Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
	)	
ADJUSTMENT OF RATES AND TERMS FOR PREEXISTING SUBSCRIPTION SERVICES AND SATELLITE DIGITAL AUDIO RADIO SERVICES	)	Docket No. 2006-1 CRB DSTRA

REBUTTAL TESTIMONY OF

STEVEN HERSCOVICI

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Public Version

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Table of Contents

I Qualifications and Statement of Assignment 1

II Summary of Conclusions 2

III Assessment of Industry Trends Relevant to Dr. Woodbury's Analysis of the Four Factors 3

A. Recording Industry Trends 3

B. Satellite Radio Industry Trends 6

C. Claimed Promotional Effect of Airplay on Satellite Radio 7

IV Response to Dr. Woodbury's Evaluation of the Statutory Objectives 11

A. Maximize the Availability of Creative Works to the Public 14

B. Afford the Copyright Owner a Fair Return for his Creative Work, and the Copyright User a Fair Income under Existing Economic Conditions 20

C. Relative Roles of the Copyright Owner and Copyright User in Making the Product Available to the Public 21

1. Creative Contribution 22

2. Technological Contributions 24

3. Investment, Costs, and Risks 24

4. Opening of New Markets 30

D. Minimize any Disruptive Impact on the Structure of the Industries Involved 31

List of Appendices

Appendix A: Curriculum Vita of Steven Herscovici

Appendix B: Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics: CDs Shipped, Millions, 1996-2006

Appendix C: Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics: Dollar Value of CD Shipments, $ U.S. Millions, 1996-2006

Appendix D Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics: Dollar Value of Digital Shipments, $ U.S. Millions, 2004-2006

Appendix E: Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics: Dollar Value of Physical and Digital Shipments, Percentage of Total Annual Shipments, 1996-2006

Appendix F: Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics: Dollar Value of Physical and Digital Shipments, $ U.S. Millions, 1996-2006

Appendix G: Recording Industry Association of America, Number of Certifications by Year, 1996-2006

Appendix H: XM and Sirius, Number of Subscribers at Year End, 2002-2006

Appendix I: XM and Sirius, Total Revenue, $ U.S. Thousands, 2002-2006

Appendix J: Audio Entertainment Competitors of Satellite Radio

Appendix K: Use of Music on Entertainment, Sports, and Talk/News Channels

Appendix L: XM Satellite Radio: Revenue and Satellite Costs, $ U.S. Thousands, 2005-2020

Appendix M: XM and Sirius, Subscriber Acquisition Costs, $ U.S. Thousands, 2002-2006

Appendix N: XM and Sirius Cost Per Gross Addition Expenses, $ U.S. Thousands, 2002-2006

Appendix O: XM and Sirius, Subscriber Acquisition Costs on a Per-Subscriber Basis, $ U.S., 2002-2006

Appendix P: XM and Sirius Cost Per Gross Addition, $ U.S., 2002-2006

Appendix Q: XM and Sirius, Average Monthly Subscription Revenue on a Per-Subscriber Basis, $ U.S., 2002-2006

Appendix R: XM Satellite Radio Bond Issuances: Amounts in $ U.S. Millions

Appendix S: Sirius Satellite Radio Bond Issuances: Amounts in $ U.S. Millions

TESTIMONY OF STEVEN HERSCOVICI

I QUALIFICATIONS AND STATEMENT OF ASSIGNMENT

1. My name is Steven Herscovici and I am a Managing Principal in the Boston office of Analysis Group, Inc. Analysis Group is an economic and financial research and consulting firm with offices in Boston, Massachusetts; Chicago, Illinois; Dallas, Texas; Denver, Colorado; Los Angeles, Menlo Park, and San Francisco, California; Montreal, Quebec; New York City; and Washington, DC. My area of specialization is the application of microeconomic theory, econometrics, and data analysis to complex business problems. I have conducted analyses in a broad range of areas including antitrust; finance and securities; and economic consulting more broadly. I have testified or consulted on numerous matters in the music industry on behalf of music publishers, record companies, and performing rights organizations. I have B.A., M.A., and Ph.D. degrees in economics from the University of Chicago, where I was a National Institutes of Health pre-doctoral fellow at the University's Population Research Center. A complete listing of my professional publications and prior testimony is included in my curriculum vitae, which is attached as **Appendix A**.

2. I have been retained in this case by Counsel for SoundExchange to provide economic analysis and expert testimony in this matter. Specifically, I have been asked by Counsel to evaluate the arguments made by Dr. John R. Woodbury on behalf of the digital satellite radio services XM Satellite Radio ("XM") and Sirius Satellite Radio ("Sirius") (collectively, the "Services") concerning the four statutory objectives established by Congress for determining an appropriate copyright royalty rate for music licensed by those Services and to provide an economic evaluation of those factors. As part of this assignment, I have reviewed prior decisions of the copyright panels, the Librarian, and the courts concerning the factors, as well as evidence submitted during the direct phase of this proceeding and other evidence concerning the industries in which the Services and record companies and performers operate.

3. This Testimony and the opinions expressed herein are based on my understanding of the issues involved in this matter, together with my training, education, and experience. Documents, testimony, or other materials may become available that could lead me to supplement my conclusions.

II SUMMARY OF CONCLUSIONS

4. I have reached the following conclusions:

5. The recording industry has undergone a significant shift during this decade. Sales of physical media, such as CDs, records, and tapes, have fallen from their peak in 2000, and are expected to continue to fall. This trend has important implications on industry profitability. At the same time, digital media, including downloads purchased from iTunes, ringtones for mobile phones, and subscription services, have become a new source of revenue for record companies, though these sources have not offset the decline in revenue from physical sales. Going forward, these new sources of sales and licensing will become an increasingly important component of record company revenues.

6. Satellite radio has become among the fastest growing subscription service in history. It is now a billion dollar per year industry with nearly 14 million subscribers and all signs point toward continued growth. XM and Sirius have established strategic partnerships with major corporations that help them make their services known to the public and increase their subscriber bases. They also continue to raise capital on increasingly favorable terms and expect to become profitable during the upcoming license period. In fact, the services themselves report that, by some measures, they are already profitable today.

7. The claim that satellite radio provides promotional benefits to the recording industry is merely an assertion, not a conclusion reached by systematic evaluation of the evidence. Rather the evidence suggests that satellite radio does not promote sales of sound recordings but, instead, is a substitute for such sales.

8. A market royalty rate negotiated and agreed to by the parties in the free market would satisfy the first three 801(b) statutory objectives in this case. With respect to the fourth objective—to minimize the disruptive impact on the structure of the industries—the concerns expressed by the Librarian in the 1996 proceeding involving the Pre-existing Subscription Services ("PES") that one or more of the PES was at risk of exiting the industry simply do not apply to the Services today. Conversely, the recording industry is in a more fragile position today than it was at the time of the previous proceeding. Thus, this factor does not favor the Services as it did the PES a decade ago.

III ASSESSMENT OF INDUSTRY TRENDS RELEVANT TO DR. WOODBURY'S ANALYSIS OF THE FOUR FACTORS

9. As new technologies have been introduced and adopted over the past decade, the music industry has undergone substantial change. Indeed, the introduction of satellite radio represents one of a number of important changes during this period in the distribution of recorded music through digital means. These changes have implications for the current and future economic health of both the recording industry and satellite radio industry, as the relative importance of satellite radio as a means of disseminating music is likely to grow significantly over time. As part of a rebuttal to Dr. Woodbury's assessment of the four statutory objectives, it is useful to assess industry trends occurring over the past decade.

A. Recording Industry Trends

10. Physical media, such as records, cassettes, CDs, and music DVDs, have traditionally served as the primary source of revenue for record companies. However, sales of CDs, which now comprise the vast majority of such sales, have been declining throughout this decade. **Appendix B** presents CD unit shipments from 1996 through 2006. The appendix shows that although CD shipments increased between 1996 and 2000, unit shipments from 2000 through 2006 declined by 35 percent, a rate of nearly 7 percent per year. By 2006, the number of CD units shipped was 20 percent below the number of units shipped ten years earlier. **Appendix C** presents the dollar value of CD shipments and shows a similar pattern, with the declining by 30 percent, or nearly 6 percent per year. This trend appears to have accelerated in the first part of 2007, according to *The Wall Street Journal*: "In a dramatic acceleration of the seven-year sales decline that has battered the music industry, compact-disc sales for the first three months of [2007] plunged 20% from a year earlier, the latest sign of the seismic shift in the way consumers acquire music."[1]

11. The decline in CD sales cannot be explained by overall economic activity. While the number of CD shipments fell by 35 percent between peaking in 2000 and 2006, Real U.S. Personal Consumption Expenditures, a broad measure of consumer spending, increased by 20 percent, or 3 percent per year. In addition, between 2000 and 2006, Real U.S. Gross Domestic

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[1] Smith, Ethan, "Sales of Music, Long in Decline, Plunge Sharply — Rise in Downloading Fails to Boost Industry," *The Wall Street Journal*, March 21, 2007, p. A1. See also, "Digital Music Sales Surge as CDs Continue to Slide," *The Wall Street Journal*, July 5, 2007, p. B3.

Product, perhaps the broadest measure of economic activity, increased by 16 percent, or 2.5 percent per year.[2]

12. **Appendix D** shows that formerly "non-traditional" sources of revenue, such as digital downloads and mobile ringtones, have grown substantially since 2004. These digital revenue sources include a host of new types of music products and services, ranging from digital downloads through services like Apple's iTunes, ringtones sold by cellular carriers, ad-supported music video services offered by Internet portals including AOL and Yahoo!, and monthly subscription services providing on-demand access to sound recordings like Rhapsody. And new services and types of services continue to come online. In combination, revenues attributable to digital music has grown at an annual rate of over 200 percent between 2004 and 2006. As such, as **Appendix E** shows, digital music has become an increasingly important source of revenue for record companies, increasing from approximately 1.5 percent of the total retail value of the U.S. recorded music industry in 2004 to more than 16 percent in 2006.

13. **Appendix F** shows that the substantial growth in digital music revenue has not offset the revenue that has been lost due to declining sales of more traditional physical media. As a result, the total retail value of the U.S. recorded music industry has declined at an annual rate of nearly 4 percent since 2000. These trends reflect an important change in the business model of record companies, and suggest that formerly "non-traditional" forms of revenue will continue to grow in significance in the future. Indeed, there appears to be no dispute among record companies, commentators, and others that the decline in physical sales will continue, if not accelerate, and the recording industry will increasingly depend on receiving sufficient compensation from digital revenue sources, including satellite radio.

14. It is well known that the vast majority of record albums never earn a profit. In fact, industry estimates indicate that approximately 90 percent of sound recordings never recover their costs.[3] As a result, a relatively small fraction of albums that are released provide the funding source for investments into the production of all other albums—investments that are necessary to create the wide portfolio of albums released each year. Because of the highly skewed distribution of album profits, the recent decline in album sales has important implications for the overall profitability of the recording industry.

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[2] Bureau of Economic Analysis, "Table 1.1.6 Real Gross Domestic Product, Chained Dollars," http://www.bea.gov, visited on July 21, 2007.

[3] Written Direct Testimony of Michael Kushner, p. 14.

15. In many respects, the economics of the recording industry mirrors that of other R&D-intensive industries, such as biotechnology or pharmaceuticals, where relatively few products are successful, but those successful products provide the revenue streams necessary to fund all R&D activities. An important driver of profits in the recording industry is the existence of highly-profitable blockbuster albums. It is therefore relevant that declining CD sales over the recent period appear to be particularly pronounced among these blockbuster albums. One way this trend can be seen is by considering the change over time in the number of album sales necessary to gain the Number 1 weekly ranking, which has fallen in just the past few years. This trend has been discussed in *The Wall Street Journal*:

> In recent weeks, the music industry has posted some of the weakest sales it has ever recorded. This year has already seen the two lowest-selling No. 1 albums since Nielsen SoundScan, which tracks music sales, was launched in 1991. One week, [the No. 1 album] sold just 65,000 copies ... another week, the [No. 1 album] sold a mere 60,000. As recently as 2005, there were many weeks when such tallies wouldn't have been enough to crack the top 30 sellers. In prior years, it wasn't uncommon for a No. 1 record to sell 500,000 or 600,000 copies a week.[4]

16. A broader measure of blockbuster status in the recording industry is whether an album is certified gold or platinum by the Recording Industry Association of America, the RIAA. **Appendix G** presents the number of albums that were certified at least gold (i.e., gold, platinum, multi-platinum, and diamond) in 1996 through 2006. As the appendix shows, the number of these albums has declined substantially, from 710 in 1996, peaking at 861 in 1999, and then declining to 406 in 2006. This trend was also discussed recently in *The Wall Street Journal*:

> Selling enough records to reach gold or platinum status (500,000 and one million, respectively) is one of the music industry's most coveted accomplishments. But with sales slowing, the Recording Industry Association of America last year certified just 407 albums and singles as gold or platinum—down from 976 in 1999.[5]

17. The decline of highly successful albums cuts deeply into the profits available to record companies for further investment in the creation of new sound recordings.

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[4] Smith, Ethan, "Sales of Music, Long in Decline, Plunge Sharply — Rise in Downloading Fails to Boost Industry," *The Wall Street Journal*, March 21, 2007, p. A1.

[5] "Gold Bust: When the Hit Parade Slows — The Music Industry's Slump Spills onto Makers of Commemorative Records," *The Wall Street Journal*, June 2, 2007, p. P1.

18. While record companies have seen their revenue picture become increasingly uncertain, the costs of creating sound recordings have not changed significantly or have increased.[6] The result has been significant dislocation in the recording industry, with widespread lay-offs of personnel and reductions in artist rosters.[7]

B. Satellite Radio Industry Trends

19. The trends observed in the satellite radio industry are entirely different from those of the recording industry. **Appendix H** shows that both XM and Sirius have grown rapidly since 2002, with annual growth rates exceeding 100 percent and 200 percent, respectively. Although XM has had more subscribers than Sirius since its launch, Sirius' subscriber base has grown more rapidly in recent years. By the end of 2006, the Services had nearly 14 million subscribers, and they forecast more than 17 million subscribers by the end of this year.[8] XM and Sirius have claimed that they are one of the fastest growing subscription products in history and also among the fastest growing audio products in terms of consumer adoption in history, adopted by consumers faster than radio, television, satellite television, CD players, and mp3 players.[9]

20. The popularity of satellite radio has transformed it into a billion dollar industry. **Appendix I** shows that XM and Sirius have each realized more substantial annual growth in revenues than in subscribers. The difference in growth relative to subscribers is attributable to increases in average revenue per subscriber and the amount of revenue sources other than subscription fees, such as advertising revenues—which themselves depend on subscriber growth. As XM and Sirius continue to increase their subscriber bases, it is likely that advertising revenue will continue to increase as well since each service will be able to deliver a larger and more valuable audience to advertisers. These trends suggest a favorable outlook for the satellite radio industry. Indeed, according to the consensus analyst projections reported by Mr. Butson, by the end of the license period, the Services will have combined

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6 Written Direct Testimony of Michael Kushner, p. 19.

7 Written Direct Testimony of Michael Kushner, p. 13-21.

8 XM Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/33658, posted April 26, 2007; Sirius Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/34119, posted May 1, 2007.

9 "XM Satellite Radio Tops One Million Subscribers," XM Press Release, October 27, 2003; "Sirius Satellite Radio Ends 2005 With More Than 3.3 Million Subscribers," Sirius Press Release, January 5, 2006.

revenues of over $5 billion,[10] which is nearly half the retail value of the entire U.S. recorded music industry today—which is in the midst of a prolonged decline.

21. In sum, the trend for satellite radio is highly favorable. Satellite radio's business model is one marked by high fixed costs and low variable costs, resulting in high incremental margins. Because the Services do not incur high costs as they acquire new subscribers, each additional subscriber adds significantly to the bottom line. Once the Services reach a sufficient number of subscribers, which is expected within the term of this license, they will be highly profitable.[11]

C. Claimed Promotional Effect of Airplay on Satellite Radio

22. Much has been made of the potential promotional effect on CD sales of airplay on satellite radio, and that claimed promotional effect is a linchpin for much of Dr. Woodbury's analysis of the four statutory factors. Among other things, Dr. Woodbury states, "there is no evidence to support the proposition that satellite radio listenership displaces any CD or download sales, let alone by a large enough amount to offset the *substantial* promotional benefits."[12] The

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[10] Butson Written Rebuttal Testimony, Appendix C.

[11] Stifel Nicolaus projects both XM and Sirius to "become highly profitable within 5 years" (Spring, Kit, "Satellite Radio: April NPD Retail Data Unlikely to Wow; But Tracking in Line," Stifel Nicolaus Media and Internet, May 23, 2007). Stifel Nicolaus also projects Sirius will have over $1 billion in cash flow from operations by 2012 ($950 million net of capital expenditures) (Spring, Kit, "Updated Model and Thoughts: Maintain Buy and $5 Target," Stifel Nicolaus, May 7, 2007); Sirius projects that it will realize $1 billion in free cash flow two years earlier, in 2010 (Sirius Satellite Radio, "Wachovia Securities Nantucket Equity Conference," June 19, 2006, SIR0010319-SIR00010338; Sirius Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/34119, posted May 1, 2007); Sirius Satellite Radio, "Investor Presentation: $250 Million Senior Notes, March 2005," SX Trial Ex. 41 (SIR00014930-SIR00014969). For XM, Cowen and Company projects XM to have $995 million in pre-marketing cash flow by 2010 (Watts, Tom and Shaun Parvez, "XM Satellite Radio: Q1: Weak Net Adds, Financials In-line. Our Positive Thesis Still Intact," Cowen and Company, April 26, 2007).

[12] Woodbury Written Direct Testimony, p. 47 (emphasis added) To support this statement, Dr. Woodbury cites to *some* of the growing literature on music downloading and file sharing stating, "[o]n music downloading, there is no clear consensus on the direction or magnitude of the effect of downloading on CD sales. ... If downloading has no clear displacement effect or effect on artists' incomes, then it seems even less likely that listening to satellite radio would lead to displacement" (Woodbury Written Direct Testimony, fn. 89). Although it is true that this body of literature is still developing, Dr. Woodbury has ignored recent published research pointing to a clear displacement effect from such activity. See, for example, Liebowitz, Stan J. "File Sharing: Creative Destruction or Just Plan Destruction?" *Journal of Law & Economics*, Vol. XLIX, April 2006, pp. 1-28; Rob, Rafael and Joel Waldfogel, "Piracy on the High C's: Music Downloading, Sales Displacement, and Social Welfare in a Sample of College Students," *Journal of Law & Economics*, Vol. XLIX, April 2006, pp. 29-62; and Zentner, Alejandro, "Measuring the Effect of File Sharing on Music Purchases," *Journal of Law & Economics*, Vol. XLIX, April 2006, pp. 63-90. In combination with the studies cited by Dr.

basis for Dr. Woodbury's statements about the promotional effect of satellite radio airplay is purely anecdotal and based on flawed logic.

23. Most fundamentally, Dr. Woodbury's analysis falls prey to the *fallacy of composition* by attempting to infer the effect of satellite radio airplay on overall CD sales from the behavior of individual record companies, stating "[t]he best evidence of the effect of airplay on satellite radio on the sales of CDs is the behavior of the labels themselves and that behavior is to get more airplay."[13] But while individual record companies or artists may be able, in some circumstances, to increase their sales through airplay, particularly if the artist is new or relatively unknown, it does not necessarily follow that overall sound recording sales would expand from such airplay. Although conventional wisdom suggests that airplay on *terrestrial radio* is among the most important drivers of album sales, one must account for the many activities undertaken by record companies (e.g., touring, print and television advertising, in-store marketing, radio and television appearances by artists, music videos) as part of a promotional campaign conducted in conjunction with seeking terrestrial radio airplay to identify the independent effect of terrestrial radio airplay. Recent empirical research that attempts to estimate this relationship indicates that, overall, terrestrial radio actually displaces sales of sound recordings in other distribution channels, implying that such airplay acts as a substitute rather than a complement in aggregate.[14] To the extent that airplay acts as a promotional device for individual record companies, artists, or albums, there is research suggesting that the effect of terrestrial radio airplay is likely to be heterogeneous—i.e., it may help some artists and harm others.[15]

24. To the extent that satellite radio airplay provides promotional benefits to individual artists based on discrete promotional activities, it makes sense to allow individual record companies

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Woodbury, the balance of evidence points to an economically important displacement effect from music downloading and file sharing.

[13] Woodbury Dir. Test., Vol. VI, p. 331. See also, Woodbury Written Direct Testimony, pp. 44-45.

[14] See, for example, Liebowitz, Stan J., "Don't Play it Again Sam: Radio Play, Record Sales, and Property Rights," Unpublished Working Paper, January 5, 2007; Liebowitz, Stan J., "Measuring the Impact of Radio Play on Record Sales," Unpublished Working Paper, September 24, 2006; and Liebowitz, Stan J., "The Elusive Symbiosis: The Impact of Radio on the Record Industry," *Review of Economic Research on Copyright Issues*, Vol. 1 (1), 2004, pp. 93-118.

