EXHIBIT A

SIRIUS-XM JOINT OPPOSITION
MB Docket No. 07-57
July 24, 2007

CRA INTERNATIONAL,
ECONOMIC ANALYSIS OF THE COMPETITIVE EFFECTS OF THE SIRIUS-XM MERGER

REDACTED

FOR PUBLIC INSPECTION

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
XM Satellite Radio Holdings Inc.	)	
Transferor	)	
	)	
and	)	MB Docket No. 07-57
	)	
Sirius Satellite Radio Inc.	)	
Transferee	)	
	)	
Consolidated Application for Authority to	)	
Transfer Control of XM Radio Inc. and Sirius	)	
Satellite Radio Inc.	)	

ECONOMIC ANALYSIS OF THE COMPETITIVE EFFECTS OF THE SIRIUS – XM MERGER

Steven C. Salop
Professor of Economics and Law, Georgetown University Law Center
Senior Consultant, CRA International

Steven R. Brenner
Lorenzo Coppi
Serge X. Moresi
Vice Presidents, CRA International

July 24, 2007

TABLE OF CONTENTS

I. INTRODUCTION AND EXECUTIVE SUMMARY 1

II. MARKET DEFINITION 9

A. Inter-modal Demand Substitution and Competition 10

1. Changes in Listening Patterns 12
2. Satellite Radio Penetration versus Terrestrial Radio Coverage 14
3. Inter-modal Competitive Responses 16

a) Terrestrial Radio: AM/FM and HD Radio 17

b) Wireless Phones 21

c) iPods and Other MP3 Players 26

d) Feature Convergence and New Product Innovation 27

B. Product Differentiation 30

1. Product Differentiation and Switching Costs Between Sirius and XM 30

a) Content Differentiation 31

b) OEM Distribution Differentiation 32

2. Product Differentiation Between Satellite Radio and Other Audio Entertainment Modes 34

C. Penetration Pricing, Market Growth and the SSNIP Test for Market Definition 43

D. Conclusion on Market Definition 48

III. MARKET SHARES AND CONCENTRATION IN THE MARKET FOR AUDIO ENTERTAINMENT DEVICES 48

IV. COMPETITIVE EFFECTS ANALYSIS 52

A. Inter-Modal Competition in the Short-Run and Longer-Run 54

B. Repositioning, Emerging Competition, and Entry 56

1. Product Extensions and Repositioning 57
2. Emerging Competition and Expansion 57
3. De Novo Entry 61

C. Internalizing the Dynamic Demand Spillover Externality 61

D. Reducing Production and Distribution Resource Costs 63

E. Increasing Product Quality 65

F. Reducing Content Acquisition Costs 66

G. Reducing Automobile OEM Distribution Costs 70

H. Reducing Retail Distribution Costs 72

I. Conclusions on Competitive Effects 72

V. PRICE DISCRIMINATION AGAINST SUBSCRIBERS IN AREAS WITH LIMITED AM/FM COVERAGE 76

VI. CONCLUSIONS 83

Appendix A: Dynamic Demand Functions and Implications for Merger Analysis: Penetration Pricing and Dynamic Spillover Effects A1

Appendix B: Dynamic Demand Functions and Implications for Merger Analysis: The Effects of Lump Sum Payments for Inputs on Downstream Output Prices ...B1

Exhibit A

Exhibit B

Exhibit C

I. INTRODUCTION AND EXECUTIVE SUMMARY

1. These Reply Comments provide an economic analysis of the merger of Sirius Satellite Radio Inc. (hereinafter "Sirius") and XM Satellite Radio Holdings Inc. (hereinafter "XM") and reply to Comments submitted by other participants in this proceeding. The authors are Steven C. Salop, Professor of Economics and Law at Georgetown University Law Center, and Senior Consultant at CRA International; Steven R. Brenner, Vice President at CRA International; Lorenzo Coppi, Vice President at CRA International; and Serge X. Moresi, Vice President at CRA International. We have been retained by Sirius and XM. Our Curricula Vitae are attached as Exhibit A.

2. We are confident that the overall effect of the merger of Sirius and XM will be procompetitive, even though the merger will eliminate existing rivalry between the merging firms. It will lead to an increase in the number of subscribers of the merged firm, not a decrease in output. The merger will reduce the level of prices relative to what likely would prevail if the merger does not occur. Moreover, competition in the market for audio entertainment will increase from the merger, and consumers will benefit. This is in part because the market is broader than satellite radio, including other audio entertainment devices, content and services. Competition in this market is already intense and will increase over time as the functionality of devices converges – a trend illustrated most recently by the iPhone – and wireless mobile connectivity improves. Competition also will increase because the merger will lead to a variety of procompetitive efficiencies, including cost-reductions, product quality improvements, and increased incentives for low penetration pricing as well as for demand-enhancing and cost-reducing investments. These efficiency benefits likely also will spur more investment and innovation by other competitors in the market.

3. Thus, we disagree with the Comments that argue for a very narrow satellite radio-only market that ignores the reality of consumer substitution across many differentiated products (as well as ignoring differentiation between XM and Sirius), and is confined to a static analysis that ignores the fact that demand is dynamic and competition is both dynamic and increasing over time. We also disagree with the Comments that argue that the merger will fail to offer real efficiency benefits. Our conclusion that the merger likely will be procompetitive holds regardless of how the relevant market is defined.

4. Audio entertainment is a dynamic market and this dynamism broadens the scope of competition and substitution.

- Satellite radio is still in a growth phase and consequently Sirius and XM have powerful incentives to focus on attracting new subscribers from people who currently listen to terrestrial radio and other media, rather than on trying to divert subscribers from one another. There were fewer than 14 million subscriptions to Sirius and XM at the end of 2006, a level insufficient to cover the substantial costs of the two services. Current projections are for the firms to almost double their combined penetration by the end of 2010. To accomplish this, they also must replace exiting subscribers, very few of whom switch from one satellite service to another. If the annual churn rate is 20%, they would have to add about 28 million new subscribers to replace the lost subscribers and achieve the forecast growth in subscribers. Sirius and XM could not come close to reaching their projections by simply trying to divert subscribers from each other. Sirius and XM instead must set prices with a focus on the goal of overcoming the inertia of the approximately 95% of the population who do not subscribe to satellite radio.
- The audio entertainment market is not likely to tip to satellite radio in the future. Projections indicate that satellite radio service will continue to have a fairly small share of the audio entertainment market for many years. In fact, lower than expected subscriber numbers, due at least in part to current inter-modal competition and recognition of emerging competition over time, led last year to significant downward revisions in satellite radio subscriber projections by a number of analysts.
- Competition already is substantial today. It also is intensifying over time and thus the demand facing the merged firm is likely to become more elastic. Terrestrial radio broadcasters will continue to adopt HD radio technology. Broadcasters even may be able to use recently developed encryption technology to license HD radio programming on a subscription basis like satellite radio. Competition and potential substitution in response to higher prices will increase as music, news, and sports content increasingly are delivered over wireless phones, including those connected to auto sound systems, and wireless technology improves to permit more robust Internet service in moving vehicles. The introduction of Internet service in vehicles is already beginning. As Internet radio becomes widely available in vehicles, listeners will have thousands of stations from which to choose, just as they do now at home.
- Demand for satellite radio involves a dynamic demand spillover effect. This dynamic spillover effect occurs because satisfied consumers display, explain, demonstrate, and recommend the product to other potential customers, as well as because that consumer base reduces the uncertainty of potential new subscribers about the viability of the product in the marketplace and sets off and maintains a bandwagon effect. Creating a "buzz" helps establish a product category in the eyes of potential customers, as well as with the distributors – retailers and OEMs – all of whom have a number of options for audio products to utilize or distribute. Indeed, the satellite radio companies devote substantial effort to monitoring and maintaining subscriber growth rates, as any

slowdown may be interpreted as a sign the product category is not succeeding, and such a market judgment may be irreversible. (As one report put it, "the buzz may be killed.") In this situation, firms have an immediate incentive to engage in low "penetration pricing" and other demand-increasing investments to overcome consumer inertia and exploit the dynamic spillover effect to maximize longer-run profits, rather than simply trying to maximize short-run profits. This inherently longer-run marketing focus and the resulting emphasis on penetration pricing will continue – and indeed increase – after the merger and must be taken into account in the economic analysis of market definition and the competitive effects of the merger.

5. Carrying out a market definition analysis, it is clear that the market is broader than satellite radio-only. Sirius and XM compete in an audio entertainment market, not only with one another but also with other forms of audio entertainment products. These products include, among others, devices such as terrestrial radio (both analog and HD radio), iPods and other MP3 players, audio content-enabled wireless phones, and the content and services listened to on these devices. These products are differentiated along various dimensions, but they nonetheless compete. Sirius and XM are relatively small players in the audio entertainment market, with only about 14 million subscriptions as of the end of 2006. Sirius and XM together have a combined market share of only **[[REDACTED]]**% to **[[REDACTED]]**%, depending on which data source and share measurement is used. In contrast, the market share of terrestrial radio is much larger, between **[[REDACTED]]**% and **[[REDACTED]]**%, depending on the data source and share measure. The merger will not have a significant effect on market concentration, increasing the HHI by less than **[[REDACTED]]** points. (Even if the market were defined only as terrestrial and satellite radio, the HHI would increase by less than 50 points.)

6. This broad market definition is supported by evidence of substantial buyer substitution and seller competitive responses among these different types of audio entertainment products. Substantial usage and survey data supports the conclusion that customers treat satellite radio and other products as reasonable substitutes in that broad market. This evidence includes usage data showing that when people subscribe to satellite radio, their usage of alternate audio entertainment products such as terrestrial radio and MP3s goes down; when they disconnect from satellite radio, their usage of these alternate products goes up. In addition, the data on disconnections show that only about **[[REDACTED]]** of subscribers who disconnect from one satellite radio service churn to the other satellite radio service. The evidence therefore strongly supports the fact that there are a large number of substitutes available to satellite radio subscribers, as well as the fact that XM and Sirius are highly differentiated from each other as a practical matter. Further, data show an inverse relationship between satellite radio penetration and the number of terrestrial stations that are received: when there are fewer terrestrial stations, satellite radio penetration is higher. The AAI (a commenter critical of the transaction) suggested this relationship as a test of the

cross-price elasticity of demand between satellite and terrestrial radio. Further evidence of competition and demand substitution between the formats includes the following:

- **Terrestrial Radio:** Every satellite radio subscriber previously listened to AM/FM radio, and many eventually churn from satellite radio back to terrestrial radio. Sirius advertises itself as the "best radio on radio." XM's initial advertising campaign was "Beyond AM, Beyond FM…XM Radio." Terrestrial radio is free and broadcasters have run their own ad campaigns, such as "Radio: You shouldn't have to pay for it." Terrestrial radio also has responded to competition from satellite radio by reducing the number of commercials and by rolling out HD radio, which increases channel capacity, improves sound quality and is commercial-free for side channels. Advertising to promote HD radio in 2007 is expected to be about $250 million, **[[REDACTED** [redacted]]. Clear Channel also now makes some of its programming content available on wireless phones through mSpot radio.
- **Wireless Phones:** Almost all wireless carriers offer phones enabled for listening to music, sports, news, talk and other audio entertainment content. The number of these phones that have been sold is growing rapidly and is expected to reach 28 million by the end of this year (about twice the current number of activated satellite radios). Wireless phone competitors are offering a large and growing number of audio services, including news and sports as well as music, that subscribers can enjoy on the go or, increasingly, in the car. For example, Sprint offers numerous audio streaming packages, including content from Pandora, mSpot Radio, Music Choice, Rhapsody, as well as Sirius. AT&T offers content from Napster, and Yahoo!, as well as XM. Alltel offers the Axcess Radio audio streaming package, as well as a streaming service from XM. Verizon VCast service offers streaming sports programming and audio downloading. Services like Mercora M and Mobzilla also offer audio streams to wireless phone subscribers with Internet access. In response, Sirius and XM have offered their content on a wholesale basis through various wireless networks including Sprint, Alltel, and AT&T. These wireless phones may be connected for audio listening to many auto sound systems, both through auxiliary input jacks and, increasingly, through new technologies such as the recently-introduced Ford Sync product. Sprint also has just announced a new phone that connects through the FM radio.
- **iPods/MP3 Players:** Sellers of iPods and other MP3 players, which are commercial-free and offer high quality sound, have introduced podcasts and facilitated delivery of individual songs, news, and talk programming and subscription-based audio (such as Rhapsody, Yahoo! and Napster) at home and at Wi-Fi hotspots, as well as on some wireless phones. The new Slacker product will introduce a music service delivered to portable devices both over the Internet and Wi-Fi and Ku band satellite capacity. XM and Sirius have introduced radios that can store audio. iPods and MP3 players also can be connected to many car stereo systems through auxiliary input jacks and, in addition,

automakers now offer a docking option that integrates iPods operation with the car stereo in about 70% of new cars.

- **Internet Radio:** There are thousands of Internet radio stations available to home listeners, and every week millions listen to Internet radio. In response, Sirius and XM stream their services over the Internet to subscribers, as do some terrestrial radio stations. Internet radio content already can be streamed over wireless phones or packaged into podcasts for MP3 players and wireless devices, and used away from home and in vehicles. The new Slacker service will provide Internet-based service. As Internet service becomes even more widely available in vehicles, listeners will have access to the unlimited variety of audio content offered on the Internet. Indeed, Avis already offers Internet in its rental cars via Autonet, and the *Wall Street Journal* has reported that Slacker and Pandora have had talks with the OEMs about installing their technologies in automobiles.
- **Channel Variety: [[REDACTED** [redacted]]]. Wireless phone carriers offer radio channels to data plan subscribers at low prices. AT&T offers 50 channels from MobiRadio for $8.99 per month. Alltel offers 40 channels through the Axcess music streaming service for $6.99. Sprint offers a variety of streaming services from Pandora, Rhapsody and MSpot for less than $6 each. Owners of MP3 players can achieve enormous musical variety by subscribing to a subscription service like Rhapsody, Yahoo! or Napster, which are priced at less than $15 per month, and loading their players from a huge library, including playlists formulated by others. Sports and news programming also is available through AM/FM radio, Internet streaming, and increasingly through wireless phones.
- **Sound Quality and Commercials:** Sirius and XM offer commercial-free service and high quality sound (the latter on factory-installed radios). However, these factors are not significant for most of their subscribers. **[[REDACTED** [redacted]]]. Moreover, the sound quality of satellite radios can vary

depending on installation. Commercial-free and high quality audio also is available for listening through MP3 players, wireless phones, and HD Radio stations.

- **Product Differentiation between Sirius and XM:** Sirius and XM are differentiated from one another, as are the other audio entertainment products. This differentiation reduces the degree of demand substitution between Sirius and XM, *ceteris paribus*, relative to their degree of substitution with other audio entertainment products. Sirius and XM are differentiated because their radio equipment is not compatible. Almost all auto manufacturers offer only one of the satellite radio services installed and integrated. The proportion of new satellite radio subscribers who are new automobile buyers with satellite radios integrated into the auto sound system is growing over time. In the first quarter of 2007, aftermarket net additions were only 21% of all net additions for XM and 35% of the total for Sirius. This reduces the incentives to substitute between Sirius and XM because switching requires the purchase of a new aftermarket receiver (or, improbably, a new car) that often would have a more complicated and less integrated installation and inferior sound. Subscribers with an aftermarket receiver also would incur switching costs because they would need to purchase a new receiver to switch to the other satellite service. Sirius and XM also are differentiated from each other because of their exclusive offering of certain high-value content. As a result, very few subscribers quit one satellite radio service to subscribe to the other.

7. The competitive effects of the merger of Sirius and XM are unlikely to be harmful. The audio entertainment market is too unconcentrated and complex to support a coordinated effects theory. Adverse unilateral effects are unlikely because the relevant market is broad; the merged firm will have a very low market share; inter-modal competition is significantly increasing; there are ample opportunities for rival repositioning and entry; and the merger will generate cognizable merger-specific efficiencies.

8. In fact, the merger of Sirius and XM will be procompetitive. The merger likely will increase output and competition in the audio entertainment market by reducing the merged firm's costs, improving product quality, and enhancing incentives for penetration pricing as well as incentives for other demand-increasing and cost-reducing investments. Even if the market were erroneously defined as satellite radio-only, this conclusion would not change.

   - The merger will reduce the costs faced by the combined firm, giving it the ability and incentive to reduce prices.

   - The merger will create more desirable products. The merger will lead to satellite radio subscribers obtaining a larger and more desirable mix of channels, because content that is now currently exclusive will be made available on both platforms and because interoperable radios will be introduced more rapidly and promoted more intensively as the merger resolves the current free-rider problems.

- The merger will decrease incentives for price increases and immediately increase incentives for demand-expanding and cost-reducing investments by resolving the free-rider problem that is inherent when demand is dynamic. Today, without the merger, low prices and high promotion by either supplier attract the interest of potential subscribers to satellite radio generally. For example, if Sirius were to reduce its price or increase its promotion, that would attract attention to satellite radio generally and some of the new consumers would end up subscribing to XM instead of Sirius. The resulting free-rider problem limits to some degree each firm's unilateral incentives for procompetitive penetration pricing in the pre-merger world. The merger will resolve this free-rider problem, dampening the incentives for price increases and enhancing the incentives for price decreases. Similarly, because of the dynamic demand spillover effect, the merger will increase the returns realized on other demand-increasing and cost-reducing investments, and thus will increase the incentives to engage in such investments. These effects also will lead to increased output and lower satellite radio prices.
- **[[REDACTED** [redacted]]].

9. A concern has been raised that the merger will eliminate the most important competition that exists in areas with very few terrestrial radio stations and will lead to geographic price discrimination. Some Comments have erroneously argued that this merger is like the rejected DirecTV-Echostar satellite TV merger. The level and pattern of penetration rates differ substantially between satellite TV and satellite radio. DBS penetration in uncabled areas is 68%, about 53 percentage points greater than the 15% penetration rate in cabled areas. In contrast, satellite radio penetration in the areas with six or fewer AM/FM stations is only **[[REDACTED]]**%, about **[[REDACTED]]** greater than the **[[REDACTED]]**% penetration rate in areas with more than six AM/FM stations. **[[REDACTED** [redacted]]], suggest a combination of two economic factors – satellite radio faces more competition and consumers find satellite radio more dispensable in such areas than satellite TV in uncabled areas.

10. The merger will not lead to geographic price discrimination in these areas. It is true that that the penetration of satellite radio is somewhat higher in areas where there are fewer terrestrial radio signals, a fact that demonstrates that terrestrial radio and satellite radio are good substitutes. However, our analysis shows that geographic price discrimination likely would not be profitable for a number of reasons and so would not be attempted.

- The fraction of the population in those areas with very few AM/FM stations and the magnitude of the elevation in satellite radio penetration are too small to support a profitable price discrimination strategy. Only a very small proportion of the population lacks access to terrestrial radio. Just 2% of the continental U.S. population and just over **[[REDACTED]]**% of satellite radio subscribers live in areas with six or fewer terrestrial radio signals.

- Price discrimination against such a narrow group of subscribers would be too costly and imperfect for several reasons, including the following: (i) consumers in targeted areas could evade the discrimination by purchasing equipment from Internet retailers at lower prices, and some consumers could avoid subscription price discrimination by using their business addresses instead of their home addresses; (ii) price discrimination against targeted new car purchasers would require the acquiescence and cooperation of the auto manufacturers and dealers; (iii) the discrimination strategy would be imperfectly targeted because factors other than the number of AM/FM stations also affect a consumers' willingness-to-pay, including income and where and how much a person drives and listens to the radio (as opposed to where the person lives). In fact, satellite radio penetration varies greatly among areas that receive the same number of AM/FM stations).

- If the geographic area and population targeted for discrimination were expanded to include those areas with somewhat more AM/FM stations, the difference in penetration rates between the targeted and untargeted areas would shrink further, making it too small to support profitable price discrimination with its unavoidable costs and imperfections. For example, in areas with fifteen or fewer AM/FM stations, the average satellite radio penetration rate is only **[[REDACTED]]** higher than the average penetration rate where there are more than fifteen AM/FM stations (*i.e.,* **[[REDACTED]]**), and **[[REDACTED** [redacted]**]]**. Coupled with the fact that willingness-to-pay also depends on other factors such as income (which is positively correlated with the number of stations), such imperfect price discrimination likely would be unprofitable.

11. As this analysis predicts, there is no geographic price discrimination now. In light of the product differentiation and switching costs between Sirius and XM, such price discrimination might have been expected if there were no other competition and the costs and imperfections of discrimination were not a substantial barrier.

12. Some Comments have argued that the merger raises concerns because it would eliminate bidding competition between Sirius and XM for exclusive high-value content, such as MLB, NFL and Howard Stern. Others have argued that the merger raises concerns because it would eliminate bidding competition between Sirius and XM for automobile OEM distribution contracts. In this market, where the incentive for penetration pricing is powerful and competition from other audio entertainment products is strong and intensifying, cooperation in contracting with these suppliers would benefit consumers, not harm them. For these same reasons, there is no competitive concern regarding any anticompetitive exercise of monopsony power.

13. For all these reasons, the merger of Sirius and XM is highly unlikely to reduce competition and harm consumers. It is not likely to raise prices, relative to the outcome without the merger. Instead, the merger is likely to benefit consumers and increase the attractiveness and the output of the merged firm, regardless of how the market is defined.

14. The vehement opposition to this merger by the NAB indicates both that the merger benefits competition and that the relevant market extends beyond just satellite radio. In fact, as Judge Posner has suggested, under contemporary principles of antitrust law, competitor complaints are a "telling point" that support the view that a merger is lawful. Posner's economic reasoning is directly applicable here, in light of the absence of any threat of anticompetitive exclusion. In particular, the NAB and its consultants have argued that the merger will create a monopoly in satellite radio. But, if this were the case, terrestrial broadcasters would benefit from the resulting higher prices and reduced output of satellite radio after the merger. Accordingly, the fact that the NAB opposes the merger suggests that the NAB membership fears the procompetitive effects of the merger and recognizes that satellite radio competes extensively with AM/FM, as the NAB has always argued in the past.

15. The remainder of this Report sets out the economic analysis that forms the basis for our conclusions that the Sirius/XM merger likely will be procompetitive and benefit consumers. Section II discusses the scope of demand substitution, competitive responses and their implications for market definition. This section also discusses the impact of the dynamic demand spillover on pricing incentives and the implementation of the *ssnip* test. Section III evaluates market shares and concentration in the audio entertainment market. Section IV carries out a competitive effects analysis of the merger, discussing inter-modal competition, rival repositioning, cost savings, quality improvements, and the impact of the merger on the incentives for penetration pricing and other procompetitive investments. Section V analyzes the potential for geographic price discrimination against consumers in geographic areas with very few AM/FM radio stations. Section VI restates our conclusions. Certain technical economic issues are discussed in detail in Appendix A and Appendix B. Exhibits follow.

II. MARKET DEFINITION

16. Many Comments focus on market definition.[1] In our view, the relevant market is audio entertainment, a broad set of listening devices that include AM/FM radio, HD radio, Internet radio, iPods and other MP3 players, audio content-enabled wireless phones (including those with MP3 capability), and CD players, as well as satellite radio, and the

[1] *See, for example, Petition to Deny of the National Association of Broadcasters*, MB Docket No. 07-57 (July 9, 2007) (hereinafter "NAB Petition") at 11-23; *Petition to Deny of the Consumer Coalition for Competition in Satellite Radio*, MB Docket No. 07-57 (July 9, 2007) (hereinafter "C3SR Petition") at 29-32.

content and services associated with these devices. (We refer to these devices, content services and content collectively as audio entertainment "products.") The market shares of Sirius and XM and market concentration in this market are very small. Even if the market were erroneously defined as satellite radio-only, our analysis of competitive effects below demonstrates that the merger will be procompetitive.

17. In this section, we will explain why the correct relevant market definition for evaluating the impact of this merger is not limited solely to satellite radio, but also includes other audio entertainment products. This analysis involves evaluation of inter-modal competition as well as demand substitution, product differentiation, and the demand for satellite radio in this growth phase of the product life cycle. We will explain why the "small but significant and nontransitory increase in price" (*ssnip*) test for market definition from the antitrust agencies' Horizontal Merger Guidelines[2] must take into account the dynamic nature of demand and the important role of longer-term profit-maximization for Sirius and XM. This analysis will show that the extensive demand (and supply) substitution at current prices understates the disincentive of the merged firm to raise post-merger prices because of intertemporal linkages in demand, which make each lost customer today, as well as any slowdown in growth (*i.e.,* each lost prospective customer), costly in terms of foregone future profits.

18. In subsequent sections, we also will explain why the proposed merger is procompetitive, even if the relevant market definition were erroneously limited solely to satellite radio.[3]

A. Inter-modal Demand Substitution and Competition

19. Sirius and XM compete with many others, not just each other. They compete with other audio entertainment products that are used by many more people than the 14 million subscribers to satellite radio. If Sirius and XM were to raise their prices, fewer people would choose to subscribe because of the variety of other alternatives available. In addition, producers of other audio entertainment devices and content services would respond to higher satellite radio prices by extending or repositioning their products to increase the substitutability with satellite radio. There are many other popular audio entertainment options to which satellite subscribers can and do substitute, and vice versa.

    - When XM and Sirius first were licensed in 1997 – before any satellite receiver had been built – terrestrial radio receivers were ubiquitous: in 98 million U.S. households

[2] U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines* (Apr. 8, 1997) (hereinafter "Merger Guidelines") at § 1.0.

[3] *See* Section IV (Competitive Effects).

(99 percent of all households), with over 2.1 radio receivers per person and 5.6 receivers per household.[4]

- There were more than 243 million vehicles on the road in the U.S in 2004[5] and virtually all of them are equipped with AM/FM radios and CD players. Additional radios and CD players are used at home.
- There are 46 million current users of MP3s and iPods, and 30% of Americans are estimated to own MP3 players, up from 22% just a year ago.[6] In fact, Apple sold its 100 millionth iPod in April of this year and subscribers to Apple's iTunes Store downloaded over 1 billion songs in 2006 alone.[7] There also are over 2 million subscribers to the Rhapsody and Napster music subscription services.[8,9] Yahoo, a leading Internet portal, provides a similar music service.[10] These players can be used in vehicles as well as elsewhere. Many vehicles have auxiliary input jacks and various aftermarket devices are sold to connect iPods to auto sound systems without input jacks – everything from cassette player adapters to FM modulators. Additionally, iPod integration by OEM car companies has increased rapidly.[11]

---

[4] U.S. Census Bureau, *Statistical Abstract of the United States: 2001, Information and Communications*, Table 1126, *available at* http://www.census.gov/prod/2002pubs/01statab/inforcomm.pdf (last visited July 21, 2007); U.S. Census Bureau, *Statistical Abstract of the United States:2001,Comparitive InternationalStatistics*, Table 1375, *available at* http://www.census.gov/prod/2002pubs/01statab/intlstat.pdf (last visited July 21, 2007).

[5] Bureau of Transportation Statistics, *National Transportation Statistics 2006* (December 2006), Table 1-11, *available at* http://www.bts.gov/publications/national_transportation_statistics/2006/index.html (last visited July 17, 2007).

[6] Jupiter Research, *US Music Forecast, 2006 to 2011* (Vol.2, 2006) at 8; Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 14.

[7] Apple Press Release, *100 Million iPods Sold* (April 9, 2007), *available at* http://www.apple.com/pr/library/2007/04/09ipod.html (last visited July 2, 2007); Apple Press Release, *iTunes Store Tops Two Billion Songs* (January 9, 2007), *available at* http://www.apple.com/pr/library/2007/01/09itunes.html (last visited July 13, 2007).

[8] Real Networks Press Release, *Real Networks Launches Rhapsody 4.0 & Teams To Deliver First Rhapsody-Optimized MP3 Players* (October 5, 2006), *available at* http://www.realnetworks.com/company/press/releases/2006/rhap4.html (last visited July 2, 2007).

[9] Napster Press Release, *Napster Reports Record Sales of $28.4 Million in the Third Quarter, Expects to End Fiscal Year at Record Subscriber Levels* (February 8, 2007), *available at* http://www.napster.com/press_releases/pr_070208.html (last visited July 2, 2007).

[10] *See* Yahoo! Music Offer Details, *available at* http://music.yahoo.com/ymu/default.asp?ovchn=GGL&ovcpn=YMU&ovcrn=Yahoo+Music&tab=togo (last visited July 21, 2007).

[11] Apple Press Release, *Apple Teams Up With Ford, General Motors & Mazda To Deliver Seamless iPod Integration* (August 3, 2006), *available at* http://www.apple.com/pr/library/2006/aug/03ipod.html (last visited June 5, 2007).

- By the end of this year, Americans are expected to own nearly 28 million mobile phones that can receive and play audio and video content, more than double the number at the end of 2006.[12] This number will far exceed the number of satellite radio subscribers at the end of this year. These phones also increasingly can be integrated into auto sound systems.[13]
- Internet Radio is popular with home users. There are thousands of radio stations streamed over the Internet.[14] Approximately 49 million Americans listened to Internet radio in the past month, according to a recent estimate.[15] In fact, Avis has begun to offer Internet in some of its rental cars via Autonet.
- Thus, there are many other popular audio entertainment options to which satellite subscribers can and do substitute, and vice versa.

20. The relevant market should include all the products that are reasonably interchangeable with the products sold by the merging firms. In this section, we examine a number of indicia of substitutability, including evidence of likely demand substitution and evidence of producers of one type of audio entertainment product responding competitively to developments elsewhere in the market.

1. Changes in Listening Patterns

21. Usage data from Sirius and XM demonstrate that there is substantial demand substitution between satellite radio and other audio entertainment devices.

22. When people activate satellite radio subscriptions, their listening behavior changes in a predictable way.

- **[[REDACTED** [redacted] **]]**.[16]

---

[12] Jupiter Research, *US Music Forecast, 2006 to 2011* (Vol.2, 2006) at 8.

[13] Mobile phones can be connected to the auxiliary input jacks now provided for many vehicle sound systems. In addition, more advanced options are becoming available. See, for example, the discussion of Ford Sync below.

[14] For a list of over 2,500 Internet radio stations, *see* http://radio-locator.com (last visited July 17, 2007).

[15] Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 5.

[16] **[[REDACTED** [redacted] **]]**.

- **[[REDACTED** [redacted]]].[17]

23. Sirius and XM also must compete with other audio entertainment modes to keep their existing subscribers. When XM subscribers deactivate their subscriptions, nearly all switch their listening to other audio entertainment modes, not Sirius. A similar pattern is seen for Sirius subscribers.

- **[[REDACTED** [redacted]]].[18]
- **[[REDACTED** [redacted]]].[19]
- **[[REDACTED** [redacted]]].[20]
- **[[REDACTED** [redacted]

---

[17] **[[REDACTED** [redacted]]].

[18] **[[REDACTED** [redacted]]].

[19] **[[REDACTED** [redacted]]].

[20] **[[REDACTED** [redacted]]].

[redacted][21] [redacted]]].

2. Satellite Radio Penetration versus Terrestrial Radio Coverage

24. Analysis of the relationship between satellite radio penetration and terrestrial radio coverage provides clear evidence of demand substitution between satellite radio and AM/FM radio. The submission of the American Antitrust Institute (AAI) suggested the relevance of data on the relationship between satellite radio penetration and the number of terrestrial radio stations for evaluating competition and market definition.

