Conference on the Future of the Postal Service	
"Welfare Economics of Postal Pricing"	1979
Department of Justice Antitrust Seminar	
"The Industry Performance Gradient Index"	1979
Eastern Economic Association Convention	
"The Social Performance of Deregulated Markets for Telecom Services"	
1979	
Industry Workshop Association Convention	
"Customer Equity and Local Measured Service"	1979
Symposium on Ratemaking Problems of Regulated Industries	
"Pricing Decisions and the Regulatory Process"	1979

Woodrow Wilson School Alumni Conference "The Push for Deregulation"	1979
NBER Conference on Industrial Organization "Intertemporal Sustainability"	1979
World Congress of the Econometric Society "Theoretical Industrial Organization"	1980
Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation "Network Access Pricing"	1978
ALI-ABA Conference on the Economics of Antitrust "Predatoriness and Discriminatory Pricing"	1978
AEI Conference on Postal Service Issues "What Can Markets Control?"	1978
University of Virginia Conference on the Economics of Regulation "Public Interest Pricing"	1978
DRI Utility Conference "Marginal Cost Pricing in the Utility Industry: Impact and Analysis"	1978
International Meeting of the Institute of Management Sciences "The Envelope Theorem"	1977
University of Warwick Workshop on Oligopoly "Industry Performance Gradient Indexes"	1977
North American Econometric Society Convention "Intertemporal Sustainability"	1979
"Social Welfare Dominance"	1978
"Economies of Scope, DAIC, and Markets with Joint Production"	1977
Telecommunications Policy Research Conference "Transition to Competitive Markets"	1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition"	1985
"Market Power in The Telecommunications Industry"	1984
"FCC Policy on Local Access Pricing"	1983
"Do We Need a Regulatory Safety Net in Telecommunications?"	1982
"Anticompetitive Vertical Conduct"	1981
"Electronic Mail and Postal Pricing"	1980
"Monopoly, Competition and Efficiency": Chairman	1979

"A Common Carrier Research Agenda"	1978
"Empirical Views of Ramsey Optimal Telephone Pricing"	1977
"Recent Research on Regulated Market Structure"	1976
"Some General Equilibrium Views of Optimal Pricing"	1975
National Bureau of Economic Research Conference on Theoretical Industrial Organization	
"Compensating Variation as a Measure of Welfare Change"	1976
Conference on Pricing in Regulated Industries: Theory & Application	
"Ramsey Optimal Pricing of Long Distance Telephone Services"	1977
NBER Conference on Public Regulation	
"Income Distributional Concerns in Regulatory Policy-Making"	1977
Allied Social Science Associations National Convention	
"Merger Guidelines and Economic Theory"	1990
Discussion of "Competitive Rules for Joint Ventures"	1989
"New Schools in Industrial Organization"	1988
"Industry Economic Analysis in the Legal Arena"	1987
"Transportation Deregulation"	1984
Discussion of "Pricing and Costing of Telecommunications Services"	1983
Discussion of "An Exact Welfare Measure"	1982
"Optimal Deregulation of Telephone Services"	1982
"Sector Differentiated Capital Taxes"	1981
"Economies of Scope"	1980
"Social Welfare Dominance"	1980
"The Economic Definition of Predation"	1979
Discussion of "Lifeline Rates, Succor or Snare?"	1979
"Multiproduct Technology and Market Structure"	1978
"The Economic Gradient Method"	1978
"Methods for Public Interest Pricing"	1977
Discussion of "The Welfare Implications of New Financial Instruments"	1976
"Welfare Theory of Concentration Indices"	1976
Discussion of "Developments in Monopolistic Competition Theory"	1976
"Hedonic Price Adjustments"	1975
"Public Good Attributes of Information and its Optimal Pricing"	1975
"Risk Invariance and Ordinally Additive Utility Functions"	1974
"Consumer's Surplus: A Rigorous Cookbook"	1974
University of Chicago Symposium on the Economics of Regulated Public Utilities	
"Optimal Prices for Public Purposes"	1976
American Society for Information Science	
"The Social Value of Information: An Economist's View"	1975
Institute for Mathematical Studies in the Social Sciences Summer Seminar	