[15] See, for example, Montgomery, Alan L. and Wendy W. Moe, "Should Music Labels Pay for Radio Airplay? Investigating the Relationship Between Album Sales and Radio Airplay," Unpublished Working Paper, August 2002 and Moe, Wendy W. and Peter S. Fader, "Modeling Hedonic Portfolio Products: A Joint Segmentation Analysis of Music Compact Disc Sales," *Journal of Marketing Research*, Vol. XXXVIII, August 2001, pp. 376-385.

and/or artists to enter into agreements with the Services for such promotions (possibly at lower royalties or for other consideration), rather than to assume without any basis that airplay benefits all artists generally. Indeed, I understand that such agreements are negotiated between record companies and satellite radio companies for particular promotions, such as Sirius' agreement with Sony BMG to broadcast "Bruce Springsteen & The E Street Band Channel." In some circumstances, those agreements may require the satellite radio companies [ ][16]

25. Dr. Woodbury relies on excerpts from subscriber e-mails as further evidence of the promotional benefits associated with airplay on satellite radio. In doing so, Dr. Woodbury attempts to extrapolate from statements in a dozen or so emails to the behavior of 14 million satellite radio subscribers. This kind of anecdotal evidence provides no evidence on the point. That *some* people purchase a CD after hearing songs played on satellite radio does not provide evidence on whether the Services have a promotional effect on CD sales overall because it does not account for those who would have purchased a CD in the absence of satellite radio or for the net effect of satellite radio on sales overall. Even the emails that Dr. Woodbury quotes provide contrary evidence. For example, one of the emails Dr. Woodbury cites as evidence of promotion says "'When I bought my XM, the salesman told me I would no longer need my CD's.'"[17] When asked about this particular statement, Dr. Woodbury simply said that "[the salesman] was wrong."[18] In fact, Dr. Woodbury undermines his own conclusion by stating that the question he "was addressing was obviously the broader question of overall, what's the net effect on CD purchases,"[19] a question that even Dr. Woodbury recognizes a few emails cannot answer. It should not be difficult to find examples of subscribers who have reduced their CD purchases. For example, XM's own website highlights an email from a new subscriber who wrote "No more need to ever buy another CD."[20] Despite Dr. Woodbury's assertions, I am not aware of any empirical evidence to support the promotional effect of satellite radio.

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16 SE0005536-SE005539.

17 Woodbury Written Direct Testimony, fn. 87.

18 Woodbury Dir. Test., Vol. VI, p. 337.

19 Woodbury Dir. Test., Vol. VI, p. 336.

20 SX Trial Ex. 4, p. 1.

26. In any case, notwithstanding the claimed promotional benefits of terrestrial radio, there is no basis for concluding that satellite radio has the same effect on sales. Indeed, there is evidence pointing in the opposite direction—that there is no promotional effect of satellite radio airplay and that satellite radio's net effect is in fact substitutional. This evidence is consistent with the research presented by Professor Wind and Mr. Mantis, research that demonstrates that satellite radio has a measurable displacement effect on CD sales.[21]

27. Outside of this proceeding, XM and Sirius acknowledge and even embrace the substitutability of other audio entertainment services. In the context of the proposed merger of XM and Sirius, Counsel for XM states, "Satellite Radio is a Small Part of a Highly Competitive and Ever-Expanding Market for Audio Entertainment."[22] Among the products listed as substitutes for satellite radio are: terrestrial radio, HD radio, Internet radio, iPods and other MP3 players, mobile phones, and CD players.[23] Importantly, with respect to CD players, Counsel for XM and Sirius state, "[c]ompact discs have provided competition for satellite radio since the [Federal Communications] Commission first authorized this service," as is depicted in **Appendix J**.[24] Such statements directly contradict the Services' arguments in this proceeding that rely on the alleged promotional effect on CD sales of satellite radio airplay.

28. While sales of physical media, such as CDs, and satellite radio may not serve as perfect substitutes, they are at least partial substitutes and, in any case, satellite radio is an even more complete substitute for a variety of digital revenue streams that are growing in the marketplace. For example, a portable satellite radio device sold by XM or Sirius can be a close substitute for webcasting to a personal computer and for webcasting subscription services sold over cellular networks. It is worth noting that XM and Sirius themselves compete directly with those services: XM offers its subscription XM Radio Online webcasting service to personal computers for $7.99 per month for more than 70 music channels;[25] Sirius also offers a subscription webcasting service, Sirius Internet Radio, for $12.95 per month for all of Sirius' music channels and some (but not all) of Sirius' non-music

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21 Wind Written Rebuttal Testimony, pp. 2-5, 13-16; Mantis Written Rebuttal Testimony.

22 XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc., Consolidated Application for Authority to Transfer Control, March 20, 2007, p. 21.

23 XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc., Consolidated Application for Authority to Transfer Control, March 20, 2007, p. 21-38.

24 XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc., Consolidated Application for Authority to Transfer Control, March 20, 2007, p. 37.

25 http://xmro.xmradio.com/xstream/index.jsp; http://xmro.xmradio.com/xstream/channel_lineup.jsp, both visited on July 18, 2007.

channels.[26] In addition, XM now offers 20 music channels over Alltel's cellular network for $7.99 per month, and Sirius offers 20 of its music channels over Sprint's cellular network for $6.95 per month.[27]

29. XM and Sirius compete with on-demand subscription services, such as Rhapsody. The potential substitution and impact on record company revenues of satellite radio can be seen by a simple example. Satellite radio costs subscribers $12.95 per month. Other consumer subscription services similar to the Services in price are portable on-demand subscription services including Yahoo! Music Unlimited or Rhapsody To Go, whose prices range from $12 to $15 per month. Record companies receive approximately [[redacted]] per subscriber per month, or [[redacted]] of the monthly subscription fee from portable on-demand subscription services.[28] If even 25 percent of consumers looking to spend $12.95 per month on music choose satellite radio over Rhapsody To Go or a similar portable subscription service, record companies will lose a significant sum unless the royalties received from satellite radio are approximately [[redacted]] per subscriber per month.

30. Given this substitutability and the increasing importance of this new revenue stream to record companies, satellite radio almost certainly displaces other revenues streams for the record companies. Thus, much of Dr. Woodbury's analysis of the four factors falls apart because he relies so heavily on the claimed "promotional" effect in his analysis of several of the factors. In particular, the strong evidence of substitution means that the "contribution" of the Services is reduced and the risks that record companies incur because of satellite radio are increased.

IV RESPONSE TO DR. WOODBURY'S EVALUATION OF THE STATUTORY OBJECTIVES

31. It is my understanding that the Copyright Royalty Judges ("CRJs") are obligated to evaluate the following statutory objectives in determining a proper royalty rate: (1) to maximize the availability of creative works to the public; (2) 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; (3) to reflect the relative roles of the copyright owner and the copyright user in

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26 http://www.sirius.com/servlet/ContentServer?pagename=Sirius/Page&c=FlexContent&cid=1158082415620; http://www.sirius.com/wo/i/channel-popup/index2.html, both visited on July 18, 2007.

27 http://alltel.com/axcess/tv_radio.html?id=0; http://www1.sprintpcs.com/explore/ueContent.jsp?scTopic=sirius&PCode=vanity:sirius, both visited on July 19, 2007.

28 Ordover Written Rebuttal Testimony, pp. 9-10.

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 (4) to minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices.[29] Dr. Woodbury provided his view on the application of these factors. Below, I evaluate several of his conclusions.

32. It is also my understanding that Section 801(b) requires the setting of "reasonable terms and rates" consistent with the statutory factors specified by Congress. The factors themselves do not specify the starting point for setting a rate based on those factors, but cases interpreting the statute have used as a starting point a market rate or range of market rates that can then be adjusted based on the statutory factors. As the Librarian described in the last case decided under Section 801:

> [T]he Panel considered the parties' presentations of different rates negotiated in comparable marketplace transactions and first determined whether the proposed models mirrored the potential market transactions which would take place to set rates for the digital performance of sound recordings.[30]

33. It appears that in the written direct testimony, all of the economists in this case agree that the Court should first identify through marketplace benchmarks what rate would be set if the license were "negotiated at arms-length."[31] Indeed, Dr. Woodbury in his testimony in both this proceeding and in the PES I proceeding, has indicated that the rates that would be negotiated in a free market between willing buyers and willing sellers is the place to which most economists would look in setting a rate under the 801(b) factors and that a market rate is critical to assessing the "reasonableness" of any rate adopted.[32]

34. I understand, however, that Dr. Woodbury has modified his opinion on this issue. In his oral testimony in this proceeding, Dr. Woodbury suggested that it is better to start with a rate that is not a market rate, but one that instead relates to a different service and that has already been adjusted to account for the Section 801(b) factors as applied to that other service, i.e.,

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[29] 17 U.S.C. 801(b)(1).

[30] Library of Congress, Copyright Office 37 CFR Part 260, Docket No. 96-5 CARP DSTRA, *Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings,* Federal Register, Vol. 63, No. 89, 25394, May 8, 1998 ("PES I Librarian's Decision"), p. 25399.

[31] Woodbury Written Direct Testimony, p. 3; Ordover Written Direct Testimony, p. 35; Pelcovits Written Direct Testimony, p. 5.

[32] Testimony of John R. Woodbury, *In re: Determination of Statutory License Terms for Certain Digital Subscription Transmissions of Sound Recordings*, No. 96-5, Sept. 9, 1996, pp. 4.

the PES rate.[33] As an initial matter, that does not appear to me to be the way the Librarian interpreted the Section 801(b) factors in the last proceeding. Rather than starting from a rate for an entirely different service that was adjusted for the 801(b) factors based on circumstances that may have no application at all to the service at issue, the Librarian started by attempting to estimate a market rate for the service at issue and then adjusted the rate based on the factors. From an economic perspective, starting by estimating a market rate for the services and license period at issue makes more sense and appears to be consistent with at least the first three factors of the statutory framework, which reflect considerations that would likely be incorporated in a market rate. In contrast, starting with an entirely different service based on a rate established by analysis of the four factors at an entirely different time and based on a set of circumstances unique to the other service (here the PES) does not make sense as an economic approach here. It is my understanding that the Librarian in the PES I proceeding and the Register have suggested the previously-determined Section 801(b) rates generally reflect specific facts and circumstances of the particular service and one cannot easily generalize from one time period and one service to another because "a future [tribunal] may reach an entirely different result based on the then-current economic state of the industry and new information on the Services impact on the marketplace."[34] I believe that Dr. Woodbury's original opinion—that the CRJs should start with a market rate and then make adjustments consistent with the statutory factors—is a better approach.

35. Professor Ordover has concluded that the first three statutory factors would generally be captured by a market rate.[35] I agree with Professor Ordover's conclusion. Indeed, this understanding appears to be consistent with the court decisions interpreting the factors, which have suggested that the first three factors address marketplace concerns, while the last factor does not.[36] Thus, the outcome of analysis of the four factors may result in something other than a market rate—effectively a subsidy for one side or the other. Under some circumstances, the factors may suggest no adjustment to a market rate. In others, they may lead to a subsidy for the Services by leading to a below-market rate for some or all of the

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[33] Woodbury Dir. Test., Vol. VII, pp. 72, 75.

[34] Library of Congress, Copyright Office 37 CFR Part 201, Docket Nos. RF 2006-2 and RF 2006-3, Designation as a Preexisting Subscription Service, Federal Register, Vol. 71, No. 213, 64639, November 3, 2006, p. 64641, n. 7.

[35] Ordover Written Direct Testimony, p. 12.

[36] *Amusement and Music Operators Ass'n v. Copyright Royalty Tribunal*, 676 F.2d 1144, 1157 (7th Cir. 1982).

license period; alternatively, they may lead to a subsidy for the copyright owners and performers by leading to a price support for sound recordings for some or all of the license period. Although application of the factors could theoretically lead to an above-market price support for sound recordings, I understand that the Librarian has suggested that an above-market rate is unlikely to obtain.[37]

A. Maximize the Availability of Creative Works to the Public

36. In the previous proceeding involving the PES, the Librarian concluded that this factor favored the copyright owners, stating "the record companies and the performers make the greater contribution in maximizing the availability of the creative works to the public."[38] That is, the Librarian concluded that assuring that copyright owners and performers are fully compensated for their efforts is the best way to encourage the creation of additional recordings. It is my understanding that in the recent Webcasting decision, the Court recognized that creation is an ongoing process that requires ongoing investment—investment that will only be made if there are fair returns to record companies and performers.[39]

37. It is important to recognize that the sound recording is the scarce resource in this case. As is clear from the work of Professor Wind—and the Services' own survey research—sound recordings contribute significant value to satellite radio.[40] Indeed, the Services likely could not exist if not for the sound recordings. The Services began as predominantly commercial-free music services. Today, even though the services offer a wide array of non-music channels, sound recordings remain the bulk of their programming and constitute a significant amount of their listening.

38. Indeed, sound recordings are even an important part of their programming on non-music stations. Music pervades many of the channels that fall outside of the category of the

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[37] *Recording Industry Association of America v. Librarian of Congress,* 176 F.3d 528, 534 (D.C. Cir. 1999).

[38] PES I Librarian's Decision, p. 25407.

[39] Library of Congress, Copyright Royalty Board, 37 C.F.R. Part 380, Docket No. 2005-1 CRB DTRA, *Digital Performance Right in Sound Recordings and Ephemeral Recordings*, Federal Register, Vol 72, 24084, May 1, 2007 ("Webcasting II"), p. 24094.

[40] Wind Written Direct Testimony, as Amended; XM's internal research finds that subscribers spend 62 pecent of the time listening to XM listening to music programming (SX Trial Ex. 10); Sirius's internal research finds that if music were removed, 80 percent of subscribers would either cancel their subscription or spend more time listening to terrestrial radio (SX Trial Ex. 33, p. 5); see also SX Trial Ex. 35 and SX Exhibit 125 DR (attached to Wind Amended Testimony), which reflect the Services' internal research showing the importance of music.

Services' commercial-free music channels, setting the tone or theme of a program or even filling entire programming blocks. To examine the importance of music in so-called non-music programming, I looked to the channel programming schedules posted on the Services' websites. Many "non-music" channels, including some of the most popular channels, include large blocks of music programming.

39. To take one example, Sirius OutQ Radio, [ ].[41] Although Sirius classifies this channel under its "entertainment" listings, an examination of the weekly programming schedule reveals that Sirius OutQ Radio plays at least 61 hours of music programming every week—more than one-third of every week's regularly scheduled programming.[42] During the week, Sirius OutQ Radio features "a collection of music exclusively by GLBT artists, or bands with at least one member who is openly gay, lesbian, bisexual or transgender."[43] And each weekend, Sirius OutQ highlights the top twenty songs by GLBT artists, and "showcase[s] ... cutting-edge and classic recordings by gay and gay-interest artists from all over the world."[44]

40. Several other non-music channels classified as "entertainment" channels use music as part of their programming. For example, the Maxim Radio channel—[ ],[45]—devotes at least 38 hours of weekly programming exclusively to music.[46] Sirius recognizes the importance of music during its non-music entertainment programs, as highlighted in the following email excerpt:

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41 TNS, "SIRIUS Satellite Radio Listener Study: Wave 2," October 2006, SX Exhibit 112 DR (attached to Wind Amended Testimony) (SIR00025607-SIR00025752), p. 29.

42 "Sirius OutQ Radio," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/CachedPage&c=Channel&cid=1104779631490, visited on July 19, 2007.

43 "Sirius OutQ Radio Programming," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/Page&c=Channel&cid=1104779631490&s=prog, visited on July 19, 2007.

44 "Sirius OutQ Radio Programming," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/Page&c=Channel&cid=1104779631490&s=prog, visited on July 19, 2007.

45 TNS, "SIRIUS Satellite Radio Listener Study: Wave 2," October 2006, SX Exhibit 112 DR (attached to Wind Amended Testimony) (SIR00025607-SIR00025752), pp. 53-64.

46 "Maxim Radio," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/CachedPage&c=Channel&cid=1104779630540, visited on July 19, 2007.

[ ][47]

41. Two new channels, Cosmo Radio and Road Dog Trucking, also rely heavily upon music programming. Cosmo Radio broadcasts at least 29 hours of programming that features music each week, showcasing the "hottest hits" for four hours each weekday as well as "set[ting] the mood for love" for 9 hours every Saturday night into Sunday morning.[48] Road Dog Trucking broadcasts at least 53 hours every week devoted to music or a combination of music and comedy.[49] Finally, the "Ferrall" show on Howard 101 (which also is a channel that began in 2006) broadcasts live and in replay 43 hours each week, featuring mostly popular music in the background nearly constantly throughout the program.[50]

42. Likewise, XM also relies heavily on music programming for more than just their commercial-free music channels. In particular, XM has five channels that are programmed by ClearChannel, carry commercials and are classified as "Regional, News, Talk, and Music Channels."[51] However, these channels are essentially rebroadcasts of terrestrial radio stations that focus on specific genres of music.

43. These examples show that a significant amount of the programming on non-music channels is largely indistinguishable from programming on music-format radio stations. In addition to the review of program schedules showing program blocs that are almost exclusively music, I also reviewed how music is used more generally on certain XM and Sirius non-music channels. In **Appendix K**, I report the results of a study of the Services' use of music on its most popular Entertainment, Sports, and Talk/News channels. This research reveals that both

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47 E-mail excerpt from J.J. Jeffries to Steve Blatter, June 13, 2005 (SIR00016491-SIR00016492).

48 "Cosmo Radio," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/CachedPage&c=Channel&cid=1138308146011, visited on July 19, 2007.

49 "Trucking Radio," Sirius Satellite Radio, http://www.sirius.com/servlet/ContentServer?pagename=Sirius/CachedPage&c=Channel&cid=1104779630449, visited on July 19, 2007.

50 According to Sirius' market research, [ ] of its subscribers listen to Howard 101 in a given week, [ ] (TNS, "SIRIUS Satellite Radio Listener Study: Wave 2," October 2006, SX Exhibit 112 DR, attached to Wind Amended Testimony, SIR00025607-SIR00025752, p. 88).

51 "Mix," XM Satellite Radio, http://www.xmradio.com/onxm/channelpage.xmc?ch=mix, visited on July 22, 2007.

XM and Sirius use sound recordings, including those of popular works, in a wide variety of ways, on a broad range of channels and programming.

44. Copyrights provide creators of sound recordings an exclusive property right for the exploitation of such works. The purpose of conferring this exclusive property right is to provide an incentive for the production of creative works. In the previous proceeding, the Librarian noted, "'[t]he immediate effect of our copyright law is to secure a fair return for an 'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good.'"[52] That is, all else equal, higher copyright rates should lead to increased production of creative works.

45. Record companies undertake numerous investments and incur substantial costs identifying and developing new talent, along with promoting and distributing new creative works. For example, Howard Vogel writes that in addition to talent acquisition costs, record companies incur significant expenses related to the production of sound recordings, including studio time and equipment use fees; producers, engineers and backup musicians' fees; and artwork and marketing expenses. Further, the record companies must create and maintain a well-organized distribution network. Mr. Vogel further notes, "[w]ith the rate of project failure so high, and with all but the most successful recorded music products having a relatively short life cycle, lasting at most a few months, there is no room for distribution inefficiency; it is essential that retailers located over a wide geographic swath have their inventories of hits quickly replenished."[53] These investments are necessary to continually enhance the availability of creative works available to the public. Should the record companies' traditional and new sources of revenue continue to decline, they would be unable to recover the costs associated with continuing to make creative works available to the public, unless other sources of revenue emerge. As a result, record companies would likely decrease those investments, thereby leading to a reduction in the availability of these creative works.

46. The costs expended by record companies to identify, develop, and promote artists are significant and must be recouped from all of the different revenue sources that record

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[52] PES I Librarian's Decision, p. 25406.

[53] Vogel, Harold L., *Entertainment Industry Economics,* 5th Edition, Cambridge University Press, 2001, pp. 160-166. See also, Brabec, Jeffrey and Todd Brabec, *Music Money and Success, The Insider's Guide to Making Money in the Music Industry,* Schirmer Trade Books, 2004, pp. 85-89, which notes that record companies incur expenses and bear risks associated with videos, promotion, touring and recording; and Passman, Donald S., *All You Need To Know About the Music Business,* 5th Edition, Free Press, 2003, Chapter 7, which lists artist and repertory, sales, marketing and promotion, product management, production and distribution as some of the primary functions of the record label.

companies have. As Mr. Kushner from Atlantic Records explained, those costs can be as significant as, or more significant than, they have been in the past; yet earning sufficient revenue is more difficult than ever for many of the reasons discussed above. The reductions in staff and artist rosters at Atlantic over the last several years demonstrates an obvious point—a decline in the ability to earn a fair return on sound recordings results in the signing of fewer artists, fewer sound recordings being made, and/or reduced investment in future sound recordings. Should this trend continue, the record companies may not be able to develop new artists and expand their libraries of creative works as they have in the past.

47. That satellite radio revenues are today a small portion of record companies' overall revenue stream provides no basis to argue for a low royalty rate. Record companies have traditionally recovered the costs of promoting creative works through the sales of CDs and other recordings and through licensing revenues. Because traditional revenue sources continue to decline, revenue from licensing becomes increasingly critical to recovering the costs and increasing the availability of creative works and maintaining the level and variety of recorded music currently enjoyed by the public.

48. Moreover, the claim made by the Services that the royalty rate should be low because satellite radio revenue is a small portion of record company revenues misses the point: Music is the scarce resource and music adds significant value to satellite radio. Again, this line of argument is subject to a fallacy of composition—that is, if such an argument were accepted individually for each of the many new products record companies now produce, the overall level of revenues earned by record companies would fall below the level necessary to maintain the investments that encourage the creation of new music. Such an argument also ignores other real world evidence to the contrary. Consider, for example, on-demand subscription services: Those services provide a relatively small percentage of overall revenue to the record companies and yet pay a high percentage of their total revenue to record companies,[54] reflecting the value that sound recordings provide to those services.