> A degree of cross elasticity might be shown if the rate of satellite radio subscriptions is higher in markets with fewer terrestrial radio stations. On the other hand, if the rate of satellite subscriptions is geographically uniform throughout the country, this would tend to indicate little cross elasticity.[22]

25. We have carried out such a substitution analysis. Sirius and XM commissioned BIA Research, Inc. to provide data on the number of AM/FM radio stations reaching each census block in the lower-48 U.S. states.[23] These data on AM/FM coverage at the census block level were aggregated up to ZCTAs (*i.e.*, a Census Bureau area approximating a ZIP code) and combined with data on the location by ZIP code of Sirius and XM subscribers.[24]

---

[21] **[[REDACTED** [redacted]]].

[22] *Comments of the American Antitrust Institute in Opposition to Transfer Application*, FCC Filing, MB Docket No. 07-57 (June 5, 2007) (hereinafter "AAI Comments") at n.68. *See also* Philip M. Napoli, *Market Definition in Satellite Radio: Why the Sirius/XM Merger Would Result in Anti-Competitive Conditions*, Statement Prepared for the National Association of Broadcasters (April 2007), Submitted to FCC, June 29, 2007, (hereinafter "Napoli") at 5 ("no evidence to date suggesting that the quantity or quality of available terrestrial radio stations are significantly related to satellite radio penetration in individual radio markets"). Sidak also raises the relevance of this relationship. *Supplemental Declaration of J. Gregory Sidak*, Exhibit B, C3SR Petition (July 9, 2007) (hereinafter "Sidak-II") at ¶25.

[23] The BIA Research, Inc. data use the 2 mV/m contours for AM stations and the 60dBu contours for FM stations to determine the number of AM or FM stations reaching the centroid of each census block in the lower-48 states.

[24] ZCTAs, or ZIP Code Tabulation Areas (ZCTAs), are areas that closely approximate ZIP code areas and were developed by the Census Bureau to allow ZIP code and census block data to be merged. Census blocks do not map into ZIP codes, but may be mapped into ZCTAs. The BIA Research, Inc. data reported AM/FM coverage by census blocks, while data on the locations of satellite radio subscribers are available only by ZIP code. Our analysis used the BIA Research data on the number of AM/FM stations received in each census block within ZCTAs, together with population data, to calculate the population-weighted average number of AM/FM stations received in each ZCTA. Subscribers with valid ZIP codes in the lower-48 states were assigned to the ZCTA that corresponds to their ZIP code, and the number of subscribers in each ZCTA was divided by ZCTA population to determine the satellite radio penetration in each ZCTA. **[[REDACTED** [redacted]]]. Subscribers without valid ZIP codes necessarily also were excluded. Some ZIP codes correspond to a point, such as those for P.O. Boxes; there is no corresponding ZCTA for

These data then were used to calculate the relationship between satellite radio penetration (*i.e.*, the number of subscribers paying for satellite radio service as a percentage of population in a ZCTA area) and the average number of AM/FM stations received in that ZCTA area.

26. Exhibit B contains a table and chart reporting the relationship. Figure B1 plots the average satellite radio penetration in areas receiving each number of AM/FM stations from zero to 68 (the maximum number received anywhere).[25] Table B1 reports these same data, together with other information on satellite radio penetration and the proportion of population in the lower-48 states receiving various numbers of AM/FM stations.

27. Figure B1 and Table B1 show a clear, relatively smooth inverse relationship between average satellite radio penetration and the number of AM/FM radio stations received. Satellite radio penetration generally is higher in geographic areas where there are fewer AM/FM stations. The inverse relationship between satellite radio penetration and AM/FM coverage **[[REDACTED** [redacted]]. Average satellite radio penetration **[[REDACTED]]**% in ZCTAs receiving zero AM/FM stations, **[[REDACTED]]**% in ZCTAs receiving two AM/FM stations. Average satellite radio penetration **[[REDACTED** [redacted]].[26] **[[REDACTED** [redacted]].[27] This clear inverse relationship shows that

---

these ZIP codes assigned by the Census Bureau, and therefore subscribers with these ZIP codes were excluded. **[[REDACTED** [redacted]].

[25] The population-weighted average number of AM/FM stations received across the lower-48 states, according to these data, is just under 31. Note that the average number of AM/FM stations received in a ZCTA is not necessarily an integer value because it is the population-weighted average of the number of AM/FM stations received in the census blocks contained within the ZCTA. For example, the average satellite radio penetration in areas with "zero" terrestrial radio stations is defined in this paper as the penetration for all ZCTAs receiving (on average) 0.5 or fewer AM/FM stations.

[26] About 9% of population in the lower-48 states lives in ZCTAs receiving 11 or fewer AM/FM stations, as reported in column 5 of Table B1. This column also shows that only very small percentages of the population live in areas receiving small numbers of AM/FM stations. Less than 0.05% of the population lives in areas receiving "zero" (*i.e.*, fewer than 0.5) AM/FM signals.. Only 0.2% of the population lives in areas receiving 2 or fewer AM/FM stations, and only 2% in areas receiving 6 or fewer AM/FM stations.

[27] Nearly 45% of lower-48 population lives in areas receiving 33 or more AM/FM stations. **[[REDACTED** [redacted]].

consumers view AM/FM radio and satellite radio as reasonably close substitutes. As discussed in Section V below, price discrimination against consumers in areas that receive very limited numbers of terrestrial radio stations would not be profitable and so would not be attempted.

28. We have carried out an econometric analysis of the relationship between satellite radio penetration and the number of terrestrial radio stations. We estimated the impact of the number of terrestrial radio stations on the penetration of satellite radio, after controlling for a number of relevant factors for each area, including income, gender mix, and the percentage of the population commuting by car.[28] There is a statistically significant negative relationship between the number of terrestrial radio stations and satellite radio penetration, as pictured in Figure B2 in Exhibit B.[29] The regression results are reported in Table B2. Thus, this econometric analysis supports the conclusion that terrestrial radio and satellite radio are good substitutes.

3. Inter-modal Competitive Responses

29. Economic evidence supporting a broad market definition also comes from the fact that firms operating in one format have responded directly to competition from developments in other modes by rapidly adding new products and repositioning the products they sell.[30]

---

[28] The regression used a fifth order polynomial form for the number of terrestrial radio stations, which allows for great flexibility in the shape of the relationship between satellite radio penetration and terrestrial radio coverage. It also included a variable for the percentage of population in each ZCTA in census blocks classified by the Census Bureau as urban and a variable interacting the percentage urban with the percentage that commute by car.

[29] Figure B2 plots the relationship between the number of AM/FM stations received and satellite radio penetration predicted by the regression, when the other variables take on their median values.

[30] Sidak suggests that this type of competitive response evidence is not relevant for market definition because market definition involves consumer perceptions, not the perspective of competitors. Sidak-II at ¶22. Sidak is wrong to discard competitive response evidence in defining markets for three reasons. First, as is widely understood, the conduct of industry participants provides information about buyer substitution because it shows how buyer substitution is understood by sellers, who are experts on their buyers. For example, "evidence about the extent to which firms monitor and respond to the price changes and new product introductions of rival sellers, and about the products and locations of the rivals that have their greatest attention, is commonly employed as a guide to the products and locations where buyer substitution is the most likely." Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 ANTITRUST L.J. 129, 141 (2007). Accordingly, the competitive responses of Sirius and XM, which reflect the types of products from which they fear demand substitution, provide useful evidence as to the nature of likely demand substitution. Second, in order to understand whether buyer substitution would make unprofitable a price increase, the market definition question in the Merger Guidelines, it is necessary to identify the competing products to which consumers could substitute in the event of a price increase. The competitive responses of competitors to satellite radio services are relevant to this issue. Third, in a mature market, those alternatives would be available now. But in a market with dynamic demand like this one, the products that will be introduced in the future also are relevant to understanding longer-term demand substitution, and thus to applying the market definition test in the Merger Guidelines. In addition, going beyond strict market definition, competitive response evidence also is relevant because firms that can extend or reposition their products would be considered as "market participants" into a narrow market and assigned market shares, which would affect the HHI.

These competitive responses also provide evidence of how some of these audio entertainment products and content are being blended together. This evidence of substitution supports the conclusion that producers of other audio entertainment devices participate in the market in competition with Sirius and XM.[31] We examine this evidence for the various types of audio entertainment products that compete with Sirius and XM.

a) Terrestrial Radio: AM/FM and HD Radio

30. There have been substantial substitution and competitive responses between XM and Sirius on the one hand and terrestrial radio broadcasters on the other. The entries of Sirius and XM are themselves competitive responses to AM/FM radio. Since being introduced in late 2001 and early 2002, XM and Sirius have obtained a base of about 14 million subscriptions, a small fraction of the 300 million population of the U.S., almost all of whom have access to AM/FM radio. Before subscribing to satellite radio, those people were listening to terrestrial radio and other forms of audio entertainment. This need to attract subscribers away from other audio entertainment products continues, as the growth of new satellite radio subscribers greatly exceeds the loss of old subscribers. Over the 4-year period 2007-2010, analysts have projected that XM and Sirius will add at least 12 million net new subscriptions to their 2006 base.[32] If the annual churn rate is 20% per year, then these subscriptions also would need to be replaced, which would imply the need to add 28 million new subscriptions to replace the lost subscriptions and attain that forecast growth rate. (As discussed elsewhere, only a small percentage of exiting subscribers switch from one satellite radio to the other service.) In other words, absent a merger, Sirius and XM would have to focus primarily on inducing demand substitution away from other audio entertainment modes, not on inducing substitution away from one another.[33]

31. Terrestrial radio stations in turn have responded to competition from Sirius and XM and repositioned their products in a number of ways. First, in response to the success of the commercial-free options available on satellite radio, some AM/FM radio stations have

---

[31] For a general discussion of the definition of "participants" in a relevant market *see* Merger Guidelines at §1.3.

[32] David Bank (Managing Director-Equity Research RBC Capital Markets), *Testimony to the U.S. Senate Committee on Commerce, Science and Transportation* (April 17, 2007), *available at* http://commerce.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=1848&Witness_ID=6583 (last visited July 12, 2007) (hereinafter "Bank Testimony").

[33] Sidak suggests that there are switching costs from satellite radio to HD radio because of the need to purchase an HD radio. J. Gregory Sidak, *Expert Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio Inc. and XM Satellite Radio Inc.*, Prepared for the Consumer Coalition for Competition in Satellite Radio (March 16, 2007), Submitted to the FCC March 28, 2007 (hereinafter "Sidak-I") at 12. That switching cost would only apply only if the consumer already has satellite radio. There would be no switching cost for a potential satellite radio subscriber who was deciding whether to subscribe to satellite radio versus whether to purchase an HD radio instead. Of course, there also would be no switching costs if the HD radio came as standard equipment in a new vehicle.

reduced the number of commercial minutes.[34] Clear Channel also reduced the length of its commercials.[35] More recently, Clear Channel's 92.5 Lone Star in Dallas has decided to forego radio commercials altogether and instead try to rely on an hourly corporate sponsor.[36] Second, AM/FM stations have repackaged music to better compete with satellite radio.[37] Clear Channel has responded by adding prominent on-air personalities.[38] Third, terrestrial radio also has responded to the superior sound and increased variety offered through satellite radio by introducing HD Radio, which provides digital broadcasts.[39]

---

[34] For example, consider the following: "More and more would-be radio listeners, especially teenagers, are now opting for on-demand and choice-driven listening provided by new technologies like MP3 players and satellite radio." In response, "Radio executives have also moved to reduce the length and number of advertisements heard on the broadcast waves. Clear Channel launched a 'Less is More' campaign designed to reduce the total number of ad minutes per hour of airtime. They're also trying to teach advertisers how to make shorter, more entertaining commercial spots. A guide on Clear Channel's Web site is entitled 'How to Make Commercials that Don't Suck'." NewsHour with Jim Lehrer, *Revolutions in Radio* (May 4, 2005), *available at* http://www.pbs.org/newshour/media/radio/broadcast.html (last visited July 2, 2007).

[35] Brett Corbin, *Clear Channel Advertising Strategy Aims For Less Clutter*, BUSINESS FIRST OF LOUISVILLE (Oct. 8, 2004), *available at http://www.bizjournals.com/louisville/stories/2004/10/11/story5.html?t=printable* (last visited July 15, 2007). ("Kelly Carls, regional vice president of programming for Clear Channel, said the cuts work out to an average of 20 percent for all the Clear Channel radio stations across the country.... Carls said the move by Clear Channel was 'pre-emptive,' with the radio giant making an active move to counter emerging technology instead of waiting a few years to react to competitors such as satellite radio.") *See also* Tom Lowry, *Antenna Adjustment; Clear Channel is pulling apart its empire as it scrambles to compete in a changed media world*, BUS. WK. (June 20, 2005), *available at* http://www.businessweek.com/magazine/content/05_25/b3938093_mz016.htm (last visited July 11, 2007).

[36] Andrew Adam Newman, *In Dallas, Commercial Radio Without Commercials*, NEW YORK TIMES (April 23, 2007), *available at* http://www.nytimes.com/2007/04/23/business/media/23radio.html?ei=5088&en=670c621e96d488ef&ex=1334980800&partner=rssnyt&emc=rss&pagewanted=print (last visited July 10, 2007).

[37] NewsHour with Jim Lehrer, *Revolutions in Radio* (May 4, 2005), *available at* http://www.pbs.org/newshour/media/radio/broadcast.html (last visited July 2, 2007). ("Spanish talk shows, eclectic music mixes, and entertaining ads were not the common fare on American broadcast radio just a few years ago. But these new sounds and new ideas are making their way to market only as broadcasters seek to stem the flow of listeners headed for other audio formats."); *see also* Randy Dotinga, *Radio Industry Hits Shuffle*, WIRED (June 6, 2005), *available at* http://www.wired.com/entertainment/music/news/2005/06/67727 (last visited July 17, 2007). ("Boasting they're 'like an iPod on shuffle,' the new stations typically dump their disc jockeys in favor of huge song playlists that mimic a well-stocked portable music player. The Jack format, which is already spawning imitators, could be a key to FM's survival as an alternative to satellite radio, internet radio and MP3 players.")

[38] Tom Lowry, *Antenna Adjustment; Clear Channel Is Pulling Apart Its Empire As It Scrambles To Compete In A Changed Media World*, BUS. WK. (June 20, 2005), *available at* http://www.businessweek.com/magazine/content/05_25/b3938093_mz016.htm (last visited July 11, 2007). ("Clear Channel is also hellbent on winning back some of the status it has lost to satellite newcomers XM and Sirius by signing big names to host their own shows, including Donald Trump and Jesse Jackson.")

[39] *Clear Channel answering satellite radio with HD rollout*, CINCINNATI BUSINESS COURIER (December 5, 2005), *available at* http://cincinnati.bizjournals.com/cincinnati/stories/2005/12/05/05/daily1.html (last visited July 15, 2007); *see also HD Radio Could Cure US Broadcasters' Satellite Radio Woes, says ABI Research*, BUSINESS WIRE (May 22, 2006), *available at* http://findarticles.com/p/articles/mi_m0EIN/is_2006_May_22/ai_n16374685 (last visited *July 15, 2007)*. ("Fear of satellite radio is prompting an unprecedented level of cooperation among

32. Today, the approximately 1350 HD Radio stations broadcasting in digital cover 82% of the U.S. population.[40] Of these stations, 620 are HD2 or side channels.[41] For now, HD radio side channels are being provided on a commercial-free basis, as are many satellite radio channels. Additionally, these HD2 channels tend to provide more specialized genres than traditional FM broadcasts, which allows a response to satellite radio programming.[42] According to one report, some of the genres for initial HD2 channels included the following: "Classical Alternative, Traditional Jazz & Blues, Coffee House, Female Talk, Future Country, Extreme Hip Hop and in-depth news," and, among rock genres, "Deep Cuts Classic Rock, Live Rock, New Alternative, Fusion Hispanic-Anglo Rock, Chick Rock, Indie & New Rock."[43] Over 3,000 HD Radio stations are predicted to be in operation in the next few years and iBiquity forecasts 5700 channels by 2011.[44] HD radio offers better sound than standard terrestrial radio and the technology also permits more channels to be broadcast over the available spectrum than does analog technology. Moreover, the HD Digital Radio Alliance, a consortium of terrestrial radio groups such as Bonneville International, Citadel Broadcasting, Clear Channel Radio, Emmis Communications, Entercom, Greater Media, and Infinity Broadcasting, committed $200 million in airtime in 2006 for advertising to raise the profile of HD radio and expects to commit $250 million in 2007. This is the largest-ever radio advertising campaign **[[REDACTED** [redacted] **]]**.[45] This campaign

---

broadcasters in their efforts to launch HD Radio and HD2"); Robert Mullins, *Digital HD Radio Offers Option – at a price*, SAN JOSE BUSINESS JOURNAL (June 24, 2005), *available at* http://sanjose.bizjournals.com/sanjose/stories/2005/06/27/focus4.html (last visited July 7, 2007).

[40] In Washington, DC, for example, there are 35 HD channels broadcasting with 5 more scheduled to begin broadcasting soon. iBiquity, *Find a Station*, *available at* http://ibiquity.com/hd_radio/hdradio_find_a_station/DC/StnMarket (last visited July 19, 2007); *see also* Bear Stearns, *XM-SIRI – More Competition Coming* (June 29, 2007) ("reporting on the iBiquity presentation").

[41] Bear Stearns, *XM-SIRI – More Competition Coming* (June 29, 2007) ("reporting on the iBiquity presentation").

[42] Tom Lowry, *Antenna Adjustment; Clear Channel Is Pulling Apart Its Empire As It Scrambles To Compete In A Changed Media World*, BUS. WK. (June 20, 2005), *available at* http://www.businessweek.com/magazine/content/05_25/b3938093_mz016.htm (last visited July 17, 2007). ("Clear Channel is busy converting 1,000 of its stations to digital, which could mean up to 3,000 more channels to program.")

[43] FMQB, *HD Digital Radio Alliance Launches 264 New Channels* (January 18, 2006), *available at* http://fmqb.com/Article.asp?id=165202 (last visited July 11, 2007).

[44] HD Radio Press Release, *Jaguar Joins Digital HD Radio™ Revolution* (Apr. 4, 2007), *available at* http://www.hdradio.com/press_room.php?newscontent=81 (last visited July 11, 2007); *see also* Bear Stearns, *XM-SIRI – More Competition Coming* (June 29, 2007). *See also* HD Radio Digital Alliance Press Release, *HD Radio Celebrates Major Milestone: Rollout in Top 100 Markets* (May 14, 2007), *available at* http://www.hdradio.com/the_buzz.php?thebuzz=93 (last visited July 2, 2007). "HD Radio is now available in the Top 100 Radio Markets."

[45] *See* HD Radio Digital Alliance website, *availa*ble at http://www.hdradioalliance.com/i/Activate_Brochure.pdf (last visited July 17, 2007); *see also* Bear Stearns, *XM-SIRI – More Competition Coming* (June 29, 2007); *see also*

follows a previous advertising campaign in 2005 for AM/FM with the tag line, "Radio: You shouldn't have to pay for it."[46]

33. HD radios also are beginning to be introduced in automobiles, in competition with satellite radio and standard AM/FM radio for dashboard space.[47] BMW offers a factory-installed digital HD Radio receiver as an option across its entire 2007 product line.[48] Hyundai recently announced that it will offer HD Radio on its Genesis premium sports sedan scheduled for introduction in 2008. Jaguar announced that it will offer HD Radio technology in its redesigned 2008 luxury XJ sedan. Overall, iBiquity estimates that nine OEMs will offer HD radio in over 50 models by 2010.[49]

34. The developer of HD radio technology, iBiquity, recently projected that HD radio will be used to provide a variety of new content services, including (a) on-demand radio, including traffic and weather, (b) TiVo-like sort and play capabilities, (c) the ability to purchase music, (d) program-associated data, such as stock quotes or scores, and (e) electronic program guides. iBiquity also expects subscription services to be provided over HD Radio.[50] The FCC is finalizing rules for the use of encrypted subscription services for HD radio. Encryption would permit some station owners to reposition by offering audio content on a subscription basis, like XM and Sirius, rather than relying solely on advertising to earn revenues.[51] The ability to use encryption technology to support a subscription model for HD radio permits a choice of business models that predictably would lead to further expansion of HD radio stations.

NAB Website, *Unprecedented Radio Partnership Sends "Unmistakable Signal"* (Dec. 12, 2005), *available at* http://www.nab.org/xert/corpcomm/newsletters/RadioRave/radiorave_121205.asp (last visited July 12, 2007).

[46] NAB Press Release, *Radio Industry Launches New On-Air Ad Campaign* (Nov. 30, 2005), *available at* http://www.nab.org/AM/Template.cfm?Section=Press_Releases1&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=5170 (last visited July 19, 2007).

[47] *For example, see* S. Diaz, *HD Radio Grabs the Ear of Satellite Rivals*, WASHINGTON POST (July 3, 2007) at D4, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2007/07/02/AR2007070201730.html (last visited July 15, 2007). ("Over the past few months, high-definition radio technology, which delivers clearer and crisper sound for over-the-air radio, has made inroads into the new-car market, a major battleground for audio entertainment.")

[48] iBiquity Press Release, *HD Digital Radio Alliance Launches First Ad Campaign for BMW* (February 14, 2007), *available at* http://www.ibiquity.com/press_room/news_releases/2007/432 (last visited July 15, 2007).

[49] *Hyundai, Jaguar Offer HD Radio*, TWICE (April 23, 2007), *available at* http://www.twice.com/article/CA6435612.html (last visited June 5, 2007).

[50] Bear Stearns, *XM-SIRI – More Competition Coming* (June 29, 2007).

[51] Federal Communications Commission, *Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service, Second Report and Order, First Order on Reconsideration and Second Further Notice of Proposed Rulemaking*, MM Docket No. 99-325 (May 31, 2007) at ¶49.

35. The fact that satellite radio has induced market responses by terrestrial radio broadcasters was summarized succinctly by David K. Rehr, President and CEO of the NAB:

> In 2006, we have satellite and Internet radio. And barely a day passes without the introduction of a new competing device or service. But we have news for our competitors: "We will beat you – as we have beaten those change agents in the past."[52]

b) Wireless Phones

36. There also is competition and potential demand substitution between Sirius, XM and audio entertainment on wireless phones. Wireless companies began offering competing products in 2005, and today most offer audio content-enabled phones and audio services.[53]

37. Combined cell phone/MP3 players that can play streaming music and other content, either distributed by wireless companies or sideloaded from other sources, have become increasingly common. Of 81 phones currently listed on AT&T's website, 29 can receive audio entertainment.[54] AT&T offers the new iPhone, which is a combined cell phone, iPod and Internet communication device.[55] The iPhone has enjoyed enormous initial success, with as many as 700,000 phones purchased over the first weekend after its launch.[56] It has been forecast that 10 million iPhones will be sold next year.[57] AT&T is not alone. Verizon offers multiple models, including the Chocolate; Sprint also has multiple models including the dual-screen Upstage, while Alltel has the Wafer. Additionally, some phones, such as the Sony Ericsson W810i for AT&T, now include an FM tuner. Clear Channel has begun to distribute some of its programming to mSpot Radio for streaming on wireless phones.

38. The sales of audio content-enabled phones are increasing. Sales of such phones rose from 18% of second quarter 2006 U.S. phone sales to 38% of first quarter 2007 U.S. phone

---

[52] David K. Rehr, *The 2006 NAB Radio Show* (Sept. 21, 2006), *available at* http://www.nab.org/AM/Template.cfm?Section=Press_Releases1&CONTENTID=6802&TEMPLATE=/CM/ContentDisplay.cfm (last visited July 12, 2007).

[53] *See, for example,* Fierce Wireless News, *Cingular Wireless, MobiTV to launch MobiRadio* (Nov. 14, 2005), *available at* http://www.fiercewireless.com/story/cingular-wireless-mobitv-to-launch-mobiradio/2005-11-15 (last visited July 21, 2007).

[54] *See* http://www.wireless.att.com/cell-phone-service/cell-phones/music-phones.jsp (last visited July 17, 2007).

[55] *See* http://www.apple.com/iphone/ (last visited July 3, 2007).

[56] Connie Guglielmo, *Apple IPhone Sold Out at Most Stores After Four Days*, BLOOMBERG NEWS (July 3, 2007), *available at* http://www.bloomberg.com/apps/news?pid=20601087&sid=afGVODED.wHU&refer=home (last visited July 21, 2007).

[57] Janet Whitman, *Apple's Big Talk,* NEW YORK POST (March 1, 2007), *available at* http://www.nypost.com/seven/03012007/business/apples_big_talk_business_janet_whitman.htm (last visited July, 12, 2007).

sales.[58] One study projects that MP3/video-capable mobile phones will grow from about 28 million in 2007 to 50 million in 2008 to 77 million in 2009. This study projects that by 2009 and beyond, the number of MP3/Video-capable mobile phones will exceed the number of users of MP3 players.[59] It also will far exceed the number of satellite radio subscribers.

39. Wireless companies also compete with satellite radio by offering subscribers a wide range of audio and other content. Sprint, AT&T, and Alltel each offer multiple streaming news, music, and sports channels, many of which are commercial-free, plus downloads of MP3s to subscribers with audio content-enabled phones. Verizon offers sports programming and music downloads with VCast.[60]

- Sprint offers channels of music and other audio content as part of its Power Vision data packages, as well as additional choices.[61]
    - The basic Power Vision access pack, at $15 a month, includes 10 commercial-free music channels as part of package that also provides access to Power View Music with exclusive videos and artist interviews, NFL Mobile, unlimited data access, Sprint Mobile Email, Sprint Picture Mail, and unlimited web browsing.[62]
    - For $5 more, the Music Power Vision Pack at $20 a month adds to the basic offering another 40 commercial-free music channels (bringing the total to 50), plus streaming of over 95 local terrestrial radio stations from around the country that can be listened to no matter where the customer is.[63]
    - Subscribers who want more streaming audio have a choice of other options they can add:[64]

---

[58] NPD Group, *Music Enabled Phones* (2007), *available at* http://wireless.npd.com/bulletin_music_phones.html (last visited July 12, 2007).

[59] Jupiter Research, *US Music Forecast, 2006 to 2011* (Vol.2, 2006) at 8.

[60] T-Mobile has minimal music offerings.

[61] In almost all cases, to avoid paying for data usage charges, a cellular subscriber must have a data package.

[62] Sprint Press Release, *Power of Mobile Music Now More Accessible Than Ever To Sprint Customers* (March 26, 2007), *available at* http://www2.sprint.com/mr/news_dtl.do?id=15821 (last visited July 12, 2007). *See also* Sprint Press Release, *Sprint Offers NFL Mobile – The Exclusive Source of Real-Time NFL Information – Free of Charge to Vision or Power Vision Subscribers* (July 24, 2006), *available at* http://www2.sprint.com/mr/news_dtl.do?id=12760 (last visited July 17, 2007).

[63] Sprint Press Release, *Power of Mobile Music Now More Accessible than Ever to Sprint Customers* (March 26, 2007), *available at* http://www2.sprint.com/mr/news_dtl.do?id=15821 (last visited July 12, 2007). *See also* http://datapack.sprint.com/Radio.html (last visited July 19, 2007). *See also* http://datapack.sprint.com/MapSearch.aspx (last visited July 15, 2007). *See also* Sprint service brochure (2007).

[64] In addition to the packages listed above, Sprint customers can also purchase monthly subscriptions to a number of video services such as International Music Feed, Hip Hop Official and Music Choice.

- 50 MSpot channels (not included in any Vision pack), includes over 50 channels of music radio and videos, news, sport and talk, including NPR and Fox Sports, for $5.95 a month;[65]
- Sony Music Box Connect, with 15 commercial-free radio stations, for $5.95 a month;[66]
- Rock on Attitude, with rock music, tour info, news etc., for $5.99 a month;[67]
- Multiple sports channels that offer scores, audio highlights and photographs, including Fox Sports Mobile Pro, CBS SportsLine Mobile, and PGA Tour's TOURCast Mobil, each for $4.99 a month);[68]
- An assortment of Rhapsody channels, for $5.95 a month;[69]
- Pandora's streaming service, for $2.99 a month;[70]
- 20 Sirius channels, for $6.95 a month;[71]
- Live audio broadcasts of MLB games from MLB GameDay, for $5.99 a month;[72]
- Various audio, graphic, and video news and weather channels at prices from $2.99-$4.99 a month, including The Weather Channel, Weather News, NYTimes and many local stations.[73]

---

[65] This is also known as Sprint Radio Extra. *See* Sprint's Digital Lounge, *Entertainment, Music and Radio, available at* https://manage.sprintpcs.com/Manage/portal/goTo?action=DigitalLounge&ATR_ExtraOne=UHPCHP_DME_Link_ShopDigitalLounge (last visited July 21, 2007).

[66] *Id.*

[67] *Id.*

[68] *See* Sprint's Digital Lounge, *Applications,Sports, available at* https://manage.sprintpcs.com/Manage/portal/goTo?action=DigitalLounge&ATR_ExtraOne=UHPCHP_DME_Link_ShopDigitalLounge (last visited July 21, 2007)..

[69] *See also* Sprint's Digital Lounge, *Entertainment, Music and Radio, available at* https://manage.sprintpcs.com/Manage/portal/goTo?action=DigitalLounge&ATR_ExtraOne=UHPCHP_DME_Link_ShopDigitalLounge (last visited July 21, 2007).

[70] Stefanie Olsen, *Pandora's music box on Sprint phones*, CNET NEWS (May 23, 2007), *available at* http://news.com.com/8301-10784_3-9722106-7.html (last visited July 12, 2007).

[71] *See* https://manage.sprintpcs.com/Manage/portal/!ut/p/_s.7_0_A/7_0_AFHH/.cmd/ad/.ar/sa.spf_ActionListener/.c/6_0_310/.ce/7_0_50NJ/.p/5_0_18L/.d/0?PC_7_0_50NJ_spf_strutsAction=%212fselectFolder.do%213ffolderId%3DFLD101011#7_0_50NJ (last visited July 12, 2007).

[72] Sprint Press Release, *Sprint and Major League Baseball Advanced Media Reach Landmark Agreement Offering Live Major League Baseball Gameday Audio - Fans' Mobile Lifeline To Every Game* (August 9, 2006), *available at* http://www2.sprint.com/mr/news_dtl.do?id=12980 (last visited July 16, 2007).

- AT&T offers access to:
  - MobiRadio, with over 50 commercial-free radio channels, including NPR, Fox News, ESPN Radio, The Weather Channel, and music channels, for $8.99 a month;[74]
  - XM Radio Mobile, with 25 channels, for $8.99 a month;[75]
  - A variety of sports offerings, including CBS SportsLine Mobile, with the latest scores and insider sports info, for $4.99 a month; Fox Sports Mobile which offers news, scores, standings, schedules, odds and more for $4.99 a month; as well as other sports offerings including MLB Gameday, ESPN and Soccer '06;[76]
  - Napster, Yahoo, and eMusic subscription services, for their normal rates;[77]
  - MobiTV, which offers live television from MSNBC, ABC, Fox Sports, The Discovery Channel and other music, comedy, and cartoon channels, for $9.99 a month;[78]
  - Mobilcast, which offers access to a catalog of podcasts from news, music, and comedy channels including MTV News, Onion Radio News, NPR, NY Times and CNN, for $4.99 a month;[79]
  - Hip Hop Official by GoTV, with new hip hop music, news and interviews, for $5.99 a month;[80]

---

[73] *See* Sprint's Digital Lounge, *Applications, Weather, News & Traffic*, *available at* https://manage.sprintpcs.com/Manage/portal/goTo?action=DigitalLounge&ATR_ExtraOne=UHPCHP_DME_Link_ShopDigitalLounge (last visited July 21, 2007).