"The Sustainability of Natural Monopoly"	1975
U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services "The Evaluation of the Economic Benefits of Productive Information"	1975
NYU-Columbia Symposium on Regulated Industries "Ramsey Optimal Public Utility Pricing"	1975

Research Seminars:

Bell Communications Research (2)	University of California, San Diego
Bell Laboratories (numerous)	University of Chicago
Department of Justice (3)	University of Delaware
Electric Power Research Institute	University of Florida
Federal Reserve Board	University of Illinois
Federal Trade Commission (4)	University of Iowa (2)
Mathematica	Universite Laval
Rand	University of Maryland
World Bank (3)	University of Michigan
Carleton University	University of Minnesota
Carnegie-Mellon University	University of Oslo
Columbia University (4)	University of Pennsylvania (3)
Cornell University (2)	University of Toronto
Georgetown University	University of Virginia
Harvard University (2)	University of Wisconsin
Hebrew University	University of Wyoming
Johns Hopkins University (2)	Vanderbilt University
M. I. T. (4)	Yale University (2)
New York University (4)	Princeton University (many)
Northwestern University (2)	Rice University
Norwegian School of Economics and Business Administration	Stanford University (5) S.U.N.Y. Albany

Testimony of Robert D. Willig in Last Four Years

National Collegiate Athletic Association et al., Plaintiffs, v. Christopher J. Christie et al., Defendants, In the United States District Court for the District of New Jersey, Civil Action No. 3:12-cv-04947 (MAS) (LHG), expert report 11/21/2012, deposition 11/30/2012.

In Re Cathode Ray Tube (CRT) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, Master File No. CV-07-5944-SC MDL No. 1917, expert report 12/17/12, deposition 01/24/13.

In Re Titanium Dioxide Antitrust Litigation, In the United States District Court of Maryland Northern Division, Case No. 1:10-cv-00318-RDB, expert report 12/21/2012, deposition 02/07/2013, 02/08/2013.

PPL EnergyPlus, LLC, et al., v. Douglas R.M. Nazarian, in his official capacity as Chairman of the Maryland Public Service Commission, et al., In the United States District Court of Maryland Northern Division, Case No. 1:12-cv-01286-MJG, expert report 12/21/2012, supplemental expert report 02/01/2013, deposition testimony 02/14/2013, trial testimony 03/08/2013.

PPL EnergyPlus, LLC, et al., v. Robert Hanna (originally, Lee A. Solomon), in his official capacity as President of the New Jersey Board of Public Utilities, et al., In the United States District Court for the District of New Jersey, Case No. 3:11-cv-00745-PGS-DEA, expert report 02/06/2013, deposition 02/14/2013 and 02/21/2013, and trial testimony 4/9-10/2013.

Total Petrochemicals & Refining USA, Inc. v. CSX Transportation, Inc., Before the Surface Transportation Board, Docket Number NOR 42121, verified statement, 6/20/2013.

Australian Taxation Office - Rio Tinto Limited transfer pricing rules mediation matter, Expert Reports: 11/14/2013; 11/24/2013; 5/15/2014; and 8/29/2014.

GSI Technology, Inc. v. Cypress Semiconductor Corporation, United States District Court, Northern District of California, Case No. 5:11-cv-03613-EJD, expert report 3/28/2014, reply report 5/8/2014, deposition 5/29/2014.

In re: Cathode Ray Tube (CRT) Antitrust Litigation, In the United States District Court for the Northern District of California, San Francisco Division, MDL Docket No. 1917, Master File No. CV-07-5944-SC, expert report 8/5/2014; deposition 9/19/2014.