49. In addition, recent history from other digital services casts doubt on the notion that a revenue stream like satellite radio will stay small over the course of the licensing period at issue in this proceeding. For example, in 2002, iTunes did not exist and virtually no one had heard of ringtones. By February 2006, the iTunes store had sold one billion songs, and by January

[54] Eisenberg Dir. Test., Vol. IX pp. 155-158, 161-162, 221.

2007 it had sold a billion more.[55] Today, digital downloads such as those offered by iTunes, subscription services, and ringtones contribute over a billion dollars in revenue annually to the record companies.[56] These examples show that earning a fair return on each revenue stream, no matter how small today, is critical to the survival of the record companies. This may be especially true given the pace of change in the music industry and the changes that are likely to take place through 2012.

50. In contrast, although the Services use an enormous amount of music, it is not clear how they increase the dissemination of that music. In the PES I proceeding, the Librarian rejected the assertion that "a new mode of distribution will itself stimulate the creation of additional works" as without foundation.[57] Dr. Woodbury argues that the Services expand the distribution of music because they play sound recordings not played by terrestrial radio.[58] This argument ignores the Services' other competitors—competitors whom the Services emphasize when seeking approval for the proposed merger. As discussed above, the Services, in documents related to their proposed merger, acknowledge that they compete directly with other music services, like iTunes and Rhapsody, each of which disseminate a large array of music. With or without satellite radio, this music is available to consumers on a wider array of platforms and services than ever before.

51. Dr. Woodbury's second argument—that the Services actually expand the supply of sound recordings because the Services promote the sale of sound recordings in other distribution channels—is repeated throughout his testimony without any empirical support. As discussed above, however, the assumption that the Services are on balance promotional for sound recordings runs counter to the empirical evidence.

52. Dr. Woodbury cites the Services' surveys indicating that satellite radio subscribers reduce their listening to terrestrial radio, but in concluding that the Services promote sales he appears to ignore the fact those same surveys show that subscribers reduce their consumption of CDs and digital downloads.[59] Dr. Woodbury's assertion that satellite radio promotes sales of sound recordings completely ignores the fact that these surveys show that satellite radio

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[55] See "A Nice Number for iTunes: One Billion," *CNNMoney.com*, February 24, 2006; "iTunes Store Tops Two Billion Songs," Apple Computer Press Release, January 9, 2007.

[56] "2006 Year End Shipment Statistics," RIAA, http://www.riaa.com/keystatistics.php, visited on June 19, 2007.

[57] PES I Librarian's Decision, p. 25406.

[58] Woodbury Written Direct Testimony, p. 42.

[59] Woodbury Written Direct Testimony, Exhibit 11.

almost certainly leads to fewer sales and less revenue for record companies—unless of course the Services pay a royalty rate set in this proceeding that compensates for this loss. In addition, as discussed above, actual empirical evidence discussed in the testimony of Professor Wind and Mr. Mantis indicates that satellite radio listeners do in fact purchase less recorded music.[60] Thus, use of the Services would actually result in record companies losing money unless the level of compensation is significantly higher than that proposed by the Services.

53. Consideration of this factor strongly suggests that a reasonable rate would be at the higher end of the range. The reason is simple: music is the scarce resource and the copyright owners make more significant contributions to the creation of new music. In addition, I am aware of no evidence demonstrating how the Services themselves lead to an increased availability of creative works. Importantly, a rate set at the higher end of the reasonable range provides an incentive to create new music, which is consistent with the promotion dynamic efficiency because doing so allows the copyright owner to recoup up front investments necessarily associated with the creative process. Without such an incentive, it is likely that at least some music valued by consumers would not be created in the first place. There is no basis under this factor to depart from the range of rates that one would expect to see in a competitive marketplace, where, as Professor Ordover has testified, a rate would reflect both the services' and the copyright holders' needs to operate profitably based on the consumers' willingness to pay for the service.[61]

B. Afford the Copyright Owner a Fair Return for his Creative Work, and the Copyright User a Fair Income under Existing Economic Conditions

54. Creation of a digital performance right "affords the copyright owners some control over the distribution of their creative works through digital transmissions, then balances the owners' right to compensation against the user's need for access to the works at a price that would not hamper their growth."[62] In the PES I proceeding, the Librarian found that this factor is satisfied when a rate is set after considering marketplace benchmarks and weighing all the record evidence in light of the statutory objectives.

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[60] Wind Written Rebuttal Testimony, pp. 13-23; Mantis Written Rebuttal Testimony, Figures 1, 3.

[61] Ordover Written Direct Testimony, pp. 22-25; Ordover Dir. Test., Vol. XII, pp. 103-106.

[62] PES I Librarian's Decision, p. 25409.

55. This factor also points to market rates. In particular, a fair result would examine the compensation that sound recording copyright owners regularly receive in the marketplace and would examine the amounts that the Services freely pay for content to non-music providers. Both of these benchmarks, examined by Professor Ordover and Dr. Pelcovits, are highly relevant to the fairness of any rate set here because they represent free decisions by each side about, on the one hand, the value of their own content, and, on the other hand, the value of content to the Services' business.

56. Dr. Woodbury suggests a "fair" return to record companies and performers would be a rate near the "zero" paid by terrestrial radio. In addition to ignoring that the lack of payments by terrestrial radio is a matter of history and congressional policy, not of fairness or based on any empirical evidence, Dr. Woodbury again ignores the evidence that satellite radio substitutes for other types of music consumption from which record companies do receive compensation. Indeed, if satellite radio listeners stop listening to terrestrial radio altogether, but also buy between two and three fewer CDs per year, record companies would lose money because of satellite radio[63]—again, unless the royalties in this proceeding are set at a sufficient level. This is not to say that a fair return is one that merely makes up for the amount record companies lose in other channels due to satellite radio. A market rate, which is the best measure of this factor, would very likely exceed a rate that merely compensates record companies for the lost revenue due to substitution, leaving the record companies indifferent to satellite radio. Rather, a market rate would likely make both record companies and the Services better off with each other than without.

C. Relative Roles of the Copyright Owner and Copyright User in Making the Product Available to the Public

57. This factor relates to 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."[64] This factor, although it has sub-parts that could be analyzed separately, is precisely the type of information that would be taken account of in marketplace transactions.

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[63] Wind Written Rebuttal Testimony, p. 13; Mantis Written Rebuttal Testimony, p. 15.

[64] 17 U.S.C. 801(b)(1).

58. Indeed; I understand that in the recent Webcasting case, the CRJs evaluated a similar factor under the willing buyer-willing seller standard and found that Section 114(f)(2)(B)(ii)'s requirement that the Judges consider "the relative roles of the copyright owner and the transmitting entity in the copyrighted work and the service made available to the public with respect to creative contribution, technological contribution, capital investment, cost and risk" is essentially subsumed in a market rate:

> Because we adopt a benchmark approach to determining the rates, we agree with Webcaster I that [these] considerations 'would have already been factored into the negotiated price' in the benchmark agreements ... [and as such are] implicitly accounted for in the rates that result from negotiations between the parties in the benchmark marketplace.[65]

59. Thus, I believe that this third factor also would be best addressed through adoption of a market rate. Nonetheless, I examine below each of the statutory sub-factors and evaluate Dr. Woodbury's analysis of these sub-factors. The sub-factors appear to overlap to some extent with one another, and are therefore difficult to separate. In considering the sub-factors dealing with creative and technical contribution, I will exclude financial investments by record companies, artists, and the Services to avoid any double counting. Rather, I have considered the financial investments in the sub-factor dealing with "capital investment, cost, and risk."

1. Creative Contribution

60. In the PES I proceeding, the Librarian concluded this objective favored copyright owners. As discussed above, the scarce resource in this matter is the sound recording, and the record companies and recording artists each play significant roles in the creation of the sound recordings.

61. The creative contribution of recording artists is discussed in some detail in the testimony of Mr. Navarro and the designated testimony of Ms. Fink, Mr. Bradley, and Ms. Brooke from the Webcasting proceeding.[66] That testimony discusses the creative contribution and risks faced by performers. The testimony of Mr. Kushner details the creative contribution of record companies, including their role in identifying talent and actually making the sound recordings that people listen to, including on satellite radio. That testimony shows that record

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[65] Webcasting II, p. 24092, 24095.

[66] Navarro Written Direct Testimony, pp. 2-6; Designated Testimony of Cathy Fink, October 2005, pp. 5-9; Designated Testimony of Harold Ray Bradley, October 2005, pp. 4-10; Designated Testimony of Designated Testimony of Jonatha Brooke, October 2005, pp. 2-7.

companies are integral to the creative process, both through their financial contribution and through their work with performers.[67]

62. In contrast, the Services claim that they provide a creative contribution by programming sound recordings and by providing, for example, DJs to enhance their programming. I understand that those types of arguments appear to have been rejected in prior proceedings because merely formatting a radio station is of *de minimis* value compared to actually creating the copyrighted works themselves.[68] That conclusion has intuitive appeal: It is difficult to imagine that the creative contribution of those who decide the order in which sound recordings are played is large compared with the creative contribution of those who create the sound recordings themselves. Moreover, it is difficult to see how the creative contribution of DJs can be compared to that of performers. Indeed, the Services' own surveys indicate that their subscribers view DJs not as creative contributors but as distractions.[69]

63. Dr. Woodbury also asserts that the Services' purchase of non-music content from third parties is a "creative contribution" because it attracts subscribers and may promote additional sales of sound recordings. That argument fails for at least two reasons. First, Dr. Woodbury's whole theory depends, once again, on an unsubstantiated claim that the Services provide net promotional benefit for the sale of sound recordings. Second, Dr. Woodbury's approach appears to be inconsistent—he wants to ignore all of the artists and record companies' efforts on the grounds that those efforts are not "incremental," i.e., because there are other outlets for the distribution of sound recordings. But he wants to count all of the Services' non-music investment, even though such investment is not "incremental" to the creation of music programming. Moreover, as noted above, counting the Services' other investments, when such investments are already considered in the sub-factor on technological contributions, double counts the money spent by the Services. Such investments are better considered elsewhere.

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67 Kushner Written Direct Testimony, pp. 5-13.

68 *Nat. Assoc. Broadcasters v. Copyright Royalty Tribunal*, 772 F.2d 922, 931 (D.C. Cir. 1985).

69 SX Trial Ex. 13, p. 4.

64. In sum, record companies and performers make a more significant contribution to making the creative work available to the public than do the Services.[70] Simply put, without sound recordings, XM and Sirius probably would not exist.

2. Technological Contributions

65. It is my understanding that in the PES I proceeding, the Librarian found that the PES made a greater technological contribution than the copyright owners.[71] On this sub-factor, the Services' relative contribution should be taken into account, as it would be through a market rate which necessarily reflects these technological contributions. However, although the Services' technological contributions are valuable, Mr. Elbert discusses how the technology that the Services use had previously been used and proven by others and, although the Services have indeed taken steps to adapt and extend technology, they are not developing entirely new technology but rather extending the technological contributions of others.[72]

66. As discussed above, it is not clear that the financial investment of the Services in technology should properly be captured in consideration of this sub-factor, instead of in the discussion of the sub-factor considering investment, cost, and risk. As I did not consider the financial aspects of the record companies and recording artists' creative contribution, it seems inappropriate to consider the Services' technological investments here. In any case, as discussed below, the Services' investments in technology are long-lived investments that are but a fraction of the expected revenues of the Services, even after accounting for the timing of the investments and revenues.

3. Investment, Costs, and Risks

67. It is my understanding that in the PES I proceeding, the Librarian found that the PES faced greater costs and risks than the record companies. The Librarian focused on the fact that the PES had "invested significant start-up costs and [were] undergoing a shift in how they market[ed] their services."[73] The Librarian also found that the PES might not be able to survive as ongoing concerns, in part because they were facing new competition from sources such as Internet and digital radio.[74] Conversely, the Librarian found that although the record companies faced significant risks when producing new sound recordings, "the record

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70 PES I Librarian's Decision, p. 25407.

71 PES I Librarian's Decision, p. 25407.

72 Elbert Written Rebuttal Testimony, pp. 20-40.

73 PES I Librarian's Decision, p. 25407.

74 PES I Librarian's Decision, p. 25407.

companies have adapted to the vagaries of the music business, and as an industry, have shown consistent growth in units shipped and dollar value of records, CDs, and music videos from 1982-1996."[75] In addition, and of great importance to the Librarian, the PES service was conceived as one that would promote, rather than substitute for, other revenues of record companies—thus decreasing the overall risks faced by record companies.

68. As discussed above, the risk factors at issue in this proceeding and at this time in the history of the music industry are dramatically different from those that existed at the time of the PES I proceeding It is now the record companies that are "undergoing a shift" in how they market their products. Record companies no longer show consistent annual growth in units shipped and dollar value of CDs and music videos. Rather, those data show dramatic declines in recent years, and all predictions are that the recording industry will continue to suffer from a decline in sales as consumers adapt to new ways to consume music, including through satellite radio.

69. At the same time, the investments that record companies must make have not changed—only their returns and the funds available for future investment are declining. As discussed in the testimony of Mr. Kushner, record companies must expend similar amounts in developing and promoting artists, but the returns they are seeing are lower.[76]

70. Dr. Woodbury essentially ignores the investment of record companies and the risks they face, claiming that there is no incremental investment by record companies and artists from exploitation of their sound recordings on satellite radio. Although it is true that record companies do not need to re-record music to make it available on satellite radio, Dr. Woodbury's conclusion ignores the business that the record companies are in—record companies and recording artists invest in sound recordings in order to earn revenue in multiple distribution channels including this one; one cannot simply ignore those investments because sound recording copyright owners also seek to recoup those investments in other channels.

71. Dr. Woodbury's argument falls apart, both because it has no basis in economics and because it is inconsistent with the Services' own actions. The record companies benefit from a form

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[75] PES I Librarian's Decision, p. 25407.

[76] Kushner Written Direct Testimony, pp. 13-17.

of *economies of scope,* which provides no economic justification to reduce the royalty rate.[77] Moreover, the Services themselves spend significant sums to license existing non-music content. As an example, in 2006, Sirius entered into a [ ] agreement with the Fox News Network for a non-exclusive license to broadcast the Fox News Channel and Fox News Talk Channel whereby Sirius essentially simulcasts the programming on the cable television station and syndicated for radio stations. Because the content broadcast on Sirius' Fox News and Fox News Talk channels already exists, Dr. Woodbury's logic holds that Sirius should pay a low license fee for that content. Yet, Sirius agreed to pay [ ] for the license.[78] And this contract likely requires little, if any incremental effort on the part of Fox News.

72. Dr. Woodbury simply ignores the dramatic changes in the market for sound recordings over the last decade; he essentially fails to analyze these factors in light of current data. Finally, Dr. Woodbury's conclusion again rests entirely on the untested assumption that satellite radio promotes the sale of sound recordings in other distribution channels—an assumption that runs counter to the evidence.

73. As discussed below, the Services also make significant investments in their businesses. It is important to recognize, however, that the scarce resource on which they rely—sound recordings—also requires significant investment and increasing risk. Whereas the Services have invested around $3 billion to date since their inception,[79] a single record company—UMG—will exceed that level of investment in about [ ] years.[80] The aggregate investment of record companies each year dwarfs that of the satellite radio industry. That is not to say that analysis of investment, cost, and risk should be made on a dollar-for-dollar basis, but merely to demonstrate that record companies and performers make significant financial investments each year to create the sound recordings, which the Services use to derive revenue.

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[77] The term "economies of scope" refers to cost efficiencies associated with the joint production of multiple products, usually by the same manufacturer. An example of economies of scope is the joint production of beef and leather hide by cattle ranchers. Applying Dr. Woodbury's argument to this example, cattle ranchers who whose primary business is selling beef should receive a below-market price for the leather hide they produce because little or no incremental investment is necessary to make the leather available to the market. From this example, it is easy to see that Dr. Woodbury has ignored the contribution of consumer value—which economists typically refer to as demand—in determining prices.

[78] SX Trial Ex. 22.

[79] Musey Written Direct Testimony, pp. 6-7.

[80] Ciongoli Written Direct Testimony, pp. 3-9.

74. Although it is true that the Services have incurred $3 billion in capital expenditures to date, these investments are not particularly high when put in their proper perspective. For example, Sirius has estimated it will earn $3 billion in revenue in 2010 alone (although Mr. Buston and analysts put this figure closer to $2 billion—and that number will only increase each year.[81] In addition, Mr. Butson estimates that XM alone will generate [[redacted]] in subscription revenue between 2005 and 2020.[82] These revenue streams put in context the investments that XM and Sirius make—especially the investments in satellite technology that XM and Sirius repeatedly report as their primary investment. The [[redacted]] revenue figure is not directly comparable to the cost of the satellites because it does not account for the timing of the revenues. **Appendix L** accounts for this difference by translating the projected revenues into a *present discounted value* as of 2005, which is [[redacted]].[83] XM recently spent $566 million to launch two satellites, XM-3 and XM-4 (aptly named "Rhythm" and "Blues"). Thus, the $566 million cost of the satellites represents [[redacted]] of the present discounted value of XM's projected subscription revenues over their useful lives. That is, given that XM charges subscribers $12.95 per month, spending on satellites is about [[redacted]] per subscriber per month. To put this into perspective, [[redacted]] per subscriber per month is approximately what XM spends on [[redacted]],[84] and less than what Sirius spends on Howard Stern.

75. The cost of XM's recently launched satellites does not represent the true out-of-pocket cost (or risk) to XM. For example, in February 2007, XM completed a sale-leaseback transaction involving its satellite XM-4, which was launched and placed into service in the fourth quarter of 2006.[85] As a result, XM is able to pay for its use of this satellite over its economic life, rather than in one up-front payment.

76. The need for a business to make initial investments is not unique to satellite radio. All businesses make investments with the expectation of reaping a return over the useful life of those investments; otherwise, they would not make the investment. Moreover, much of the

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81 Sirius Satellite Radio, "Wachovia Securities Nantucket Equity Conference," June 19, 2006 (SIR0010319-SIR00010338); Sirius Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/34119, posted May 1, 2007.

82 Butson Written Rebuttal Testimony, Appendix B.

83 The term "present discounted value" is used here to mean the value of the stream of future revenues in 2005, discounted for the fact that revenues are not expected to be realized until after 2005.

84 Butson Written Direct Testimony, p. 20.

85 XM Satellite Radio Holdings, Form 10-Q for the quarterly period ended March 31, 2007, p. 11.

start-up investments incurred by the Services are not "sunk." That is, if one of the Services ceases operations, its investors will likely be able to recoup some portion of the investments by selling certain assets to another user. For example, it is my understanding that the satellites could be used for another purpose if they were not transmitting music and other content for the Services.

77. Similarly, the fact that the Services are expected to continue to incur losses in the upcoming years is not surprising or troubling. Few businesses, particularly businesses with the cost structure of the Services, are profitable in their early years. Indeed, many firms that are considered to be successful businesses reported losses in their early years. For example, Amazon.com, which is generally considered to have a strong brand name among Internet retailers, did not report a single profitable quarter until the fourth quarter of 2001, six and one-half years after it began operating. Between 1997 and 2002, Amazon.com sustained nearly $3 billion in cumulative losses, but since 2002 has earned nearly $1.2 billion in net income.[86] This pattern of incurring losses early on and later earning profits is not uncommon among firms whose cost structure requires high fixed costs. In the case of Amazon.com, its early losses said little about the likelihood that Amazon.com would be successful in the future. A testament to the likelihood of future success was that, despite having incurred $3 billion in losses, Amazon.com had a market capitalization of $4 billion at the end of 2001—in the depths of the dot.com bust.[87] Today, even though Amazon.com still has cumulative losses of $1.8 billion, it has a market capitalization of nearly $30 billion.[88] Likewise, investors are optimistic about the future of satellite radio and, as a result, the Services have a combined market capitalization of $8 billion.[89]

78. Likewise, the losses that the Services have incurred, and are expected to incur in the near future, say little about their long-term prospects and profitability. The key to the success of the satellite radio companies is attracting subscribers. Each new subscriber generates high margins for the Services and with a sufficient number of subscribers the Services are expected to be highly profitable. That is why content—and especially music—is the

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[86] Thomson Financial.

[87] Bloomberg: Amazon Historical Market Capitalization, 12/2001.

[88] "Amazon.com, Inc.," Google Finance, http://finance.google.com/finance?q=AMZN, visited on July 22, 2007.

[89] "XM Satellite Radio Holdings Inc.," Google Finance, http://finance.google.com/finance?q=XMSR; "Sirius Satellite Radio Inc.," Google Finance, http://finance.google.com/finance?q=SIRI, both visited on July 22, 2007.

centerpiece of their businesses. Content attracts subscribers and content is the key to the Services' long-term profitability. As content attracts subscribers, the risks and investment in satellites and other technology become a diminishing part of the business.

79. Dr. Woodbury attempts to compare the Services' business to that of the PES in 1996, but the differences are stark and render any comparison meaningless. In contrast to the PES—a business that was suffering in 1996 and does not appear to have improved since then—the Services are well-funded, have strong prospects, and claim to be the fastest growing subscription services in history—facts that the Services repeatedly tell investors. In further contrast to the PES, the Services are having great success in attracting paying subscribers. The consumer value proposition and the future of the PES services and the Services are not at all comparable.