[74] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLHome.jsp?dc=0 (last visited July 21, 2007). To avoid data usage charges, customers subscribing to these AT&T plans likely will also subscribe to a data usage plan, which will include both data usage and other services. For example, The Media Works plan, at $15 a month, includes both 5 MB of usage for services including mobile music, web, or email and 1500 text messages, and the Media Max 200 plan, at $19.99 per month, includes unlimited usage for mobile music, web, or email, and 200 text messages. AT&T, *AT&T Nation Calling Plans* (rev. June 3, 2007).

[75] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLDir.jsp?dc=0&c1=CFWEB2048&sf=CFHTML&dc=0 (last visited July 21, 2007).

[76] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLDir.jsp?dc=0&c1=CFWEB2048&c2=CFWEB5926&c3=CFWEB2695&trail=all%20CFWEB2695 (last visited July 21, 2007).

[77] *See* http://www.wireless.att.com/source/music/mobilemusic.aspx (last visited July 16, 2007); *see also* Grace Aquino, *Dialed In: Cingular Plays a New Tune*, PC WORLD (November 29, 2006), *available at* http://www.pcworld.com/printable/article/id,127998/printable.html (last visited July 12, 2007).

[78] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLHome.jsp?pc=U&dc=0 (last visited July 16, 2007).

[79] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLDir.jsp?trail=all+CFWEB4655&c3=CFWEB4655&c2=CFWEB5926&c1=CFWEB2048&resourceIndex=7&sf=CFHTML&dc=0 (last visited July 21, 2007).

  - Alt Rock, with new rock music, news, tour info and more, for $5.99 a month;[81]
  - Weather channels with information on current U.S. weather conditions and radar and satellite imagery, including Weather News, My Cast Weather, NBC Weather Plus and the Weather Channel at rates of $2.99 - $3.99, and more specialized channels for flying or fishing conditions cost for $5.99 to $9.99.[82]

- Alltel offers two streaming radio packages:
  - Alltel's Axcess Radio, with 40 commercial-free music channels for $6.99 a month;[83]
  - XM Radio Mobile, with 20 XM channels, for $7.99 a month;[84]
  - Alltel also offers:
    - Axcess TV, with more than 25 music, news, sports, fashion, weather and comedy video channels, including Fox Sports, ESPN, Fox News, and MLB for $9.99 per month;[85]
    - Axcess Mobilcast, which offers access to a catalog of over 4000 on-demand podcasts and radio shows with music, comedy, sports programming, from channels including NPR, MSNBC, Fox Sports, CNN, Fox TV, ESPN Radio, and MLB for $3.99 a month.[86]
- Verizon offers both sports audio and audio downloads:
  - Live broadcasts of MLB games are available at $6.99 a month, or $29.99 for a season pass;[87]
  - V Cast Music offers a choice of 1.8 million songs for purchase at $1.99 via the phone or $0.99 via computer.[88]

---

[80] http://mediamall.wireless.att.com/sf/storefront/endUserHTMLDir.jsp?trail=all+CFWEB4655&c3=CFWEB4655&c2=CFWEB5926&c1=CFWEB2048&resourceIndex=1&sf=CFHTML&dc=0 (last visited July 21, 2007).

[81] *Id.*

[82] *See* http://mediamall.wireless.att.com/sf/storefront/endUserHTMLDir.jsp?dc=0&c1=CFWEB2048&c2=CFWEB5926&c3=CFWEB2693&trail=all%20CFWEB2693 (last visited July21, 2007).

[83] *See* http://www.alltel.com/axcess/tv_radio.html (last visited July 12, 2007). Subscribers to these packages also likely will want to subscribe to Alltel's Axcess Minutes plan, which provides unlimited airtime minutes for Axcess Radio, TV, and Axcess Web and more for $10 per month.

[84] *Id.*

[85] *Id.*

[86] *Id.*

[87] Major League Baseball, *Gameday plus Gameday Audio*, *available at* http://mlb.mlb.com/mobile/gameday.jsp (last visited July 17, 2007).

- Still other services are available to wireless subscribers on an "off-deck" basis, *i.e.*, without distribution support from wireless carriers. These services are accessible to wireless users with a data plan by direct access to a mobile portal.
    - Mercora M offers over a hundred thousand channels of digital radio and other services for $4.99 a month or $49.99 a year.[89]
    - Mobzilla for $9.99 a month offers commercial-free music channels, including artist DJ channels and music that is personalized based on the consumer's choice of style and rating and skipping of songs.[90]

40. Delivery of audio content to wireless phones is still a relatively new service that undoubtedly will expand over the next few years, but these services already are attracting substantial numbers of subscribers.[91] Sirius and XM have not ignored this competition. In addition to offering satellite radio service, they also offer their radio streams on a wholesale basis to wireless phone companies in competition with firms including Pandora, mSpot Radio, MobiTV, Music Choice, and Clear Channel.

c) iPods and Other MP3 Players

41. Sirius and XM similarly face competition from iPods and other MP3 players. Content and service providers for iPods and other MP3 players (including the subscription services) have responded to satellite radio, making available a wide variety of audio content, including Internet radio programs. Subscription services now permit audio content to be loaded onto compatible players at Wi-Fi hotspots, for about $15 per month.[92] This permits users to gain continual access to new music and the playlists of others. This product extension and repositioning has involved changing the type of product offered, not merely trying to change the consumer perceptions of the products. The new Slacker product will be introduced later in 2007 and will involve a music service distributed via the Internet and

---

[88] *Verizon Wireless Service Brochure* (July/Aug/Sept 2007) at 23. Associated usage is covered by separate data package, such as V Cast V Pak, which gives users unlimited airtime for V Cast Music, Video and Mobile Web services, as well as access to unlimited basic video clips, unlimited monthly access to Mobile Web services (e.g. Hotmail, Yahoo!), and ESPN MVP (manage fantasy sports teams, etc.). *Verizon Wireless Service Brochure* (July/Aug/Sept 2007) at 20.

[89] *See* http://www.mercora.com/m/ (last visited July 17, 2007).

[90] *See* http://www.mobzilla.com/what.is.aspx (last visited July 21, 2007).

[91] Sprint had nearly 1.2 million subscribers for its Sprint Power Vision packages, which include audio content, by the end of Q2 2006. Seeking Alpha, *Sprint Nextel Q2 2006 Earnings Conference Call Transcript* (August 3, 2006), *available at* http://seekingalpha.com/article/14951 (last visited July 21, 2007). mSpot, which launched the first service streaming radio service to cell phones in 2005, announced that it had passed 1 million paying subscribers for its audio and video services. mSpot Press Release, *MSPOT Surpasses One Million Subscribers* (March 26, 2007), *available at* http://www.mspot.com/press-releases11.php (last visited July 21, 2007).

[92] *For details, see* http://music.yahoo.com/ymu/?tab=togo (last visited July 12, 2007); *see also* http://www.napster.com/napstermobile/ (last visited July 12, 2007).

Ku band satellite to both portable devices and vehicles. Sirius and XM have attempted to meet this competition by adding recording and storage capacity to their receivers, and by then expanding that storage capacity. In addition to permitting time shifting, the storage capacity also permits users to listen to songs from their MP3 or other digital files, CD collections, or Napster in order to self-program their music mix.[93] XM and Sirius also allow subscribers to stream music on their computers. In fact, **[[REDACTED** [redacted] **]]**.[94]

42. More than 70% of new vehicles in the 2007 model year will have an option that allows integrated use of their iPod player over the vehicle's audio system.[95] Many vehicle radios also have auxiliary input jacks, often paired with 12 volt outlets, to which iPods or other MP3 players, as well as audio content-enabled wireless phones such as the new iPhone, can be connected. The number of iPods and other MP3 players in use is projected to grow by about 60 million between now and 2009.[96] Those players allow consumers to listen to music from the owner's CD collection, songs and podcasts from the iTunes Music Store and its competitors, and music from subscription services like Rhapsody and Napster. Owners of MP3 players also can load their players with playlists programmed by others or with their own collections shuffled up.[97]

d) Feature Convergence and New Product Innovation

43. This discussion indicates that there has been substantial blending among products as features associated with one type of device become incorporated into other devices. In this market, product extension and repositioning is a constant process of product innovation. For example, satellite radios and wireless phones are adding more storage capability; wireless phones are adding audio streaming; and iPods and other MP3 players are gaining more capability to acquire additional content (*e.g.,* radio-style podcasts), even when away from home (*i.e.*, at Wi-Fi hotspots, on WiMAX networks and over Ku Band). The

---

[93] Orbitcast, *Samsung Nexus - Orbitcast Review* (May 27, 2006), *available at* http://www.orbitcast.com/archives/samsung-nexus-orbitcast-review.html (last visited July 12, 2007); *see also* Adotas, *XM's Push-and-Purchase Function Glimpses at Advertising's Future* (February 23, 2006), *available at* http://www.adotas.com/2006/02/xms-push-and-purchase-function-glimpses-at-advertisings-future/ (last visited July 19, 2007).

[94] **[[REDACTED** [redacted] **]]**; XM Satellite Radio, *Form 10-Q, 3Q* 2006.

[95] Apple Press Release, *Apple Teams Up With Ford, General Motors & Mazda To Deliver Seamless iPod Integration* (August 3, 2006), *available at* http://www.apple.com/pr/library/2006/aug/03ipod.html (last visited June 5, 2007).

[96] Jupiter Research, *US Music Forecast, 2006 to 2011* (Vol.2, 2006) at 8.

[97] *For example, see* Rhapsody, Music to go, *available at http://learn.rhapsody.com/players?src=rcom_footbox* (last visited July 17, 2007); *see also* Yahoo! Music Unlimited To go, available at http://music.yahoo.com/ymu/default.asp?tab=togo (last visited July 17, 2007).

excitement created by the iPhone reflects the growing competition from blended devices. These market developments will tend to increase the degree of demand substitution (and cross-elasticities of demand) between the satellite radio providers and other forms of audio entertainment as devices blend and become less differentiated. These developments also indicate the potential for rapid supply-side repositioning in response to any post-merger price increases.

44. In this dynamic market, new products are being introduced on a regular basis to create more convergence among audio entertainment modes. One product that highlights this convergence is the new joint Ford-Microsoft product called Sync. Using Bluetooth or a USB port, Sync allows music and cellular devices to instantly become integrated with the car. Then, using voice commands, a driver can dial contacts in their cell phone or have an MP3 player switch to the next track. Ford, which offers Sirius radios on many models, also will have the Sync system available for 12 models later this year.[98] Another product, SelectRadio software, permits owners of wireless phones and PDAs that use Windows Mobile software to stream music (including Sirius and XM programming) and podcasts.[99] Sprint soon will be offering a new phone that connects through the FM radio.[100]

45. Other products, such as Slacker, are blurring the lines between different audio mediums. Slacker also shows how nimble new entrants can quickly expand their product offerings. Initially, Slacker launched an online streaming radio player, which allowed users to rate and customize the music they hear (as do Pandora and other Internet-based services such as Mercora), as well as load a user's MP3s and other music files.[101] Next, Slacker will launch a portable player, which integrates the streaming music player and allows users to update their radio stations over Wi-Fi. Finally, Slacker will introduce a music service using Ku band satellite capacity, which will allow Slacker users to receive updates for their portable player in their cars. Slacker recently received an additional $40 million in funding for the launch of their service.[102]

---

[98] Ford Press Release, *Ford Teams Up with Microsoft to Deliver Sync; In-Car Digital System Exclusive to Ford* (January 7, 2007), *available at* http://media.ford.com/newsroom/release_display.cfm?release=25168 (last visited July 3, 2007).

[99] *See* http://www.selectradio.com/SelectRadioFeatures.html (last visited June 7, 2007).

[100] This phone is the Musiq by LG. *See* John Biggs, *Transmit Your Music to FM Right From Your Cellphone*, NEW YORK TIMES (July 12, 2007), *available at* http://www.nytimes.com/2007/07/12/technology/circuits/12phone.html?_r=1&oref=slogin (last visited July 12, 2007).

[101] Erica Ogg, *Slacker's new wavelength for satellite radio*, CNET.COM (March 14, 2007), *available at* http://news.com.com/2100-1041_3-6166934.html (last visited June 5, 2007). For a description of Slacker's products, *see* http://www.slacker.com/company/products.html (last visited July 17, 2007).

[102] Robert Nelson, *$40 million more in funding for Slacker*," GADGETELL (June 5, 2007), *available at* http://www.gadgetell.com/2007/06/40-million-more-in-funding-for-slacker/ (last visited June 11, 2007).

46. New cars may well come with connections for Internet radio over the next few years. Internet offerings for the car already are becoming more robust, as discussed earlier. Autonet Mobile will begin selling a portable router that turns a car into a "rolling hotspot," allowing multiple users to connect to the Internet.[103] The router, which is being released this summer, will sell for $400 and the monthly network connection will be $50 a month. Autonet has already reached an agreement with Avis to offer their service in select cars.[104] Moreover, Aeris is finalizing the integration of broadband service into the telematic system of automobiles in the 2008 model year car.[105] By 2009 automobiles may have IP addresses to communicate information over broadband networks.[106] As discussed below, new access technologies and networks will make mobile broadband access widely available in the coming years. The emergence of mobile Internet connectivity will enhance the competitive significance of Internet radio companies. Pandora has already begun discussions with OEMs about integrating Pandora into new vehicle models.[107]

47. The importance of inter-modal demand substitution in this dynamic market also is suggested by the pattern of satellite radio sales growth. Inter-modal competition and emerging competition has increased substantially and both XM and Sirius have missed their initial subscriber projections for 2006. Increased competition from other forms of audio entertainment also has led several analysts to make significant downward revisions in

---

[103] Dan Tynan, *Cruising the Internet at 70 MPH: Soon you'll be able to surf the Web, download music, and check e-mail in your car*, PC WORLD (March 21, 2007), *available at* http://www.pcworld.com/printable/article/id,129779/printable.html (last visited June 15, 2007). *See also* http://www.autonetmobile.com/wp/service (last visited July 16, 2007).

[104] *Id. See also* Avis Press Release, *Rent From Avis and Get Your Own Mobile Wi-Fi Hot Spot* (May 21, 2007), *available at* http://www.autonetmobile.com/wp/wp-content/uploads/2007/05/avis_release_may07.pdf (last visited July 17, 2007). The connection to the Internet works best in areas that have EV-DO Rev. A coverage. The EV-DO Rev A upgrade allows CDMA wireless networks to offer mobile, broadband access with faster download and upload speeds. Verizon Wireless has upgraded its entire wireless network to EV-DO Rev A, and Sprint reaches more than 203 million people nationwide with its upgrade EV-DO Rev A network. Verizon Press Release, *Verizon Wireless: 100 Percent Of Wireless Broadband Network Now Enhanced With Fast Speeds* (June 29, 2007), *available at* http://news.vzw.com/news/2007/06/pr2007-06-28h.html (last visited July 12, 2007); Sprint Press Release, *American's Largest and Fastest Mobile Broadband Network Just Got Even Larger – Sprint Customers Can Do More, In More Places, And At Fast Speeds* (June 19, 2007), *available at* http://www2.sprint.com/mr/news_dtl.do?id=17121 (last visited July 12, 2007).

[105] Dan Tynan, *Cruising the Internet at 70 MPH: Soon you'll be able to surf the Web, download music, and check e-Mail in your car*, PC WORLD (March 21, 2007), *available at* http://www.pcworld.com/printable/article/id,129779/printable.html (last visited June 15, 2007). *See also* http://www.aeris.net/index.html (last visited July 18, 2007).

[106] Dan Tynan, *Cruising the Internet at 70 MPH: Soon you'll be able to surf the Web, download music, and check e-Mail in your car*, PC WORLD (March 21, 2007), *available at* http://www.pcworld.com/printable/article/id,129779/printable.html (last visited June 15, 2007).

[107] Sarah McBride, *Going Wireless: Internet Radio Races To Break Free of the PC – Pushing Portability In Cars, Music Players; Static Over WiFi*, WALL STREET JOURNAL (June 18, 2007).

their projections for 2010, with figures as much as 20% lower.[108] Over the same period, growth of iPods and MP3 portable players has greatly exceeded expectations.

B. Product Differentiation

48. Product differentiation is ubiquitous among audio entertainment products and most consumer products and brands are differentiated in some way. Audio entertainment products and content services are differentiated along a number of dimensions – for example, programming mix, sound quality, number of commercials, number of channels, and price. XM and Sirius also are differentiated from each other because of exclusive content and exclusive installation with automobile manufacturers, as well as program mix and DJs. The existence of product differentiation does not mean that every differentiated product comprises its own separate relevant market. Indeed, automatically to treat differentiation as determinative would imply that XM and Sirius each would be in separate markets.

49. The relevant economic issue for market definition is whether XM and Sirius are especially close substitutes, relative to the other audio entertainment products and content services, such that a small but significant post-merger price increase would be profitable. As discussed above, there is significant demand substitution between satellite radio on the one hand, and the other modes of audio entertainment on the other. Over time, the potential for demand substitution will increase, not decrease. At the same time, the differentiation between Sirius and XM reduces the degree of substitution between them. Thus, the main constraints on Sirius and XM's pricing and product offerings are substitution to other audio entertainment products and the need to build demand through penetration pricing, not buyer substitution to the other satellite radio provider.

1. Product Differentiation and Switching Costs Between Sirius and XM

50. Some Comments have suggested that XM and Sirius are basically fungible products, or at least especially close substitutes to each other relative to other audio entertainment products.[109] These claims are incorrect. Substituting between Sirius and XM involves

---

[108] Bank Testimony. *See also* Goldman Sachs, *Conundrum Squared: Why XM And Sirius Should Wait* (February 11, 2007) at 1 ("An already competitive environment is slowing retail net adds and a measured pace of OEM penetration faces an increasingly competitive in-car market.") Goldman Sachs revised downward its year end subscriber projections for XM and Sirius for 2007 and 2008 by about 6-7% and 14-16% respectively, and its projections for net additions in 2007 by 20-25% and in 2008 by 39-41%. *Id.* at 4, 30-31. *See also* JP Morgan, *XM Satellite Holdings Inc* (January 16, 2007) at 2 ("This reflects our view that 2005 and 2006 retail sales were skewed by an early adopter surge that will be hard to top in the future, especially with strong competition from iPod, cell phones and other music devices.")

[109] AAI Comments at 22-25; *Cf.* David Balto, Testimony of David A. Balto before the Antitrust Subcommittee of the Senate Judiciary Subcomittee on Antitrust, Competition Policy and Consumer Rights (March 20, 2007) (hereinafter "Balto") at 3-4; *see also* Sidak-I at 25-32.

substantial switching costs for current subscribers. For example, a 10% increase in the current subscription price of $12.95 per month would increase service costs by less than $16 per year; if a subscriber switched to the other service in response, it would take about 9 years to recover incremental equipment and accessory costs of $150. These switching costs tend to differentiate the two products for current subscribers. In addition, Sirius and XM are differentiated on the basis of content and OEM distribution. These sources of differentiation have been increasing over time.

a) Content Differentiation

51. XM and Sirius each have substantial exclusive content. This exclusive content comprises some of the most popular stations offered by each firm. For example, Sirius has Howard Stern, NFL, NASCAR, and Martha Stewart, among others. XM has MLB, NHL, Opie and Anthony, and Oprah Winfrey, among others. Subscribers also may have preferences among the disk jockeys who program or host the various channels for each of the genres offered by the two services. For example, XM has Bob Dylan, Willie Nelson, and Snoop Doggy Dog.[110] Sirius has personalities such as Steve Van Zandt, Jamie Foxx, 50 Cent, and Tony Stewart.[111]

52. This exclusive content differentiation is important to many consumers. For example, **[[REDACTED** [redacted].[112] [redacted].[113] [redacted].[114] [redacted]]].[115]

---

[110] A list of exclusive content on XM can be found on XM Satellite Radio website, *available at* http://www.xmradio.com/onlyonxm/index.xmc (last visited July 18, 2007).

[111] A list of DJs and show hosts for Sirius can be found at Sirius website, *available at* http://www.sirius.com/servlet/ContentServer?pagename=Sirius/Page&c=Page&cid=1107787275024& (last visited July 5, 2007).

[112] **[[REDACTED** [redacted]].

[113] **[[REDACTED** [redacted]].

[114] **[[REDACTED** [redacted]].

[115] **[[REDACTED** [redacted]].

53. This type of content product differentiation makes it less likely that satellite radio comprises a market separate from other audio entertainment products. This is because the product differentiation reduces the degree of demand substitution between the two services, relative to the degree of demand substitution with other audio entertainment devices and modes of listening. For example, a diehard fan of Opie and Anthony would find AM/FM a closer substitute than Sirius for XM because Opie and Anthony also are available on CBS radio, as well as on XM, but not on Sirius.[116] The same situation would apply to baseball fans. For instance, in Washington, D.C., listeners can choose between XM and Bonneville Radio's AM1500/FM107.7 for coverage of Nationals games, but they cannot choose Sirius.[117] Similarly, Redskins fans in Washington can choose between WJFK and Sirius, but not XM. Sports content from MLB, NFL, NBA, and NASCAR are also available on AM/FM, but not from the other satellite radio provider. Games also are streamed on the Internet by the Leagues.[118] They also are increasingly being offered on wireless phones.[119] Indeed, Major League Baseball expects to have over a million subscribers this season for its GameDay package of audio baseball game broadcasts or its video content.[120]

54. As discussed in more detail below, this product differentiation also is relevant for unilateral competitive effects analysis, regardless of how the market is defined. The product differentiation between XM and Sirius reduces the impact of the merger on their pricing incentives, *ceteris paribus*.

b) OEM Distribution Differentiation

55. Sirius and XM are differentiated in a second key way. Sirius and XM each have distribution agreements with a large number of automobile manufacturers, most of whom pre-install the radios of only one of the two services. XM's OEM partners (GM, Honda, Hyundai, Toyota, Nissan and others) accounted for a little under 60% of U.S. car and light truck sales in 2006. Sirius' OEM partners (Daimler Chrysler, BMW, Mitsubishi, Ford and

---

[116] Peter Johnson, *Opie & Anthony Airing on XM & CBS*, USA TODAY (April 24, 2006), *available at* http://www.usatoday.com/life/people/2006-04-24-opie_x.htm (last visited June 7, 2007).

[117] Barry Svrluga & Paul Farhi, *Nationals Announce 3-Year Radio Broadcast Deal*, WASH POST (Jan. 20, 2006), *available at* http://www.washingtonpost.com/wp-dyn/content/article/2006/01/19/AR2006011903073.html (last visited July 5, 2007).

[118] *See* http://mlb.mlb.com/mlb/subscriptions/gameday_audio.jsp?c_id=mlb (last visited July 20, 2007); *see also* http://www.nfl.com/fieldpass/faq (last visited July 16, 2007).

[119] For example, as noted above, live game day broadcasts of MLB games are offered by both Sprint and Verizon. Sprint Press Release, *Sprint and Major League Baseball Advanced Media Reach Landmark Agreement Offering Live Major League Baseball Gameday Audio - Fans' Mobile Lifeline To Every Game* (August 9, 2006), *available at* http://www2.sprint.com/mr/news_dtl.do?id=12980 (last visited July 17, 2007). *See also* http://mlb.mlb.com/mobile/gameday.jsp (last visited July 17, 2007).

[120] Steven Levy, *Major League Baseball's Digital Fortunes,* NEWSWEEK (June 25, 2007), *available at* http://www.msnbc.msn.com/id/19196667/site/newsweek (last visited July 17, 2007).

others) accounted for about 40% of U.S. sales.[121] The OEMs install integrated receivers as standard or optional equipment in many of their models. These are long term contracts, many of which will not expire for more than 5 years. Subaru, which accounted for about 1% of U.S. car and light truck volume in 2006, is the only manufacturer to offer a factory-installed option between Sirius and XM in the 2008 model year.[122] One important reason for these *de facto* exclusive relationships is that it is less costly to deal with a single supplier and integrate only a single type of unit into the auto sound system.

56. The effect of car manufacturers offering only one satellite radio service is to reduce the cross-elasticity of demand between Sirius and XM. It is unlikely that any consumers would sell their current automobile and purchase a different brand in response to a price increase by either Sirius or XM. Replacing the installed radio that is integrated into the sound system with a plug-and-play aftermarket model is possible, but that product substitution would involve the switching costs of having to purchase new equipment, and perhaps somewhat inferior sound quality. This OEM practice of installing only XM or Sirius radios, rather than offering a choice, obviously significantly reduces the degree of demand substitution among current subscribers between Sirius and XM in response to price changes. The cost of purchasing new equipment also reduces the cross-elasticity of demand between Sirius and XM for subscribers who have already purchased an aftermarket radio for one or the other service, though not to the same degree.

57. It is therefore not surprising that the actual incidence of substitution by current subscribers of one satellite radio service to the other is quite low. **[[REDACTED** [redacted] .[123] [redacted]]]. This substitution evidence supports the conclusion that the relevant market should not be defined as just satellite radio.

---

[121] Motor Intelligence, *New Vehicle Sales* (2007 CYTD), *available at* http://www.motorintelligence.com/body.asp (last visited July 20, 2007).

[122] Nissan/Infiniti previously offered both Sirius and XM, but will offer only offer XM radios beginning in the 2008 model year. Only XM radios are factory-installed by Toyota, although Sirius radios can be dealer-installed on certain Toyota models.

[123] Calculated from **[[REDACTED** [redacted]]].

58. This product differentiation between Sirius and XM also supports a broader market definition when it is coupled with the fact that the companies have not been able to charge supra-competitive prices. Suppose that one were to assume that satellite radio is a separate market, distinct from other forms of audio entertainment. In this alleged duopoly "market," in which the duopolists have highly differentiated products, one also would expect that they would have been able to enjoy substantially high margins. **[[REDACTED** [redacted]]]. The firms' $7 billion in losses as of 3Q 2006 certainly raise questions about their ability and incentive to insulate themselves from competition with other audio entertainment devices.[124]

2. Product Differentiation Between Satellite Radio and Other Audio Entertainment Modes

59. Comments opposing the merger tend to downplay the differentiation between XM and Sirius and instead focus only on the differentiation between satellite radio and other audio entertainment modes. The latter differentiation is not strong enough to justify a narrow satellite radio-only market definition. Perfect substitution is not required for two products to be in the same relevant market. A set of imperfect substitutes can provide a highly significant constraint on a product. For example, various AM/FM radio stations are not perfect substitutes for advertisers because they all have slightly different demographics but they still act as competitive constraints on each other.

60. Some Comments suggest that satellite radio and terrestrial radio are in separate markets because satellite radio depends predominately on subscription revenue, whereas terrestrial radio earns advertising revenue.[125] However, the use of different "business models" does not imply the absence of listener substitution between terrestrial radio and satellite radio or that such substitution to terrestrial radio would fail to deter the exercise of market power by a merged XM and Sirius. Listeners are not concerned about "business models" and they do substitute between satellite radio and AM/FM, as discussed earlier. If Sirius and XM were to raise their subscription prices, fewer people would choose to subscribe because of the variety of other alternatives available.[126]

---

[124] For losses to date, *see* Goldman Sachs, *Conundrum squared: Why XM and Sirius Should Wait* (February 11, 2007) at Exhibit 10.

[125] *For example, see* Sidak-I at 26.

[126] *Cf.* NAB Petition at 15 ("the conclusion that local terrestrial broadcast radio is not a substitute for satellite DARS in the *national satellite DARS market* is not inconsistent with a conclusion that satellite DARS is a substitute for local terrestrial broadcast radio in the separate (and broader) *local audio market.*") The NAB states the economic proposition exactly backwards. The fear of *subscriber substitution* from satellite radio to terrestrial radio would constrain the ability and incentive of the merged firm to raise price profitably. But, the fear of *advertiser substitution* from terrestrial radio to satellite radio likely would not be sufficient to constrain the ability of a terrestrial radio advertising cartel to raise price profitably. XM and Sirius have few listeners and little advertising,

61. The same analysis of substitution applies to claims that satellite radio belongs in a separate market from terrestrial radio because satellite radio is mainly limited to national programming, whereas terrestrial radio is mainly local. This does not make economic sense. Listeners value local as well as national content. The inability to offer much local programming is a disadvantage, not an advantage. As discussed above, the fear of substitution to terrestrial radio clearly would constrain the ability and incentive of the merged firm to raise its subscription price. Terrestrial radio carries national as well as local content, and listeners may choose between the national and local content that is broadcast. Moreover, terrestrial radio stations are not significantly constrained from increasing the amount of national content above the current level. Companies like Clear Channel serve multiple local areas. Networks can broadcast the same content around the country. In addition, national content is syndicated and sold to stations nationally.[127] For example, we understand this is done with programming like The Rush Limbaugh Show and American Top 40. That is also the way the Howard Stern programming was sold before he moved to Sirius. There are companies that specialize in arranging nationally syndicated distribution.[128]

62. The NAB suggests that satellite radio is a separate relevant market because it is the only source for "a multi-channel, mobile audio service that is available as the consumer travels anywhere in the country."[129] There are several problems with this rationale for defining the market. First, this analysis ignores the fact that, for example, the Classic Rock radio station in one area probably is a pretty good replacement for the Classic Rock in another area for a motorist traveling around the country. Second, very few potential satellite radio subscribers actually travel around the country enough to justify paying $13 per month for radio service. This product characteristic might be highly salient for long distance truckers, but less important for most others.[130] Third, it would not be surprising if satellite radio

---

relative to terrestrial radio stations. But, the issue here is not collusion in the advertising market. It is whether an increase in the price of satellite radio would lead to subscriber substitution – fewer consumers subscribing to satellite radio and more current subscribers terminating the service. In that arena, there is substantial scope for substitution from satellite radio to terrestrial radio.

[127] For a similar point, *see* Comments of Edwin Meese III, The Heritage Foundation, *and* James L. Gattuso, The Heritage Foundation, MB Docket No. 07-57 (July 9, 2007) at 3.

[128] One example is Westwood One. *See generally* Westwood, *Form 10-K* (2006), *available at* http://images.westwoodone.com/images/pdf/Investor-Relations/PFBNY31158_4_0828.PDF (last visited July 20, 2007).

[129] NAB Petition at 12; *see also* Sidak-I at 27 *and* Sidak-II at ¶26.

[130] **[[REDACTED** [redacted]

penetration were higher for truckers. Sirius and XM have channels targeted at truckers. But, neither Sirius nor XM price discriminate against truckers now, and such price discrimination would be highly unlikely after the merger.

63. Some Comments argue that satellite radio is a separate market because satellite radio offers commercial-free music channels and listeners dislike ads.[131] Surveys indicate that commercial-free programming is a relevant attribute for many satellite radio subscribers.[132] However, while many subscribers may value commercial-free programming, many more consumers have not valued it enough to pay for satellite radio, and many who have subscribed likely do not value it enough to pay significantly more than they do now. In particular, survey evidence indicates **[[REDACTED**

]]. Sidak relies on empirical evidence from a Wilson Research Strategies survey. Sidak-II at ¶¶24-27. The Wilson survey reports a much higher number – 77% of subscribers cited uninterrupted signal nationwide as an important reason for subscribing. Wilson finds higher numbers for the importance of several satellite radio attributes than do company surveys. The XM and Sirius surveys were commissioned for use in the normal course of business, in contrast to the Wilson survey, which was commissioned by the NAB for use in this proceeding. Too little information has been provided about the questionnaire or methodology of the Wilson survey to analyze why it found results that differ substantially from those of the companies' surveys.