Amazon.com, Inc. v. Commissioner of the Internal Revenue Service, Tax Court Docket No. 31197-12, expert reports 6/6/2104 and 8/1/2014; deposition 9/11/2014; trial testimony 11/21/14.

Commonwealth of Massachusetts v. Partners Health Care System, et al.,

Suffolk Superior Court Civil Action No. 14-2033-BLS, affidavit 9/25/2014.

Before the Surface Transportation Board; Railroad Revenue Adequacy, Docket No. EP 722; Reply Verified Statement on Behalf of the Association of American Railroads, 11/4/14.

In re: Wellbutrin XL Antitrust Litigation, In the United States District Court for the Eastern District of Pennsylvania, No. 08-cv-2431, 2433, expert report 12/23/2014; deposition 1/20/2015.

In the Matter of the Merger of Exelon Corporation and Pepco Holdings, Inc., Before the Public Service Commission of Maryland, Case No. 9361, Rebuttal Testimony of Dr. Robert D. Willig, 1/7/2015; Rejoinder Testimony of Dr. Robert D. Willig, 1/29/2015; Hearing testimony, 1/30/2015.

In re: Domestic Drywall Antitrust Litigation, In the United States District Court for the Eastern District of Pennsylvania, MDL No. 2437 13-MD-2437, expert report 03/13/15; deposition 4/9/15, 4/10/15.

The Valspar Corporation, and Valspar Sourcing, Inc. v. Millennium Inorganic Chemicals, Inc., Court File No. 13-3214-RHK-LIB; The Valspar Corporation, and Valspar Sourcing, Inc. v. E.I. DuPont De Nemours and Company, Case No. 14-527-RGA; and The Valspar Corporation, and Valspar Sourcing, Inc. v. Huntsman International, LLC, and Kronos Worldwide, Inc., expert report 6/12/2015; deposition 7/16/2015.

Methodist Health Services Corporation v. OSF Healthcare System, In the United States District Court For the Central District of Illinois, Peoria Division, Case No.: 13-cv-1054, expert report 8/14/2015, deposition 10/8/2015, Reply Report, 9/2016.

BRFHH Shreveport, LLC d/b/a University Health Shreveport and Vantage Health Plan, Inc. v. Willis-Knighton Medical Center, d/b/a Willis-Knighton Health System, In the United States District Court for the Western District of Louisiana, Shreveport Division, Case No.: 5:15-CV-02057, Joint Declaration of Margaret E. Guerin-Calvert and Robert D. Willig 9/8/2015.

Australian Consumer and Competition Commission v. Informed Sources Pty Ltd & Ors, Before the Federal Court of Australia, Victoria Registry, File number VID450/2014, expert report 11/24/15.

Clark R. Huffman, Brandi K. Winters, Patricia L. Grantham, and Linda M. Pace, Individually and on behalf of all others similarly situated vs. The Prudential Insurance Company of America, In the United States District Court For the Eastern District of Pennsylvania, Civ. No. 2:10-cv-05135-EL, expert report 2/25/16, deposition 4/5/16.

Maxon Hyundai Mazda, et al., vs. Carfax Inc., In the United States District Court For the Southern District of New York, Case No.: 13 CV 2680 (AJN) (RLE), expert report 2/26/16, deposition 4/21/16.

Federal Trade Commission and Commonwealth of Pennsylvania vs. Penn State Hershey Medical Center and Pinnacle Health System, In the United States District Court For the Middle District of Pennsylvania, Civil Action No. 1:15-cv-02362, expert report 3/7/16, deposition 3/25/16, Trial testimony 4/15/16.

In the Matter of Business Data Services in an Internet Protocol Environment; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent

Local Exchange Carrier Rates for Interstate Special Access Services; Before the FCC; WC Docket No. 16-143; WC Docket No. 05-25; RM-10593; Declaration, August 8, 2016

United States of America, et al., vs. Anthem Inc. and Cigna Corp., In the United States District Court For the District of Columbia, Civil Action No. 16-cv-01493 (ABJ), expert report 10/7/16.