80. Similar to the Services, the record companies make large investments. The record companies invest in identifying, financing, and making new talent available to the public. These investments are sunk, and few of their investments ever turn out to be profitable. About 90 percent of sound recordings never recover their costs let alone make a profit.[90]

81. In the end, both the Services and the record companies make significant investments, incur significant costs and face significant risks. The Services are on a path to rapid growth and profitability; by contrast, the record companies are facing ever-more difficult times, retrenching as the shift to digital distribution forever alters their businesses. Simply put, whereas the Services are growing, the record companies are consolidating and shrinking.

82. On this factor, the substitution effect of satellite radio is also highly relevant. Whereas sound recordings are essential to making the Services profitable, any substitution caused by the Services reduces the profitability of record companies by reducing revenues from other distribution channels. In terms of risk, the mere existence of satellite radio—absent proper levels of compensation—creates risk for sound recording copyright owners. If all consumers were to transfer their music spending to satellite radio and the levels of compensation were what the Services propose, record companies would likely be unable to survive at all. Even at the more modest levels of substitution suggested in the surveys submitted by

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[90] Written Direct Testimony of Michael Kushner, p. 14.

SoundExchange,[91] record companies would earn less revenue overall if satellite radio were allowed to operate while paying the kinds of royalty rates that the Services are proposing.

4. Opening of New Markets

83. In the PES I proceeding, the Librarian found that the PES contributed more than the record companies in opening new markets, and served as a promotional vehicle for the record companies.[92] Although the Librarian acknowledged a lack of conclusive data on the subject, the Librarian concluded that if anything, "the Services decreased the risk to the recording companies because the digital audio services have substantial promotional value."[93] As discussed above, the evidence does not support the notion that digital music services generally (and XM and Sirius in particular) lead on balance to increased sales of CDs or MP3s.

84. The economic environment for sound recordings is far different today than it was in 1996. Whereas the PES services were really the first music service of their kind, today there is no shortage of consumer options for listening to music in the home and elsewhere. The Services emphasize in their filings in favor of their proposed merger that there are a host of services with which they compete, especially for music that is disseminated and can be listened to on a portable basis. And as noted above, even if the Services were to be viewed as opening a new market, they are effectively displacing other forms of music consumption. One consequence of the ability to listen to the Services in more places (in sharp contrast to the PES) is the reduction in the demand for CDs. That is, ubiquity not only enhances the attractiveness of the Services—and thus strengthens their long-term viability—but currently may also substitute for sales to a greater extent than other digital services that can be accessed only through a television. Thus, on net the Services may not open up new markets because they may not expand the extent to which subscribers consume music; instead, they allow subscribers to substitute one form of music consumption (e.g., CDs, digital downloads, or other competitive portable services) for another (listening to the Services).

85. In sum, as with the factors discussed above, I see no reason that consideration of this factor should lead the CRJs to depart from the range of rates that one would find in the marketplace unconstrained by regulation. As Dr. Ordover explains, these third factor considerations

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91 Wind Written Rebuttal Testimony; Mantis Written Rebuttal Testimony.

92 PES I Librarian's Decision, pp. 25407-08.

93 PES I Librarian's Decision, p. 25408.

generally reflect market dynamics, and nothing about the particular situation of the Services or the recording industry suggests a departure from market rates here and now.[94]

D. Minimize any Disruptive Impact on the Structure of the Industries Involved

86. The fourth factor permits adjustment in order "[t]o minimize any disruptive impact on the structure of the industries involved and on generally prevailing industry practices."[95] It is my understanding that the statute itself does not provide guidance on how to evaluate what would be "disruptive," and the concept does not have a clear meaning in economics. In analyzing this factor, I have attempted to provide economic interpretations of disruption that may be of use to the Judges.

87. I am interpreting a "disruptive impact" to be an effect that is more substantial than simply causing an increase in costs to the Services or a decline in royalties to the record companies. Any royalty rate that the CRJs will set here will cause the Services to incur costs. It is true by definition that a higher royalty will result in higher costs to the Services, and a lower rate will result in less revenue for the record companies; this does not in itself speak to disruption. Similarly, a rate that might cause the stock price of XM or Sirius to tick up or tick down does not necessarily provide evidence of disruption. Stock prices increase and decrease for myriad of reasons, depending on investors' expectations. A rate that is set on the high (low) side could cause the Services' stock prices to increase (decrease) if investors are expecting the CRJs to set a rate that is even higher (lower) than the rate determined. None of these considerations necessarily suggests a disruption in business operations.

88. At the other extreme, a royalty rate that would cause one or both of the Services to cease offering sound recordings altogether, or to exit the business, would be disruptive. The Librarian and the CARP in the PES I proceeding focused on whether the rates proposed would cause the PES to exit the business in determining that this factor supported a lower rate.[96] Mr. Butson makes clear that there is no risk that SoundExchange's proposed rate would have this effect.[97]

89. A useful measure of whether a particular rate is disruptive is what the Services freely negotiate to pay for other content that they believe will attract or retain subscribers. To the

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[94] Ordover Dir. Test., Vol. XII, pp. 105-111.

[95] 17 U.S.C. § 801(b)(1)(D).

[96] PES I Librarian's Decision, p. 25408.

[97] Butson Written Rebuttal Testimony, p. 18.

extent that XM or Sirius voluntarily agrees to pay any amount for content that it believes will attract enough subscribers to justify the cost, such a rate necessarily is not disruptive. Even though it increases the costs of the Services and may delay profitability, by acquiring the content, the Services must believe that such investment is worth the cost and not disruptive. To the extent that sound recordings attract or retain a sufficient number of subscribers to the Services, the cost for sound recordings would also necessarily not be disruptive.

90. I also view disruption as fundamentally a forward-looking analysis of the impact of a new rate on the industries in question. A rate of zero or 100 percent cannot affect decisions made in the past. Thus, evidence such as that discussed by Dr. Woodbury concerning the Services' past and historical losses seem to me to be largely irrelevant to the question of disruption. By contrast, the analysis provided by Mr. Butson, which examines the future prospects of the Services and the impact of different royalty rates on those prospects, is forward-looking and, therefore, can be used to address the question of disruption.

91. Moreover, from an economic perspective, I do not believe disruption is caused by normal business risks. Therefore, I do not interpret this factor to mean that the CRJs must insulate the Services from business risk. Dr. Woodbury appears to focus on the date on which the Services will become profitable as an important measure of "disruption."[98] He does not explain, however, why this is a relevant measure of disruption. As noted above, companies like XM and Sirius typically incur losses for years after inception—that is the nature of the business model. The Services have incurred losses for reasons completely unconnected to the rate they pay for sound recordings, and adjusting the rate to allow them to record profits at some arbitrary date in the future (or setting a rate to accelerate profitability) would seem to be unconnected with a meaningful interpretation of "disruption."

92. A sound recording royalty rate that delays profitability (i.e., the time at which the Services become cash flow or EBIDTA positive) for a year or two, or one that results in the Services electing to finance their operations through borrowing is not necessarily disruptive. That a sound recording royalty rate might have the result (perhaps along with a host of other factors) of inducing the Services to cut costs, or to borrow to finance their continued expansion also does not suggest that the royalty rate itself has a disruptive impact. Instead, the relevant question is whether the increased expenses associated with the royalty will threaten the Services' longer-term ability to operate profitably. As to that, Mr. Butson's analysis shows

[98] Woodbury Written Direct Testimony, p. 53.

that the rate proposed by SoundExchange allows the Services to operate profitably over the long term.[99]

93. In this regard, it important to note that whether the Services make or lose money, have free cash flow, or have to borrow money over the short term depends on wide variety of factors, and the rate that they pay for sound recordings is only one factor. The Services have borrowed money in the past for a host of reasons, including to finance expansion of their businesses. They have voluntarily increased their costs and delayed their profitability because they have chosen to invest in non-music content. These may well have been rational business decisions and, therefore, would not be characterized as having a disruptive impact. Healthy businesses in a host of industries make rational decisions every day that cause a reduction in their current profits or a delay in future profits.

94. For the same reasons, the fact that the Services budget certain amounts for sound recording royalties, or discuss with analysts their beliefs of what the rate should be (which may then become the basis for analysts' projections), reveals nothing about whether higher royalties would have a disruptive impact. I understand that Mr. Vendetti, XM's CFO, has testified that a royalty rate of 4 percent of total revenue would have no impact on XM's business plan.[100] Similarly, I understand that Sirius budgets using a royalty rate of approximately 4 percent for sound recordings.[101] These facts demonstrate that such a rate cannot be disruptive. On the other hand, a royalty rate that causes the Services to incur higher sound recording royalties than they budgeted is not, in and of itself, disruptive. If it were otherwise, then the Services would rationally prepare budgets with a rate of zero and claim that any non-zero rate would be disruptive.

95. All of the above discussion suggests that the issue of disruption must be analyzed on a forward-looking basis and that a disruptive impact must be one that has a significant effect on the actual operations of the business. As the prospects of the Services will likely improve over the course of the license on virtually every financial metric, a reasonable rate consistent with the statutory factors may be judged to be disruptive today but that same rate may not raise such concerns in the future. If the CRJs believe a given rate is appropriate, but is concerned about the impact of the rate in the near term, they could phase in the rate over the

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[99] Butson Written Rebuttal Testimony, pp. 19-20.

[100] Vendetti Dir. Test., Vol. III, pp. 37-39.

[101] Frear Dir. Test., Vol. VI, p. 185.

term of the license. Doing so would give the parties time to adapt their business plans before the full effect of the rate goes into effect. I understand that phasing in royalty rates over time has been viewed as addressing concerns about disruption under this factor.[102] If the concern is that an otherwise appropriate rate might be too high for the Services at this time, phasing in the rate would allow the Services time to prepare for increased royalty costs. The Services are all but certain to increase their subscriber bases and dramatically increase their revenues over the course of this license. Because of the cost structure of their business—high fixed and low incremental costs—those new subscribers will be highly profitable. Thus, the Services' ability to pay, which no doubt would be a key component in any marketplace transaction (and is directly relevant to the question of disruption), will improve throughout the course of the license. Thus, a royalty rate that begins as a lower percentage of revenue at the beginning of the license term and increases to what might be considered a more appropriate longer-term percentage may be an intelligent approach to addressing disruption.

96. As discussed in more detail above, the situations facing the recording industry and the Services are very different, and far different from the situations facing the recording industry and the PES in 1996. Unlike the PES, both XM and Sirius have established sizeable subscriber bases and appear to have strong growth prospects. and the Services improving prospects stand in sharp contrast to the recording industry, whose position is significantly worse today than it was a decade ago, with no clear end to the current slide in sight.

97. As discussed above, by the end of 2006, there were nearly 14 million subscribers to satellite radio, and the Services expect to have more than 17 million subscribers at the end of this year.[103] Again, according to XM and Sirius, this diffusion rate is among the highest recorded in history for subscription products or consumer products more generally.[104] As is common with many businesses, the Services have expended significant resources in efforts to build their subscriber bases. The Services' track their *Subscriber Acquisition Cost*, the cost incurred to acquire new subscribers, presented in **Appendix M**. The appendix shows that between 2002 and 2006, XM and Sirius have increased annual Subscriber Acquisition Costs

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[102] *Amusement and Music Operators Ass'n v. Copyright Royalty Tribunal*, 676 F.2d 1144, 1157 (7th Cir. 1982).

[103] "XM Satellite Radio Holdings Inc. Announces First Quarter 2007 Results," XM Satellite Radio, April 26, 2007; "SIRIUS Satellite Radio Reports Strong First Quarter 2007 Results," Sirius Satellite Radio, May 1, 2007.

[104] "XM Satellite Radio Tops One Million Subscribers," XM Press Release, October 27, 2003; "Sirius Satellite Radio Ends 2005 With More Than 3.3 Million Subscribers," Sirius Press Release, January 5, 2006.

at annual rates of nearly 50 percent and over 100 percent, respectively. Another related cost metric is *Cost Per Gross Addition Expenses*, which is comprised of Subscription Acquisition Costs and other marketing expenses. **Appendix N** shows that, between 2002 and 2006, XM and Sirius have also increased their Cost Per Gross Addition Expenses by over 30 percent and over 50 percent, respectively. These expenditures, in part, have contributed to the Services' success in building a sizeable subscriber base.

98. Although the Services have increased their Subscriber Acquisition Costs and Cost Per Gross Addition Expenses in recent years, these expenditures have become increasingly productive. Both XM and Sirius report their *Subscriber Acquisition Cost per Gross Activation,* which measures the expenditures necessary to generate a new subscriber. **Appendix O** presents this measure for the Services from 2002 through 2006, and shows that such costs have declined dramatically for both XM and Sirius. For XM, the Subscriber Acquisition Cost per Gross Activation has declined from $116 in 2002 to $64 in 2006. The decline in Subscriber Acquisition Cost per Gross Activation has been even more dramatic for Sirius, from $668 in 2002 to $114 in 2006, a decline of more than 80 percent, or 35 percent per annum. Likewise, as **Appendix P** shows, *Cost Per Gross Addition* has declined significantly for both XM and Sirius over this same time period.

99. Also over this time period, both Services have realized increases in the Average Monthly Subscription Revenue per Subscriber, as shown in **Appendix Q**. This combination of falling costs and increased revenue per subscriber suggests that XM and Sirius are in a strong position to capitalize on the investments each has made to date. Indeed, these figures suggest that on average a new subscriber becomes profitable within about a year.[105]

100. The Services recognize the cost structure associated with building a satellite radio business. As a result, both XM and Sirius report a metric called *Pre-Marketing EBITDA* when reporting their financial situation to Wall Street analysts and potential investors.[106] Generally

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[105] This calculation was made by dividing the Services' Subscriber Acquisition Cost per Gross Activation by 70 percent of the Average Monthly Revenue per Subscriber. I included 70 percent of the revenue per subscriber figures to account for the Services' incremental profitability from new subscribers. XM reports its margin "in the high 60s to 70%" on new subscribers, and Sirius reports contribution margins exceeding 70 percent. (See XM Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/33658, posted April 26, 2007; Sirius Satellite Radio Q1 2007 Earnings Conference Call Transcript, http://media.seekingalpha.com/article/34119, posted May 1, 2007.)

[106] *EBITDA* is "a measure of [a] company's revenues less its cash operating expenses, excluding expenses associated with interest, taxes, depreciation and amortization, and stock based compensation" (Butson

speaking, this metric can be understood as how the services would be performing if they were to cease simply serviced their existing subscribers rather than attempting to increase their subscriber bases. It is noteworthy that in 2006, both companies reported positive Pre-Marketing EBITDA: $253 million for XM and $129 million for Sirius.[107] XM's Chief Financial Officer, Joe Euteneuer, explained the significance of this as follows: "Our continuing growth in premarketing EBITDA is an early key indicator of our ability to generate positive cash and self-sustainability. This financial performance is driven by our ability to grow revenue while leveraging our fixed cost base."[108] Thus, on an operating basis, net of marketing expenditures, the Services are already EBITDA-positive. They do not report positive EBITDA overall in part because they continue to invest in increasing their subscriber bases recognizing that additional subscribers are highly profitable to them and such investments are prudent.

101. There are additional reasons to believe that XM and Sirius will continue to increase their subscriber bases in the upcoming years. In order to receive the digital signal transmitted by the Services, a consumer must have specialized hardware installed at home or in the car. In economic terms, the satellite radio hardware and the services provided by XM and Sirius are considered "complements," which means that demand for the Services increases as consumers continue to adopt the hardware. Several recent developments with respect to satellite radio hardware lead me to conclude that the position of the Services will continue to strengthen over time. Perhaps most important, the prices of such hardware devices have

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Written Rebuttal Testimony, p. 15). XM and Sirius both define Pre-Marketing EBITDA relative to *Adjusted* EBITDA. XM defines *Adjusted EBITDA* as "EBTIDA excluding loss from de-leveraging transactions, loss from impairment of investments, equity and net loss of affiliate, other income (expense) and stock-based compensation" and explains that is uses this measure because "we have funded the build-out of our system through the raising and expenditure of large amounts of capital, our results of operations reflect significant charges for depreciation, amortization and interest expense. We believe Adjusted EBITDA provides helpful information about the operating performance of our business, apart from the expenses associated with our physical plant or capital structure" (XM Satellite Radio Holdings, Form 10-K for the year ended December 31, 2006, p. 33,). See also Sirius Satellite Radio, Inc., Form 10-K for the year ended December 31, 2006, p. 40, for a similar discussion.

XM defines *Pre-Marketing EBITDA* as, "a measure which is calculated by adding back total marketing, excluding retention and support to adjusted EBITDA" (XM Satellite Radio Holdings, Form DEFA14A, Q4-2006 Conference Call, February 26, 2007). Sirius defines Pre-Marketing EBITDA as "Adjusted EBITDA before SAC [Subscriber Acquisition Cost, as Adjusted] and marketing costs" (Sirius Satellite Radio, Inc., Form 425, Q4-2006 Conference Call, February 28, 2007).

[107] XM Satellite Radio Holdings, Form DEFA14A, Q4-2006 Conference Call, February 26, 2007; Sirius Satellite Radio, Inc., Form 425, Q4-2006 Conference Call, February 28, 2007.

[108] XM Satellite Radio Holdings, Form DEFA14A, Q4-2006 Conference Call, February 26, 2007.

generally been declining over time.[109] All else equal, a decline in the price of satellite radio hardware will increase demand for the Services.

102. XM and Sirius now offer portable devices to users which expand their service to both home users and those consumers who wish to listen to satellite radio on the go. With this important development, consumers can now listen to satellite radio anywhere they wish—at home or work, in the car, and on the go. This ubiquity increases the appeal of satellite radio and will lead to an increase in subscribers to the service, while at the same time likely leading to an increase in the substitution effect of satellite radio, particularly with respect to other forms of digital music.

103. As a testament to their long-term viability, the Services have developed sources of financing and several business relationships that both increase their ability to meet short-term financing needs and to encourage long-term growth. Early on they were successful in securing funding from private equity firms such as Apollo and Blackstone, and media companies such as DirecTV and Clear Channel.[110] In addition, XM is available as original equipment in over 140 automobile models from manufacturers such as General Motors, Honda/Acura, Toyota/Lexus, Nissan/Infiniti, Porsche, and Suzuki, among others.[111] Similarly, Sirius radios are available as a factory-installed option in over 130 vehicle models from manufacturers such as DaimlerChrysler, Ford, BMW, Volkswagen, Audi, and Rolls-Royce, among others.[112] Over time, the Services have expanded their strategic partnerships to include airlines, rental car companies, heavy-duty truck manufacturers, boat builders, major retailers, and hardware device manufacturers.[113]

104. One indication of the health of the satellite radio industry is the Services' continued success in raising capital. Capital can take the form of debt or equity, and the cost to obtain new capital for any publicly traded firm is commonly expressed as a *Weighted Average Cost of Capital* (WACC). According to Mr. Musey, the cost of capital for both XM and Sirius has declined considerably over time, from approximately 25 percent in 1998 to just over 10

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[109] See, for example, Hamrick, Mark, "Satellite Radio Prices are Moving Down as XM, Sirius do Battle," *Buffalo News*, December 12, 2005.

[110] SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Year Ended December 31, 2002, pp. 8, 42; XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Year Ended December 31, 2002, p. 2.

[111] XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Year Ended December 31, 2006, p. 4.

[112] SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Year Ended December 31, 2006, pp. 6-7.

[113] XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Year Ended December 31, 2006, p. 5-7; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Year Ended December 31, 2006, pp. 6-7.

percent in 2006.[114] This trend indicates that the market has increasingly assigned less risk to each of the Services as they have continued to grow their subscriber base and leverage their fixed investments. As a result, the Services have little trouble accessing capital and the financial markets view them as increasingly sound investments.

105. **Appendix R** documents the bonds issued by XM since its inception, as reported by Bloomberg. The appendix indicates that XM has been able to issue and repay significant amounts of debt. XM has issued nearly $6 billion in bonds on 20 separate occasions, and has retired nearly $4 billion to date. Similarly, Bloomberg reports that Sirius has issued $3.5 billion in bonds and has retired more than $1.8 billion, as shown in **Appendix S**. These appendices show that nearly all of the bonds that have been retired were called by the Services, reflecting their ability to secure lower cost financing. This point is reflected in XM's financial statements: "The Company effectively replaced $486.5 million of senior secured debt with interest rates ranging from 10.63% to 14% and maturities in 2009 and 2010 (as well as covering redemption premiums and transaction costs) and $320 million of fixed payment obligations to General Motors due in 2007 through 2009, or $806.5 million of obligations, with $800 million of senior unsecured debt with current interest rates from 9.75% to 9.86% and maturities in 2013 and 2014."[115]

106. Although rating agencies Standard & Poor's and Moody's rate the Services' debt below investment grade, the terms each has received appear to suggest a more optimistic outlook for the industry. For example, a recent trade press report stated: "In a fledgling business that demands high capital expenditures, the two companies that comprise the US satellite radio industry are receiving mixed messages from the markets and ratings agencies. That's because while the agencies are staunch in their perception of Sirius Satellite Radio's and XM Satellite Radio's triple-C credit quality, the high yield and equity markets appear to disagree."[116] As Sirius CFO David Frear explained, "Clearly, the market assesses risk differently than Moody's."[117]

107. It is important to understand that a firm's decision to access the debt market does not signal poor financial health for a firm. To the contrary, firms often issue debt to fund up-front capital expenditures when they have more productive uses for their cash. That is, when the

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[114] Direct Testimony of J. Armand Musey, October 30, 2006, p. 11.

[115] XM Satellite Radio Holdings, Form 10-K for the year ended December 31, 2006, p. F-24.

[116] Laughlin, Kate, "XM, Sirius: Darlings Despite Low Ratings," *Bank Loan Report*, September 26, 2005.