[131] *For example, see* Balto at 2. *See also* Sidak-II at ¶26; C3SR Petition at 6; NAB Petition at 14 ("it is significant that terrestrial radio is a free, rather than subscription, service.") Sidak-I asserts that terrestrial radio is an inferior product to satellite radio because listeners have to pay a cost for terrestrial radio by listening to commercial advertisements. He measures the "cost" by the listener's wage rate. Sidak-I at 26. This analytic approach is unconvincing because it leads to very unreasonable results. Assume that a typical person listens to terrestrial radio just 10 hours a week and there are 8 minutes of commercials an hour). In this scenario, the "cost" of listening to commercials for a person earning $20/hr (or about $40,000) a year would be 33 cents per minute, or about $110 a month. Even for someone earning $10 an hour, the "cost" by Sidak's measure would be about 17 cents a minute or $55 a month. Since satellite radio only costs $12.95 a month, Sidak's methodology would imply that nearly everyone that earns $10 an hour or more and listens 10 hours a week would choose to subscribe choose satellite radio – paying the lower "price" for what Sidak claims is a much broader service. In fact, about 230 million Americans listen to terrestrial radio each week, while there are only about 14 million satellite radio subscribers. More recently, Sidak has proposed a different ad hoc approach to determining the value of avoiding commercials, as discussed below. Sidak-II at ¶¶43-44.

[132] For example, **[[REDACTED**

]]. The results reported from the Wilson survey prepared for this proceeding finds that a substantially higher proportion of subscribers (i.e., 87%) place a high importance on commercial-free music than do XM and Sirius surveys, such as those cited here and later in this paragraph. Sidak-II at ¶26.

[redacted]].[133] This lack of importance to most subscribers also can be seen directly from listening data as both services have very popular channels that carry commercials. **[[REDACTED** [redacted]].[134] In addition, Sirius has a number of other highly rated advertiser-supported stations. **[[REDACTED** [redacted]].[135] **[[REDACTED** [redacted]].[136]

64. Moreover, consumers who prefer commercial-free listening have other listening alternatives. Listening to CDs and most content on MP3 players would be commercial-free, including subscription services like Rhapsody and Napster, content from services like the Apple iTunes Store, and some podcasts. In addition, there are about 1350 radio stations currently broadcasting in HD, including more than 600 HD2 channels that now offer commercial-free content, and these figures are increasing rapidly.[137] Finally, as discussed earlier, encryption technology for HD radio would make it possible for HD radio stations to be provided on a commercial-free subscription basis.

65. Some Comments argue that satellite radio is a separate market because satellite radio has higher quality sound than AM and FM.[138] Some satellite radio subscribers have a strong preference for higher sound quality but many do not. And, customers with that preference are not limited only to satellite radio. They also can obtain superior sound quality by listening on CD players, iPod/MP3 players and wireless phones connected to an auto sound system or a high quality headset. According to company surveys, **[[REDACTED** [redacted]

---

[133] **[[REDACTED** [redacted]].

[134] **[[REDACTED** [redacted]].

[135] **[[REDACTED** [redacted]].

[136] **[[REDACTED** [redacted]].

[137] HD Radio Alliance Press Release, *Best Buy Expands HD Digital Radio Line-Up at All Stores Nationwide* (April 23, 2007), *available at* http://www.hdradio.com/press_room.php?newscontent=86 (last visited June 11, 2007). *See also* iBiquity, *Find a Station, available at* http://www.ibiquity.com/hd_radio/hdradio_find_a_station (last visited June 7, 2007).

[138] *See* AAI Comments at 22; *Petition to Deny of Common Cause, Consumer Federation of America, Consumers Union and Free Press*, MB Docket No. 07-57 (July 9, 2007) at 2, Ex. ES-1 (listing sound quality as a distinguishing characteristic of satellite radio).

[[REDACTED]].[139] It is also noteworthy that these Comments overstate the sound quality advantage of satellite radio. Sound quality can vary depending on radio and installation. About half of the current base of satellite radio subscribers use radios purchased on the aftermarket and sound quality over aftermarket installations may be inferior to factory installations. Moreover, the sound quality advantage of satellite radio over terrestrial radio is not necessarily permanent. Terrestrial radio companies are not standing still. They are innovating in response to satellite radio by offering HD radio, which provides higher quality sound.[140]

66. Gregory Sidak claims that iPods belong in a separate market for the same reason, arguing that the iPod gives relatively poor sound quality when attached through the FM transmitter or cassette attachment.[141] Sidak ignores the fact that many satellite radios also are attached with FM transmitters. As a result, satellite radio lacks a distinct advantage in this regard for many subscribers. In any event, the sound quality of installations is improving for both iPods and satellite radio. While the fraction of satellite radios factory-installed in vehicles is rising substantially over time, high quality connections are increasingly available for iPod/MP3 players and other devices. Many new vehicles are equipped with auxiliary inputs (and often a nearby power outlet) that provide high quality connections to the sound system for iPods and other MP3 players with a simple interconnect cable that costs perhaps $2-3. About 70% of 2007 car models offer an option to integrate operation of an iPod through the vehicle audio system and integration continues to improve through products like the Ford Sync system. Indeed, a recent survey by J.D. Power and Associates reported that 60% of iPod owners are willing to pay $150 to connect their iPod to their cars' audio system.[142] Thus, this sound quality issue is not a convincing rationale for separate markets.

67. Some Comments argue that satellite radio is a separate market because it has the advantage of a large number of channels, relative to terrestrial radio.[143] A large number of channels provide some advantages, at least for some consumers.[144] However, there are many

---

[139] [[**REDACTED**]].

[140] The Comments that focus on the sound quality advantage of satellite radio also ignore the internal inconsistency in their position. On the one hand, right now satellite radio has a very small penetration rate despite these advantages. On the other hand, in the future, satellite radio faces growing competition from the improved sound quality of HD Radio.

[141] Sidak-II at ¶14.

[142] Joseph D. Younger, *Car Tunes*, CAR & TRAVEL MAGAZINE (November 2006).

[143] *For example, see* AAI Comments at 22; NAB Petition at 12; Balto at 3.

[144] The Wilson survey finds that 77% of subscribers said that the number of channels was an important factor in the decision to subscribe. Sidak-II at ¶26. But an XM survey found that [[**REDACTED**

consumers for whom far fewer channels would be adequate. **[[REDACTED** [redacted] **]]**.[145] **[[REDACTED** [redacted] **]]**.[146] **[[REDacted** [redacted] **]]**.[147] **[[REDACTED** [redacted] **]]**. Sprint offers 10 music channels with its basic Power Vision Package and 135 additional channels with a package that costs $5 more; AT&T offers 50 commercial-free channels of music, news, and sports for $8.99 to subscribers with data packages; and Alltel offers a music streaming service that includes 40 channels at a price of $6.99.[148]

68. There are other ways to obtain a wide variety of audio entertainment. For example, by taking a subscription service like Rhapsody or Napster, owners can achieve as much variety as offered on XM and Sirius; for example, Rhapsody has a library of over

---

[redacted] **]]**.

[145] **[[REDACTED** [redacted] **]]**.

[146] **[[REDACTED** [redacted] **]]**.

[147] **[[REDACTED** [redacted] **]]**.

[148] See the discussion above, which describes other offerings of the wireless carriers, including Sprint offering 20 Sirius channels for $6.95, AT&T offering 25 XM channels for $8.99, and Alltel offering 20 XM channels for $7.99.

3,000,000 songs.[149] Listeners also can obtain iPods and other MP3 players with very large hard drives to store music and other content. An iPod with 80 gigabytes of disk space can hold over 1,000 hours of audio. If the listener wants new and different music every day, the subscription services can provide it. These subscription services are priced comparably to Sirius and XM.[150] In addition, the number of terrestrial radio stations is increasing as HD radio is being rolled out with new HD2 side channels.

69. Some Comments argue that satellite radio is a separate market because, unlike iPods and other MP3 players, satellite radio does not require listeners to program their music themselves and potentially has a wider-range of audio channels available.[151] While these characteristics likely are an advantage for some listeners, they are not for others who do not care about variety or who prefer their own mix of songs and can obtain a "surprise" element by using the "shuffle" feature. In addition, consumers who value music programmed by others have many options besides satellite radio, including terrestrial radio, HD radio and Internet radio. Music subscription services like Rhapsody, Yahoo and Napster offer a huge variety of musical choices, including playlists formulated by others and Internet radio stations, that allow listeners to enjoy new and unfamiliar music. Podcasts allow listeners to enjoy music and talk on their MP3 players. A variety of talk programming is available, including news and personalities like Rush Limbaugh and Sean Hannity.[152] Moreover, listeners may have the ability to load their MP3 players with content from Internet radio stations.[153] Obviously, when vehicles gain access to Internet radio in the coming years, Internet radio will have an even more direct path to in-car audio systems.

---

[149] *See* http://www.real.com/rhapsody/unlimited?pageid=broadBandHomePage&pageregion=bottom_region&src=rhapsody%2Crealhome_bb_0_3_1_0_0_1_0&pcode=rn&opage=realhome_bb (last visited July 5, 2007).

[150] Rhapsody Unlimited, which allows the subscriber to listen to unlimited music on the PC, is available for $12.99/month. Rhapsody to Go, which allows the subscriber to download unlimited music on an MP3 player, is available for $14.99/month. *See* Rhapsody Offer Terms, *available at* http://shop.rhapsody.com/plans?pageid=unagi.11939110.wrapper&pageregion=A1&src=rotw.shop_overview&pcode=rn&opage=rotw.shop_overview (last visited July 21, 2007). The basic subscription tier of Napster offers unlimited listening and PC downloading on up to three computers for $9.95 per month. For $14.95, music fans can subscribe to Napster To Go, the company's portable subscription tier, and enjoy unlimited transfer of music to their choice of compatible MP3 players, cell phones and PDAs in addition to unlimited streaming and PC downloading. *See* Napster, *available at* http://free.napster.com/subscribe/ (last visited July 17, 2007). *See also* Troy Dreier, *Napster 3,* PC MAG.COM, *available at* http://www.pcmag.com/article2/0,1895,1765320,00.asp (last visited July 17, 2007).

[151] *For example, see* Balto at 6.

[152] *For example, see,* ABC News Website, *available at* http://abcnews.go.com/Technology/Podcasting/ (last visited July 13, 2007); *see also* http://www.rushlimbaugh.com/home/Rush247.guest.html (last visited July 13, 2007); *see also* http://podcasts.yahoo.com/series?s=fcda1cab83fa57f24c12c5ac7f680f76 (last visited July 13, 2007).

[153] One product that facilitates this is the iFill. *See* http://www.griffintechnology.com/products/ifill/ (last visited July 5, 2007).

70. The Comments that discuss the advantages of satellite radio also tend to ignore its offsetting competitive disadvantages. Most notably, satellite radio subscribers face a monthly subscription price of $12.95 and must purchase a specialized receiver, whereas terrestrial radio is free and virtually every automobile comes equipped with an AM/FM radio. Aside from weather and traffic, satellite radio also does not have the local news and other local content that terrestrial radio stations offer. These offsets represent significant disadvantages for Sirius and XM. Satellite radio has only about 14 million subscribers, whereas over 230 million consumers listen to terrestrial radio each week.[154]

71. Finally, as previously discussed, feature convergence is reducing product differentiation among these competing devices. Satellite radios and wireless phones are adding more storage capability, wireless phones are adding audio streaming services, and iPods and other MP3 players are gaining the capability to acquire additional content and to do so away from home. Internet radio is becoming available away from home. This feature convergence is intensifying over time, and will further increase the scope for demand substitution.

72. Some Comments have suggested that listening on iPod/MP3 players is a "complement" for listening on satellite radio, not a "substitute" that would constrain the pricing of satellite radio.[155] This is not correct as a matter of economic logic. Economic complementarity occurs if the cross-price elasticity of demand is negative, that is, if an *increase* in the subscription price of satellite radio would lead to a *decrease* in the demand to listen on the other products (*e.g.,* terrestrial radio or MP3 players); thus, listening on the other products would not constrain the pricing of satellite radio).[156] In contrast, products are economic substitutes if the cross-price elasticity of demand is positive, that is, if an increase in the subscription price of satellite radio would lead to an *increase* in the demand for listening on other products; thus, listening on the other products would constrain the pricing of satellite radio. The latter substitute product relationship is more plausible than the former and is supported by the evidence. **[[REDACTED** [redacted]**]]**.

73. Some Comments claim that satellite radio and terrestrial radio are complements because certain data has suggested that satellite radio subscribers listen to more terrestrial radio than do non-subscribers.[157] Such results are not evidence on how individuals would respond to a

---

[154] Arbitron, *Radio Today, How America Listens to Radio: 2007 Edition* at 90. For the estimate of U.S. population aged 12+ as of January 1, 2007, *see* Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4.

[155] Sidak-I at 30; Sidak II at ¶20; *see also* Napoli at 6.

[156] *For example, see* Jeffrey M. Perloff, MICROECONOMICS 53-54 (2007).

[157] Sidak-II at ¶19-20; *see also* AAI Comments at n.51. The New York Times article cited as evidence by Sidak at ¶20 does not in fact contain information on how much time satellite radio subscribers spend listening to terrestrial

price change. Instead, they compare the listening to terrestrial radio by different groups of individuals who likely differ in their overall interest in audio entertainment, with the high-interest people listening to more of everything. The high-interest people, who listen the most, also tend to subscribe to satellite radio. When they subscribe, they cut back on their AM/FM listening, as suggested by the survey results of listening patterns already discussed, but they may not cut back AM/FM listening on a one-to-one basis. Thus, their total listening may be higher. This fact pattern would not make listening on satellite radio and terrestrial radio or MP3 players into economic complements.[158]

74. Some Comments have suggested that satellite radio is a separate market because subscribers are "locked-in" as a result of equipment purchases or by the fact that their automobiles come equipped with satellite radio already installed.[159] The implication drawn for market definition is erroneous. If subscriber lock-in is a result of past equipment purchases, that lock-in would apply to either XM or Sirius individually, and not to satellite radio generally. Thus, this type of lock-in to an *individual firm* would not provide any incremental pricing power to the *merged firm*. The lock-in is not merger-specific.[160] In fact, this type of lock-in reduces the potential for adverse competitive effects of the merger, not the other way around, because the lock-in reduces substitution between Sirius and XM before the merger.[161] Finally, consumers face no switching cost if they decide to move to terrestrial radio, as terrestrial radio receivers are freely available in the car and elsewhere.

---

radio. The article only includes survey information that compares the listening behavior of the average consumer with what it somewhat misleadingly labels as "digital radio subscribers" – survey respondents who listened to online radio in the past *or* who had ever listened to an audio podcast *or* who subscribed to satellite radio. No information was provided on the listening behavior of those respondents who *only* subscribed to satellite radio. Nor is such information available in the underlying study on which the New York Times article apparently relies, Arbitron/Edison Media Research, *The Infinite Dial 2006: Radio's Digital Platforms* (2006).

[158] For example, consider the example of "hard rock" CDs, "soft rock" CDs and CD players. CD players are an economic complement for the CDs themselves. Both are needed to listen to a CD. If the price of CDs were to rise substantially, that would reduce the demand for CD players. However, hard rock and soft rock CDs likely are substitutes. If the price of hard rock CDs were to rise, that likely would increase the total demand for soft rock CDs, not reduce it. At the same time, a person with a high income and a love of rock-and-roll may have many hard rock and soft rock CDs, even though they are substitutes. That person might like to listen to relatively more soft rock in the morning and relatively more hard rock at night. The two types of CDs might be viewed as complements in a layman's use of the term, but the two products are not likely to be economic complements that belong in separate markets. Instead of being economic complements, hard rock and soft rock CDs more likely are economic substitutes with positive cross-price elasticity of demand. As a result, the two types of CDs would belong in the same relevant market.

[159] *See* Sidak-I at 12.

[160] A similar analysis would apply to any lock-in to a particular service caused by long term contracts or cancellation fees.

[161] Note also that XM and Sirius both offer substantially lower subscriptions price to people who are buying a second radio subscription, rather than giving a lower price to people who are initially choosing between XM and Sirius to be their service provider, and, thus, have not yet become "locked-in." The rates for additional subscriptions are $6.99 versus $12.95 for the first subscription.

[[REDACTED [redacted] **]].**[162] There also are no switching costs for those consumers of moving from a satellite radio service to these alternatives.

C. Penetration Pricing, Market Growth and the *SSNIP* Test for Market Definition

75. The relevant market should include all the products that are "reasonably interchangeable" with the products sold by the merging firms.[163] The Merger Guidelines suggest the use of the *ssnip* test for market definition to implement this standard.[164] The *ssnip* test evaluates whether a hypothetical "'small but significant and non-transitory' increase in price" (*ssnip*) for a group of products by a hypothetical monopolist would cause so many customers to substitute away from the products to make the hypothetical price increase unprofitable.[165] If the price increase would be profitable, then the group of products is said to comprise a relevant market.[166]

76. In mature industries, it might be reasonable to implement the *ssnip* test by focusing on short-run profitability.[167] But this approach does not accurately capture the significance of

---

[162] **[[REDACTED** [redacted] **]].**

[163] Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 482 (1992) (citing du Pont); United States v. E.I. Du Pont de Nemours & Co., 351 U.S. 377, 395 (1956) ("reasonably interchangeable by consumers"). The product offered by Sirius (and XM) includes several components – the device itself and the monthly content service (which in turn includes the audio content). For certain other products, the components are sold by different firms. For example, Pioneer may sell a terrestrial radio, while Clear Channel and other broadcasters provide the content service; or, Sansa sells an MP3 player, while Rhapsody sells a monthly content subscription service and EMI sells a CD that can be burned to a computer and transferred to the Sansa device for listening. The terrestrial radio plus the broadcasted content (and the Sansa plus the content service and content) are substitutes for the packages provided by Sirius and XM. Thus, it does not make sense for this merger analysis to define separate markets for each separate component but rather focus on substitution among the packages.

[164] *See* Merger Guidelines at § 1.11.

[165] The non-transitory price increase typically is considered to last for a long period of time. As stated in the Guidelines, "In attempting to determine objectively the effect of a 'small but significant and nontransitory' increase in price, the Agency, in most contexts, will use a price increase of five percent *lasting for the foreseeable future*." Merger Guidelines at § 1.11 (italics added). In a recent article, Dennis Carlton suggests that the *ssnip* might last for two years. *See* Dennis W. Carlton, *Market Definition: Use and Abuse*, 3 COMPETITION POLICY INTERNATIONAL, 15 (2007) (hereinafter "Carlton (2007)").

[166] *See* Merger Guidelines at §§ 1.0, 1.32.

[167] Several recent articles have raised questions about the usefulness of the *ssnip* test (or *critical loss* analysis) when it is not applied within a consistent economic framework. *See, for example,* Carlton (2007); Michael L. Katz & Carl Shapiro, *Critical Loss: Let's Tell the Whole Story*, 17 ANTITRUST 49 (2003); Daniel P. O'Brien & Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST L.J. 161 (2003); Kenneth L. Danger & H.E. Frech III, *Critical Thinking about "Critical Loss" in Antitrust*, 46 ANTITRUST BULLETIN 339 (2001); and James Langenfeld & Wenqing Li, *Critical Loss Analysis in Evaluating Mergers*, 46 ANTITRUST BULLETIN 299

demand substitution for the profitability of a price increase by the merged firm in this case because it ignores longer-run considerations, which dominate for XM and Sirius in their young and growing businesses. This merger involves two firms that have been in business less than 6 years and whose sales are projected to nearly double over the next 4 years.

77. In evaluating the profitability of a price increase, growing firms like XM and Sirius undoubtedly focus more on the impact of price changes on prospective new subscribers than simply on the impact of the price change on current subscribers.[168] These firms recognize that losing a customer (or slowing down growth) costs much more than any foregone short-run price-cost margin, the usual consideration in mature markets. The cost is much greater because every lost current customer means a loss of future margins, both for that customer (until the customer churns) and for other customers that would have been attracted to satellite radio by virtue of the "dynamic demand spillovers" discussed in more detail below.

78. In these circumstances, the *ssnip* test must focus on the longer-term effects of a higher price on buyer behavior and seller profitability. A short-run profitability test would not adequately capture the impact of longer term (*i.e.*, non-transitory) price increases in a growing market with dynamic demand, as explained more technically in Appendix A. In such a market, a price increase may appear profitable if only the near term impact is considered, but may fail to raise longer-run profitability or serve the longer-run interests of the firm in the pre-merger world.[169] Such price increases would likely not be attempted after a merger by a non-myopic firm, just as they have not been attempted in the pre-merger world. Thus, a finding that demand is inelastic in the short-run would not imply that a merged firm would have the incentive to raise prices.[170]

(2001). The issues raised in these articles are important in the present matter as well. These issues are in addition to the potential pitfalls that arise if the *ssnip* test is not implemented very carefully when there are dynamic demand spillovers.

[168] *See, for example,* the statements of Mel Karmazin. Thomson StreetEvent, *Sirius Satellite Radio Final Transcript, SIRI – Q1 2005 Sirius Satellite Radio Earnings Conference Call* (April 28, 2005) at 11 ("we know that there is price elasticity. What our focus today is on growing the category. It is a relatively small number of people that are currently subscribing to satellite radio. We want that number to grow huge, and we think that being attractively priced at retail, providing great content at good value is the way we grow the market.") *See also Id.* at 12-13 ("our general sense is we know that we have the ability to increase our price...Having said that, our interest as a Company is in growing subscribers.") Note that Mr. Karmazin was referring to Sirius' ability in the pre-merger world.

[169] In fact, this economic analysis suggests that in these circumstances, the subscription price set by a satellite radio provider does not satisfy the standard conditions for short-run profit-maximization and the static Lerner condition would misleadingly imply that a price increase would be profitable. Moreover, even a temporary price increase has longer-term effects when demand is dynamic and thus may fail to maximize longer-run profits even if it is profitable in the short-run. *See* Appendix A.

[170] For example, Sidak claims that the fact that XM "subscriber growth continued at such a rapid pace in the presence of 30 percent price increase [*sic*] underscores the low elasticity of demand faced by SDARS providers."

79. In a growth context like this one, the standard *ssnip* test used for market definition – and the associated *critical loss* analysis – cannot be implemented the same way they might be implemented in mature industries. The *critical loss* analysis must take into account the relevant characteristics of the industry under consideration. In particular, a static analysis that works well for mature industries will be misleading here by overstating the longer-term profitability of a price increase. Instead, it is necessary to perform a dynamic analysis and evaluate the effect of the *ssnip* on the growth rate of the hypothetical monopolist's sales, as well as the impact on the customer base at the time of the price increase. A dynamic critical loss analysis would take the firm's growth rate into account and would evaluate how the *ssnip* would reduce current and future sales, both through direct price effects and also because of dynamic demand spillovers.

80. This longer-run perspective is particularly relevant for XM and Sirius. As discussed, they still are relatively new products attempting to penetrate the audio entertainment market and establish a customer base for future growth. Their penetration rates are still low. As of the end of 2006, their combined penetration rate was less than 5% of U.S. population.[171] The number of satellite radio subscriptions currently is expected to nearly double over the next four years.

Sidak claims that this constitutes "direct evidence on the own-price industry elasticity of demand for SDARS" that implies that satellite radio is a separate market. Sidak-I at 11-12. Sidak's analysis is defective for several reasons. First, he does not employ an objective and appropriate benchmark for growth in the absence of the price increase. The proper benchmark for evaluating the response to the price increase would be the growth path absent the price increase. Saying that the growth "continued at a rapid pace" or even comparing the growth rate from the previous year as a benchmark could be misleading because growth rates change naturally over time. Second, there were numerous other changes affecting demand that occurred around the same time as the price increase. For example, XM introduced Major League Baseball. XM also included XM Online, and High Voltage channel (featuring Opie & Anthony) in the regular subscription when it raised price, all of which previously had involved extra charges. XM also permitted subscribers to lock-in the lower rate by prepaying for the lock-in period and many subscribers took that option. Thus, it is vastly oversimplified to simply say that XM increased price by $3 per month. Third, as discussed in the text, a finding that XM's demand is inelastic would not imply that the relevant market is satellite radio. A finding that XM's demand is inelastic is inconsistent with standard profit-maximization conditions. In fact, if one were to ignore that inconsistency and simply conclude that the market is defined by the results of the *ssnip* test implemented in this way, then the conclusion would be that the market would be comprised solely of XM, not satellite radio. *See also* Thomas W. Hazlett, *The Economics of the Satellite Merger* (June 14, 2007) (hereinafter "Hazlett") at 30. Fourth, Sidak's profitability analysis was based only on the near term impact on subscribers and profitability, not on the longer-term impact that is more relevant in growing market like this one. Even if a rigorous study were to find that the demand for satellite radio is inelastic in the short-run, that fact would not imply that satellite radio is a relevant market. This is because the longer term effects of a price change by the merged firm on profits might eliminate any economic incentive to raise price, even if the effect of the price change were to increase profits in the near term.

[171] XM and Sirius together had 13.7 million subscriptions as of the end of 2006 (from XM and Sirius Form 10-K data), compared to the U.S. population of 300 million. U.S. Census Bureau News, *Census Bureau Projects Population of 300.9 Million on New Year's Day, available at* http://www.census.gov/Press-Release/www/releases/archives/population/007996.html (last visited July 12, 2007).

81. This is also a market with dynamic demand and that fact makes the longer-run focus essential. It also makes the *ssnip* test and the evaluation of the likely demand substitution from a price increase more complicated still. Increased sales in the present lead to higher sales in the future. We refer to this as a "dynamic demand spillover effect."[172] This dynamic demand spillover effect occurs for several reasons. First, the stock of current subscribers will spread the word about the product to other potential subscribers, as in "viral marketing." These subscribers explain and demonstrate the product to their friends, which allows the friends to experience the product without buying it. Current subscribers also can recommend satellite radio to their friends. This type of information diffusion reduces uncertainty for potential customers and so induces incremental purchases by some of them. In this regard, **[[REDACTED** [redacted] **]]**.[173] In addition to this type of information diffusion, an increased consumer base enhances the likelihood that the customer base will be sufficient to prove the viability of the product in the market to other consumers or set off a "bandwagon effect" by generating a "market buzz" that can spur further growth by creating a momentum for the product.[174] Third, faster sales growth also encourages retail outlets to devote more space and marketing effort to the product, which helps to maintain the pace of sales.[175] Similarly, it helps to maintain auto manufacturer interest in promoting the product.

82. In this type of dynamic demand market situation, firms have the incentive to maximize longer-run profits, rather than simply trying to maximize short-run profits. This gives them an increased incentive to engage in low "penetration pricing" to take into account the benefits of the dynamic spillover effect.[176] Because of these longer-term benefits of increasing the number of subscribers and subscriber growth, the merged firm (and XM and Sirius individually before the merger) would have a reduced incentive to raise prices, even if short-run profits were to increase from a price rise. A higher current price would lead to fewer current subscribers, which in turn would lead to lower growth and fewer future subscribers, as the magnitude of the dynamic spillover effect is reduced. It is important to

---

[172] We sometimes use the term "dynamic demand" for short.

[173] **[[REDACTED** [redacted] **]]**.

[174] For example, as stated by Accenture: "Raising prices will slow growth. Slowed growth may "kill the buzz" and increase churn, especially if combined with rumors of slowed penetration and lack of timely profit which may shake market confidence." Accenture, *Satellite Radio Strategic Overview* (February 2007) at 6.

[175] During this penetration phase, the firm similarly has the incentive to offer large incentives to retailers to stock the product and demonstrate it to consumers who come into the store. The retailers serve the same role as early adopters – spreading the word about the product, demonstrating it and recommending it.

[176] *See* Appendix A for a technical analysis of the impact of dynamic demand on pricing and investment incentives. *See also* Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (MIT Press 1990) at 71.

emphasize that these incentives exist both before and after the merger, and lead to lower prices than would otherwise occur.

83. Pricing and other marketing strategies of XM and Sirius are consistent with this longer-run focus and the penetration pricing strategy. Sirius and XM have not yet turned a profit. **[[REDACTED** [redacted]]]. Setting prices that yield low margins is consistent with penetration pricing. This strategy makes sense for a firm that wants to form a larger customer base to popularize its product to others.

84. Thus, this analysis explains why firms like XM and Sirius in such growth markets would price below the short-term profit maximizing level. This pricing incentive must be taken into account when applying the *ssnip* test to define markets by focusing on longer-term demand substitution and longer-term profitability. The application of the *ssnip* test in such settings must account for growth. It also must account for the dynamic demand spillovers that characterize satellite radio.[177] The evaluation of the profitability of a *snnip* thus also must take into account demand substitution in the future as well as the present. This factor makes the *ssnip* test more difficult to implement than it is in a mature market without dynamic demand spillovers.[178]

85. As discussed in more detail in the discussion of competitive effects below, this dynamic spillover effect also helps to explain why the merger likely will not lead to consumer harm.[179] In the pre-merger world, the dynamic spillover effect generates a free-rider problem between Sirius and XM. Lower prices charged by XM also would increase the number of Sirius subscribers, and vice versa. In other words, a price reduction by XM also has a dynamic spillover effect on the sales of Sirius (not just on the sales of XM) and thus produces a positive externality on the long-term profits of Sirius. This raises a free-rider problem in the pre-merger world. The merged entity will resolve this free-rider problem by internalizing the positive demand externality, thereby reducing any post-merger incentive

---

[177] When such dynamic spillovers are present, firms focus on longer-term profits and engage in penetration pricing, rather than simply attempting to maximize short-term profits. Thus, the short-term or static Lerner condition does not hold. This implies that if the short-term *ssnip* test (as is often used in mature industries) were to be applied mechanically to this type of growing industry with demand spillovers, it would not yield a reliable result. It would likely predict a market that is overly narrow. Similarly, in dynamic markets, the static Lerner condition is unlikely to provide a meaningful measure of market power. *See* Robert S. Pindyck, *The Measurement of Monopoly Power in Dynamic Markets*, 28 JOURNAL OF LAW & ECONOMICS 193 (1985).

[178] This also means that it is not possible to infer the short-term price-elasticity of demand from the observed short-term profit margin. The relationship between the margin and the elasticity of demand is more complicated, as discussed in Appendix A. *Cf.* Sidak-II at ¶41.

[179] *See* Section IV.

to raise prices. Thus, this change in incentives is a synergy that will reduce post-merger prices, *ceteris paribus*.

86. Eventually, the market will mature, net growth will stop, and these penetration pricing incentives may no longer be significant. But, by that time, the market will be subject to even more significant competition from wide availability of Internet radio in vehicles, mobile WiMAX, more robust and widespread cellular networks and audio content offerings, and other technological advances that will constrain prices.

D. Conclusion on Market Definition

87. The proper relevant product market is audio entertainment products, not satellite radio alone.[180] The evidence suggests that other audio entertainment products are reasonable substitutes for Sirius and XM.

88. The fact that these products are differentiated does not change this conclusion. The exclusive content of XM and Sirius, their *de facto* exclusive installation relationships with automobile manufacturers and the switching costs arising from the need to replace equipment all serve to differentiate the two satellite services from each. They reduce the cross-elasticity of demand and likely degree of demand substitution between the two satellite radio services. At the same time, listening to competing audio entertainment products such as AM/FM radio, HD radio, wireless phones, iPod/MP3 players, and others are substitutes for the two satellite radio services, despite the product differentiation among them and the two satellite radio services and even though listening to satellite radio may lead to subscribers purchasing more CDs. Audio entertainment products also are becoming closer listening substitutes over time as technology advances and the products converge and blend. These facts suggest that that the relevant market is audio entertainment products, not satellite radio-only.[181]

III. MARKET SHARES AND CONCENTRATION IN THE MARKET FOR AUDIO ENTERTAINMENT DEVICES

89. Market definition is useful for calculating market shares and market concentration. If the merging firms have a low combined market share in a relevant market that is relatively unconcentrated, those facts are circumstantial evidence that the merger is unlikely to lead to reduced competition. For this reason, the Merger Guidelines contain "safe harbors"

---

[180] Even if the market were erroneously defined as satellite radio-only, the sellers of other audio entertainment products would be included as "market participants" in this market. They would be assigned market shares because of their ability to engage in production substitution (i.e., product extensions and repositioning).

[181] Analysis of likely substitution also is relevant for competitive effects analysis. The fact that XM and Sirius are differentiated products reduces the likelihood of adverse effects on post-merger price competition, even if the Commission erroneously decided to define the relevant market as satellite radio.

when the post-merger HHI is less than 1000; when the post-merger HHI is less than 1800 but the increase in the HHI is less than 100 points; and when the post-merger HHI is above 1800 but the increase in the HHI is less than 50 points.[182] Enforcement involving unilateral effects generally involves mergers where the combined market share of the merging firms exceeds 35%.[183]

90. Where merging firms have a high combined market share and market concentration is high, those facts represent circumstantial evidence that a merger is more likely to lead to reduced competition. However, the general association of reduced competition with high concentration does not mean that market definition is the endpoint of merger analysis. The association of high market shares and market concentration with reduced competition is a rebuttable presumption in antitrust law. The importance of market shares and concentration has declined over time in merger analysis. Indeed in the Baker-Hughes case decided by the DC Circuit in 1990, Justice (then Judge) Clarence Thomas opined (in an opinion joined by Justice (then Judge) Ruth Bader Ginsburg) that the Supreme Court "has adopted a totality-of-the-circumstances approach" to the Clayton Act, in which "Evidence of market concentration simply provides a convenient starting point for a broader inquiry into future competitiveness."[184]

91. When the relevant product market is defined properly as audio entertainment products, the combined market share of XM and Sirius and post-merger market concentration are very low and place the merger into the safe harbor contained in the Merger Guidelines.[185] There are a number of reasonable ways to measures the shares of satellite radio and other services in the market for audio entertainment devices, each of which has strengths and weakness as a measure of competitive significance.[186] We present estimates of shares using four

---

[182] *See* Merger Guidelines at § 1.51; *see also* Federal Trade Commission & U.S. Department of Justice, *Commentary on the Horizontal Merger Guidelines* (2006) (hereinafter "Merger Commentary") at 15.

[183] *See* Merger Commentary at 26 ("As an empirical matter, the unilateral effects challenges made by the Agencies nearly always have involved combined shares greater than 35%.")

[184] United States v. Baker Hughes, Inc., 908 F.2d 981, 984 (D.C. Cir., 1990). *See also* Carlton (2007) at 18-19.

[185] Even if the market were erroneously defined as satellite radio-only, the sellers of other audio entertainment products would be included as "market participants" and assigned market shares because of their ability to engage in production substitution, in the sense of rapid product extensions and repositioning. In the language of the Merger Guidelines, these producers are uncommitted entrants who are defined as "market participants" and assigned market shares in the evaluation of post-merger concentration, even if the market is described narrowly. Merger Guidelines at § 1.32. The Guidelines go on to explain why the market could be defined broadly in these circumstances, stating that, "[i]f production substitution among a group of products is nearly universal among firms selling one or more of those products, however, the Agency may use an aggregate description of those markets as a matter of convenience." *Id.* at n.14.

[186] As discussed below, some Comments have argued that market shares should be measured using a measure of capacity, the number of channels, but this is not a reasonable measure of the competitive significance of participants in the relevant market.

different measures of the shares of various audio entertainment products or devices: (1) total time spent listening by consumers; (2) revenue earned; (3) the number of owners or subscribers; and (4) the number of listeners or users. Precise values for many of these measures are not available, so market shares must be based on estimates.[187] As a result, we present multiple estimates of market shares in the audio entertainment market, using the four different share measures, based on multiple data sources. These market share estimates are presented in the tables in Exhibit C. Table C1 summarizes these market shares, while Tables C3-C6 provide more detail on these estimates and their derivation.[188]

92. The pattern is strikingly consistent: satellite radio's share of the market for audio entertainment is very small across all the measures and estimates. The estimated combined market share of Sirius plus XM ranges from **[[REDACTED** [redacted]**]]**.[189] Furthermore, all estimates show that the merger will result in a negligible change in market concentration; the merger results in a change in the HHI ranging from **[[REDACTED]]** points.[190] The consistency of the pattern reinforces the conclusions that satellite radio commands only a small share of the audio entertainment market and that the merger will have only a negligible effect on market concentration.

93. Some Comments suggest that the market should be no broader than satellite plus AM/FM radio.[191] As previously discussed, this market definition would be inappropriately narrow. However, even if the market were improperly defined this narrowly, the merger would not raise competitive concerns. Table C2 in Exhibit C summarizes multiple estimates of shares in this narrower, purported market.[192] The combined market shares of Sirius and XM remain small, ranging from **[[REDACTED]]**, depending on the measure and estimate of

---

[187] Alternative estimates of shares for some of these measures are available from different data sources. Some data sources fail to provide share estimates for one or another type of audio entertainment, and consequently the market shares are overstated for those products that are included.

[188] Generally the individual estimates that constitute a set of share estimates are drawn primarily from a single data source in order to maintain consistency. For most measures, share estimates for XM and Sirius from third parties have been replaced with estimates based on data from the companies.

[189] Again, it should be pointed out that in most data sources, shares for some audio entertainment products are missing. For example, the set of estimates that yield the highest share for satellite radio includes no estimate of the number of people who listen to CD players.

[190] HHI levels cannot be calculated from these estimates. With the exception of XM and Sirius, these are estimates of the shares of sources of audio entertainment, not of the shares controlled by individual suppliers of audio entertainment. Since there are multiple suppliers of each type of audio entertainment, mechanically summing the squared shares estimated in the tables in Exhibit C would result in a very large overestimate of the HHI.

[191] Sidak, for example, considers concentration in a market that includes satellite radio and analog and HD terrestrial radio, but not any broader market. Sidak-I at 36-41; *see also* Sidak-II at 3 and NAB Petition at 24, n.81.

[192] These estimates are based both on the same sources used for the estimates of shares of the market for audio entertainment and on additional sources that can be used only to estimate shares in the narrower, purported market of satellite and AM/FM radio. *See* Exhibit C for details on these shares and their derivation.

shares.[193] The merger has a small effect on market concentration even in this narrower purported market. All of these shares lead to an estimated change in HHI of less than 50 points.

94. By all of these share estimates – for either the market for audio entertainment or an assumed narrow market limited to satellite and AM/FM radio – the combined market shares of Sirius and XM are low enough that the post-merger increase in the HHI would be less than 50 points. This would place the merger in the safe harbor range of the Merger Guidelines. Thus, according to the methodology in the Merger Guidelines, the analysis of competitive effects could be stopped at this point, with the conclusion that the merger is unlikely to harm competition.

95. Some Comments have suggested that market shares in a radio market should be measured on the basis of the number of channels controlled by each provider, as a measure of capacity.[194] As discussed in the Merger Guidelines, a market share measure based on capacity is mainly used for homogeneous products, like steel, in which price is the main focus of competition. It is not appropriate for differentiated products like audio entertainment. When products are differentiated, market shares based on revenues or other measures of output are more appropriate than capacity measures.[195] Measuring market shares by capacity in this case also makes no economic sense because substitution to satellite radio from terrestrial radio requires large switching costs by subscribers. Moreover, if capacity were used, then the capacity share of satellite radio likely would not be large. Wireless phones can provide a large number of alternative streaming services to subscribers. iPods and MP3 players can access huge music repertoires, including all the songs and playlists provided by the subscription services. There are thousands of Internet radio channels available to people with broadband connections at home or on wireless phones.[196]

---

[193] The estimate that satellite radio has a 3.4% share of a satellite radio plus terrestrial radio market **[[REDACTED** [redacted]]. The 3.4% figure is drawn from a source that does not provide the information necessary to calculate satellite radio's share in the broader audio entertainment market.

[194] Sidak-I at 37.

[195] As stated in the Merger Guidelines: "Market shares will be calculated using the best indicator of firms' future competitive significance. Dollar sales or shipments generally will be used if firms are distinguished primarily by differentiation of their products. Unit sales generally will be used if firms are distinguished primarily on the basis of their relative advantages in serving different buyers or groups of buyers. Physical capacity or reserves generally will be used if it is these measures that most effectively distinguish firms." Merger Guidelines at § 1.41. *See also* Gregory J. Werden, *Assigning Market Shares,* 70 ANTITRUST L.J. 67, 83 (2002) ("Capacity-based market shares are commonly used in process industries that produce homogeneous products using equipment for which there is a rated capacity.")

[196] *See, for instance,* http://radio-locator.com (last visited July 17, 2007) for a list of over 2,500 Internet radio stations.

96. If the relevant market were erroneously restricted solely to satellite radio service, the post-merger market share of the combined firm would be 100%. However, even if this market definition were assumed, the resulting market shares and concentration levels would not mark the end of a rigorous merger analysis. High concentration creates only a rebuttable presumption. There are several important reasons why a presumption of competitive harm would be rebutted in this matter, as discussed in the analysis of competitive effects.

IV. COMPETITIVE EFFECTS ANALYSIS

97. The ultimate goal of merger analysis is to determine the likely impact of a merger on market output, prices and other competitive instruments such as product quality and innovation. Market definition is a tool used to help make this determination, rather than being an end in itself. Thus, while it seems clear that the relevant market is much broader than satellite radio-only, for all the reasons discussed above, our economic analysis indicates that the merger is unlikely to lead to a reduction in competition or consumer harm, even if the market is erroneously defined narrowly. Instead, the merger is likely to generate consumer benefits through increased competition, lower prices and increased quality. As a result, the output of the combined firm is likely to increase from the merger.

98. Economists have distinguished between two main competitive concerns arising from mergers: coordinated effects and unilateral effects. Coordinated effects involve the potential for post-merger tacit or explicit coordination of price or some other significant competitive instrument among the merged firm and other competitors. Unilateral effects involve the potential that the merged firm may raise prices, even if other competitors hold their prices constant at pre-merger levels. The purported concern over the proposed merger of XM and Sirius involves unilateral effects, not coordinated effects. There apparently have been no claims in any of the Comments that the merged firm would engage in coordinated conduct with the providers of other types of audio entertainment products, nor is it plausible that it could or would do so. The audio entertainment market is too unconcentrated and complex to support a coordinated effects theory.

99. Adverse unilateral effects are highly unlikely from this merger for a number of reasons: the product market is broad; the merged firm has a very low market share; there are ample opportunities for rival repositioning; inter-modal competition is increasing; and the merger will involve cognizable merger-specific efficiencies, including incentives to reduce prices, improve quality and expand demand-enhancing and cost-reducing investments.

100. As a general matter, unilateral effects analysis based on the Merger Guidelines would focus first on whether the products of the merging firms are especially close substitutes, relative to the products sold by other competitors. Stated in its simplest form, the unilateral effects concern is that the merged firms would have an incentive to raise prices above the levels that the individual firms would have chosen absent the merger. The concern is that a

merger allows a firm to "recapture" some of the (actual or potential) customers that it would lose if the firm raised price before the merger, because these customers would switch (or be "diverted") to its merger partner; this diversion would occur for customers who view the product of the merger partner as the next-best substitute.[197] If a large fraction of the customers a firm would lose from a price increase would switch to its merger partner, then there is a greater concern about post-merger unilateral effects, *ceteris paribus*. In contrast, when there are a number of other firms that sell close substitutes, so that a smaller fraction of the lost customers would switch to the merger partner, the unilateral effects concern is lessened.

101. Even in situations where the recapture effect is significant, *ceteris paribus*, there may be other offsetting economic reasons why the merging firms would not have an incentive to raise price and reduce output. As a general matter, these offsetting reasons can involve competition in the present from other products outside the narrow market; increased competition in the longer-run, either from technological advance or in response to the merger (that is, emerging competition, rival repositioning and entry); or procompetitive incentive effects flowing from merger efficiencies and other synergies. There are a number of specific such factors at play here that collectively lead to the conclusion that the merged firm will lack the incentive and ability to exercise market power and harm consumers by raising price or reducing product quality.

- First, as discussed already in the context of market definition, Sirius and XM face extensive competition with a number of other audio entertainment products and associated content services. Sirius and XM would not gain the power and incentive to raise prices after the merger.[198] In fact, there is relatively little diversion between these two firms today.
- Second, as discussed already, inter-modal competition will increase over time. Increased competition will come from growth in HD radio. It also will come from improvements in wireless phones and connected MP3 players that permit listeners to stream audio and acquire content more seamlessly from wireless carriers, subscription services, and Internet radio, including when listeners are away from home or in vehicles.
- Third, the merger will give the merged firm the immediate incentive to maintain or reduce penetration prices by resolving the free-rider problem involved in the dynamic

[197] Absent the merger, that loss in profits from diversion to other firms (including the merger partner) would constrain the incentive of the firm to raise it prices. But, after the merger, the loss in profits from consumers who view the merger partner as the next-best substitute would not be considered a *net* loss.

[198] Some Comments have suggested that even if there is sufficient competition in areas with a large number of AM/FM stations, competition will be reduced in areas where there are only a few AM/FM signals. This issue is discussed in Section V.

demand spillover effects. This same synergy also will result in incentives for greater demand-increasing and cost-reducing investments.

- Fourth, the merger will reduce the costs of the merged firm, which will give the merged firm the incentive to reduce prices and increase quality.
- Fifth, the merger will improve product quality in several ways, including the ability to offer to more subscribers content that is currently exclusive to a single service, an increased ability to expand effective channel capacity and an increased incentive to promote and subsidize interoperable radios.
- Sixth, the merger likely will reduce the merged firm's cost of audio content by eliminating bidding competition between Sirius and XM. As discussed below, reducing buyer-side bidding competition will not lead to a monopsonistic output reduction but instead will give the merged firm the incentive to reduce prices and increase output.
- Seventh, an analysis similar to the analysis of content costs also applies to the payments XM and Sirius make to automobile OEMs for the installation of integrated satellite radios in new automobiles. These costs likely will fall with the merger as a result of lessening the OEMs' bargaining leverage. In addition, distribution economics should improve if the merger leads to more new car buyers subscribing, as a result of lower prices, improved quality and increased promotion.
- Eighth, the cost of retail radios and their distribution will fall for a number of reasons, including lower resource costs for the merged firm, lower resource costs for the retailers, and an increased value obtained by the retailers in which the merged firm can share through making lower distribution payments.

102. It should be emphasized that analysis of these issues would be important even if the Commission erroneously were to conclude that the market should be defined solely as satellite radio. Even in that scenario, the merged firm would lack the incentives to exercise market power and harm consumers after the merger for these same eight reasons.

A. Inter-Modal Competition in the Short-Run and Longer-Run

103. As discussed in the market definition section, the merged firm will continue to face intense competition with other forms of audio entertainment, in the short-run and the longer-run, thereby eliminating any incentive to raise prices or reduce quality. Competition from other products reduces the fraction of lost customers that would substitute to the other merging firm.

104. At the same time, product differentiation between Sirius and XM reduces the incentives for pre-merger price competition between those firms and the incremental impact of the merger on those incentives.

- For consumers who have satellite radio installed in their vehicles by the manufacturer and integrated into the stereo system, switching to an integrated installation of the other service is impossible because of *de facto* exclusive relationships that Sirius and XM each have with various automobile manufacturers. Purchasing a plug-and-play receiver on the aftermarket is costly and provides a more complicated and less integrated set-up, and often inferior sound. For new subscribers who are shopping for new vehicles, it seems unlikely that very many consumers would choose a different vehicle rather than pay slightly more for satellite radio service.
- For consumers who have already purchased stand-alone aftermarket radios, switching is not impossible, but it does involve significant switching costs. For example, as discussed earlier, if one of the firms raised subscription fees by 10%, a little less than $16 per year, it would take a subscriber who had to pay $150 to purchase new radio equipment about 9 years to recover these equipment costs from the savings in subscription fees. **[[REDACTED** [redacted]]].[199]
- **[[REDACTED** [redacted]]].[200] **[[REDACTED** [redacted]]].[201] **[[REDACTED** [redacted]]].

105. In the aftermarket, Sirius and XM face competition for new subscribers from AM/FM radio and other devices like iPods/MP3 players, wireless phones and HD Radios as well as each other. The merger is not likely to raise significant competitive concerns in this segment for several reasons. First, the already strong inter-modal competition with these other devices will only intensify over time as a result of feature convergence. Satellite radios and wireless phones are adding more storage capability. Wireless phones are adding audio

---

[199] **[[REDACTED** [redacted]]].

[200] **[[REDACTED** [redacted]]].

[201] **[[REDACTED** [redacted]]].

streaming and wireless internet capability and gaining the ability to be integrated into auto sound systems; with the highly publicized introduction of the iPhone, the line between wireless phones and MP3 players is blurring.[202] iPods and other MP3 players are gaining more capability to access content (including radio-style podcasts) away from home (*e.g.*, at Wi-Fi hotspots and via transmissions from Ku Band satellite networks). Second, as discussed already, Sirius and XM are differentiated from each other by the exclusive content they each offer. Third, aftermarket radio competition between XM and Sirius will become less important over time even absent the merger. Aftermarket satellite radio purchasers are becoming a declining fraction of new subscribers over time as the market moves to integrated installations by automobile makers. It has been projected that aftermarket purchases will represent a rapidly declining share of new subscriber additions over the next several years.[203] In the first quarter of 2007, aftermarket net additions were only 21% of all net additions for XM and 35% of the total for Sirius.[204] Fourth, any small loss in competitive incentives in the aftermarket radio segment will be offset by the significant efficiency benefits discussed below, which will reduce the cost and raise the quality of satellite radio service and lead to more procompetitive pricing and investment incentives.

106. The merger also would not give the merged firm the incentive to restrict product quality, either by eliminating premium content or degrading the features offered on receivers. The merged firm must offer high quality products in order to attract and keep subscribers who otherwise would use a different audio entertainment product. For example, there will be continued incentives after the merger to offer such features as increased storage, more premium content, and traffic and weather programming. In fact, the merged firm intends to improve the offering of premium content by offering a best-of-both service. The merger also will permit the merged firm to improve signal quality and increase channel capacity.

B. Repositioning, Emerging Competition, and Entry

107. There is intense competition in the audio entertainment market today, and competition is increasing over time, not decreasing. This involves competition from new and emerging technologies. It also involves competitive responses by sellers using current technologies

[202] As a another example of how music phones are adding features, a new mobile phone, the Musiq by LG, soon to be offered by Sprint, not only can work as a music player, handle memory cards up to 2 gigabytes, can download music wireless, but it also comes with a built-in FM transmitter that can be used to play music over a vehicle's car radio. John Biggs, *Transmit Your Music to FM Right From Your Cellphone*, NEW YORK TIMES (July 12, 2007), *available at* http://www.nytimes.com/2007/07/12/technology/circuits/12phone.html?_r=1&oref=slogin (last visited July 12, 2007).

[203] *See, for example,* Goldman Sachs, *Conundrum squared: Why XM and Sirius should wait* (February 11, 2007) at Exhibit 6, which projects that retail growth will slow sharply in 2007 and afterwards, and (at 5) that retail will account for only 35% of XM's net additions in 2007, down from a (projected) 44% in 2006.

[204] XM Satellite Radio, *Form 10-Q, 1Q 2007*; Sirius Satellite Radio, *Form 10-Q, 1Q 2007.*

to extend or reposition their product offerings to compete more directly with satellite radio. This innovation and repositioning is continuous in the audio entertainment market. It means that the merged firm would be unable to profitably raise prices as a result of the merger. It also means that the demand elasticity facing the merged firm likely is rising over time, a factor which will further reduce the incentives to raise prices after the merger.

1. Product Extensions and Repositioning

108. The ability of competitors to reposition their products or create new variants to compete with the merged firm reduces the incentives for post-merger price increases.[205] If the merged firm were to attempt to raise price, providers of other existing audio entertainment technologies have the ability rapidly to extend or reposition their products to compete more directly with the type of services provided by the satellite radio. In fact, this type of product convergence is already taking place in the market and is increasing the demand elasticity facing the satellite radio providers over time.[206]

109. There are numerous ways in which this product extension and repositioning can and will occur, as discussed already. Repositioning by terrestrial radio through reducing the number of commercial minutes and rolling out HD Radio has already been discussed. The increased use of wireless phones as players of audio content is another example of repositioning. Content providers also are participating in this repositioning. Pandora has moved from being solely an Internet radio provider to distributing its content on Sprint's mobile phones. Yahoo! and Napster have begun offering their services on some AT&T phones. The growth in podcasts provided by Apple's iTunes Store is another example of content adapting to new distribution opportunities. Subscription services also have adapted by creating playlists in many different genres and functionality that allows individual subscribers to develop playlists customized to their own musical tastes. Slacker is now attempting to do something similar, providing access to "radio" channel content tailored to users' tastes so that it is readily available even when the subscriber is away from their PC, for example, at Wi-Fi hotspots. Encrypting HD Radio side channel broadcasts and selling them on a commercial-free, subscription basis may also be possible, if the Commission finalizes such rules.

2. Emerging Competition and Expansion

110. In some markets for technologically new products, competition decreases over time. For example, at one time, computerized word processing faced competition from self-correcting electric typewriters. The penetration rate for computerized word processing was

---

[205] *See* Merger Guidelines at § 2.21.

[206] The merger will further increase the demand elasticity by spurring competitors to engage in more innovation and investment.

low and many consumers saw little or no need to switch away from their electric typewriters. However, the market eventually tipped to computerized word processing and now electric typewriters are found mainly in antique stores. Similarly, at one time, the penetration rate of cable TV was very low. Only a relatively small fraction of consumers felt the need to move beyond over-the-air television at first.

111. Tipping of this sort to satellite radio is very unlikely. Competition in audio entertainment is increasing over time as other new technologies are developed and introduced to the market. Rapid technological change, including no doubt some that is not yet fully anticipated, is creating new ways to distribute digital content to consumers and giving consumers new options for manipulating and playing back that content. In fact, as discussed earlier, both companies downgraded their short-term subscriber projections in 2006.[207] Financial analysts have reduced their projections for satellite radio penetration to about 9% of the population or less at the end of 2010.[208] This downgrade is not surprising in light of the intense and growing competition, particularly iPods/MP3 players and more recently audio content-enabled wireless phones. This growing competition means that demand for satellite radio will become more elastic over time, not less. Moreover, satellite radio faces other substantial uncertainties. For example, we understand that in the ongoing Copyright Royalty Board proceeding, the RIAA/SoundExchange has asked for an increase in satellite royalties up to a level of 23% of revenues by 2012.[209]

---

[207] XM revised its subscriber guidance for year-end 2006 on three occasions: first in May 2006, from 9 million down to 8.5 million (XM Satellite Radio Press Release, *XM Satellite Radio Holdings Inc. Revises Subscriber Guidance for 2006, Reaffirms Guidance For Positive Operating Cash Flow* (May 24, 2006), *available at* http://xmradio.mediaroom.com/index.php?s=press_releases&item=1317 (last visited July 17, 2007)); then in July down to 7.7-8.2 million (XM Satellite Radio Press Release, *XM Satellite Radio Holdings Inc. Announces Second Quarter 2006 Results* (July 27, 2006), *available at* http://xmradio.mediaroom.com/index.php?s=press_releases&item=1332 (last visited July 17, 2007)); and then again down to 7.7-7.9 million in November (XM Satellite Radio Press Release, *XM Satellite Radio Holdings Inc. Announces Third Quarter 2006 Results* (November 6, 2006), *available at* http://xmradio.mediaroom.com/index.php?s=press_releases&item=1382 (last visited July 17, 2007)). Sirius revised its year end subscriber guidance down from 6.3 million to 5.9-6.1 million in December 2006 (Sirius Press Release, *SIRIUS Provides Year-End 2006 Subscriber Guidance Range* (December 4, 2006), *available at* http://investor.sirius.com/ReleaseDetail.cfm?ReleaseID=220850 (last visited July 17, 2007)).

[208] Bank Testimony. The 2010 penetration figure is based on 26 to 28 million subscribers, and 2010 population of about 309 million, as reported by the Census Bureau, *Projected Population of the United States, by Age and Sex (2000-2050)*, *available at* http://www.census.gov/ipc/www/usinterimproj/natprojtab02a.pdf (last visited July 17, 2007). Indeed the trends of increasing inter-modal competition is seen over the longer-term history of satellite radio as well. In 1998, Yankee Group predicted 33 million satellite radio subscribers by 2004. *See* Merrill Lynch, *CD Radio: A Compelling Opportunity* (March 4, 1998) at 11. In fact, the industry ended with 4.4 million subs at the end of 2004 and is nowhere near that size even in 2007.

[209] *Rate Proposal For SoundExchange, Inc.*, In the Matter of Adjustment of Rates and Terms for Preexisting Subscription Services and Satellite Digital Audio Radio Services, Before the Copyright Royalty Board, Docket No. 2006-1 CRB DSTRA (October 30, 2006), p. 3.

112. Various forms of this emerging competition were discussed earlier in the context of market definition. For example, new competition is emerging from terrestrial broadcasters in the form of HD Radio. Competition in audio entertainment from wireless phones is already occurring. Moreover, the newly announced Slacker service will use Ku Band satellites to deliver audio to MP3 players. Products such as Autonet have begun to make Internet in the car a reality.

113. Competition from wireless devices obviously will expand dramatically as wireless technology permits delivery of content over the Internet to moving vehicles. Over the next two years or so, entry by a number of new services will increase the delivery of competing services that rely on mobile Internet connectivity. New mobile broadband capacity will enable additional distribution of content and entry by further content providers.

- New access technologies will make widely available mobile broadband access a reality. New players using Wi-Fi and WiMAX technology are raising capital and preparing for nationwide rollout. Clearwire, a private partnership backed by Motorola and Intel, has raised over $1 billion in capital.[210] Sprint has announced a $2.5-3 billion WiMAX rollout in 100 U.S. markets by 2008, and more recently announced that it plans to jointly construct with Clearwire an even more extensive WiMAX network.[211] NextWave, a provider of mobile broadband and wireless multimedia products, holds AWS and WCS spectrum covering about 249 million POPs in the U.S.[212]

- As broadband mobile access become widely available, established Internet-based content providers can be expected to expand the services they supply and, in addition, new content providers and entertainment services and capabilities can be expected to enter. Examples of recent new entrants are "off-deck" music services, such as those discussed above, and so-called "place-shifting" services, such as those that allow users

[210] Clearwire Press Release, *Clearwire Announces New $1 Billion Term Loan Financing* (July 5, 2007), *available at* http://clearwire.com/company/news/07_05_07.php (last visited July 17, 2007). *See also* Clearwire Press Release, *Clearwire Successfully Completes First Phase of Mobile WiMAX Field Trial* (May 21, 2007), *available at* http://www.clearwire.com/company/news/05_21_07.php (last visited July 17, 2007).

[211] Sprint Press Release, *Sprint Nextel Announces 4G Wireless Broadband Initiative with Intel, Motorola and Samsung* (August 8, 2006), *available at* http://www2.sprint.com/mr/news_dtl.do?id=12960 (last visited July 12, 2007). Under the proposed arrangement between Sprint and Clearwire, each would build their respective portions of the network and allow roaming between their territories. Sprint Press Release, *Sprint Nextel and Clearwire to Partner to Accelerate and Expand the Deployment of the First Nationwide Mobile Broadband Network Using WiMAX Technology* (July 19, 2007), *available at* http://www2.sprint.com/mr/news_dtl.do?id=17520.

[212] NextWave Wireless Press Release, *NextWave Wireless Announces Full Year Financial Results for 2006, available at* http://www.nextwave.com/page.asp?prmID=474&prmmID=503 (last visited July 17, 2007).

to stream content directly from their PCs to other internet-connected devices, including cell phones or PDAs.[213]

- Other new multi-media focused mobile broadband networks provide content rather than Internet access. These new rollouts include Qualcomm's $800 million MediaFLO launch this year, and competing DVB-H network rollout efforts by Hiwire and Modeo.[214] These broadband networks are initially focused on providing video content, but have substantial capacity that also could be used to provide audio content.[215]

All of these factors will increase the competition faced by the merged firm and, therefore, will reduce its incentive to raise prices.

114. Some Comments have requested that conditions should be attached to the merger to prevent the merged firm from negotiating agreements with auto makers that would prevent them from installing competing audio devices.[216] These requests for conditions provide direct evidence of the fact that satellite radio faces competition from other technological platforms. There is, however, no need for such conditions. The auto makers have sufficient bargaining leverage with suppliers such as the merged firm, and competitive incentives in the automobile market, to resist demands for dashboard exclusivity. In contrast to satellite radio exclusivity, most 2007 auto models are offering iPod/MP3 integration, Ford is offering the Ford Synch integration system, and BMW is leading the installation of HD Radios as optional equipment across its entire 2007 product line. The notion that the auto makers would choose to forgo Internet connectivity in response to a threat or payment by the merged firm strains credulity in light of the current and projected market shares in the audio entertainment product market. While such conditions therefore appear innocuous, there is a risk that they might be used or interpreted later on in a way to

---

[213] Such services include Orb, Avvenue, and Nutsie (from Melodeo). *For example, see* http://www.orb.com/mymusic (last visited July 17, 2007); http://www.avvenu.com/products/product?main.php (last visited July 12, 2007); *see also* http://melodeo.com/ (last visited July 12, 2007).

[214] Verizon Wireless Press Release, *Verizon Wireless Launches MediaFlo Cell Phone TV* (March 2, 2007), *available at* http://www.technewspulse.com/verizon-wireless-launches-mediaflow-cell-phone-tv-416 (last visited July 12, 2007). *See also* Andrew Wallenstein, *Cingular to offer MediaFlo for Cell phone TV*, THE HOLLYWOOD REPORTER (Feb 13, 2007) available at http://www.hollywoodreporter.com/hr/content_display/television/news/e3i4c4172643b5f38ce7206f731b9164110 (last visited July 17, 2007); *see also* Evan Blass, *Hiwire to compete with MediaFlo, Modeo's DVB-H,* ENGADGET iMOBILE (Apr 25, 2006), *available at http://www.engadgetmobile.com/2006/04/25/hiwire-to-compete-with-mediaflo-modeos-dvb-h/* (last visited July 17, 2007); Modeo Press Release, *Modeo Launches Live Mobile TV Beta Service In Nation's Largest Metro Area* (January 8, 2007), *available at* http://www.modeo.com/press_07.asp (last visited July 12, 2007).

[215] *See* Charles L. Jackson, *Service and Spectrum Alternatives for Audio News and Entertainment Services* (July 24, 2007), attached to *Joint Reply Comments of XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57.

[216] Comments of Slacker Inc; Comments of New ICO Satellite Services G.P.; *Joint Petition to Deny of Forty-Six Broadcasting Organizations*, MB Docket No. 07-57 (July 9, 2007) at 9.

have the unintended side effect of preventing efficient installation or integration agreements that would benefit consumers.

3. De Novo Entry

115. New entry into the audio entertainment product market may occur through the use of Mobile Satellite Service ("MSS") frequency bands. We understand that three firms are close to launching hybrid MSS satellite systems that will be used in conjunction with terrestrial access links, and that can be used to provide audio entertainment services.[217] ICO has announced that it will begin to offer multi-media subscription service for mobile users in 2008.[218] Similarly, TMI/TerraStar also expects to launch an MSS system in 2008.[219] Mobile Satellite Ventures has contracted for the launch of a satellite in 2009.[220]

116. Additional satellite radio capacity also could enter the market in the longer-run through de novo entry by new competitors using Wireless Communication Service ("WCS") spectrum, as described in more detail in the XM/Sirius Reply Comments.[221] Although this entry would take longer than two years, it nonetheless could provide some constraint on the incentive of the merged firm to attempt to exercise market power.