[117] Laughlin, Kate, "XM, Sirius: Darlings Despite Low Ratings," *Bank Loan Report*, September 26, 2005.

benefit to the company from using cash for other purposes (such as acquiring new subscribers in the case of the Services) exceeds the cost of borrowing, it is economically rational to use debt as a way to fund longer-term expenses. Thus, the Services' continued success in obtaining debt at favorable rates indicates that investors believe the Services have built a solid foundation on which to operate their businesses.

108. This notion of a strengthening financial outlook for the satellite radio industry is echoed in recent analyst reports covering the Services. Indeed, analysts do not appear to view the risk of lack of financing as a serious issue facing XM or Sirius currently or in the future, indicating that such concern is unfounded. To the extent that financing is addressed by analysts, the outlook appears to be favorable. For example, earlier this year the investment banking firm Stifel Nicolaus concluded, with regard to XM and Sirius that, "Balance sheets appear to be in pretty good order with cash, borrowing capacity, and debt carve-out provisions."[118] More recently, Stifel Nicolaus updated its analysis and concluded, "While both XM and Sirius have lost billions to-date, we do not believe either firm is anywhere close to a liquidity crisis."[119] These conclusions provide independent confirmation of the financial health of the Services.

109. Recent financial transactions by both XM and Sirius reveal additional investor confidence in their financial health. As mentioned above, XM recently completed a sale-leaseback transaction involving its satellite XM-4, which was launched and placed into service in the fourth quarter of 2006.[120] Through this deal, XM received net proceeds of $288.5 million dollars from Satellite Leasing LLT.[121] Sirius completed a $250 million senior secured term loan with Morgan Stanley at an interest rate of LIBOR plus 225 basis points, or 7.625 percent at the time of issue (June 2007).[122] According to Sirius, "The issue was very well received in

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[118] Spring, Kit, "Still See 55%-60% Probability of Merger; Things Aren't That Bad Absent a Merger," Stifel Nicolaus Media and Internet, April 4, 2007.

[119] Spring, Kit, "Updated Model and Thoughts: Maintain Buy and $5 Target," Stifel Nicolaus Media and Internet, May 7, 2007.

[120] XM Satellite Radio Holdings, Form 10-Q for the quarterly period ended March 31, 2007, p. 11.

[121] XM Satellite Radio Holdings, Form 10-Q for the quarterly period ended March 31, 2007, pp. 14-15. The $288.5 million represented the fair market value of XM-4 based on an appraisal performed by satellite consulting and lease appraisal firms. It is noteworthy that this figure is greater than the $273.7 million cited by Dr. Woodbury as that originally paid by XM for XM-4 (Woodbury Written Direct Testimony, Exhibit 22).

[122] "SIRIUS Completes $250 Million Loan," *M2 Presswire*, June 22, 2007.

the marketplace with strong demand and attractive pricing."[123] In large part due to their success in building a large subscriber base, the Services appear to have achieved a strong financial position.

110. Mr. Butson's rebuttal report examines a number of the aspects of the Services' business discussed here and makes projections over the term of the license concerning the impact of SoundExchange's revised rate proposal.[124] In his analysis, Mr. Butson concludes that the Services would remain liquid (i.e., would not need to borrow funds generally other than to refinance existing debt as it comes due) and would not need to cut other costs in order to pay the proposed sound recording royalties. That is not to say that the Services would choose not to borrow funds or cut costs. Both actions may be prudent decisions and are made by healthy businesses on a daily basis. As discussed above, it is routine for businesses making large capital expenditures to finance those expenditures through borrowing. If Sirius chooses to finance its new satellites in 2012 by borrowing, that in no way suggests that the purchase of satellites is disruptive to the business. Rather, it would be a prudent way to finance the investment if the Services have more productive uses for their cash. It is important to note that the market itself does not view the Services accessing capital through borrowing as a sign of potential disruption; the fact that the Services are able to borrow at lower and lower interest rates is a reflection of the confidence of the markets in the future success of these businesses.

111. Mr. Butson's analysis also indicates that the proposed SoundExchange royalty will result in a delay of about one year of the time at which the Services become free cash flow and EBITDA positive.[125] Given, however, that many factors—none related to sound recording royalties—have delayed these metrics by months or years does not suggest that SoundExchange's proposed royalty rate is disruptive. I do not understand minimizing disruptive impact to require the CRJs to guarantee the meeting of any particular metric in any particular year. Rather, this factor would seem to suggest that the rate should not be set so high that the Services cannot succeed in their chosen line of business, i.e., that the rate should not be set so high that the rate itself will cause the Services to cease operating or fundamentally change their business over the long term. Mr. Butson's analysis demonstrates that the sound recording royalty rate proposed by SoundExchange would not be disruptive in that sense.

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[123] "SIRIUS Completes $250 Million Loan," *M2 Presswire*, June 22, 2007.

[124] Butson Written Rebuttal Testimony, pp. 13-20.

[125] Butson Written Rebuttal Testimony, pp. 15-16.

112. Analysis of the record companies under this factor is different. As discussed above, and in contrast to the Services, record company sales are on the decline, and this trend appears to be continuing despite the rise of digital music.[126] As a whole, the financial situation for the recording industry has declined since the PES I proceeding, when the Librarian cited increasing sales of CDs, records, and music videos from 1982 through 1996.[127] As such, revenue from other sources, including licensing fees, has become critical to maintaining the level and variety of recorded music as the industry evolves and its core business model shifts.

113. To be sure, the setting of a low royalty rate in this proceeding will not immediately cause sound recording copyright owners to cease operating. As discussed above, a low rate will have the effect of decreasing funds available to invest in new sound recordings, which likely will reduce the availability of sound recordings in the future. Moreover, given that the Services compete against a host of other types of digital music services such as iTunes, Rhapsody, and fixed-line and wireless webcasting, the impact of a rate that is set too low could have a significant impact on the competitive structure of the industry and drive consumers from products and services from which record companies receive market-based compensation to satellite radio, from which record companies would be receiving below-market returns. It stands to reason that record companies could not survive earning the royalty rate that the Services propose (0.88 percent of revenue) across *all* platforms, products and services.

114. The conclusion to be drawn is that the royalty rate in this proceeding is of increasing importance to the record companies, not simply because of the increasing revenues of the Services but also because of the central importance of newer revenue streams such as payments from the services to sound recording copyright owners. Moreover, when the substitution effect of satellite radio is taken into account, a rate that is set too low will effectively cause record companies and performers to lose money as a result of satellite radio over the term of the license. As satellite radio grows over the term of the license and attracts more subscribers who otherwise would be purchasing CDs or other forms of sound recordings, a rate that is set too low will cause greater decreases in revenues for the recording industry.

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[126] "Digital Music Sales Surge as CDs Continue to Slide," *The Wall Street Journal*, July 5, 2007, p. B3.

[127] PES I Librarian's Decision, p. 25407.

115. At the same time, the concerns raised by the Librarian in the previous proceeding about the possibility that one or more of the PES might have been at risk exiting the industry do not apply to the Services today. Considering the age and stage of development of the satellite radio industry, the Services have built a solid foundation on which they continue to grow. As discussed above, XM and Sirius each have increased their subscriber bases and decreased their costs of acquiring new subscribers; secured, and continue to secure, financing for capital expenditures; and developed and maintained key strategic partnerships with automobile manufacturers. By contrast, the continued decline in CD sales puts the record companies in a much different position today than in 1998. As a result, this factor does not favor the Services in the way that it favored the PES in 1996. Rather, the evidence suggests that a below-market rate could pose a real threat to the record companies and the Services are able to pay market rates for content. A market rate or a rate that ramped up to a market rate at the end of the term would seem to be consistent with this factor.

116. As a final consideration, it is important to recognize that it is in the interest of the record companies for satellite radio to succeed. This is because the record companies receive a direct and measurable benefit from the success of satellite radio. The record companies would like the Services to be strong and offer high quality services to subscribers. If the Services do not survive, the record companies will lose an increasingly important source of licensing revenue. This highlights a dynamic that is relevant to this proceeding: The Services have every incentive to propose a low royalty rate, and will always benefit from a lower rate; for them, it is simply a question of reducing the cost of a necessary input. In contrast, record companies and performers have a more balanced set of incentives here. If the Services are vibrant competitors in the marketplace, it will provide a service that will attract consumers and earn revenues for themselves as well as for record companies and performers. At proper compensation levels, record companies and performers want the Services to succeed because the Services will increase their profits. If the rate is set at a level that is too low, record companies will lose money. However, if the rate is set at a level that is too high such that the Services' operations will be disrupted, record companies and performers will lose an increasingly important revenue source. This balance is one that would be accommodated by a market rate and has to be reflected in any proposal that SoundExchange makes here. In essence, SoundExchange's rate proposal already internalizes the impact of the royalty rate on the record companies' other sources of revenue.

I declare under penalty of perjury that the foregoing testimony is true and correct to the best of my knowledge and belief.

Steven Herscovici

Date: 7/24/07

Exhibit Sponsored by Steven Herscovici

Restricted exhibits, which are identified by the suffix "RR," are not included in the Public Version of SoundExchange's Rebuttal Case

Exhibit No.	Description
SX Exhibit 255 RR	Sirius slideshow presentation "Wachovia Securities Nantucket Equity Conference" (SIR00010319 et seq.) (June 19, 2006)

Appendix A

Curriculum Vitae of Steven Herscovici

STEVEN HERSCOVICI, Ph.D.
Managing Principal

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Fax: 617-425-8001
sherscovici@analysisgroup.com

111 Huntington Avenue
Tenth Floor
Boston, MA 02199

Steven Herscovici specializes in the application of microeconomic theory, econometrics, and data analysis to litigation and other complex business issues. He has testified as an expert witness in antitrust and commercial litigation. He has provided economic analyses and damages estimates in antitrust, finance and securities, environmental, employment, and general business litigation. His experience spans a variety of industries, including payment cards, entertainment, mutual funds, travel, and utilities. He has also designed statistical surveys to address such issues as market definition, market shares, and damages.

Dr. Herscovici has managed economic consulting efforts on significant projects. For example, he has directed numerous case teams supporting expert testimony in high-profile antitrust and business litigation on behalf of MasterCard International. He also has directed economic analyses to address issues surrounding class certification in major antitrust cases. His merger-related work includes managing the economic analysis on behalf of P&O Princess Cruises plc during the Federal Trade Commission's review process of Princess Cruises' merger with Carnival. In the area of finance, Dr. Herscovici has performed analyses on behalf of mutual fund complexes, fund trustees, regulators, and other interested parties to assess the impact of market timing on fund shareholders. He also has considerable experience analyzing copyright licensing issues on behalf of music publishers, performing rights organizations, and record companies.

Dr. Herscovici joined Analysis Group in 1996. Prior to joining Analysis Group, he was an NIH pre-doctoral fellow at the University of Chicago's Population Research Center. He received the Allan Nevins Dissertation Prize from the Economic History Association and Columbia University Press.

Dr. Herscovici holds Ph.D., M.A. and B.A. degrees in Economics from the University of Chicago.

EDUCATION

1996 Ph.D. in Economics, University of Chicago

Dissertation: "Progress Amid Poverty: Economic Opportunity in Antebellum Newburyport"

Winner of the Allan Nevins Prize for the best dissertation in American economic history, awarded by the Economic History Association and Columbia University Press.

Recipient of National Institutes of Health (NIA) Pre-doctoral Training Grant; National Institutes of Health (NICHD) Demography Training Fellowship; Andrew Mellon Foundation Pre-doctoral Fellowship.

1991 M.A. in Economics, University of Chicago

1989 B.A. in Economics with Department and College Honors, University of Chicago

SELECTED CASEWORK

- UNITED STATES DISTRICT COURT, CENTRAL DISTRICT OF CALIFORNIA
  Rondor Music International, Inc. et al. v. TVT Records LLC et al.
  Managed econometric analysis estimating effect of individual song on album sales in copyright infringement matter.

- AMERICAN ARBITRATION ASSOCIATION
  SESAC Inc. v. Television Music License Committee
  Expert report and testimony involving valuation of music performed on broadcast television.

- BEFORE THE DEPARTMENT OF JUSTICE
  Archipelago Holdings, Inc.
  Analysis of competitive implications of merger of New York Stock Exchange and Archipelago Holdings.

- CIRCUIT COURT OF THE 11TH JUDICIAL CIRCUIT IN AND FOR MIAMI-DADE COUNTY
  TicoFrut, S.A. v. E.I. DuPont de Nemours & Company, Inc.
  Managed economic and data analysis in product liability and RICO case brought by Costa Rican orange grower.

- BEFORE THE SECURITIES AND EXCHANGE COMMISSION AND THE STATE OF NEW YORK
  Securities and Exchange Commission v. Gary L. Pilgrim, Harold J. Baxter, and Pilgrim Baxter and Associates, Ltd.
  Estimation of losses to mutual fund shareholders resulting from market timing and excessive short-term trading.

- UNITED STATES DISTRICT COURT, SOUTHERN DISTRICT OF NEW YORK
  MasterCard International Incorporated v. First National Bank of Omaha, Inc.
  Expert report and deposition testimony analyzing competition in payment card industry in trademark dispute involving chip-based cards.

- UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF MISSOURI
  Frederick L. Sample et al. v. Monsanto Co. et al.
  Managed economic and data analyses related to class certification issues in price-fixing case.

- UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF NEW YORK
  In Re Visa Check/MasterMoney Antitrust Litigation
  Managed economic damages analyses and implemented consumer surveys supporting multiple expert witnesses in antitrust tying case.

- BEFORE THE FEDERAL TRADE COMMISSION
  P&O Princess Cruises plc
  Directed economic analysis of cruise industry, and prepared “white paper” evaluating impact of industry consolidation.

- SUPERIOR COURT OF CALIFORNIA, COUNTY OF ALAMEDA
  Adam A. Schwartz v. Visa International, Inc., Visa International Service Corp., and MasterCard International Incorporated
  Managed economic analysis evaluating “unconscionability” claims regarding foreign currency conversion.

- UNITED STATES DISTRICT COURT, WESTERN DISTRICT OF PENNSYLVANIA
  SESAC, Inc. v. WPNT, Inc. et al.
  Expert report analyzing relevant product market in antitrust case involving music licensing on broadcast radio.

- UNITED STATES DISTRICT COURT, DISTRICT OF NEW JERSEY
  Masda Corporation v. Empire Comfort Systems, Inc.
  Expert report and deposition testimony estimating damages in contract dispute involving termination of exclusive distribution agreement.

- BEFORE THE ENVIRONMENTAL PROTECTION AGENCY
  US Gen New England
  Performed benefit-cost analysis evaluating alternative technologies designed to reduce heat and flow discharge of power generating station for compliance with Clean Water Act.

- UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF PENNSYLVANIA
  Whetman et al. v. IKON Office Solutions
  Analyzed company 401(k) plan and estimated damages in ERISA litigation involving claims of "touting" and imprudence of investment alternatives.

- UNITED STATES DISTRICT COURT, SOUTHERN DISTRICT OF NEW YORK
  United States of America v. Visa USA, Inc., Visa International Service Association, and MasterCard International Incorporated
  Managed economic analysis of competition and industry structure in antitrust case in payment cards industry.

- UNITED STATES DISTRICT COURT, WESTREN DISTRICT OF PENNSYLVANIA
  Allegheny Energy Inc., v. DQE, Inc.
  Managed analysis estimating whether regulatory decisions constituted "material adverse event".

- UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF PENNSYLVANIA
  Litigation involving Eastern European bank and Information services and technology firm
  Estimated lost profits from breach of contract and fraud allegations in support of multiple expert witnesses in matter on behalf of computer software development firm.

- UNITED STATES DISTRICT COURT, SOUTHERN DISTRICT OF NEW YORK
  Virgin Atlantic Airways v. British Airways PLC
  Estimated the impact of competition on airfares in antitrust case in airline industry.

- COMMONWEALTH OF MASSACHUSETTS, MIDDLESEX SUPERIOR COURT
  Helen Brown et al. v. Town of Lexington
  Expert report and deposition testimony analyzing claims of monopolization and tying cemetery lots to burial enclosures.

- BEFORE THE FEDERAL TRADE COMMISSION
  Royal Ahold Supermarket Acquisitions
  Prepared "white papers" submitted to U.S. Federal Trade Commission and state Attorneys General assessing the competitive impact of merger-related divestitures in the food retailing industry.

SELECTED OTHER CONSULTING ASSIGNMENTS

- *On behalf of Major Music Publisher.*
  Estimated profitability of current catalog and forecasts of royalties.

- *On behalf of International Music and Film Association*
  Evaluated methodology and findings of survey designed to estimate the extent of physical piracy of CDs and DVDs in China.

- *On behalf of Asbestos Manufacturer*
  Performed statistical analyses of asbestos claims settlement data to determine whether client paid disproportionate share of settlement payments.

- *On behalf of Broadcast Music, Inc.*
  Performed numerous analyses related to determination of statistically valid estimates of broadcast use of copyrighted music.

- *Various Employment matters*
  Performed adverse impact analyses of workforce reductions following corporate restructurings; performed review of wage structure at long-term care facility to assist client experiencing high employee turnover; designed statistical survey to estimate damages in class-action claim for unpaid wages by home health care workers.

PRIOR TESTIMONY

SESAC Inc. v. Television Music License Committee
American Arbitration Association
Testimony involving valuation of music performed on broadcast television

MasterCard International Incorporated v. First National Bank of Omaha, Inc.
United States District Court, Southern District New York
Deposition testimony concerning competition in payment card industry

Masda Corporation v. Empire Comfort Systems, Inc.
United States District Court, District of New Jersey
Deposition testimony concerning lost profits in distributor termination case

Helen Brown et. al. v. Town of Lexington
Commonwealth of Massachusetts, Middlesex Superior Court
Deposition testimony concerning market definition and tying allegations

SELECTED PUBLICATIONS

Getting the Most out of Your Experts," *Expert Alert Newsletter,* (forthcoming) (with Pierre Y. Cremieux and Elizabeth A. Eccher).

"Assessing Conflict, Impact, and Common Methods of Proof in Intermediate Indirect-Purchaser Class Action Litigation," *Economics Committee Newsletter,* 6 (Spring 2006) 4–10 (with Pierre Y. Cremieux, Adam Decter, and Robert Mascola).

"Migration and Economic Mobility: Wealth Accumulation and Occupational Change Among Antebellum Migrants and Persisters," *Journal of Economic History,* 58, (December 1998) 927–956.

"Distribution of Wealth," in N.L. Shumsky (Ed.) *The Encyclopedia of Urban America: The Cities and Suburbs.* (Santa Barbara, Calif.: ABC–CLIO), 1998.

"Progress Amid Poverty: Economic Opportunity in Antebellum Newburyport," *Journal of Economic History,* 57, (June 1997) 484–488.

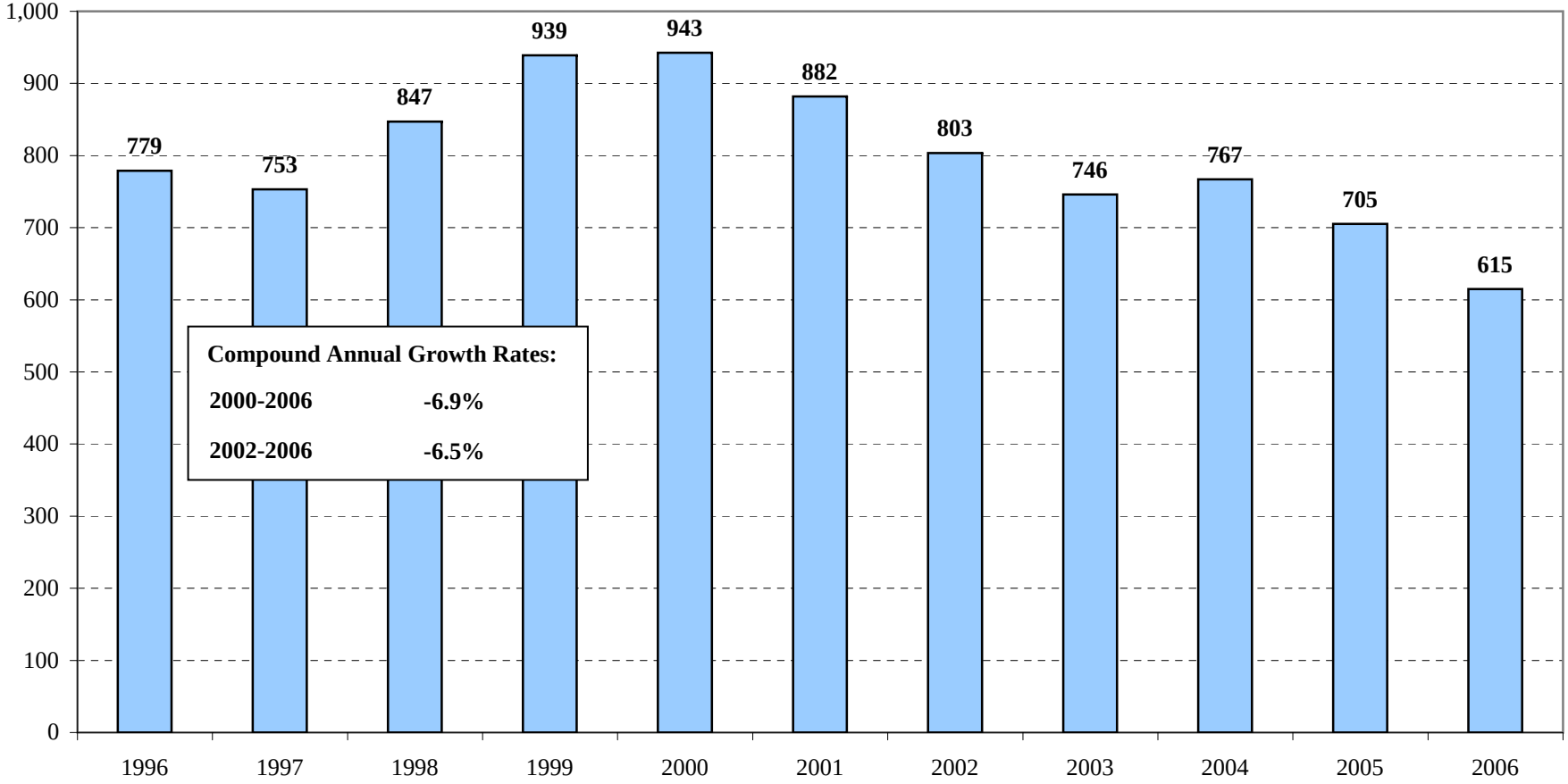
"Ethnic Differences in School Attendance in Antebellum Massachusetts: Evidence from Newburyport, 1850–1860," *Social Science History,* 18, (Winter 1994) 471–496.