C. Internalizing the Dynamic Demand Spillover Externality

117. An efficiency benefit of the merger is that the merged firm will have an increased incentive to undertake demand-enhancing investments, including penetration pricing. It similarly will give the merged firm an increased incentive to undertake cost-reducing investments. This is because the merger will resolve a free-rider (*i.e.*, externality) problem by allowing the merged firm to obtain *all* the incremental satellite radio subscriptions generated by its low prices and other investment efforts. These efficiency benefits are merger-specific. Realizing these benefits would require complex coordination that would involve difficult monitoring and incentives issues, and likely would involve joint pricing. Thus, absent the merger, cooperation would be more difficult and would involve the same type of

---

[217] *See* Charles L. Jackson, *Service and Spectrum Alternatives for Audio News and Entertainment Services* (July 24, 2007), attached to *Joint Reply Comments of XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57.

[218] ICO Press Release, *ICO Selects Alcatel-Lucent and Hughes for Alpha Trial* (May 2, 2007), *available at* http://investor.ico.com/ReleaseDetail.cfm?ReleaseID=240320 (last visited July 12, 2007).

[219] Terrastar News Release, *TerreStar Files FCC Application to Modify its Satellite Launch Milestone* (June 8, 2007), *available at* http://www.terrestar.com/news/press.html (last visited July 12, 2007). *See also* Charles L. Jackson, *Service and Spectrum Alternatives for Audio News and Entertainment Services* (July 24, 2007).

[220] *See* http://www.msvlp.com/media/press-releases-view.cfm?id=126&yr=2007# (last visited July 20, 2007).

[221] *See* Charles L. Jackson, *Service and Spectrum Alternatives for Audio News and Entertainment Services* (July 24, 2007), attached to *Joint Reply Comments of XM Satellite Radio Holdings Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57.

competitive issues raised by the merger, but in the context of behavior by independent firms.

118. As discussed above, the market penetration of XM and Sirius is small and the firms are still in a growth phase. During this phase of the product life cycle, one benefit of gaining new subscribers is the dynamic spillover effect. Increasing the current subscriber level induces incremental future subscriptions by others. In such a dynamic environment, each firm has an increased incentive to undertake demand-enhancing investments, such as mounting advertising campaigns, improving the quality of its products and services, and investing in low penetration prices. Such investments lead to an increase in the firm's customer base, and thus create a dynamic spillover benefit by increasing the number of new customers that the firm will be able to attract in the future.

119. The demand-increasing investments undertaken by one satellite radio provider also generate dynamic spillover benefits *to the other satellite radio provider as well.* This raises a classic free-rider problem. That is, some consumers who learn about satellite radio from a subscriber of one service likely will purchase the other service, because they prefer the exclusive audio content of the other service or because only the other service is offered for the vehicle brand they are purchasing. This externality – the fact that a competitor captures some of the spillover benefits – is the source of the free-rider problem.[222] This free-rider problem limits to some degree the incentive of each firm to engage in such investments in the pre-merger world.[223] The externality also leads the firm to spend additional resources to limit the size of the externality, which raises the cost of such investments.[224] The merger will resolve the free-rider problem because the merged firm will internalize the spillover externality, increasing the incentive to invest. This investment incentive includes investment in penetration pricing, as explained technically in Appendix A. This is a pro-competitive efficiency benefit from the merger.[225] This increased incentive for penetration pricing will occur immediately following the merger. It is thus less likely that XM and Sirius will raise price or reduce investment post-merger than would be the case if the merger does not take place.[226]

---

[222] If price decreases by one competitor tend to be matched by price decreases by another competitor, that competitive response does not resolve the free-rider problem. Each firm still disregards the demand benefit obtained from its investment by the other firm.

[223] Dennis W. Carlton & Jeffrey M. Perloff, MODERN INDUSTRIAL ORGANIZATION (2005) at 424.

[224] This would particularly apply to advertising. For example, pre-merger firms may inefficiently over-invest in brand-specific advertising and under-invest in generic advertising of satellite radio service.

[225] If a merger simulation model were applied, these (and other) efficiency benefits would need to be taken into account, along with the dynamic spillover effect and its associated effects on longer-run profit maximization. *Cf.* Sidak-II at ¶42.

[226] For example, a price increase by one firm would produce a negative externality on the profits of the other firm as it would reduce its future sales for two reasons. First, the higher price charged by one firm would reduce the firm's

120. A similar analysis applies to the increased incentive for cost-reducing investments. When a satellite radio provider decides how much to invest to reduce its variable costs, it would take into account that a cost reduction will allow it to charge a lower price and increase its current subscriber base. In addition, the satellite radio provider would take into account that the higher current sales will generate higher future sales due to the dynamic spillover effect. Therefore, it has a greater incentive to reduce variable costs than in the absence of the dynamic spillover effect. However, absent the merger, the firm would not account for the fact that the other satellite radio provider also benefits from the dynamic spillover effect. Again, the presence of this positive externality leads to a free-rider problem and somewhat reduces the firm's incentive to undertake such investments. The merger will resolve the free-rider/externality problem and thus will increase the incentive to invest in cost-reducing technologies.

121. As discussed earlier, the market will eventually mature and the incentives to exploit the dynamic demand spillover effect may then no longer be significant. At that time, however, the market will be subject to intense competition from wide availability of content over mobile broadband access technologies, more robust and widespread cellular networks, and other technological advances that will prevent the merged firm from exercising market power. In addition, the other efficiency benefits from the merger will deter price increases.

D. Reducing Production and Distribution Resource Costs

122. The merger will lead to significant merger-specific resource cost reductions, which will tend to reduce prices. Some of these cost savings will occur in the short-run and others in the longer-run. We understand that cost savings will be realized in a number of areas, including product development, device manufacture, customer care, retail distribution and marketing, broadcast operations, satellites, terrestrial networks, facilities, management and intellectual property. Achieving these cost-savings absent the merger would involve significant coordination or a joint venture that would be less effective and likely to lead to the same competitive concerns as a merger, leading to a conclusion that the savings likely are merger-specific.[227]

---

subscriber base that popularizes the platform to non-subscribers, and thus would reduce the number of future subscriptions to satellite radio services. Some of these lost future subscribers would have chosen the other service, and thus the future sales of that other service would be lower. Second, if one firm were to raise price, some partially informed potential subscribers might not distinguish clearly between the prices of the two firms, but might perceive only that satellite radio generally is "high priced" or no longer is a good bargain. For example, a friend might complain about the higher price of his satellite radio service, without making precise that only one of the companies raised price.

[227] *See* Merger Commentary at 50 ("That an efficiency theoretically could be achieved without a merger – for example, through a joint venture or contract – does not disqualify it from consideration in the analysis. Many joint venture agreements or contracts may not be practically feasible or may impose substantial transaction costs (including monitoring costs). In their assessment of proffered efficiency claims, the Agencies accord appropriate

123. Some of the cost savings will involve costs that vary directly with the number of subscribers. Reducing purely variable costs would have an immediate effect on pricing incentives.[228] Other cost savings involve nominally fixed costs.[229] Some of these fixed cost savings involve increases in the efficiency of advertising and other demand-enhancing expenditures. The activities can be increased in order to increase product demand. For example, additional advertising will increase the demand for the service. Similarly, investing more in terrestrial repeaters will improve subscribers' service coverage. These investments in turn will lead to higher demand for the merged firm. If the merger increases the productivity of expenditures on these demand-enhancing activities, that factor would give the merged firm an incentive to increase competition and output by increasing the level of the demand-enhancing activities.[230] Under such circumstances, these cost savings will have output-enhancing effects, as do reductions in variable costs. Still other cost savings involve reductions in fixed costs that will increase the likelihood that the merged firm will remain viable in the longer-run and maintain longer term investment incentives. These fixed cost savings all would be treated as cognizable under the current merger enforcement policy.[231]

124. **[[REDACTED** [redacted]

---

weight to evidence that alternatives to the merger are likely to be impractical or relatively costly.") The same point applies to several other of the efficiency benefits of the merger.

[228] The case of advertiser-supported channels raises a related two-sided market issue. When the merged firm offers a best-of-both content package, or combines similar channels into one channel that is broadcast on both systems, that strategy will increase the "reach" of the advertising sold on those channels by the merged firm. Greater "reach" increases the efficiency of these advertising spots to advertisers, which typically raises the price per listener. If this occurs, the increased advertising revenue stream per subscriber flowing to the merged firm will increase the incremental net revenue that the merged firm earns from selling an additional subscription. The higher revenue earned from the advertising-side of the market in turn will incentivize the merged firm to reduce the price of subscriptions on the subscriber-side on the market.

[229] Sometimes it is hard to precisely classify costs as fixed or variable. It is well known that certain costs that are often viewed as fixed tend to rise as the firm grows. And other fixed costs become variable in the longer run.

[230] Robert Dorfman & Peter O. Steiner, *Optimal Advertising and Optimal Quality*, 44 AM. ECON. REV. 826 (1954).

[231] *See* Merger Guidelines at § 4. *See also* Merger Commentary at 58 ("The Agencies consider merger-specific, cognizable reductions in fixed costs, even if they cannot be expected to result in direct, short-term, procompetitive price effects because consumers may benefit from them over the longer term even if not immediately"); *see also* Dennis W. Carlton, *Does Antitrust Need to be Modernized?* ECONOMIC ANALYSIS GROUP DISCUSSION PAPER, DOJ, EAG, 07-03 (Jan., 2007) at 5.

[redacted]]].[232]

E. Increasing Product Quality

125. The merger will improve the quality of each service by permitting the sharing of high-value content that is currently exclusive to a single service. Highly valued exclusive content will replace other lower valued content. This sharing will create a benefit to subscribers and will lead to more subscribers. These quality improvements will benefit all subscribers who highly value the new content, not just the additional subscribers who subscribe in response to the improved content. Although the merged firm may choose to charge a higher price for a service tier with better content, the quality-adjusted price is likely to fall because the merged firm likely will want to increase penetration.[233]

126. These benefits are merger-specific. The high-value content is not shared in the pre-merger world. Nor would such sharing be likely absent the merger. This type of content sharing would lead to classic promotional free-riding problems. In addition, achieving these benefits as independent firms absent the merger might violate agreements with content providers, and in any case would raise the same competition issues as does the merger.

127. The merger will increase the introduction and promotion of interoperable radios, leading to product quality improvements. Because satellite radio companies subsidize the cost of receivers, their business models are premised on the subscriber purchasing service for a period of time in order to recoup the equipment subsidy. That type of product promotion for interoperable radios generates classic free-rider problems. For example, if XM were to subsidize or promote an interoperable radio, Sirius would gain some of the benefits when some of the new subscribers chose Sirius instead of XM, and vice versa. Thus, Sirius and XM today have limited incentives to subsidize or advertise the sale of interoperable radios. The merger resolves these free-rider problems. As a result, the incentive to subsidize and advertise interoperable radios will increase after the merger. Thus, the merger will

---

[232] Sidak claims that reductions in fixed costs are not merger specific because "XM and Sirius could achieve the same efficiency by declaring bankruptcy and eliminating their debt." Sidak-II at ¶39. The notion that bankruptcy offers the same benefits to firms and consumers as a reduction in costs, without any negative effects on firms and their ability to serve customers (such as increasing their future costs of raising capital or reducing investment) is economically flawed.

[233] For examples from other industries, *see* Arthur Fishman & Rafael Rob, *Product Innovations and Quality-Adjusted Prices*, 77 ECONOMICS LETTERS 393, 393 (2002).

facilitate the more rapid introduction of interoperable radios as well as a lower retail price of these radios.[234]

128. There also may be product quality improvements resulting from resource cost reductions. For example, the merger will reduce the effective cost of adding terrestrial repeaters because repeaters for the Sirius network can be co-located at legacy XM locations. This will reduce the cost of adding repeaters, which will increase the incentive to add more repeaters. More repeaters will increase the quality of the network, which in turn will increase the demand for the satellite radio service. The same analysis would apply to improving the broadcast quality and number of channels through investment in better technology, if the merger raises the efficiency of investments or reduces investment costs.[235]

F. Reducing Content Acquisition Costs

129. Some programming offered by Sirius and XM is self-produced. Other content is acquired. The merger likely will reduce the merged firm's cost of acquiring content. Some of these cost savings will involve reductions in fees leveled on a per-subscriber basis. Others will involve reductions in lump sum payments. As discussed below (and in Appendix B), both types of cost-reductions will give the merged firm the incentive to reduce subscription prices, *ceteris paribus*. These cost-savings are procompetitive efficiency benefits.[236]

130. Some Comments deny these efficiency benefits. They claim instead that these cost savings would involve the anticompetitive exercise of monopsony power by the merged firm.[237] This monopsony claim is incorrect for the same reasons just described, namely that these cost-savings are procompetitive efficiency benefits that will lead to lower subscription prices paid by satellite radio subscribers and an increase in the number of satellite radio subscribers.

---

[234] The procompetitive efficiency benefit is merger-specific. In order to solve the free-rider problems absent the merger, the two independent firms would need to agree on the price of interoperable radios, the promotion levels by each firm, and perhaps also would need to share revenues. This cooperation by independent firms would raise monitoring costs. *See* Merger Commentary at 50. Contrary to Sidak's claim (*see* Sidak-II at ¶33), interoperable radios will offer consumers value after the merger. They will facilitate more rapid access by consumers to programming transmitted over the different satellite platforms now used by the companies and, when in general use, will allow the merged firm to cease transmitting the same channels over both satellite systems and instead to use the capacity to deliver more services to consumers.

[235] Absent the merger, this cooperation would require a complex joint venture, possibly including revenue sharing. Thus, the procompetitive efficiencies are merger-specific.

[236] The benefits are merger-specific because the merger would resolve promotional free-rider problems that would arise if two independent firms were carrying and promoting identical content. In addition, coordination of purchasing behavior by independent firms would raise the same potential competitive concerns about cooperative purchasing and price-setting that are raised when the firms fully integrate through a merger.

[237] Common Cause Petition at 45-46. NAB Petition at 31.

131. First, some content price reductions may reflect increased value obtained by content providers. For example, consider the situation of advertiser-supported content, where the content providers sell the advertising.[238] In this situation, when the merged firm offers this content as part of a best-of-both content package, that strategy will increase the "reach" of the advertising on those channels. That higher "reach" would increase the efficiency of advertising spots to advertisers, which typically raises the per listener (or per subscriber) price in the market for the sale of advertising spots. If this occurs, the per-subscriber advertiser revenue stream flowing to the content provider will increase. Because content providers compete to sell their content to satellite radio services, this revenue increase in turn will lead them to set lower prices for their content. Thus, the content costs of the merged firm will fall, which consequently will incentivize the merged firm to reduce the price it charges for subscriptions.

132. Second, unlike standard monopsony analysis, a reduction in the rights fees paid by the merged firm for most of the content likely would not compromise its creation. For example, the NFL will not play or broadcast fewer games if they receive a smaller payment from the merged firm. That payment is a very small fraction of the total NFL revenue. In this situation, a reduction in the payment will not lead to any reduction in programming. When content is provided inelastically in this way, there can be no monopsony output distortion.[239]

133. Third, lower payments for content likely would lead to the incentive for a lower retail subscription price and a larger number of subscribers, in contrast to the situation in anticompetitive monopsony. This is because the process for acquiring this content likely involves an efficient bargaining process, not monopsonistic price setting. This lower price and increased output causes consumer benefits. This result is simplest to see when content payments are structured explicitly on a per subscriber basis. In this situation, lower content payments imply that the satellite radio provider achieves a lower marginal cost of adding subscribers. This result would lead simply and directly to an incentive to lower price and increase output.[240]

134. When demand is dynamic (*i.e.,* involves dynamic spillovers), a more complex analysis implies the same beneficial impact on price and output, even when the competitive process

---

[238] A previous note analyzed the case of advertising spots sold by the satellite radio companies.

[239] Roger D. Blair, David L. Kaserman & Richard E. Romano, *A Pedagogical Treatment of Bilateral Monopoly*, 55 S. ECON. J. 831 (1989).

[240] Structuring payments on a per subscriber basis often is an efficient way to deal with uncertainty over the total value of the content to the distributor, and the number of subscribers can be a useful metering device. Per subscriber payments for cable programming content are common. For a technical analysis of this issue, *see* Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (MIT Press 1990) at 176-78.

of bidding for content against other radio networks and bargaining with content owners involves lump sum payments.

- As explained in technical terms in Appendix B, when demand is dynamic, these lump sum payments are fixed costs *ex post* but variable costs *ex ante.* That is, prior to signing the contract with the content owner, a satellite radio provider can affect the amount of the lump sum that it will pay to the content owner by undertaking (or not undertaking) certain actions or investments that will affect the value of that content.
- As discussed earlier, the dynamic spillovers give the merged firm (and – to a lesser extent – the individual firms in the pre-merger world) the incentive to engage in penetration pricing and other investments. Having additional subscribers will increase the value of particular content, which will lead in turn to a higher lump sum payment to the content provider in the future, *ceteris paribus*. Thus, the anticipation of these higher future lump sum payments (as a result of the increased number of future subscribers) dampens to some degree the incentive to engage in penetration pricing, relative to the situation where the payment would be a truly fixed cost.
- This economic analysis implies that the merger will lead to an increased incentive for penetration pricing and other investments that increase demand. If a merger-induced reduction in bidding competition for exclusive content also causes the content owner to receive a smaller fraction of the value of the content (in the form of a lower lump sum payment) after the merger, then the merged firm will be able to anticipate higher future incremental profits. These higher incremental profits will give the merged firm an increased incentive to engage in more penetration pricing, promotion, and other demand-enhancing investment. This competitive conduct will lead in turn to lower subscription prices and more subscribers. This analysis also implies that consumers will benefit from reducing the bidding competition for such exclusive and high-value content.

135. For content whose supply is somewhat elastic, reduced payments could lead to marginally less content being provided by the particular supplier.[241] However, this reduction is certainly not inevitable and would not be likely. If programming prices are individually negotiated with each content supplier in an efficient bargaining process, then there is a greater likelihood that the negotiations would lead to no reduction in supply, simply a reduced payment for inframarginal content.[242] In contrast, in situations where the negotiations involve less information, the amount of content offered might be reduced for some suppliers. This would involve reduced subscriber benefits and a marginal effect on

[241] For content that is provided perfectly elastically, there also would be no reduction in supply if the merged firm negotiates a lower lump sum price. There also is no incentive for monopsony purchase (or output) reductions when supply is perfectly elastic.

[242] As a technical economic matter, this would correspond to the use of non-linear content prices.

the number of subscribers. However, these impacts likely would be outweighed by the other beneficial effects identified above – the incentives for lower subscription prices and increased promotion, and the benefits of sharing the exclusive content.

136. For these reasons, satellite radio subscribers will benefit from the effect of the merger on the merged firm's cost of acquiring content. This same analysis also demonstrates that there should be no concern that consumers will be harmed from the exercise anticompetitive monopsony power. When monopsony power is exercised, output falls, consumer prices rise and consumers are harmed. That is not the case here. There likely is an efficient bargaining process that will increase output and reduce satellite radio prices instead.

137. Finally, in the near future, one factor likely will increase competition for content. As HD Radio increases its penetration and channel capacity, terrestrial radio networks will become more aggressive bidders for content. Their ability to bid for content also will be enhanced if HD radio networks have the choice of offering content on a subscription basis. This will intensify competition for content among satellite and terrestrial radio networks and syndicators. In addition, other audio content distributors also might be able to bid for high-value content. The same content also can be distributed by wireless phone carriers or sold through podcasts and over the Internet, and the demand for content by these audio entertainment providers is likely to grow significantly regardless of the merger. This increased competition among audio entertainment providers likely will lead to higher revenues for content owner over time, *ceteris paribus*. It is even possible that the merger could increase the revenues of certain content owners *even further*, despite the fact that XM and Sirius would no longer compete against each other for the content. This is because the merged firm might be willing to pay a larger amount for the exclusive rights to particular audio content than either XM or Sirius would be willing to pay on their own.[243] This increased competition is not anticompetitive exclusion, despite the claims in some Comments.[244] The market share of terrestrial radio is many times larger than the share of

[243] Since the merged firm would be able to offer the content to all the XM and Sirius subscribers, the value of the content would be higher because it could be sold to more subscribers. In a bargaining context, this higher value could translate into a higher payment for the content. Similarly, in a bidding context, the higher value of the content also could lead to higher revenues for the content owners. This is because the merger would have the effect of replacing two relatively weak bidders (*i.e.*, XM and Sirius) with a single, more aggressive bidder (*i.e.*, the merged firm) vis-à-vis other bidders. As a result, bidding competition would be more intense and would lead to higher revenues for content owners. For example, consider a situation where the merged firm would win the bidding competition for a particular audio content, but neither XM nor Sirius would have been able to win the bidding in the absence of the merger, say, because they would have lost to an HD radio network. In this situation where the merged firm would outbid the HD radio network, the content owner would obtain more revenue. (In fact, the content owner could benefit even if the merged firm would not win the bidding competition. In this scenario, the merger would intensify the competition between the "final two" (*i.e.*, the HD radio network and the merged firm) and the content owner would benefit regardless of which bidder would prevail in the bidding.)

[244] Clear Channel Comments at 8.

the merged firm. The merged firm is not well-situated to use "anticompetitive overbuying" of inputs to achieve monopoly power in the audio entertainment market, or even in a hypothetical radio market comprised solely of terrestrial and satellite radio.[245]

G. Reducing Automobile OEM Distribution Costs

138. The merger likely also will reduce the merged firm's cost of securing distribution of their radios through the automotive OEM channel by lessening the bargaining leverage of auto makers and increasing the demand for satellite radio. These cost savings are procompetitive efficiency benefits that will lead to lower satellite radio prices and consumer benefits.[246]

139. As in the case of content acquisition, some Comments deny these efficiency benefits. They claim that these cost savings instead would involve the anticompetitive exercise of monopsony power by the merged firm.[247] This monopsony claim is incorrect for the same reasons described above, namely, that these cost-savings are procompetitive efficiency benefits that will lead to lower prices paid by satellite radio subscribers and an increase in the number of satellite radio subscribers.

140. First, virtually all vehicle manufacturers currently work with only a single satellite radio provider. One reason is that offering radio equipment for two different services would increase the manufacturers' costs.[248] After the merger, we understand that the merged firm will have the ability and incentive to reduce these costs. Not only will this increase the quality of the products received by subscribers, but it also will improve the value to OEMs, which then would lead to lower distribution costs for the merged firm as this increased value is shared through the bargaining process. By obtaining some of this value, the merged firm's payments to OEMs can be reduced, thereby reducing its costs. In addition, if superior content packages and interoperable radios lead to more auto purchasers deciding

---

[245] *See* Steven C. Salop, *Anticompetitive Overbuying by Power Buyers*, 72 ANTITRUST L.J. 669 (2005). The NAB particularly raises the concern that the merged entity would be able to force content providers, like sports programmers, to deal only with satellite radio. NAB Petition at 31-32. The current sports exclusives of XM and Sirius operate only against each other, not against other audio entertainment products. In satellite TV, DirecTV has NFL Sunday Ticket, which is a partial exclusive; other MVPDs also carry some NFL games. More importantly, it is doubtful that DirecTV has achieved market power in the MVPD market as a result.

[246] These efficiency benefits are merger-specific because coordination of purchasing behavior by independent firms would raise the same type of potential competitive concerns about cooperative procurement that are raised in the context of the merger.

[247] Common Cause Petition at 46.

[248] These costs would include the additional costs of engineering new car models in a way to accommodate different types of receivers. They also would include additional inventory and logistical costs of manufacturing required to have cars available with both types of radios so that consumers could choose. [[**REDACTED**]].

to pay for satellite radio subscriptions, that fact also will increase the overall returns to the OEMs for the cost of installation. The merged firm also could share in this value through a correspondingly lower activation payment, which would further reduce its variable costs.

141. Second, cooperative bidding for content by the merged firm likely will lead to lower subscription and equipment prices to subscribers.[249] There currently are a number of components of the payments made by Sirius and XM to the vehicle manufacturers, including payments for the number of radios installed and/or the number of radios activated, as well as subscription revenue-sharing. A few manufacturers also receive lump sum payments. Reducing payments for radios installed and activated would reduce the variable costs of the satellite radio services, which would lead to lower subscription prices. Revenue-sharing acts like an excise tax, so that reducing the revenue-share would also incentivize the merged firm to reduce subscription prices, especially as OEM subscribers become a larger proportion of all subscribers. Reductions in lump sum payments also would have a beneficial effect on prices as a result of the dynamic demand and penetration pricing analysis, as discussed in Appendix B. Thus, satellite radio subscribers would benefit from reducing these payments. These cost-saving benefits are significant because the OEM channel represents over half of new satellite radio subscribers (net additions) today and the percentage is rising over time.[250]

142. The auto OEMs will retain some bargaining leverage after the merger. Failure to reach an agreement with an OEM would harm the merged firm as well as the OEM. In addition, the auto OEMs will have alternative devices to offer purchasers, even aside from CD players and AM/FM radios. In this regard, the auto OEMs can offer – and in many cases already are offering – iPod/MP3/wireless phone integration, HD radios and Internet connections.[251] Even if the merger failed to lessen the bargaining leverage of the auto OEMs, the merged firm's economics of OEM distribution should improve. The merger likely will lead to several efficiencies that will lead to an increased percentage of new car buyers deciding to subscribe to satellite radio.[252] This means that fewer cars will have installed but unactivated

---

[249] *Cf.* NAB Petition at 31 and Sidak-I at 41-43.

[250] There might in principle be some offsetting price-raising effects on new vehicles. However, there is no reason to conclude that this effect would exceed the direct effect that lower OEM payments would have on reducing the satellite radio subscription prices to subscribers, particularly since only about half of new automobile purchasers opt to subscribe for satellite radios installed in their new vehicles once the trial period ends. This type of multi-market welfare balancing also raises knotty antitrust issues. *See generally* United States v. Philadelphia Nat'l Bank, 374 U.S. 321 (1963).

[251] As discussed above, it is not necessary to attach conditions to the merger preventing integration or installation agreements between the merged firm and auto OEMs.

[252] In particular, as discussed in earlier, there will be increased incentives for penetration pricing and other investments, including promotion, as well as cost savings and quality improvements.

satellite radios. Future negotiations likely would lead to the merged company sharing in these benefits, aside from any issues of changing bargaining leverage.

H. Reducing Retail Distribution Costs

143. The merged firm's resource costs used in retail distribution will fall from the merger. The merger will reduce the retailers' costs and increase their value of selling satellite radio in various ways. Rationalization of equipment offerings will allow retailers to economize on retail square footage, which will reduce the retailers' opportunity costs of space, and also on storage and inventory costs. Superior content and product quality also will lead to more retail sales, which will further reduce the retailer's opportunity costs of the space. The merged firm will be able to share in the retailers' benefits, which in turn will reduce the merged firm's costs of retail distribution per unit and per subscription sold. In essence, the retailers will be able to accept lower gross margins because they will earn higher profits per square foot.[253]

144. The merged firm is unlikely to gain bargaining leverage over retailers. The retailers will continue to have the alternative of using their space to sell many other popular audio entertainment devices, including car stereos, iPods and other MP3 players, and HD radios. The retailers also can choose to use their space to sell some different types of equipment, such as cameras, televisions and home theater equipment, computers, and so on.

I. Conclusions on Competitive Effects

145. Taking all of this analysis into account, it is not likely that the merger will lead to adverse unilateral price or quality effects. The merger will resolve the free-rider problem inherent in the dynamic demand spillovers, increasing the incentives of the merged firm to maintain low penetration prices or even reduce them. The merger also will lower real prices and increase output by facilitating the cost reduction efficiencies and product quality synergies detailed above. For the same reasons, the merger will lead to increased demand-enhancing investment incentives by the merged firm. These efficiency benefits likely also will have a procompetitive effect of spurring further innovation and investment by other audio entertainment competitors. This analysis suggests that the merger likely will increase competition and consumer welfare, despite the fact that competition between Sirius and XM will be replaced with cooperation, and even if the market is erroneously defined narrowly.

[253] The benefits are merger-specific because coordination of purchasing behavior by independent firms would involve a joint venture that would raise the same potential competitive concerns as the merger. Merger Commentary at 50.

146. This conclusion is reinforced by the fact that the main opponent of the merger is the NAB. The NAB has claimed that the merger will lead to a monopoly in an alleged satellite radio-only market and have anticompetitive effects. But, the NAB also has claimed that the merger will lead to an increase in the number of satellite radio listeners at the expense of terrestrial radio broadcasters.[254] This latter claim suggests that the merger would be procompetitive, not the opposite.[255] The NAB's position is logically inconsistent. If the merger leads to increased satellite radio output from lower prices, then consumers would benefit. If the merger instead were to lead the merged firm to raise price, then broadcasters would benefit from the merger. In this regard, Judge Posner has written that competitor complaints are a "telling point" that supports the view that a merger is lawful.[256] Judge Posner's economic reasoning is directly applicable here, in light of the absence of realistic anticompetitive exclusion effects.

147. Instead of providing credible evidence against the merger, the vociferous NAB opposition suggests two conclusions, both of which support the merger. First, there is sufficient substitution between terrestrial radio and satellite radio for the NAB to care deeply about the merger, a fact that suggests that it would be erroneous to treat this as a merger to monopoly in a narrow satellite radio market. The NAB has a long history of objecting to the effect of satellite radio on terrestrial radio, including its effect on the listening audience for terrestrial radio. For example, in 1995, the NAB stated that "The primary audiences of local radio and satellite radio are the same: home/office/auto. They will compete directly for local market share."[257] In 2004, when complaining about the threat of satellite radio to terrestrial radio broadcasters, the NAB similarly stated that XM and Sirius have "devoted substantial bandwidth to compete directly with local broadcasters."[258] In 2004, in a Petition for a Declaratory Ruling, the NAB referred to studies that it claimed provided evidence of

---

[254] David K. Rehr, *Statement Before the United States House of Representatives Committee on the Judiciary Antitrust Task Force* (February 28, 2007) at 17.

[255] The situation would be different if the merger gave the merged firm control over an input needed by rivals, as in the case of a vertical merger or a dominant firm that can force suppliers to exclude its rivals. *See generally* Thomas Krattenmaker & Steven Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Gain Power Over Price*, 96 YALE L.J. 209 (1986).

[256] As stated by Judge Posner, "Hospital Corporation's most telling point is that the impetus for the Commission's complaint came from a competitor." Hospital Corporation of America v. Federal Trade Commission, 807 F.2d 1381, 1391-92. Judge Posner goes on to explain that "[t]he hospital that complained to the Commission must have thought that the acquisitions would lead to lower rather than higher prices – which would benefit consumers, and hence, under contemporary principles of antitrust law, would support the view that the acquisitions were lawful." *Id. See also* William J. Baumol & Janusz A. Ordover, *Use of Antitrust to Subvert Competition*, 28 J. OF L. & ECON. 247 (1985).

[257] National Association of Broadcasters, *The Truth About Satellite Radio, Attachment*, Reply Comments of the NAB, Gen. Docket No. 90-359 (October 1995) at 2.

[258] *NAB Petition for Declaratory Ruling*, IB Docket No. 95-91, Gen. Docket No. 90-357 (Apr. 2004) at 17. *See also* Hazlett at Appendix 1.

how terrestrial radio "could be severely impacted by diversion of the audience to SDARS."[259] Second, the NAB's opposition suggests that the likely effect of the proposed merger is to increase competition by making the satellite radio a more vigorous and effective competitor.

148. In his testimony before the U.S. House of Representative, NAB President and CEO, David Rehr, noted what he viewed to be an anticompetitive effect of the merger:

> Beyond harming consumers, a satellite radio monopoly would have the incentive and the opportunity to engage in unfair competition and anticompetitive practices against other audio service providers, especially radio broadcasters … the monopoly will attempt to accelerate the acquisition of new subscribers by offering them a lower-cost point of entry – likely a basic advertiser-supported tier offered for less than the current $12.99 per month. On its face, such a plan may not sound bad, but of course no introductory price would be locked in and a monopoly provider could easily raise this price at a later time to increase profits at the expense of consumers. [260]

To an economist, the purported harms described by Rehr sound more like the consequences of an aggressive and more efficient satellite radio competitor offering a lower price to attract current AM/FM customers, not like a monopolist restricting its output and raising its subscription price. In fact, the AAI cited this specific quote in its submission, noting that "Some of its statements suggest that the NAB does anticipate consumer benefit."[261]

149. In a surprising twist, however, the AAI speculates that the NAB's opposition conceivably may not be anticompetitively motivated. The AAI's various arguments, however, are economically flawed.[262] First, the AAI suggests that the anticompetitive effect might be to attract investment away from terrestrial radio or be a more formidable competitor in the advertising market by becoming a more attractive advertising location. From an economic point of view, however, these effects would be procompetitive in the advertising market, not the opposite. Second, the AAI suggests that the anticompetitive effect of the merger might be to "exclude broadcasters" by permitting the merged firm to outbid broadcasters

---

[259] *NAB Petition for Declaratory Ruling*, IB Docket No. 95-91 Gen. Docket No. 90-357 (Apr. 2004) at 8. Sidak suggests that the NAB opposition is explained solely by a concern that a combined XM-Sirius would compete in the advertising market. Sidak-II at ¶51. In light of the NAB's past positions, as illustrated by these various quotations, it would be surprising, however, if the NAB were concerned *only* about the effects of the merger on the advertising market and not also about its effects on satellite radio subscriptions and terrestrial radio's listening audience.

[260] David K. Rehr, *Statement Before the United States House of Representatives Committee on the Judiciary Antitrust Task Force* (February 28, 2007) at 17.

[261] AAI Comments at n.95.

[262] *Id.* at 28-29.

for content exclusives.[263] This is in direct contrast to the NAB, which said that it was concerned with the effect of the merger "to eliminate the need to compete with another national service provider to acquire programming and talent that wish to reach the national audio market."[264] Third, the AAI suggests that the NAB's expressly anticompetitive statement perhaps could be excused because the NAB might "be mistaken" in its perceptions that consumers actually will benefit from the merger, or because broadcasters have a "tribal-like" hostility to satellite radio that leads them to misperceive their own competitive interest in cartelization.[265] In contrast to the AAI, economic analysis would treat the NAB as a rational association of competitors acting in the economic interests of its members.

150. Sidak also suggests that the NAB's opposition is not anticompetitive.[266] But, his analysis is based on a faulty understanding of the "two-sided market" interaction of the sale of advertising and subscriptions. As discussed already, the merger will increase the value to advertisers of those advertiser-supported channels now offered by Sirius and XM. An increase in advertising revenue per subscriber would increase the value to the merged firm of obtaining additional subscribers. This higher value would give the merged firm the incentive to reduce the subscription price. Of course, both of these effects are procompetitive. These lower prices would benefit consumers and advertisers. The broadcasters also would be concerned that the more efficient merged company will attract more subscribers, which also will lead to the terrestrial radio stations obtaining less advertising revenue. Thus, while Sidak may be right that broadcasters are "understandably concerned that a combined XM-Sirius would divert advertising dollars away from radio stations," their concern nonetheless is anticompetitive.[267]

151. Sidak also claims that the merged firm plans to dramatically increase advertising, and that this new strategy would impose large welfare losses on subscribers.[268] Sidak's calculation is *ad hoc*, relies on unsupported and unreasonable assumptions, and ignores the unprofitability of the assumed behavior. First, he assumes that the number of ads will increase by 5 minutes per hour, apparently on every channel offered by the merged firm, and that the merged firm will change the "commercial-free nature of the service," a set of

---

[263] *Id.* at 29.

[264] David K. Rehr, *Statement Before the United States House of Representatives Committee on the Judiciary Antitrust Task Force* (February 28, 2007) at 3.

[265] AAI Comments at 28-29.

[266] Sidak-II at ¶¶50-51.

[267] Sidak-II at ¶51.

[268] Sidak-II at ¶¶43-44.

assumptions that is arbitrary and not supported by the speech cited by Sidak.[269] Second, he assumes that half of each subscriber's willingness-to-pay for satellite radio arises from avoiding commercials, an assumption that is arbitrary and unsupported, as discussed earlier.[270] Third, his analysis is implemented incorrectly, even on the basis of these assumptions. In particular, Sidak ignores the fact that the higher "effective price" from adding commercial minutes would lead to a substantial predicted subscriber loss in his model.[271] In fact, his model predicts a subscriber loss of more than 33%. Fourth, his analysis overlooks the huge impact of this 33% subscriber loss on the profitability of the assumed advertising strategy. The 33% subscriber loss implied by his analysis would make the assumed strategy highly unprofitable. The merged firm would lose the subscription revenue from a third of its subscribers. It also would sacrifice the current advertising revenue earned on the basis of those subscribers. Its advertising price also would fall, because the advertising would reach total audiences that were a third smaller.[272] Thus, his welfare estimate makes no economic sense.

V. PRICE DISCRIMINATION AGAINST SUBSCRIBERS IN AREAS WITH LIMITED AM/FM COVERAGE

152. Comments have raised another way in which they allege that the merger might eliminate competition and harm consumers – that the merged firm would engage in price discrimination against subscribers in geographic areas with limited AM/FM coverage.[273] Our economic analysis shows price discrimination does not raise a significant competitive concern.

153. As discussed previously, our analysis of the relationship between satellite radio penetration and the number of terrestrial radio stations supports the conclusion that these two audio entertainment products belong in the same relevant market. This raises the issue of

---

[269] XM and Sirius already have channels that carry advertisements. [[**REDACTED**]]. We understand that the firm does expect that it will be able to charge a higher CPM (cost per thousand) for commercials on the advertiser-supported channels because their "reach" will increase, which will increase the value of advertising spots to advertisers. *See* Thomson StreetEvents, *Final Transcript: Siri-Sirius (sic) Satellite Radio & XM Satellite Radio to Combine in Merger of Equals* (February 20, 2007), *available at* http://online.wsj.com/documents/transcript-xmsr-20070220.pdf (last visited July 17, 2007).

[270] In fact, some advertising-supported channels are extremely popular. If commercials were so disliked by all subscribers, then subscribers would avoid those channels, given the choice on satellite radio.

[271] The subscriber loss is easiest to see in his discussion of the welfare of the "marginal subscriber." By definition, the marginal subscriber's value for satellite radio just equals the subscription price, so if the value of the service falls, there would be no welfare cost. Instead, the subscriber would deactivate the service.

[272] Sidak obviously also ignores any welfare benefits from increasing competition in the advertising market.

[273] Consumer Coalition for Competition in Satellite Radio, *Consumer Vulnerabilty to a Satellite Radio Monopoly in Rural, Unserved and Underserved Geographic Markets* (July 9, 2007) (hereinafter "C3SR Paper"). Sidak-II at ¶25.

whether a merger between Sirius and XM would harm people in areas that have only a very limited selection of AM/FM radio stations. The competitive issue for merger analysis is not how many consumers live or travel in areas with a very limited selection of AM/FM stations, or whether such areas should be labeled as "unserved" or highly "underserved" by terrestrial radio.[274] The competitive issue is whether the merged firm likely would have the incentive to price discriminate against subscribers in those geographic areas with limited AM/FM coverage. Our analysis shows that price discrimination would not be profitable in areas with the most limited AM/FM coverage because the fraction of the population in such areas is too small to support an attempt to profit from an imperfect and costly price discrimination strategy. Expanding price discrimination to cover areas receiving somewhat more AM/FM stations would not be profitable because satellite radio penetration would not differ enough from that for the rest of the population to overcome the costs and offset the imperfections of the strategy.

154. Some Comments have attempted to draw an analogy between the proposed satellite radio merger and the earlier proposed merger of DirecTV and Echostar.[275] The analogy is weak and the differences between the two services indicate that post-merger price discrimination is unlikely in satellite radio. One reason is that satellite radio penetration is substantially lower than satellite TV penetration, suggesting that satellite radio faces more competition or is viewed by consumers as more dispensable than satellite TV or both. Even in these areas, consumers have the option of listening to audio on CDs, iPods and other MP3 players, and wireless phones.

155. According to a recent GAO Report, national penetration of satellite TV was 17.4% of households.[276] National satellite radio penetration at the end of 2006 was much less, only

---

[274] C3SR says that areas that receive up to 5 stations are "areas where local radio service is effectively unavailable," labeling them as "unserved," and that areas with 6 to 15 stations are "areas where local radio service is thinly available," labeling them as "underserved." C3SR Paper at 5, 7. C3SR does not, however, provide any justification for choosing these particular thresholds.

[275] *See, for example,* NAB Petition at 3, 8, 42, and 47; Comments of Clear Channel Communications, Inc. MB Docket No. 57-07 (July 9, 2007) at 4-5. *See also* Federal Communications Commission, *Application of EchoStar Communications Corporation and Hughes Electronics Corporation, Hearing Designation Order*, CS Docket No. 01-348 (October 18, 2002) at ¶275 ("at best resulting in a merger to duopoly and at worse a merger to monopoly"); and Separate Statement of Chairman Michael K Powell ("case against approving the transfer application is particularly compelling with respect to residents of rural America who are not served by any cable operator."); and Department of Justice *et al.*, *Complaint*, Case Number 1:02CV02138 – 10/31/2002, *available at http://www.usdoj.gov/atr/cases/f200400/200409.pdf* (last visited July 17, 2007), at 32 ("There are million of households in the United States for which DTV and DISH are the only competitive MVPD options"); *see also Id.* at 37 ("the two DBS services are the only competitive option for MVPD service in uncabled areas").

[276] General Accounting Office, *Direct Broadcast Satellite Subscribership Has Grown Rapidly, but varies Across Different Types Of Markets*, GAO-05-257 (April 2005) (hereinafter "GAO") at 3, 6.

about 4.5% of population.[277] Moreover, the GAO Report found that in uncabled areas, the penetration rate for satellite TV was almost 68%, about 4.5 times larger than the satellite TV penetration rate in cabled areas of 15%.[278] Here, the contrast between satellite TV and satellite radio is sharp. Table B1 in Exhibit B shows that satellite radio penetration in 2006 was **[[REDACTED]]**% in areas that received two or fewer AM/FM stations, **[[REDACTED]]** the 68% penetration rate of satellite TV in uncabled areas. **[[REDACTED** [redacted]**]]**

156. The facts for satellite radio differ from satellite TV in a second important way: far fewer satellite radio customers lack a terrestrial radio alternative than the number of satellite television customers lacking access to cable television. This provides another reason that price discrimination incentives are much lower for satellite radio. Only 0.2% of U.S. population lives in areas receiving two or fewer AM/FM stations, compared to the nearly 9% of U.S. households in uncabled areas. The fractions of population living in areas receiving at most six or nine AM/FM stations (2.0% and 5.5% respectively) are somewhat higher. But, **[[REDACTED** [redacted]**]]**. This difference **[[REDACTED]]** the 53 percentage point difference between DBS penetration of 68% of households in areas with cable television service versus 15% in areas without cable service.

157. These facts suggest that price discrimination in satellite radio is unlikely to be profitable and so is not likely to be attempted. On the one hand, in areas with a very small number of AM/FM stations, the benefits would be very limited because so few subscribers would be targeted. On the other hand, if the scope of the discrimination were increased to target subscribers (for example, those in areas with nine or less AM/FM radio stations instead of six or less), the potential profitability would be reduced because the difference in penetration rates between the targeted and untargeted groups would narrow. The average penetration rate in areas with nine or fewer AM/FM stations is **[[REDACTED]]** in areas with more AM/FM stations, a difference of **[[REDACTED]]**. (**[[REDACTED** [redacted]

[277] Satellite radio penetration of population calculated from information on end of 2006 subscriber totals (from XM and Sirius Form 10-K data) and total U.S. population from U.S. Census Bureau News, *Census Bureau Projects Population of 300.9 Million on New Year's Day* (December 28, 2006), *available at* http://www.census.gov/Press-Release/www/releases/archives/population/007996.html (last visited July 12, 2007).

[278] *See* GAO at 9-10; *see also* 21, where the report concludes that the survey data on which these findings were based "were sufficiently reliable for the purposes of this report." These numbers, and the result cited below that just under 9% of U.S. households are in uncabled areas, imply national penetration for satellite TV a little under 19.8%, somewhat higher than the 17.4% figure the GAO reports for national penetration. Note, however, that the GAO relies on different sources for its figures on national penetration and on penetration rates in areas with versus without satellite TV service.

[redacted]]].) This **[[REDACTED** [redacted]]] is unlikely to form the basis of profitable price discrimination. Thus, these two opposing factors create a no-win price discrimination scenario.

158. For example, The C3SR submission labels areas with 15 or fewer terrestrial radio stations as "underserved" by terrestrial radio. According to our analysis, approximately 17% of the U.S. population lives in these areas. C3SR claims that this group is most likely to be harmed by the proposed merger.[279] Price discrimination is only profitable, however, if one group is willing to pay significantly more than another. An analysis of data on satellite radio penetration rates – data that C3SR did not have – does not suggest a substantial difference in average willingness-to-pay. Based on the data that we have collected, the average satellite radio penetration rate for areas with 15 or fewer terrestrial stations is **[[REDACTED]]**. The average penetration rate for all areas with more than 15 stations is **[[REDACTED]]**. This **[[REDACTED]]** is unlikely to be large enough to support profitable price discrimination, in light of the costs and imperfections inherent in such discrimination. **[[REDACTED** [redacted]]].[280]

159. More generally, a price discrimination strategy likely would be unprofitable because it would be imperfect and costly to implement for the following six reasons.

- First, the price discrimination strategy would be imperfect because people do not necessarily drive and listen where they live. Some fraction of consumers targeted for higher prices by their residential ZIP codes actually may do most of their listening while driving in ZIP codes with a large number of AM/FM stations.[281] The reverse also is possible, that consumers favored with lower prices on the basis of their residential ZIP codes actually may do most of their listening while driving in ZIP codes with only a few AM/FM stations.

- Second, the price discrimination strategy would be imperfect because of arbitrage. Some fraction of the targeted subscribers would be able be able to obtain a lower prices by using a ZIP code in an untargeted area, for example, their business address. This

---

[279] *See* C3SR Paper at 5.

[280] As discussed below, the variation in penetration rates across targeted areas also is relevant to the profitability of price discrimination. **[[REDACTED** [redacted]]]. This suggests that such price discrimination would be highly imperfect.

[281] C3SR claims that the existence of areas "unserved" or "underserved" is "significant not only to the residents of these areas but especially to those who travel the roads in these areas." C3SR Paper at 5. But the merged company would find it very difficult to accurately identify which of the consumers who live in areas with more abundant terrestrial radio coverage do or do not travel regularly through areas with more limited coverage. If the merged company cannot accurately identify such travelers, it cannot profitably price discriminate against them.

imperfection would reduce the potential profitability of the strategy because those arbitraging subscribers would obtain a lower price than they would if there were no discrimination.

- Third, the price discrimination strategy would be imperfect because of **[[REDACTED** [redacted]]. For example, as shown in Table B1, **[[REDACTED]]** of satellite radio subscribers in the areas receiving six or fewer AM/FM stations live in ZCTAs whose satellite radio penetration is *below* the average penetration of **[[REDACTED]]** for all the ZCTAs with *more* than six stations. Similarly, **[[REDACTED** [redacted]]. Thus, a price discrimination strategy against subscribers with access to such a low number of AM/FM stations likely would involve prices that were relatively too high for a significant number of subscribers. This also would reduce the profitability of the strategy.[282]

- Fourth, the price discrimination strategy would be imperfect because some favored customers might overlook the lower price. For example, suppose that the higher price were nationally advertised and the lower price offer were disclosed somewhere in the ad. That disclosure might be overlooked by a significant number of consumers to whom the company wished to offer the discount. This would reduce profitability because those potential customers would base their purchase decision on the discriminatory high price and some would choose not to subscribe as a result.

- Fifth, if the higher price involved a higher aftermarket equipment price, the price discrimination would be very costly to implement. No one would voluntarily pay a higher price and the widespread availability of aftermarket radios over the Internet provides a way to avoid paying higher prices. So the merged firm would have to offer a price rebate to all the favored subscribers who can show that they who live outside the targeted areas. Mail-in rebates are generally common in consumer electronics, so this type of price discrimination strategy could be an option. However, as shown in Table B1, if the target were areas with only two or fewer AM/FM radio stations, the targeted group would involve **[[REDACTED]]** of satellite radio subscribers who live in such areas. That small percentage of targeted subscribers would mean that the rebate would have to be processed for **[[REDACTED]]** of aftermarket purchasers. Since it is costly to process mail-in rebates, this would be a very expensive program, relative to the benefits. Even if the strategy targeted subscribers with access to nine or fewer AM/FM stations, **[[REDACTED]]** of purchasers would be eligible for the rebate.

---

[282] For a general analysis, *see* Jerry A. Hausman, Gregory K. Leonard & Christopher A. Vellturo, *Market Definition under Price Discrimination*, 64 ANTITRUST L.J. 367 (1996).

- Sixth, if the merged firm wanted to price discriminate against subscribers with radios pre-installed in vehicles, they would need to obtain the cooperation and acquiescence of automobile OEMs and dealers who promote satellite radio and provide information to vehicle purchasers. It is implausible that a dealer would charge buyers who live in certain ZIP codes higher radio prices. If the merged firm later on tries to charge a higher subscription price based on ZIP code, the buyers will blame the auto manufacturer and dealer, as well as the merged company.
- Seventh, any price discrimination strategy also would be costly because of the "anger" factor. Suppose that the company nationally advertised the low subscription price, but disclosed in the "fine print" that this price was not available everywhere. Assuming that this plan would not be treated as deceptive by the FTC and State Attorneys General, some consumers charged a higher-than-advertised price likely would be angered by the disparity, resulting in the company capturing disproportionately fewer of these customers than it might have absent the discrimination, thereby rendering the discrimination less profitable. In light of the low benefits of price discrimination here, the cost of this irritation could be quite high, relative to the benefit

Thus, all seven of these factors would reduce and likely eliminate the profitability of the price discrimination plan.

160. Finally, a price discrimination strategy here would be risky for another fundamental reason. **[[REDACTED** [redacted]]]. In addition, **[[REDACTED** [redacted]] does not by itself prove whether or to what extent the average subscriber living in that area is more willing to absorb a significant price increase (relative to the average subscriber in areas that receive more AM/FM stations).[283] For example, the willingness-to-pay for satellite radio likely rises with income, and median household income tends to be lower in areas with fewer AM/FM stations.[284] This income effect suggests an offsetting lower willingness-to-pay factor for consumers in these targeted areas. This effect would thereby reduce or eliminate the profitability of any attempt to charge discriminatorily higher prices in areas with a very limited number of AM/FM signals.

---

[283] The technical point is that differences in observed penetration rates between two groups do not necessarily establish that the demand elasticity differs between the two groups (or, if so, by how much). Price discrimination between two groups of consumers can only be profitable if the demand of one group is more inelastic than that of the other. Furthermore, how different are the discriminatory prices charged the two groups and the profitability of price discriminating will depend on how different are the demand elasticities of the two groups, *ceteris paribus*.

[284] Regression analysis shows **[[REDACTED** [redacted]]].

161. This is certainly not intended to say that price discrimination is never profitable for a consumer goods company. Instead, this analysis suggests that discrimination is much less likely to be profitable in a situation like this one, where the targeted group is such a small fraction of likely customers, where the firm faces imperfect information on customers' willingness-to-pay, where there is a potential for arbitrage, and where there are significant costs of implementing a price discrimination strategy.

162. In this regard, it is significant that there is no geographic price discrimination today against subscribers in areas with few AM/FM signals. This is despite the fact that there are only two competitors in the alleged satellite radio "market" that is erroneously claimed in some of the Comments. Moreover, in this alleged duopoly, there is substantial product differentiation between Sirius and XM because of content exclusives and the fact that almost all vehicle manufacturers offer only one satellite radio brand, as well as switching costs between the two services for existing subscribers. This differentiation would appear to provide each firm with the current ability to price discriminate to some extent, if doing so were profitable. Under those circumstances, and given the economic conditions described in this section, the lack of price discrimination in the pre-merger world clearly suggests that profitable price discrimination in the post-merger world also is highly unlikely.

163. A similar analysis applies to truckers. Satellite radio is an attractive option for long distance truckers because they spend a large amount of time in their vehicles, they move across many geographic areas on major highways, and they pass through areas with few terrestrial radio stations. Both Sirius and XM have channels appealing to truckers.[285] Therefore, it would not be surprising if satellite radio were to have an above-average penetration rate among truckers. However, we understand that neither Sirius nor XM attempt to price discriminate against truckers. Moreover, price discrimination against truckers would be very difficult for the reasons already discussed. Truckers can purchase aftermarket receivers on the Internet and in big box stores around the country, so discrimination based on store location would not succeed.[286] Thus, it would be very difficult to effectively target truckers with higher prices. The merged firm conceivably might charge a very high a-la-carte price for the trucker channels, but this discriminatory strategy would be limited by the value of these channels.[287]

---

[285] Sirius offers "Road Dog Trucking Radio" (Channel 147) and XM offers "Open Road" (Channel 171).

[286] If the merged firm were to set an explicitly higher subscription price for truckers, they obviously would not disclose that they were truckers.

[287] We note that the American Trucking Associations has written a letter to the FCC in support of the merger, which is consistent with this analysis that truckers are unlikely to be harmed by the merger. Letter from Richard D. Holcomb, on behalf of the American Trucking Associations, to Marlene H. Dortch, Secretary, FCC, dated June, 21, 2007.

164. In summary, the merger will benefit consumers in areas with limited AM/FM coverage, and truckers, not harm them. The merger will reduce the costs and increase the quality of the audio entertainment product offered by the merged firm. The merger also will resolve free-rider problems and thereby increase the incentives for cost-reducing and demand-increasing investment, including penetration pricing. Thus, these consumers – as well as those living in areas that are better served by terrestrial radio broadcasters – will gain better audio options, even if there are fewer available terrestrial radio stations in some areas than others.

VI. CONCLUSIONS

165. For all these economic and factual reasons, the merger of Sirius and XM is likely to be a procompetitive transaction, however the market is defined. It is likely to increase competition and output, while reducing prices, not the opposite. The merger is unlikely to lead to price discrimination against subscribers in areas with limited coverage by AM/FM stations or against long distance truckers. The merger more likely will lead to lower costs, higher product quality, and an increased incentive to invest in demand-enhancing and cost-reducing activities. The greater efficiency and attractiveness of satellite radio after the merger likely also will have a procompetitive effect by spurring further innovation and investment by other audio entertainment competitors.

166. The parties have proposed a set of commitments to the Commission involving the offering of a variety of program options at certain prices. One component of the commitment would involve the continued availability of the current programming packages of Sirius and XM at the current $12.95 price. Another component would offer several options of fewer channels in exchange for lower prices. Another component would offer several options of increased channel coverage choices (including select content from the other service) at maximum prices of $16.99, well below the current $25.90 total price of subscribing to both services, and without the need to purchase two receivers. Finally, in the future, the parties will offer two expanded internet-based a-la-carte plans where a subscriber can pick (a) 50 channels for $6.99 with a $.25 a-la-carte per channel charge for additional channels (except for a few specified "super premium" channels, which would be available at a higher price) or (b) 100 channels for $14.99, including premium channels.

167. Our economic analysis does not rely on these commitments, and demonstrates that such commitments are not necessary to ensure that consumers are benefited from the merger. Competition and consumer welfare will increase from the lower costs, increased quality and enhanced procompetitive incentives created by the merger. However, these commitments suggest consumer benefits, absent evidence that prices would have fallen without the merger. Certain groups of consumers will opt for a reduced cost package. Others will opt for a more expensive package instead of the status quo. Even if subscribers choose a more expensive package with an expanded set of programming, the voluntary

choice suggests that they are made better off. The two a-la-carte options similarly will increase choice. In addition, none of the packages which combine content from both services would have been available absent the merger. Offering these additional price/programming will also lead to increased subscriptions to the merged firm.

Appendix A

Dynamic Demand Functions and Implications for Merger Analysis: Penetration Pricing and Dynamic Spillover Effects

The purpose of this Appendix is three-fold. First, this Appendix will analyze the pricing decision of a firm facing a *dynamic demand function*. Such demand functions arise when current sales of the product have a *spillover effect* on future sales, that is, future demand for the product will be higher if there are higher current sales. The pricing analysis will show that a firm operating in this type of environment has an incentive to engage in *penetration pricing*, the strategy of charging a relatively low current price as a means of promoting future sales. This is because a low current price represents an investment in future demand.[1]

Second, this Appendix will draw implications of penetration pricing for market definition. In particular, dynamic demand and penetration pricing imply that a naive application of the *ssnip* test based on the standard (static) Lerner condition likely would be misleading.

Third, this Appendix will examine the implications of dynamic demand and penetration pricing on competitive effects analysis in merger cases. A firm's low penetration pricing generates a positive externality on other firms' future profits because the dynamic spillover effect increases the future sales of *all* the firms, not just own future sales. This gives rise to a pro-competitive justification for mergers, as the merged entity will internalize this externality and thus will have a greater incentive to engage in low penetration pricing.

The rest of this Appendix is organized as follows. Section 1 provides a brief introduction to dynamic demand functions and foreshadows how they affect a firm's pricing behavior. Section 2 describes formally a firm's pricing decision in the presence of dynamic demand functions, showing that such a firm has an incentive to engage in penetration pricing. Section 3 derives implications of penetration pricing for market definition and competitive effects analysis in the context of mergers.

This Appendix focuses attention to a firm's pricing decision. However, it should also be emphasized that the same ideas apply to other demand-enhancing investments, such as investments in product quality and advertising. Furthermore, they also apply to investments in technologies that reduce variable costs.

1. A Brief Introduction To Dynamic Demand Functions

New products often have the characteristic that the demand for the product will be higher

[1] The dynamic demand spillover effect is similar to the "goodwill" effect described in Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (MIT Press 1990) at 71.

in the future, if there are higher current sales. In economics jargon, the *demand function* is *dynamic* because current sales have a *spillover effect* on future sales. This interdependence between current and future sales has numerous possible causes, depending on the characteristics of the product and the market.

First, dynamic demand can be attributed to a process of *information diffusion*, which can take various forms. For example, it could involve word-of-mouth diffusion from early adopters to late adopters that raises awareness for the product. In effect, early adopters could act as "marketing agents" on behalf of the firms providing the product.[2] The dynamic demand also could describe a more general informational phenomenon of "viral marketing." For example, people may become more comfortable with the product over time as it has "proven itself" in the marketplace.

Second, dynamic demand can be attributed to *network effects or bandwagon effects*. Network effects would occur if the value of the product to consumers increases as more other consumers acquire the product.[3] Alternatively, over time additional sales of the product may lead it to become more fashionable, creating a bandwagon effect that increases future sales growth. Similarly, the incentives of retailers can also give rise to dynamic demand functions, if retailers are more willing to invest in promoting a product if and when the product has proven to be popular.

Third, dynamic demand can be attributed to *consumer inertia or other switching costs*. For example, suppose that consumers are more willing to purchase a non-durable product in the future if they begin purchasing in the present.[4] In that case, future demand will be increased if current sales rise. This consumer inertia could be psychological. It could involve habituation, as in the case of cigarettes.[5] Alternatively, the inertia could arise if consumers invest in learning how to use a product, as in the case consumer software. In that latter type of situation, when the product wears out or is replaced by upgrades, the consumer is more likely to purchase the product already being used. Again, this would

---

[2] The foundations of information diffusion theory are presented in the seminal work of Everett M. Rogers, DIFFUSION OF INNOVATIONS (1983). Frank M. Bass, *A New Product Growth Model for Consumer Durables*, 15 MGMT. SCI. 1825 (1967) suggested a mathematical formulation of the theory, which gave rise to a large literature in marketing. A survey of this literature can be found in Vijay Mahajan, Eitan Muller & Yoram Wind (eds.), NEW-PRODUCT DIFFUSION MODELS (2000).

[3] *See, e.g.,* Joseph Farrell & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 RAND J. ECON. 70 (1985), and Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424 (1985).

[4] A survey of work on markets in which consumers face switching costs can be found in Paul Klemperer, *Competition When Consumers Have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics, and International Trade*, 62 REV. OF ECON. STUDIES 515 (1995).

[5] *See* Gary S. Becker & Kevin M. Murphy, *A Theory of Rational Addiction*, 96 J. OF POLIT. ECON. 675 (1988).

lead to higher current sales driving higher future sales too.[6]

In such an environment, the behavior of a myopic firm that would maximize short-term profit does not coincide with that of a rational, forward-looking firm that maximizes long-term profit.[7] In particular, a forward-looking firm facing a dynamic demand function has an incentive to set a lower current price, relative to the one it would charge if it maximized short-term profit. In this way, the firm can boost the future demand for its product, with the resulting increase in long-term profit more than offsetting the initial decrease in short-term profit. This strategy of setting a lower current price is referred to as *penetration pricing*. The low current price is an investment in future demand. Similarly, the firm has an incentive to spend more, than it otherwise would, on both demand-enhancing investments (product quality improvements and advertising) and cost-reducing investments. This is because the resulting increases in current sales due to these investments will have a dynamic spillover effect, increasing future sales as well.

The rest of the Appendix formalizes the idea that a firm facing a dynamic demand function has an incentive to engage in penetration pricing and other investments, and then derives several implications of these incentive effects for merger analysis.

2. Pricing In The Presence Of A Dynamic Demand Function

To illustrate, consider a firm that sells its product in a market that lasts for two periods. In period 1 (present) the demand for the firm's product is given by:

$$Q_1 = d_1(P_1) \tag{A1}$$

where Q_1 and P_1 denote the quantity and price of the firm's product in period 1, respectively. The function $d_1(P_1)$ is assumed to be decreasing, reflecting the standard assumption that the volume of sales decreases as the price increases.[8]

In period 2 (future) the demand for the firm's product is given by:

$$Q_2 = d_2(P_2, Q_1) \tag{A2}$$

where Q_2 and P_2 denote the quantity and price of the product in period 2, respectively. The

[6] For a model of dynamic demand due to consumer learning, *see* J. Miguel Villas-Boas, *Consumer Learning, Brand Loyalty, and Competition*, 23 MKTG. SCI. 134 (2004).

[7] There is a large literature that discusses the pricing decision of firms facing dynamic demand functions. The pricing problem of a single seller facing dynamic demand is worked out, among others, by Shlomo Kalish, *Monopolist Pricing with Dynamic Demand and Production Cost*, 2 MKTG. SCI. 135 (1983). An extension to an oligopolistic setting is provided by Engelbert Dockner & Steffen Jorgensen, *Optimal Pricing Strategies for New Products in Dynamic Oligopolies*, 7 MKTG. SCI. 315 (1988).

[8] The demand for the firm's product (implicitly) depends also on the prices of other products. For simplicity, we hold the prices of these other products constant.

function $d_2(P_2, Q_1)$ satisfies two assumptions: i) it is decreasing in the second-period price (P_2), and ii) it is increasing in the first-period quantity (Q_1). The former assumption says that the volume of sales in period 2 (Q_2) decreases as the price in period 2 (P_2) increases. The latter says that current sales have a spillover effect on future sales, such that an increase in the volume of current sales (Q_1) leads to a higher volume of future sales (Q_2). This could reflect, for example, the fact that in period 1 information diffuses from early adopters to late adopters and creates higher future demand for the product.