"The Distribution of Wealth in Nineteenth Century Boston: Inequality Among Natives and Immigrants, 1860," *Explorations in Economic History,* 30, (July 1993) 321–335.

OTHER

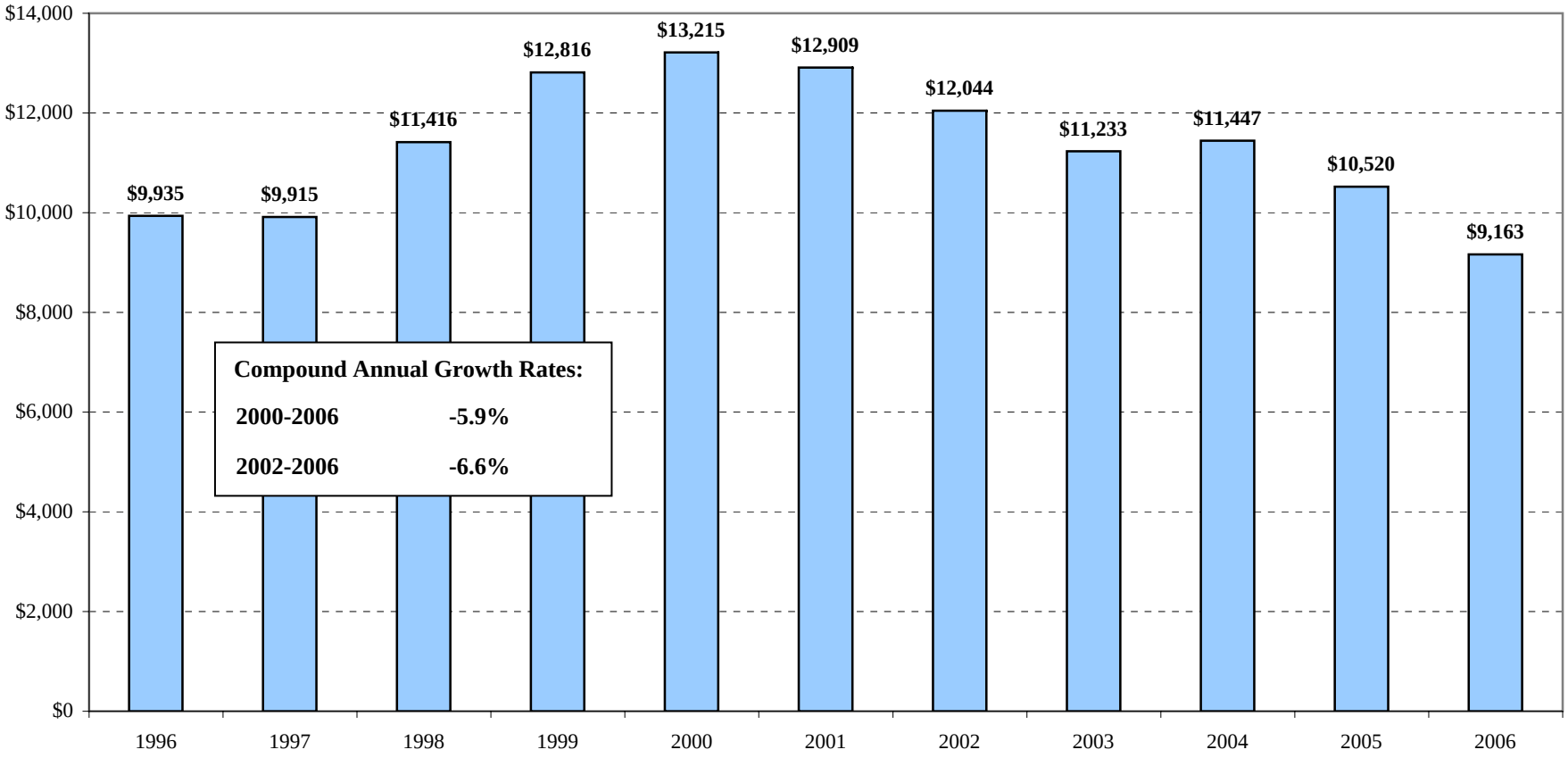
Referee for *Antitrust Law Journal, B.E. Journal of Economic Analysis & Policy, Economic History Review, Social Science History.*

Appendix B
Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics
CDs Shipped, Millions
1996-2006



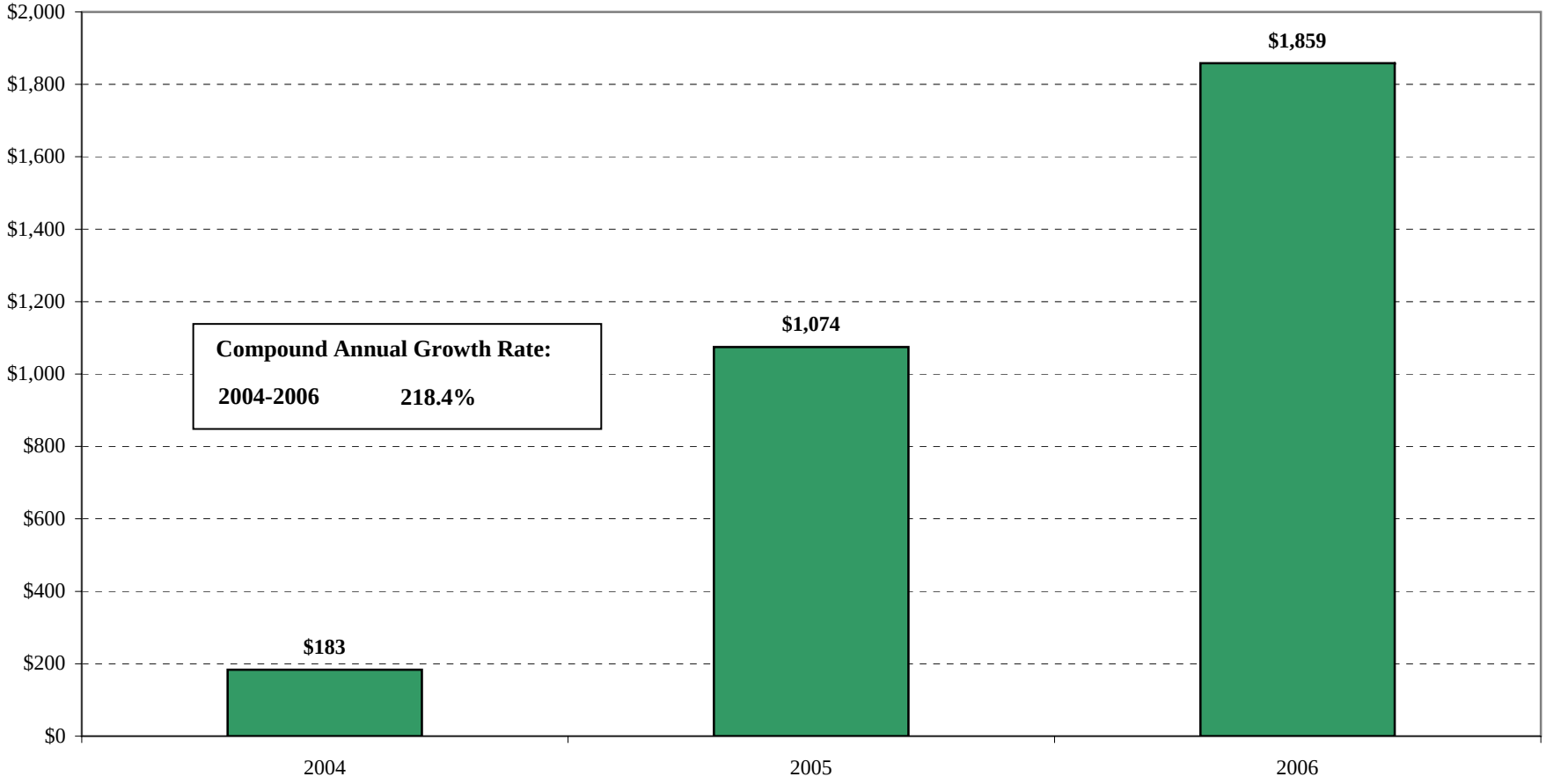
Notes: CD shipments include DualDisc. Data are net after returns.
Source: "2006 Year-End Shipment Statistics," RIAA, <http://www.riaa.com/keystatistics.php>, visited on July 18, 2007.

Appendix C
Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics
Dollar Value of CD Shipments, $ U.S. Millions
1996-2006



Notes: Dollar value is the value of shipments at suggested or estimated list price. CD shipments include DualDisc. Data are net after returns.
Source: "2006 Year-End Shipment Statistics," RIAA, <http://www.riaa.com/keystatistics.php>, visited on July 18, 2007.

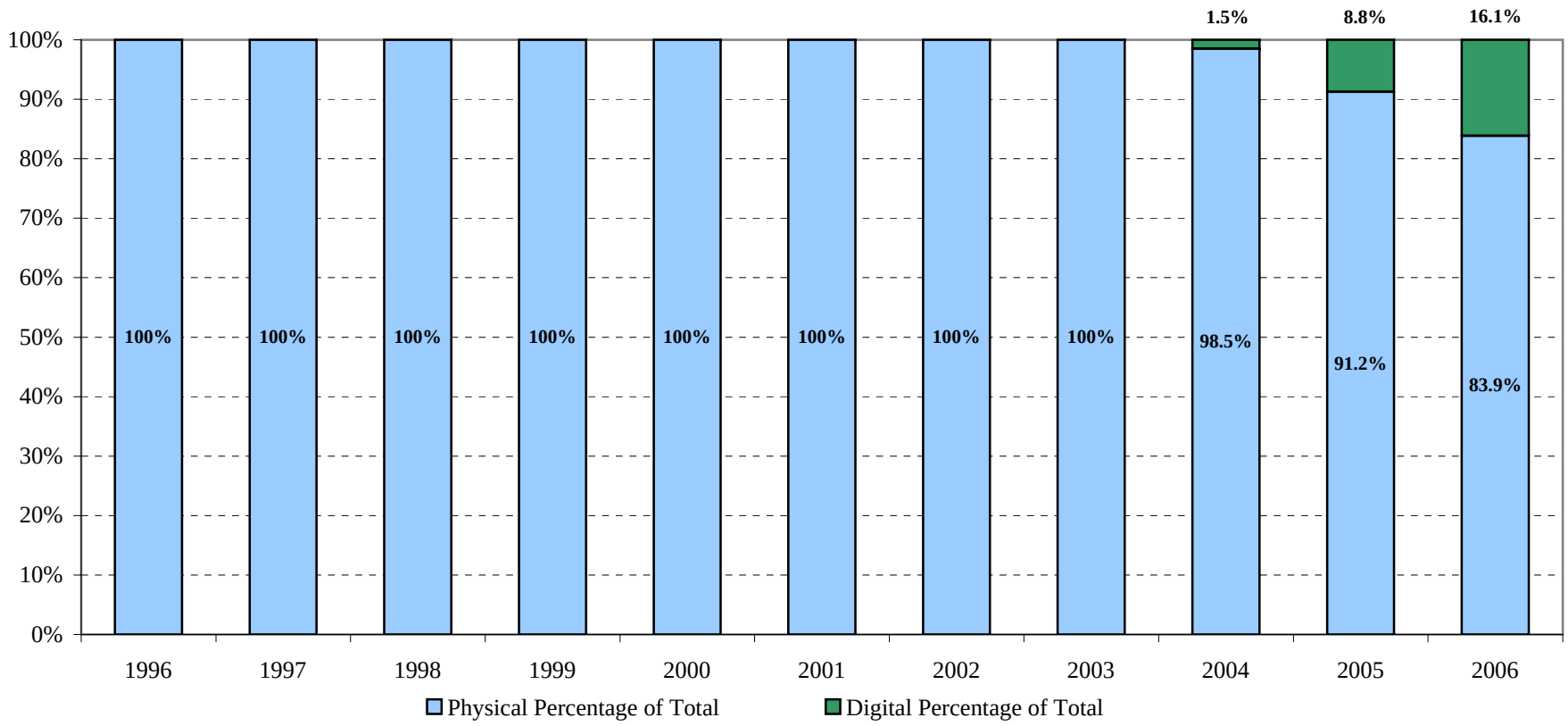
Appendix D
Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics
Dollar Value of Digital Shipments, $ U.S. Millions
2004-2006



Notes: Dollar value is the value of shipments at suggested or estimated list price. Digital shipments include downloads of singles and albums, kiosk sales of singles and albums, music videos and mobile sales including master ringtunes, ringbacks, music videos and full length downloads. Digital shipments are not reported prior to 2004.

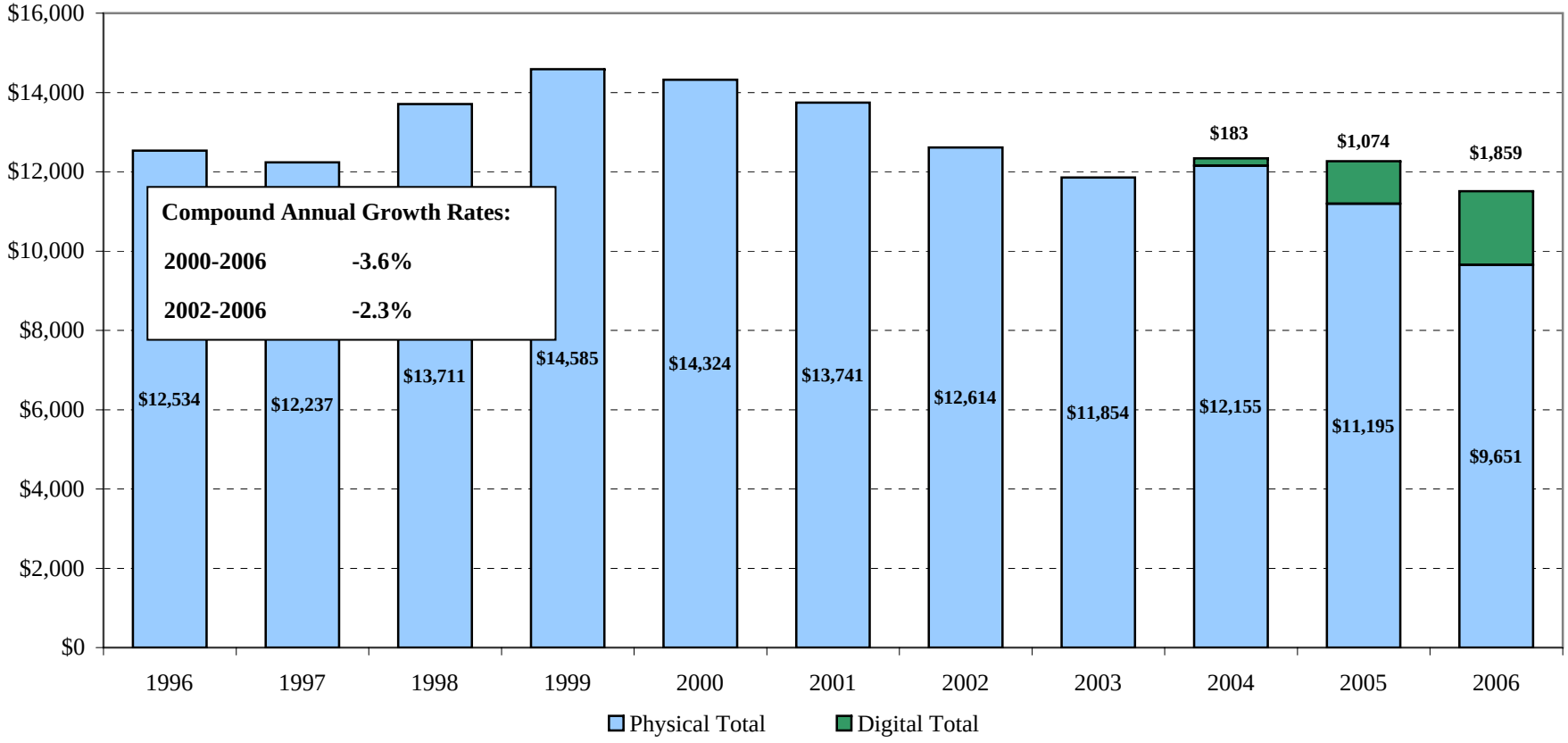
Source: "2006 Year-End Shipment Statistics," RIAA, <http://www.riaa.com/keystatistics.php>, visited on July 18, 2007.

Appendix E
Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics
Dollar Value of Physical and Digital Shipments, Percentage of Total Annual Shipments
1996-2006



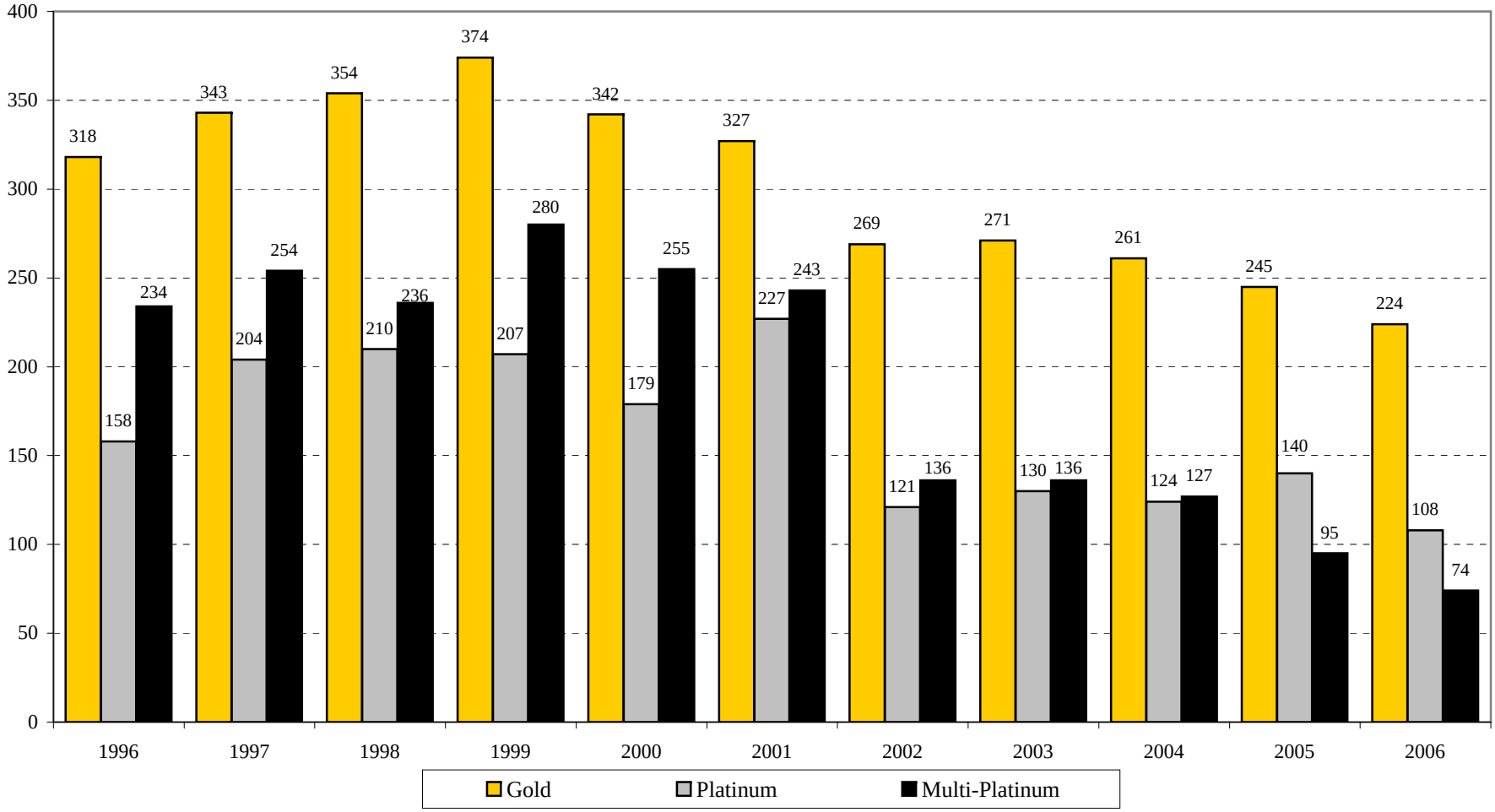
Notes: Dollar value is the value of shipments at suggested or estimated list price. Physical shipments include albums and singles on CD (including DualDisc), Cassette, Vinyl (LP/EP and singles), DVD Audio, Super Audio CDs as well as music videos. Digital shipments include downloads of singles and albums, kiosk sales of singles and albums, music videos and mobile sales including master ringtunes, ringbacks, music videos and full length downloads. Digital shipments are not reported prior to 2004. Data are net after returns.
Source: "2006 Year-End Shipment Statistics," RIAA, <http://www.riaa.com/keystatistics.php>, visited on July 18, 2007.

Appendix F
Recording Industry Association of America, U.S. Manufacturers Year-End Shipment Statistics
Dollar Value of Physical and Digital Shipments, $ U.S. Millions
1996-2006



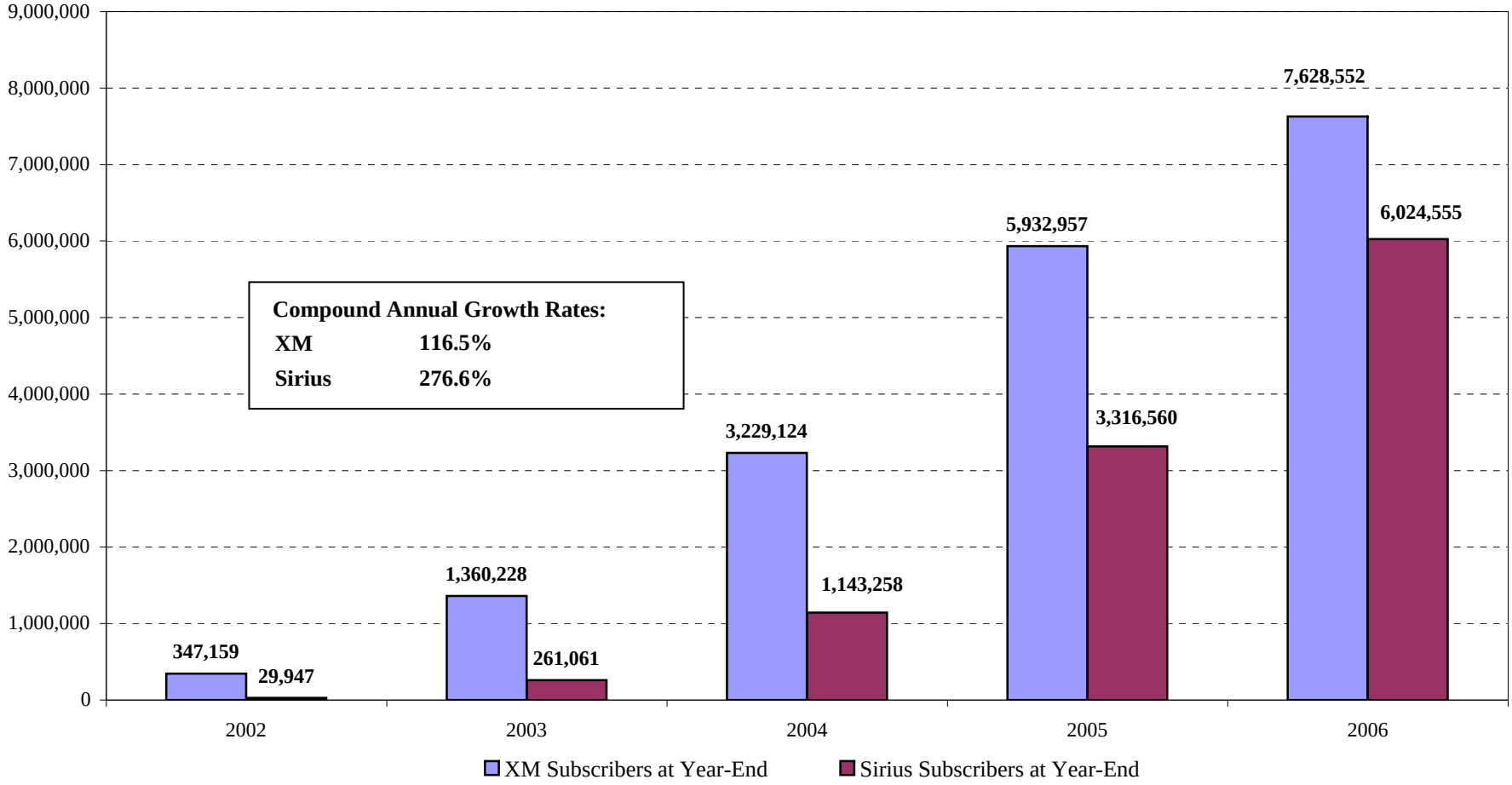
Notes: Dollar value is the value of shipments at suggested or estimated list price. Physical shipments include albums and singles on CD (including DualDisc), Cassette, Vinyl (LP/EP and singles), DVD Audio, Super Audio CDs as well as music videos. Digital shipments include downloads of singles and albums, kiosk sales of singles and albums, music videos and mobile sales including master ringtunes, ringbacks, music videos and full length downloads. Digital shipments are not reported prior to 2004. Data are net after returns.
Source: "2006 Year-End Shipment Statistics," RIAA, <http://www.riaa.com/keystatistics.php>, visited on July 18, 2007.

Appendix G
Recording Industry Association of America, Number of Certifications by Year
1996-2006



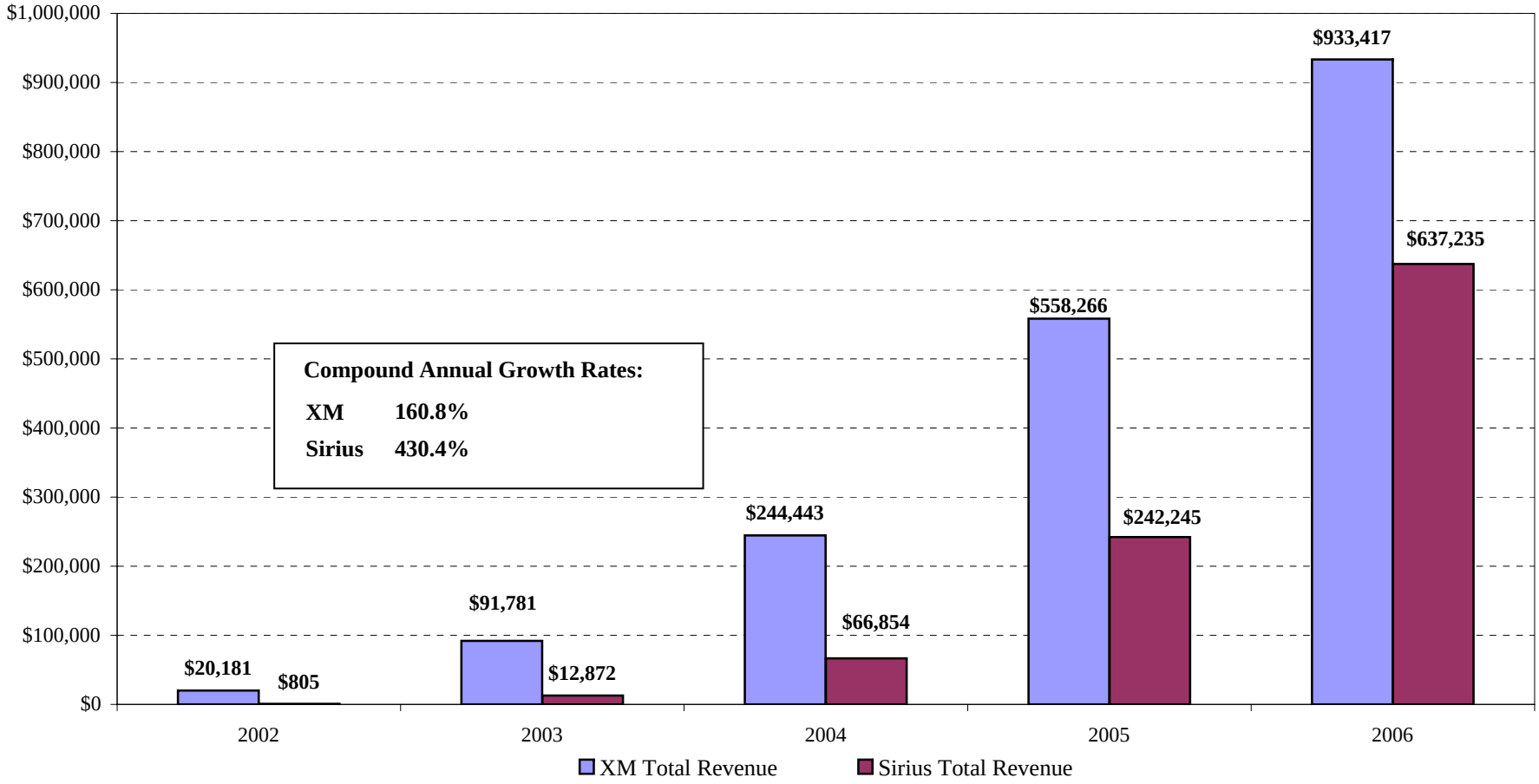
Source: RIAA Gold and Platinum Certifications.

Appendix H
XM and Sirius, Number of Subscribers at Year-End
2002-2006



Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Year Ended December 31, 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006.

Appendix I
XM and Sirius, Total Revenue, $ U.S. Thousands
2002-2006



Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Year Ended December 31, 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Year Ended December 31, 2006.

Appendix J
Audio Entertainment Competitors of Satellite Radio

Source: Sirius Satellite Radio, Inc., Form 425, February 20, 2007.

Appendix K

Use of Music on Entertainment, Sports, and Talk/News Channels

I directed a study of the use of music on programs appearing on XM and Sirius' Entertainment, Sports, and Talk/News channels. The following steps were followed in implementing the study:

- First, Entertainment, Sports, and Talk/News channels were selected for this study. These channels correspond generally to the Services' most popular channels within each category, based on the Services' market research.[1] Table K-1 below shows the channels that were reviewed:

Table K-1

	XM	Sirius
Entertainment		
	Oprah and Friends	Howard 100
	Virus XL	Playboy Radio
	Talk Radio	Martha Stewart Living Radio
	Sonic Theater	Maxim Radio
	Extreme XM	E! Entertainment Radio
	E! Entertainment Radio	Road Dog Trucking
		Cosmo Radio
		Sirius OutQ
Sports		
	ESPN Radio	ESPN Radio
	MLB Home Plate	ESPN News
	Fox Sports Radio	Sirius NFL Radio
	NHL Home Ice	Sirius NASCAR Radio
		Sports Play-by-Play 1
Talk/News		
	Fox News Talk*	
	Air America	
	America Right	
	CNN*	
	CNN Headline News*	

* Denotes station is top station on both XM and Sirius.

[1] OTX, "XM BETA Online Diary Study — Fall 2006," January 2006 [sic, 2007], SX Exhibit 113 DR (XMCRB00013766-XMCRB0013832); TNS, "SIRIUS Satellite Radio Listener Study: Wave 2," October 2006, SX Exhibit 112 DR (SIR00025607-SIR00025752).

- Second, the programming schedules for each of the above channels were reviewed. As part of this review, it was determined that some of these channels have blocks of time during which they are largely indistinguishable from a music-format station. Stations were reviewed at times when they were not broadcasting pure music content.
- Third, the programming on these stations was listened to between July 18, 2007 and July 20, 2007, and this programming was also saved onto portable receivers with recording capabilities. Programming on each Entertainment channel was recorded continuously for two hours; programming on each Sports channel was recorded continuously for 15 minutes; and programming on each News/Talk channel was recorded continuously for 20 minutes. Each occurrence of music (i.e., each "needle drop") was noted, along with the time elapsed since the program or recording began, use of music (e.g., background, bumper, sound effect), whether the music is popular music (i.e., a work that would typically be broadcast on a music-format radio station or purchased by consumers), and other identifiable information about the use of music.
- Table K-2 presents a summary of the music used on these programs. It shows that music is used by XM and Sirius on non-music-format programs in a variety ways on all channels that were part of the study. Importantly, the vast majority of the music used on this programming consisted of pre-recorded sound recordings, as opposed to live music. Thus, XM and Sirius rely on sound recordings for programming on many of their most popular Entertainment, Sports, and Talk/News channels.

Table K-2

XM										
		Length of	Number of Music	Popular	Music Use					
Station Genre	Station Name	Listening	Occurrences	Music	Bumper	Background	Sound Effect	Feature Song	Promo / Theme	PSA
Entertainment	E! Entertainment Radio	120 min	104	x	x	x	x			
	Sonic Theater	120 min	56	x	x	x				
	Extreme XM	120 min	11	x	x	x				
	Oprah and Friends	120 min	62	x	x	x		x	x	
	Virus XL	120 min	25	x	x	x	x	x		
	Talk Radio	120 min	53	x	x	x	x	x	x	
Sports	ESPN Radio	15 min	5	x		x				
	Fox Sports Radio	15 min	10	x	x	x				
	MLB Home Plate	15 min	6	x		x	x			
	NHL Home Ice	15 min	19	x	x	x				
Talk/News	Air America	20 min	19	x	x	x	x	x	x	
	America Right	20 min	8	x	x	x				
	CNN	20 min	9	x	x	x				
	CNN Headline News	20 min	9	x	x	x	x		x	
	Fox News Talk	20 min	17	x	x	x	x	x		

Sirius										
		Length of	Number of Music	Popular	Music Use					
Station Genre	Station Name	Listening	Occurrences	Music	Bumper	Background	Sound Effect	Feature Song	Promo / Theme	PSA
Entertainment	Howard 100	120 min	34	x	x	x	x		x	
	Maxim Radio	120 min	81	x	x	x		x		
	Martha Stewart Living Radio	120 min	45	x	x	x			x	
	Sirius OutQ	120 min	41	x	x	x		x	x	x
	Cosmo Radio	120 min	29	x	x	x	x	x	x	
	Road Dog Trucking	120 min	61	x	x	x		x	x	
	E! Entertainment Radio	120 min	67	x	x	x	x		x	
	Playboy Radio	120 min	67		x	x	x		x	
Sports	Sports Play-by-Play 1	15 min	5	x	x	x				
	Sirius NFL Radio	15 min	4	x	x	x				
	ESPN News	15 min	16	x	x	x		x	x	
	ESPN Radio	15 min	11		x	x			x	
	Sirius NASCAR Radio	15 min	6	x	x	x			x	

Notes:
[1] Popular music is defined as a work that would typically be broadcast on a music-format radio station or purchased by consumers.
[2] Bumper is defined as music used to separate two different program segments, for example a commercial and the program.
[3] Background is defined as any music played in the background, for example in the background of an interview or a commercial.
[4] Sound effect is defined as a short musical clip used to add accent to the program.
[5] Feature song is defined as a full or partial musical work used as content on the program.
[6] Promo / Theme is defined as music used in segments promoting programming or theme music for the program.
[7] PSA refers to public service announcement.

Appendix L
XM Satellite Radio
Revenue and Satellite Costs, $ U.S. Thousands
2005-2020

Revenue [1]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Subscriber Revenue	$502,612	$825,626	$1,000,602	$1,203,014	$1,432,278	$1,664,393	$1,897,738	$2,127,305	$2,358,310	$2,597,468	$2,849,485	$3,115,191	$3,388,056	$3,653,663	$3,897,078	$4,120,932
Total Revenue	$558,266	$933,418	$1,122,424	$1,373,140	$1,666,241	$1,972,256	$2,272,435	$2,556,118	$2,828,646	$3,111,383	$3,409,749	$3,724,665	$4,048,702	$4,365,365	$4,658,180	$4,930,470

Revenue in 2005 Dollars (using 11% Weighted Average Cost of Capital)[2]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Subscription Revenue	$502,612	$743,807	$812,111	$879,633	$943,486	$987,736	$1,014,608	$1,024,634	$1,023,333	$1,015,414	$1,003,544	$988,398	$968,445	$940,870	$904,102	$861,293
Total Revenue	$558,266	$840,917	$910,984	$1,004,028	$1,097,605	$1,170,438	$1,214,936	$1,231,176	$1,227,425	$1,216,317	$1,200,861	$1,181,774	$1,157,284	$1,124,144	$1,080,674	$1,030,490

2005 Present Value of Subscription Revenue	$14,614,027
2005 Present Value of Total Revenue	$17,247,318
Costs of XM3 and XM4 [3]	$566,072
Satellite Costs as % of Subscription Revenue	3.9%
Satellite Costs as % of Total Revenue	3.3%

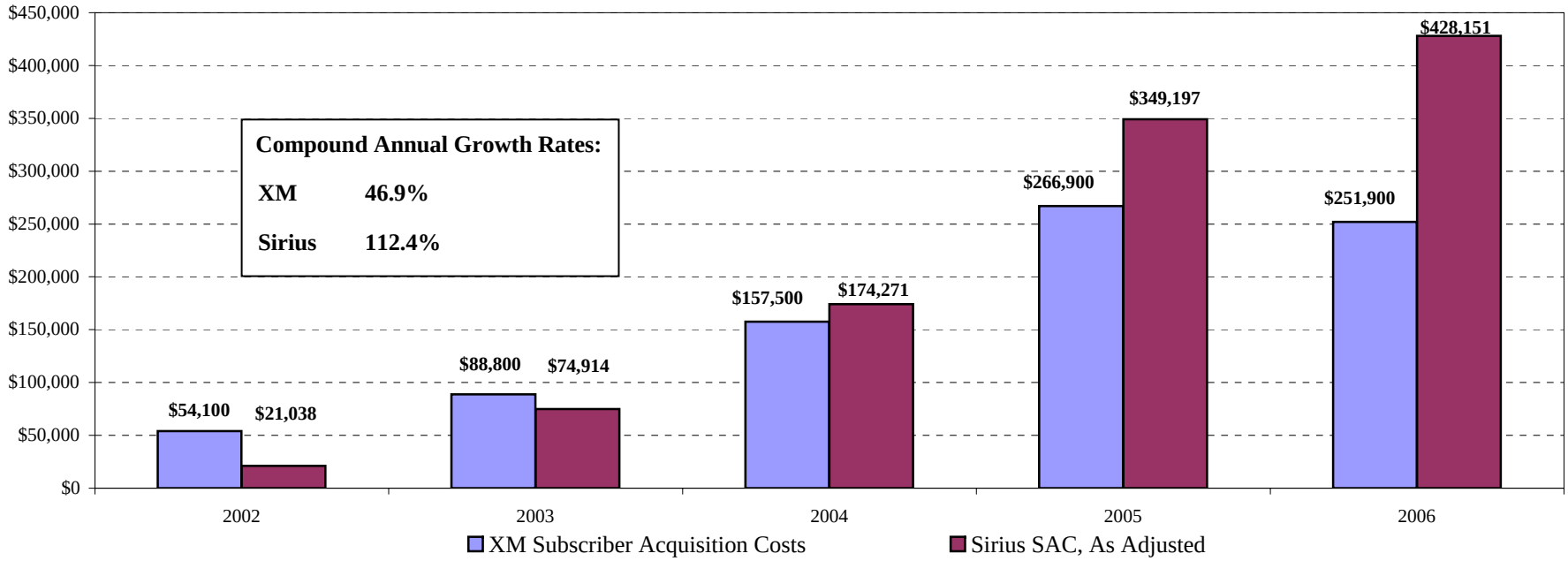
Sources:

[1] XM projected revenue data are from Rebuttal Testimony of Sean Butson, CFA, In the Matter of Adjustment of Rates and Terms For Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2006-1, CRB DSTRA, July 24, 2007, Appendix B.

[2] XM weighted average cost of capital data are from Direct Testimony of J. Armand Musey, In the Matter of Adjustment of Rates and Terms For Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2006-1, CRB DSTRA, Octobe 2006, October 30 2006, p. 11.

[3] XM satellite expenditure data are from Expert Report of Dr. John R. Woodbury, In the Matter of Adjustment of Rates and Terms For Preexisting Subscription Services and Satellite Digital Audio Radio Services, Docket No. 2006-1, CRB DSTRA, October 30, 2006, as Amended May 14, 2007, Exhibit 22.

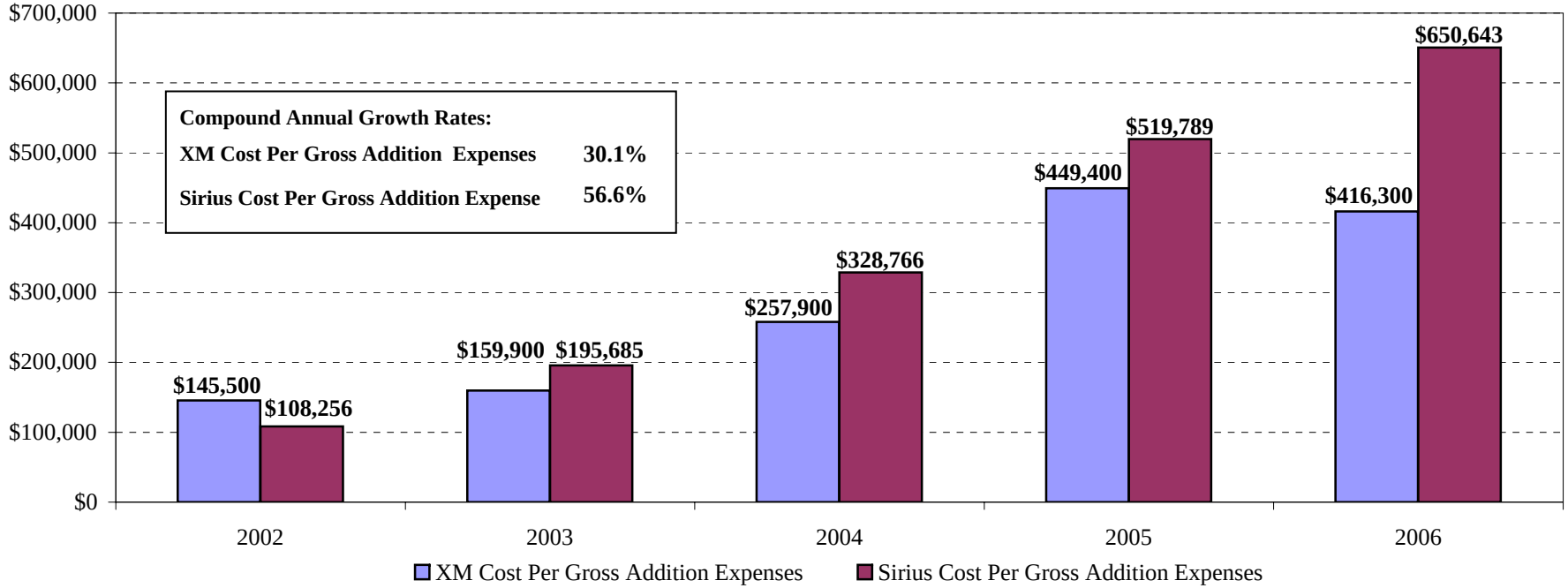
Appendix M
XM and Sirius, Subscriber Acquisition Costs, $ U.S. Thousands
2002-2006



Notes: XM defines Subscriber Acquisition Costs as follows: "We consider subscriber acquisition costs to include radio manufacturer subsidies, certain sales, activation and installation commissions, and hardware-related promotions. These costs are reported in Subsidies & Distribution. The negative margins from equipment sales are also included in subscriber acquisition costs. Subscriber acquisition costs do not include ongoing loyalty payments to retailers and distribution partners, payments under revenue sharing arrangements with radio manufacturers and distributors and certain guaranteed payments to General Motors." Sirius defines Subscriber Acquisition Costs (SAC) as follows: "Subscriber acquisition costs include hardware subsidies paid to radio manufacturers, distributors and automakers, including subsidies paid to automakers who include a SIRIUS radio and a prepaid subscription to our service in the sale or lease price of a new vehicle; subsidies paid for chip sets and certain other components used in manufacturing radios; commissions paid to retailers and automakers as incentives to purchase, install and activate SIRIUS radios; product warranty obligations; and compensation costs associated with stock-based awards granted in connection with certain distribution agreements...Subscriber acquisition costs do not include advertising, loyalty payments to distributors and dealers of SIRIUS radios and revenue share payments to automakers and retailers of SIRIUS radios, which are included in sales and marketing expense. Subscriber acquisition costs also do not include amounts capitalized in connection with our agreement with Hertz, as we retain ownership of certain SIRIUS radios used by Hertz." Sirius defines SAC, as adjusted, as follows: "SAC, as adjusted, ... is derived from subscriber acquisition costs, excluding stock-based compensation, and margins from the direct sale of SIRIUS radios and accessories." SAC, as adjusted, is shown in this exhibit. SAC, as adjusted, is a reported line item for the years 2004 through 2006. Its equivalent was computed for the years 2002 and 2003.

Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006.

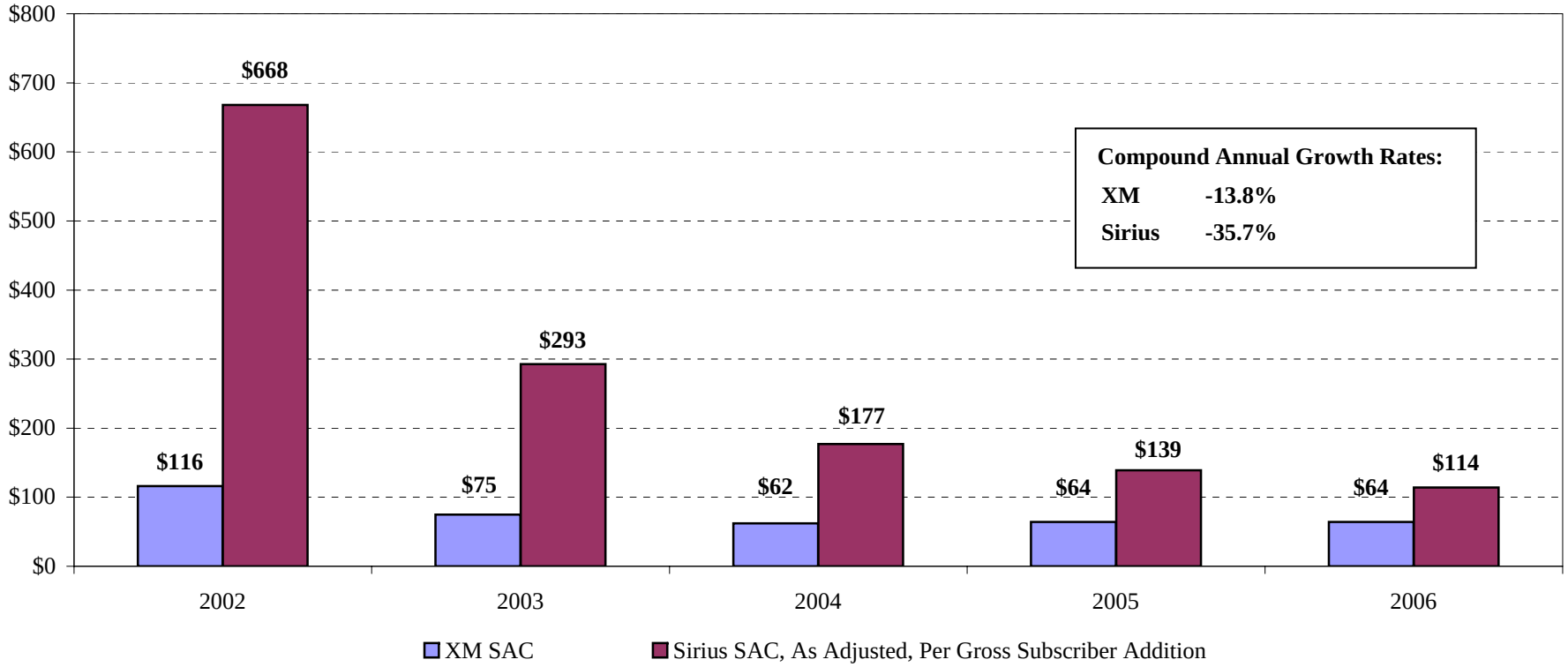
Appendix N
XM and Sirius, Cost Per Gross Addition Expenses, $ U.S. Thousands
2002-2006



Notes: See notes to Appendix M for XM's definition of Subscriber Acquisition Costs and Sirius's definition of SAC, as adjusted. XM defines Cost Per Gross Addition (CPGA) Expenses as follows: "We consider CPGA to include the amounts in SAC, as well as advertising, media and other discretionary marketing expenses. In our financial statements, SAC costs are captured in Subsidies & Distribution and the negative margins from equipment sales, while CPGA costs are primarily captured by the combination of Subsidies & Distribution, Advertising & Marketing, plus the negative margins from equipment sales. CPGA does not include marketing staff (included in Retention & Support) or the amortization of the GM guaranteed payments (included in Amortization of GM liability)." Sirius does not report CPGA Expenses, however, Kagan Research suggests that Sirius's "... reported SAC plus sales and marketing costs [is] an essentially equivalent metric." Sirius defines Sales and Marketing as follows: "Sales and marketing expenses include costs for advertising, media and production, including promotional events and sponsorships; residuals; cooperative marketing; revenue share; customer retention and compensation. Residuals are monthly fees paid based upon the number of subscribers using a SIRIUS radio purchased from a retailer. Cooperative marketing costs include fixed and variable payments to reimburse retailers and automakers for the cost of advertising and other product awareness activities." Sirius's CPGA Expenses were computed by adding Sales and Marketing, less stock-based compensation, to SAC, as adjusted.

Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; "Satellite Radio Outlook: Analysis and Projections for the Industry," Kagan Research, July 2005.

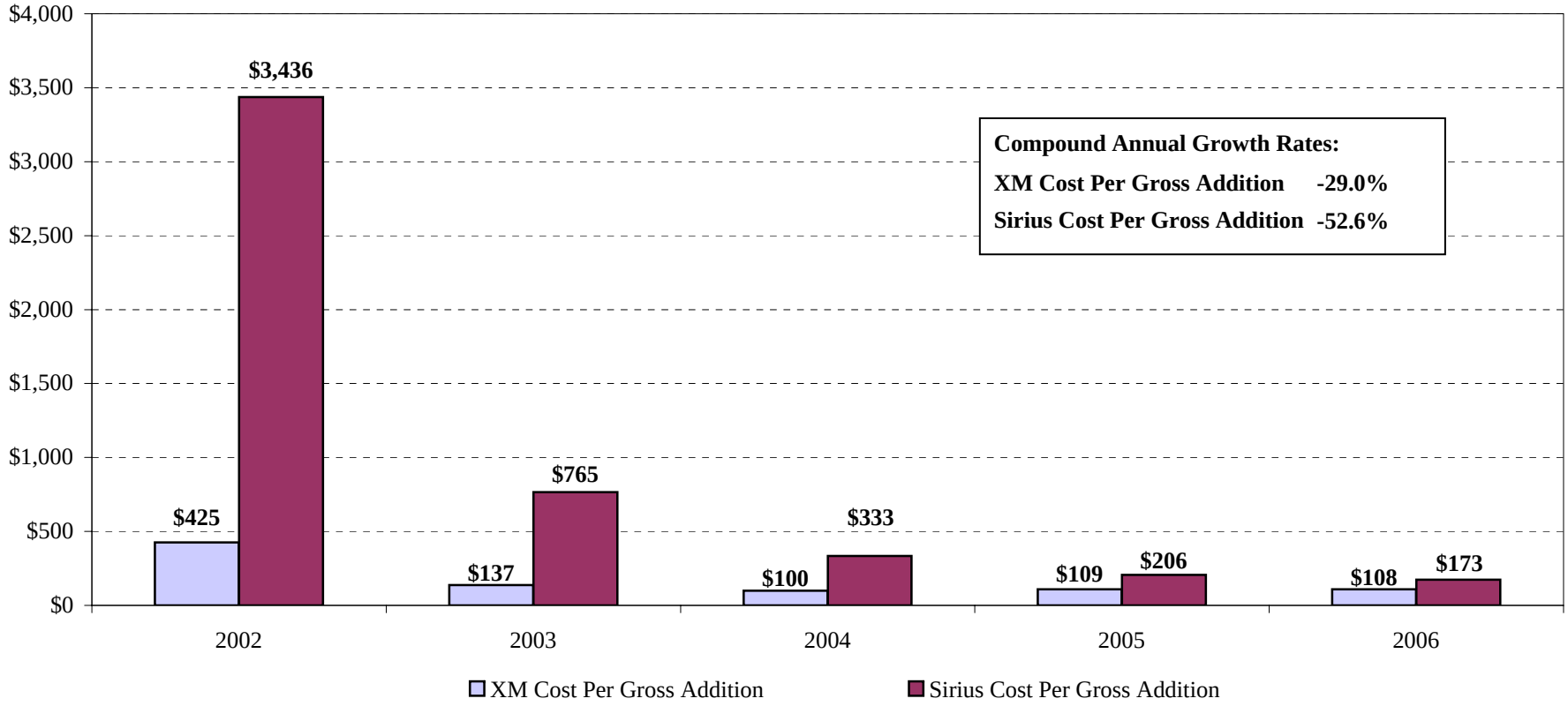
Appendix O
XM and Sirius, Subscriber Acquisition Costs on a Per-Subscriber Basis, $ U.S.
2002-2006



Notes: See notes to Appendix M for XM's and Sirius's respective definitions of Subscriber Acquisition Costs. XM defines SAC as follows: "Subscriber acquisition costs are divided by the appropriate gross additions or units manufactured to calculate what we refer to as 'SAC.'" Sirius defines SAC, as adjusted, per gross subscriber addition as follows: "SAC, as adjusted, per gross subscriber addition is derived from subscriber acquisition costs, excluding stock-based compensation, and margins from the direct sale of SIRIUS radios and accessories divided by the number of gross subscriber additions for the period." SAC, as adjusted, per gross subscriber addition is shown in this exhibit. SAC, as adjusted, per gross subscriber addition is a reported line item for the years 2004 through 2006. Its equivalent was computed for the years 2002 and 2003.

Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006.

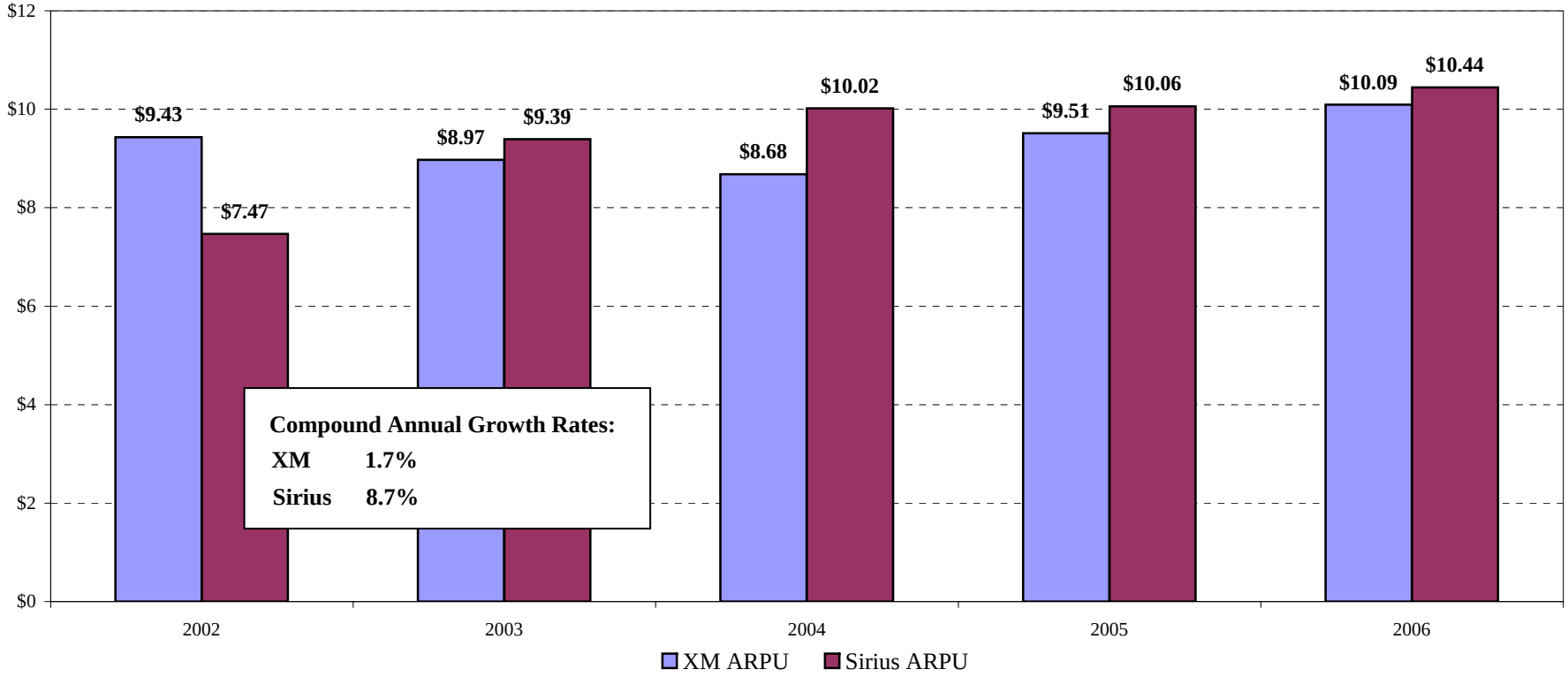
Appendix P
XM and Sirius, Cost Per Gross Addition, $ U.S.
2002-2006



Notes: See notes to Appendix M for XM's definition of Subscriber Acquisition Costs and Sirius's definition of SAC, as adjusted. See notes to Appendix N for XM's definition of Cost Per Gross Addition (CPGA) Expenses and Sirius's definition of Sales and Marketing. XM also reports: "[Cost Per Gross Addition (CPGA) Expenses] are divided by the gross additions for the period to calculate CPGA." Sirius's CPGA Expenses were computed by adding Sales and Marketing, less stock-based compensation, to SAC, as adjusted. The number of gross subscriber addition Sirius uses to calculate SAC, as adjusted, per gross subscriber addition was then used to determine Sirius's CPGA.

Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006.

Appendix Q
XM and Sirius, Average Monthly Subscription Revenue on a Per-Subscriber Basis, $ U.S.
2002-2006



Notes: XM defines Average Monthly Revenue per Subscriber (ARPU) as follows: "Average monthly subscription revenue per subscriber is derived from the total of earned subscription revenue (net of promotions and rebates) divided by the monthly weighted average number of subscribers for the period reported." Sirius previously reported ARPU based on total earned subscription revenue without net advertising revenue in the years 2002-2005, and it was defined as follows: "Average monthly revenue per subscriber, or ARPU, is derived from total subscriber revenue over the daily weighted average number of subscribers for the period." Because Sirius currently reports ARPU based on total earned subscription revenue and net advertising revenue, ARPU was calculated in 2006 using only earned subscription revenue and not net advertising revenue.

Sources: XM Satellite Radio Holdings Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 and 2006; SIRIUS Satellite Radio Inc., Form 10-K For The Fiscal Years Ended December 31, 2004 through 2006.

Appendix R
XM Satellite Radio Bond Issuances
Amounts in $ U.S. Millions

Unique Bloomberg Identifier	Amount	Announce Date	Maturity Date	Status
COEC2383866	0.33	3/10/2000	3/15/2010	Matured / Called
COEC2382546	325.00	3/10/2000	3/15/2010	Matured / Called
COEC3063996	325.00	9/7/2000	3/15/2010	Matured / Called
COEC3559886	125.00	3/1/2001	3/1/2006	Matured / Called
COEC8421314	437.96	1/28/2003	12/31/2009	Matured / Called
COEF9187685	412.60	1/28/2003	12/31/2009	Outstanding
COED0174984	185.00	6/12/2003	6/15/2010	Matured / Called
COED0175429	185.00	6/12/2003	6/15/2010	Matured / Called
COED1730552	185.00	8/27/2003	6/15/2010	Matured / Called
COED4290307	200.00	4/15/2004	5/1/2009	Matured / Called
COED4290182	200.00	4/15/2004	5/1/2009	Matured / Called
COED5538969	200.00	5/28/2004	5/1/2009	Matured / Called
COED7033191	400.00	11/18/2004	12/1/2009	Outstanding
COED9407344	400.00	5/2/2005	12/1/2009	Outstanding
COEF3787837	200.00	4/21/2006	5/1/2013	Matured / Called
COEF3788074	600.00	4/21/2006	5/1/2014	Matured / Called
COEF3787910	600.00	4/21/2006	5/1/2014	Matured / Called
COEF3787993	200.00	4/21/2006	5/1/2013	Matured / Called
COEF6474623	600.00	8/17/2006	5/1/2014	Outstanding
COEF6470100	200.00	8/17/2006	5/1/2013	Outstanding
Total Amount Issued	**5,981**			
Total Amount Outstanding	**2,013**			
Number of Issuances	**20**			
Number of Issuances Matured/Called	**15**			
Number of Issuances Outstanding	**5**			

Note: All bond issuances recorded by Bloomberg are reported above, including those issuances that matured or were called and those issuances that remain outstanding.
Source: Bloomberg.

Appendix S
Sirius Satellite Radio Bond Issuances
Amounts in $ U.S. Millions

Unique Bloomberg Identifier	Amount	Announce Date	Maturity Date	Status
CODD1143377	258.20	11/21/1997	12/1/2007	Matured / Called
CODD1143369	0.01	11/21/1997	12/1/2007	Matured / Called
COEC1360550	200.00	5/13/1999	5/15/2009	Matured / Called
COEC1360998	0.20	5/13/1999	5/15/2009	Matured / Called
COEC1360816	200.00	5/13/1999	5/15/2009	Matured / Called
COEC1361095	0.20	5/13/1999	5/15/2009	Matured / Called
COEC1840346	143.75	9/23/1999	9/29/2009	Outstanding
COEC1997336	200.00	10/13/1999	5/15/2009	Matured / Called
COEC9876474	201.25	5/20/2003	6/1/2008	Outstanding
COED3333884	300.00	2/13/2004	2/15/2009	Outstanding
COED6358888	300.00	8/13/2004	2/15/2009	Outstanding
COED6449000	230.00	10/8/2004	10/15/2011	Outstanding
COEF0463937	500.00	8/2/2005	8/1/2013	Matured / Called
COEF0463572	500.00	8/2/2005	8/1/2013	Matured / Called
COEF1993031	500.00	12/6/2005	8/1/2013	Outstanding
Total Amount Issued	**3,534**			
Total Amount Outstanding	**1,675**			
Number of Issuances	**15**			
Number of Issuances Matured/Called	**9**			
Number of Issuances Outstanding	**6**			

Note: All bond issuances recorded by Bloomberg are reported above, including those issuances that matured or were called and those issuances that remain outstanding.
Source: Bloomberg.