The firm will set prices in periods 1 and 2 so as to maximize the discounted sum of its profits from both periods (*i.e.*, its long-term profit). In other words, the firm solves:

$$\max_{P_1, P_2} \Pi_1 + \delta \Pi_2 = (P_1 - C_1) d_1(P_1) + \delta (P_2 - C_2) d_2(P_2, Q_1) \tag{A3}$$

where C_1 and C_2 denote the firm's (constant) marginal cost in periods 1 and 2, respectively, and $\delta > 0$ denotes the "discount factor" between periods 1 and 2.[9]

Letting $s = \partial d_2(P_2, Q_1) / \partial Q_1$ denote the dynamic spillover effect between current and future sales, the first-order conditions for profit maximization yield:

$$\frac{(P_1 - C_1) + \delta s (P_2 - C_2)}{P_1} = \frac{1}{E_1} \tag{A4}$$

$$\frac{P_2 - C_2}{P_2} = \frac{1}{E_2} \tag{A5}$$

where E_1 and E_2 denote the price elasticities of the demand functions $d_1(P_1)$ and $d_2(P_2, Q_1)$, respectively.

Equation (A5) is the standard *static* Lerner condition that determines the optimal price in period 2. It says that the profit margin in period 2 (expressed as a percentage of the second-period price) is equal to the inverse elasticity of demand in period 2.

Equation (A4) is a *dynamic* Lerner condition that determines the optimal price in period 1. It is similar to the standard static condition, except that the relevant profit margin is not just the first-period margin (*i.e.*, $P_1 - C_1$) but also includes the discounted future margin obtained in period 2 from an additional sale in period 1 (*i.e.*, $\delta s (P_2 - C_2)$).

[9] One can assume that the discount factor is less than 1, i.e., $\delta = 1/(1+r)$, where r is the rate of interest. Alternatively, one can assume $\delta > 1$ if period 2 in fact corresponds to many (identical) periods.

Moreover, inspecting equation (A4), it follows that the presence of dynamic spillover effects tends to reduce the price in period 1, relative to the case of no dynamic spillover effects (*i.e.*, the case with $s = 0$). To see this, it is useful to re-write equation (A4) as shown below:

$$\frac{P_1 - [C_1 - \delta s(P_2 - C_2)]}{P_1} = \frac{1}{E_1} \tag{A6}$$

This says that the dynamic spillover effect makes the firm behave as if its first-period marginal cost was lower by the amount $\delta s(P_2 - C_2)$, which is the discounted margin that the firm will obtain in period 2 from an additional sale in period 1. As a result, in the same way that a reduction in marginal cost induces a firm to lower its price, the dynamic spillover effect tends to reduce the price in period 1. Thus, the benefit of the spillover effect is also shared by consumers in the form of a lower price. All else equal, the greater the extent of the dynamic spillover effect, s, the more pronounced is the incentive to lower the price.[10]

The intuition behind the result is straightforward. When current sales lead to higher future sales, *i.e.*, $s > 0$, the firm faces the following trade-off between current and future profits. By setting a lower first-period price, relative to the price that maximizes the (short-term) first-period profit, the firm foregoes some profits in the first period. At the same time, however, the lower price allows the firm to expand sales in the first period, which in turn increases demand and hence profitability in the second period. In a longer time frame, this effect will continue to occur as long as demand exhibits dynamic spillover effects.

In this respect, it is important to note that in a model with N>2 periods of dynamic demand, the incentive to engage in penetration pricing continues until the very last period. Only in the very last period will there be no future benefits of holding price below the short-term profit-maximizing level.

---

[10] For example, if $C_1 = C_2 = 1$ and $E_1 = E_2 = 2$, then Equations (A4) and (A5) imply the following optimal prices: $P_2 = 2$ and $P_1 = 2(1 - \delta s)$. Thus, the stronger the dynamic spillover effect (i.e., the higher the value of s), the lower the price in period 1. To illustrate this point, suppose that the discount rate is $\delta = 1$ and the dynamic spillover effect is initially $s = 0.5$. Then, the first-period price is $P_1 = 1$ and is 50% lower than in the absence of a dynamic spillover effect (i.e., the case with $s = 0$). If the spillover effect increases to $s = 0.75$, then the first-period price falls from $P_1 = 1$ to $P_1 = 0.5$, a further 50% reduction. Notice that in this type of dynamic market, the (long-term) profit-maximizing first period price can be less than marginal cost. This is reminiscent of below-cost pricing that may arise when a firm sells complementary products (*e.g.*, a firm might sell razors at prices below cost in order to sell more blades later).

The same logic also applies to other demand-increasing investments, such as product quality improvements and advertising. That is, such investments increase the firm's current volume of sales and thus have a dynamic spillover effect on future sales. (In the case of a permanent quality improvement, future sales will be higher both because of the higher quality and also because of the dynamic spillover effect.) The firm therefore has a greater incentive to undertake such investments than it would have if it maximized short-term profit. A similar logic also applies to cost-reducing investments. When a firm decides how much to invest to reduce its variable costs, the firm takes into account that a cost reduction will allow it to charge a lower price and increase its current volume of sales. In addition, the firm takes into account that the higher current sales will generate higher future sales due to the dynamic spillover effect. Thus, the firm has a greater incentive to reduce variable costs than it would have if it maximized short-term profit.

To summarize, in markets with dynamic demand spillovers, firms have an incentive to engage in penetration pricing, the strategy of setting a relatively low current price to create higher future demand. This is a rational strategy because the resulting decrease in short-term profit is more than offset by an increase in future profits.

3. Implications For Merger Analysis

This section discusses three important implications of penetration pricing for merger analysis.

First, penetration pricing has an important implication for the implementation of the *ssnip* test and market definition. If one were erroneously to evaluate the profitability of a *ssnip* using the *static* Lerner Condition, then one likely would find the *ssnip* to be profitable. However, a correct implementation of the *ssnip* test should be based instead on the *dynamic* Lerner condition (see equation (A4)), which takes into account the dynamic spillover effect. This is what a forward-looking hypothetical monopolist who maximizes long-term profit would use.

Second, the preceding discussion also has implications for the use and interpretation of econometric studies for the purposes of market definition. For example, even if a rigorous econometric study were to find that the short-term demand for a group of products is relatively inelastic, that fact would not imply that the group of products is a proper relevant antitrust market.

Third, penetration pricing has implications for competitive effects analysis. Notice first that when there are two (or more) firms, low penetration pricing by one firm will also increase the future demand faced by the *other* firm(s). This is because a firm's current sales will have a spillover effect on the future sales of the product category as a whole. For example, seeing an increasing number of people using an iPod creates a bandwagon effect both for portable music devices in general, as well as for the iPod brand. A similar effect

applies to satellite radio brands. Increased sales of XM Radio will also promote satellite radio in general, not just XM Radio, which will increase the future demand for Sirius as well.

Consequently, each firm's low penetration price in period 1 creates a positive externality on the other firm's profit in period 2. This is because by reducing its price in period 1, a firm sells more in period 1, which means that the other firm also will obtain a greater boost to its second-period demand through the dynamic demand process. In some sense, penetration pricing has a "public good" (*i.e.*, "externality") aspect. Pre-merger, however, each firm does not account for the spillover benefit obtained by the other firm, and therefore there is "under-provision of the public good" in the sense that there is too little penetration pricing. This is a type of "free-rider" problem. A merger will allow the two firms to internalize the positive externality created by penetration pricing, giving them an incentive to further decrease their prices to boost future demand. This incentive to reduce prices post-merger may offset or even override the incentive to raise prices that merging firms have in standard unilateral effects analysis.[11]

The increased incentive to reduce prices post-merger can also be understood in the context of the two-period model described above. The internalization of the positive externality on the other firm's future profit can be thought of as corresponding to an increase in the extent of the dynamic spillover effect, s. As a result, in the same way that an increase in the extent of the dynamic spillover effect, s, leads a firm to decrease its first-period price, the merger will create an incentive for the merging firms to decrease their first-period prices post-merger. In addition, the merged firm will have an increased incentive to undertake both demand-enhancing investments (product quality improvements and advertising) and cost reducing investments. In a longer time frame, these effects will continue to occur as long as demand exhibits dynamic spillover effects.

[11] The positive externality discussed here thus coexists with the usual negative externality between a firm's lower price in period t and the other firm's profit in period t.

Appendix B

Dynamic Demand Functions and Implications for Merger Analysis: The Effects of Lump Sum Payments for Inputs on Downstream Output Prices

The purpose of this Appendix is to establish two important results. First, in the presence of dynamic demand spillovers, *lump sum* payments to input suppliers have the effect of raising downstream output prices. Second, if the merger of two users of a given input weakens the input supplier's bargaining position vis-à-vis the merging firms, then there is a pro-competitive merger effect regardless of whether the weaker bargaining position of the supplier leads to lower variable (*i.e.*, per unit) payments or to lower lump sum payments from the merged firm.

When suppliers set input prices on a per unit basis and have a degree of market power, it is well understood that the merger of two customers may generate a procompetitive effect if it gives the merging parties some degree of countervailing bargaining leverage. That is, suppose that the merged firm is able to negotiate a lower price per unit (for an unlimited number of units) of an input sold by a supplier with market power. Under these conditions, simple microeconomic theory would imply that the input purchaser would have an incentive to pass a portion of these input cost savings on to consumers in the form of lower output prices. This Appendix will show that in markets with dynamic demand spillovers, a similar result applies when supply contracts specify lump sum payments (as opposed to per unit prices) for the inputs.

Markets with dynamic demand spillovers have the property that lump sum payments to input suppliers have an effect on output prices. This is because lump sum payments represent a fixed cost *ex-post* (*i.e.*, in the future, after the payments have been agreed upon), but a variable cost *ex-ante* (*i.e.*, from the perspective of the present, before the amounts of the payments are determined). Therefore, the expectation of making lower lump sum payments for inputs in the *future* increases a firm's incentive to engage in low penetration pricing in the *present*. This result stems from the observation that when a firm expects to pay a smaller fraction of its future profits to input suppliers, the firm perceives a greater return from increasing its current volume of sales as a means to boost future demand and increase future profits (through dynamic demand spillovers).[299]

Drawing on these results, this Appendix will explain that when a merger between two purchasers of a given input reduces the supplier's bargaining leverage vis-à-vis the merging firms, there is a pro-competitive merger effect, even if the payments for the input involve only lump sum payments. This arises from the fact that the merged firm will

[299] Therefore, the expectation of making lower lump sum payments for inputs in the future also increases a firm's incentive to undertake other demand-enhancing investments (such as quality improvements and advertising) as well as cost-reducing investments.

expect to keep a higher fraction of future profits and, as a result, will have a greater incentive to engage in low penetration pricing, even when the payments that will be made to suppliers are lump sum.

The rest of this Appendix is organized as follows. Section 1 provides a brief discussion of the efficiency rationale for lump sum payments in the context of bilateral bargaining and their effect on downstream output prices. Section 2 analyzes through an illustrative two-period model how a firm's pricing decisions depend on lump sum payments to input suppliers when there are dynamic spillover effects. Section 3 derives implications for merger analysis.

1. Bilateral Bargaining, Lump Sum Payments For Inputs, And Downstream Output Prices

Consider an upstream monopolist (input supplier) selling to a single downstream buyer. To fix ideas, suppose that the buyer in question is a satellite radio provider and the input supplier is a content provider with exclusive rights on one of the major sports. Both sides of this transaction are large and sophisticated economic agents. As a result, neither of them can be thought of as the dominant "price setter." Rather, the two parties can be thought of as jointly determining the price and quantity of the input through a process of bilateral bargaining and negotiation.[300]

Under standard "textbook" assumptions (*i.e.*, no uncertainty, no asymmetric information, etc.), the bilateral bargaining model leads to an efficient outcome. For example, the content provider and the satellite radio provider can agree to a pricing scheme that has two components: (a) a per-subscriber price for the input (*i.e.*, for the rights to offer the content to subscribers), and (b) a lump sum payment from the satellite radio provider to the content provider. An efficient outcome can be achieved by setting the per-subscriber price equal to the content provider's marginal cost of supplying broadcast rights.[301] This guarantees that the satellite radio provider faces the true resource cost of the input and therefore makes efficient output decisions (*e.g.*, the amount of coverage of that particular sport to be aired on the radio's sports channel). In other words, marginal cost pricing ensures that the buyer will produce the highest possible value from the input (or generate the biggest possible

[300] The economic literature sometimes refers to this bilateral bargaining process as bilateral monopoly, to be contrasted with the case of pure monopoly where the price is set by the seller (content provider), and the case of pure monopsony where the price is set by the buyer (satellite radio provider). This literature dates back to Arthur L. Bowley, *Bilateral Monopoly*, 38 ECON. J. 651 (1928). Some widespread misconceptions surrounding the bilateral monopoly problem are discussed in Roger D. Blair, David L. Kaserman & Richard E. Romano, *A Pedagogical Treatment of Bilateral Monopoly*, 55 S. ECON. J. 831 (1989).

[301] For broadcast media, royalty payments might be the main marginal cost.

total surplus).[302] The lump sum payment then is the mechanism with which the buyer shares the gains from trade with the seller.[303]

It should be emphasized that the bilateral bargaining model is different from the standard (pure) monopsony model in two respects. First, in the monopsony model, the supply side of the market is assumed to consist of a large number of small input suppliers who have no bargaining leverage (*i.e.*, they take the input price set by the monopsonist as given).[304] Second, the monopsonist is constrained to use linear pricing, *i.e.*, it must choose a constant per-unit price and cannot use lump sum payments. For these reasons, an increase in monopsony power leads to an inefficient reduction in the amount of input purchased (and thus a lower input price) which in turn leads to an inefficient output reduction (and thus a higher output price). In sharp contrast, in the standard bilateral bargaining analysis, an increase in the bargaining leverage of the buyer does not lead to any inefficient input or output reduction, or a higher output price. This is because a change in the parties' relative bargaining leverage leads to a change in the size of the lump sum payment, but it does not change the per-unit price of the input (as the latter remains equal to the supplier's marginal cost).

Similarly, the bilateral bargaining model is different from the standard (pure) monopoly model. In the monopoly model, the demand side of the market consists of a large number of small buyers with no bargaining leverage and who take the price set by the monopolist as given. The monopolist is constrained to choose a constant per-unit price and cannot use lump sum payments. These assumptions imply that an increase in monopoly power leads

---

[302] Marginal cost pricing may not be optimal if the "textbook assumptions" of the standard bilateral monopoly model do not hold. In particular, when the level of demand for the final product is uncertain, efficient risk-sharing between the supplier and the distributor may lead to a price greater than marginal cost (and to a lower lump sum payment). For risk-averse firms, that is a more efficient arrangement as it allows them to share the risk associated with demand uncertainty. This is a type of "metering," though in this analysis it is not used to price discriminate or as part of a tying arrangement. Other instances where departures from marginal cost pricing may be efficient arise in the presence of information asymmetries. For example, similar contracts with price above marginal cost can mitigate moral hazard issues (*e.g.,* by increasing the supplier's incentive to undertake non-contractible, demand-enhancing investments after the contract is signed). They also can be used as a screening device (*e.g.,* when the supplier does not know how efficient the distributor is) and as a signaling device (*e.g.,* when the distributor cannot observe or verify the quality of the product). For a more complete discussion of these issues, *see* Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (MIT Press 1990) at 176-78.

[303] We adopt an *efficient bargaining* framework to simplify the analysis. The main result of this Appendix – that lump sum payments to upstream input suppliers may have an effect on downstream output prices – continues to hold even if the bargaining is more complex.

[304] The acquisition of content by satellite radio providers involves direct bargaining with content owners. The content is not fungible, as in the standard monopsony model. Instead, it is highly differentiated. The owners of certain content have potential market power on the sell-side because their content is uniquely differentiated and highly desirable.

to an inefficient output reduction and a higher price for consumers.[305]

We now turn to the relationship between lump sum payments to input suppliers and downstream output prices. To fix ideas, consider the effect of lump sum payments to content providers on the pricing decisions of satellite radio providers for their final products. For a satellite radio provider, the lump sum amount that it has agreed to pay to a content provider (at the beginning of the current period) represents a fixed cost and thus has no effect on the pricing decision of the satellite radio provider in the current period.[306] However, the analysis is more complex when the satellite radio provider can affect future lump sum payments by its current pricing. In this scenario, the satellite radio provider should take this interdependence into account when setting the current price of its radio service. In effect, this is because future lump sum payments are fixed costs ex-post (*i.e.*, after they have been written into the supply contract), but they are variable costs ex-ante (*i.e.*, before they are agreed upon). The next section will show that this is precisely the situation faced by a firm whose product demand is characterized by dynamic demand spillovers. The last section will draw implications of this fact for merger analysis.

2. The Firm's Pricing Decision

The basic illustrative set up is similar to that of Appendix A: there is a firm (satellite radio provider) that sells its product in a market that lasts for two periods, and faces a dynamic demand for its product given by equations (A1) and (A2), for periods 1 and 2, respectively.

The following modification is now added. The satellite radio provider needs an input (programming content) which it can acquire from a unique input supplier (content provider). Both the satellite radio provider and the content provider are assumed to be large, sophisticated buyers and, as a result, their interaction can be best described as bilateral bargaining. Furthermore, it is assumed that at the beginning of each period, before the satellite radio provider has set its output price, the two parties bargain over the terms of trade and reach an efficient bargaining agreement to cover the supply of content for the upcoming period.

We draw on the discussion of the previous section and assume for simplicity that the content provider has zero marginal cost. (In addition, there is no demand uncertainty or asymmetric information.) Under these conditions, an efficient agreement generally will involve a lump sum payment from the satellite radio provider to the content provider. The variable F_t denotes the lump sum payment that the satellite radio provider pays to the content provider in period t. Thus, the satellite radio provider's discounted sum of profits

[305] Bilateral bargaining therefore does not lead to a "double distortion" of output but rather an increase in output up to the efficient, competitive level.

[306] Alternatively, the lump sum payment could represent a sunk cost, depending on when the lump sum amount is paid out.

from periods 1 and 2 (*i.e.*, its long-term profit) is:

$$\Pi_1 + \delta\ \Pi_2 = (P_1 - C_1)d_1(P_1) - F_1 + \delta\ [(P_2 - C_2)d_2(P_2, Q_1) - F_2] \tag{B1}$$

With respect to the determination of the lump sum amount F_2, we assume that the satellite radio provider and the content provider will agree at the beginning of period 2 on a lump sum payment that corresponds to a fraction (x) of the second-period gross profit of the satellite radio provider. This is consistent with standard bargaining theory.[307]

Under the above assumptions, and given the lump sum amount F_1 agreed upon by the parties at the beginning of period 1, the satellite radio provider will choose output prices in periods 1 and 2 by solving:

$$\max_{P_1, P_2}\ (P_1 - C_1)d_1(P_1) - F_1 + \delta\ (1-x)(P_1 - C_2)d_2(P_2, Q_1) \tag{B2}$$

Letting $s = \partial d_2(P_2, Q_1) / \partial Q_1$ denote the dynamic spillover effect between current and future sales, the first-order conditions for profit maximization yield:

$$\frac{P_1 - [C_1 - \delta(1-x)s(P_2 - C_2)]}{P_1} = \frac{1}{E_1} \tag{B3}$$

$$\frac{P_2 - C_2}{P_2} = \frac{1}{E_2} \tag{B4}$$

[307] Under standard bargaining theory, the outcome is an equal split of the total profits (surplus) generated by the transaction, relative to the parties' next-best alternatives. For example, suppose that (a) the content provider has no alternatives and thus has a reservation price of zero, and (b) in the absence of an agreement, the gross profit of the satellite radio provider would be reduced by 20%. In this case, an equal split of the surplus corresponds to $x = 10\%$ (*i.e.*, the lump sum payment to the content provider corresponds to 10% of the gross profit of the satellite radio provider). This outcome is referred to as the Nash bargaining solution, due to John F. Nash, Jr., *The Bargaining Problem*, 18 ECONOMETRICA 155 (1950), who provided an axiomatic foundation. This work is further extended in John Nash, *Two-Person Cooperative Games*, 21 ECONOMETRICA 128 (1953). Ken Binmore, Ariel Rubinstein & Asher Wolinsky, *The Nash Bargaining Solution in Economic Modelling*, 17 RAND J. OF ECON. 176 (1986) provided conditions under which the Nash bargaining solution coincides with the perfect equilibrium of the non-cooperative, alternating-offer bargaining game analyzed by Ariel Rubinstein, *Perfect Equilibrium in a Bargaining Model*, 50 ECONOMETRICA 97 (1982).

Equations (B3) and (B4) are the dynamic and static Lerner conditions, as in equations (A4), (A5) and (A6) in Appendix A.

Equation (B3) shows that the first-period price (P_1) does not depend on the magnitude of the lump sum amount that the satellite radio provider has agreed to pay in period 1 (F_1). Likewise, equation (B4) shows that the second-period price (P_2) does not depend on the second-period lump sum payment, since equation (B4) does not involve the fraction x. These observations confirm a general result in the context of this two-period model: the fixed costs that a firm incurs in a given period do not affect the price that the firm charges for its product in that period.

However, the lump sum amount that the satellite radio provider *expects to pay in period 2* does affect the price that the satellite radio provider charges in period 1, since equation (B3) involves the fraction x. This occurs because the second-period lump sum payment represents a fixed cost *ex-post* (*i.e.*, from the perspective of period 2), but is a variable cost *ex-ante* (*i.e.*, from the perspective of period 1). That is, the satellite radio provider can alter the amount it will pay to the content provider in period 2 by modifying its price in period 1.

Moreover, if in period 1 the satellite radio provider expects that it will pay a smaller amount in period 2 (*i.e.*, if the lump sum payment to the content provider will represent a smaller fraction x of the second-period profit of the satellite radio provider), then equation (B3) shows that the satellite radio provider behaves as if its first-period marginal cost is lower. As a result, in the same way that a marginal cost reduction is passed through to consumers in the form of a lower price, a reduction in the bargaining leverage of the content provider (*i.e.*, a reduction in the magnitude of the fraction x) leads to a lower first-period price.

This section's main result can be stated as follows:

> When there are dynamic spillover effects (*i.e.*, $s > 0$), if future lump sum payments to input suppliers will represent a smaller share of the firm's future profits, then the firm has an incentive to reduce its current price (*i.e.*, P_1 decreases as x decreases). In other words, if the firm expects to pay lower lump sum amounts in the future, then it charges a lower price in the present.

The intuition is as follows. When $s > 0$, the demand for the product will be higher in period 2 if there are more sales in period 1. This creates an incentive to set a low penetration price in period 1 (relative to the price that would maximize short-term profit) in order to boost demand and profitability in period 2. The higher the "weight" $\delta(1-x)$ that the firm assigns to the second-period profit, the lower the first-period price. In particular, if the firm expects to keep a higher fraction of the gross profit in period 2 (*i.e.*, if 1-x is

larger), then the firm will weigh the future relatively more, and thus has a greater incentive to decrease price in period 1.

To summarize, when demand exhibits dynamic spillover effects, a firm has a *greater* incentive to engage in penetration pricing (*i.e.*, set a lower current price) if it expects to surrender a *smaller* fraction of its future profits in the form of lower lump sum payments to input suppliers. A similar analysis also would apply to the firm's incentive to undertake other demand-enhancing investments (*e.g.,* product quality improvements and advertising) as well as cost-reducing investments.

3. Implications For Merger Analysis

Mergers often allow the merging parties to negotiate better terms with their suppliers. It is well understood that when these "better terms" take the form of lower *per-unit* input prices, they will be passed through in part to final consumers in the form of lower output prices.

The above analysis has demonstrated that lower *lump sum* payments similarly lead to lower prices for final consumers, if there are dynamic demand spillovers. A direct consequence of this result is that mergers in such dynamic markets produce a pro-competitive effect if the input supplier's bargaining leverage vis-à-vis the merging parties decreases post-merger. This favorable outcome occurs because the merged entity expects that it will concede a smaller fraction (relative to pre-merger) of its future profits to input suppliers, and hence the merged entity has a greater incentive to engage in penetration pricing (*i.e.*, charge lower current prices to boost future sales). In addition, the merged entity also has an increased incentive to invest in the product, relative to the incentives that the merging firms have pre-merger.

REDACTED
FOR PUBLIC INSPECTION

INTERNATIONAL

STEVEN C. SALOP

Senior Consultant

Ph.D. Economics
Yale University

M.Phil. Economics
Yale University

B.A. Economics
University of Pennsylvania

FIELDS OF SPECIALIZATION

- Industrial Organization
- Competition and Antitrust Policy
- Economics of Information
- Law and Economics

EMPLOYMENT EXPERIENCE

Professor of Economics and Law, Georgetown University Law Center, 1982–present.

Guest Scholar, Brookings Institution, 1990–1991.

Visiting Professor, Massachusetts Institute of Technology, Spring 1986.

Visiting Interdisciplinary Professor, Georgetown University Law Center, July 1981–June 1982.

Associate Director for Special Projects, Bureau of Economics, Federal Trade Commission, January 1980–June 1981.

Assistant Director for Industry Analysis, Bureau of Economics, Federal Trade Commission, September 1979–January 1980.

Deputy Assistant Director for Consumer Protection, Bureau of Economics, Federal Trade Commission, December 1978–September 1979.

Economist, Division of Consumer Protection, Bureau of Economics, Federal Trade Commission, July 1978–December 1978.

Economist, Office of Economic Analysis, Civil Aeronautics Board, September 1977–July 1978.

Economist, Federal Reserve Board, July 1972–September 1977.

Adjunct Professor, Department of Economics, University of Pennsylvania, September 1977–June 1978.

Adjunct Professor, Department of Economics, George Washington University, September 1975–January 1978.

SELECTED PROFESSIONAL ACTIVITIES

Associate Editor, Economists' Voice

Associate Editor, Litigation Economics Review

Consultant, FTC Joint Venture Project (1999).

Advisory Committee, FTC Hearings on Global and Innovation-Based Competition (1996).

Associate Editor (Industrial Organization), *Journal of Economic Perspectives* (1987–1993).

American Bar Association Antitrust Task Force on Second Requests (1990).

Advisory Board, Georgetown Project on Treble Damages (1986–1987).

Associate Editor, *Journal of Industrial Economics* (1983–1988).

Associate Editor, *International Journal of Industrial Organization* (1984–1989).

Secretary, Antitrust Section, American Association of Law Schools (1983–1984).

Memberships: American Economic Association, American Bar Association, Phi Beta Kappa.

Nominating Committee: American Economic Association, 1982.

Economics Editorial Advisor, *Journal of Consumer Research*, 1982.

OTHER ACTIVITIES

Board of Directors, CRA International

Management Advisory Committee, La Leche League International (1994–1999).

Board of Trustees, The Lowell School (1989–1995).

HONORS AND AWARDS

NSF Graduate Fellowship, 1968–1972.

Graduated *summa cum laude*, with Honors in Economics, from the University of Pennsylvania, 1968.

Schoenbaum Prize in Economics, University of Pennsylvania, 1968.

Phi Beta Kappa, 1968.

PUBLICATIONS

Books and Reports

Strategy, Predation, and Antitrust Analysis. (Editor.) Federal Trade Commission, 1981.

Consumer Post-Purchase Remedies. With J. Howard Beales et al. Federal Trade Commission Staff Report, 1980.

Consumer Information Remedies. With Lawrence Kantor et al. Federal Trade Commission Staff Report, 1979.

Articles

"Exclusionary Vertical Restraints: Did the Chicago-School Overshoot the Target?" (Prepared for Kirkpatrick Conference at GULC, April 2007) (forthcoming)

" The Controversy over the Proper Antitrust Standard for Anticompetitive Exclusionary Conduct," Barry Hawk (ed), *Fordham Competition Law Institute 33rd Annual Conference on International Antitrust Law and Policy* 2006

Exclusionary Conduct, Effect on Consumers, and the Flawed Profit-Sacrifice Standard," Antitrust Law Journal (2006).

"Anticompetitive Overbuying by Power Buyers," Antitrust Law Journal (2005)

"A Few Righteous Men: Imperfect Information, Quit-for-Tat and Critical Mass in the Dynamics of Cooperation." Festschrift in Honor of Joseph E. Stiglitz (2003). With Serge Moresi.

"Chicago & Post-Chicago Antitrust: Issues for Discussion." Canadian Bar Association (Annual Fall Conference on Competition Law), 2002.

"Should Concentration Be Dropped From the Merger Guidelines." With Jonathan Baker. Symposium on Antitrust Analysis of Mergers: Merger Guidelines vs. Five Forces, University of West Los Angeles Law Review, 2001.

"Analysis of Foreclosure in the EC Guidelines on Vertical Restraints." International Antitrust Law & Policy, Annual Proceedings 2000, Fordham University School of Law, 2001.

"The Flawed Fragmentation Critique of Structural Remedies in the Microsoft Case." With R. Craig Romaine and Robert Levinson. *Antitrust Bulletin*, 2001.

"The First Principles Approach to Antitrust, *Kodak*, and Antitrust at the Millennium." *Antitrust Law Journal*, 2000.

"Competitive Analysis of Partial Ownership: Financial Interest and Corporate Control." With Daniel O'Brien. *Antitrust Law Journal*, 2000.

"The Competitive Effects of Passive Minority Equity Interests: Reply," With Daniel O'Brien. *Antitrust Law Journal*, 2001.

"Preserving Monopoly: Economic Analysis, Legal Standards and Microsoft." With R. Craig Romaine. *George Mason University Law Review*, 1999.

"Decision Theory and Antitrust Rules," With C. Frederick Beckner, III. *Antitrust Law Journal*, 1999.

"Analyzing Vertical and Horizontal Cross Ownership in Cable Television: The Time Warner-Turner Merger." With S. Besen, J. Murdoch, D. O'Brien, and J. Woodbury. In J. Kwoka and L. White (eds.), *The Antitrust Revolution*, 1998.

"Vertical Mergers and Leverage." In *The New Palgrave Dictionary of Law and Economics*, 1998.

"You Keep on Knocking but You Can't Come in: Evaluating Restrictions on Access Rules to Input Joint Ventures." With D. Carlton. *Harvard Journal of Law and Technology*, 1996.

"Evaluating Vertical Mergers: A Post-Chicago Approach." With M. Riordan. *Antitrust Law Journal*, 1995.

"Evaluating Vertical Mergers: Reply to Reiffen and Vita Comment." With M. Riordan. *Antitrust Law Journal*, 1995.

"Exclusionary Vertical Restraints: Has Economics Mattered?" *American Economic Review*, May 1992.

"An Economic Analysis of Copyright Collectives." With S. Besen and S. Kirby. *Virginia Law Review*, 1991.

"Competition Among Complements, and Intra-Network Competition." With N. Economides. *Journal of Industrial Economics*, 1992.

"Rowing Against the Tidewater: A Theory of Voting by Multi-Judge Panels." With D. Post. *Georgetown University Law Review*, 1992.

"Evaluating Network Pricing Self-Regulation." In Guerin-Calvert and Wildman (eds.), *Electronic Services Networks: A Business and Public Policy Challenge of Electronic Shared Networks*, 1991.

"Equilibrium Vertical Foreclosure." With J. Ordover and G. Saloner. *American Economic Review*, 1990.

"Vertical Foreclosure Without Commitment: Reply to Reiffen." With J. Ordover and G. Saloner. *American Economic Review*, 1992.

"Deregulating Self-Regulated Shared ATM Networks." *Economics of Innovation and New Technology*, 1990.

"Monopoly Power and Market Power in Antitrust Law." With T. Krattenmaker and R. Lande. *Georgetown University Law Review*, 1987.

"Analyzing Anticompetitive Exclusion." With T. Krattenmaker. *Antitrust Law Journal*, 1987.

"Cost-Raising Strategies." With D. Scheffman. *Journal of Industrial Economics*, 1987.

"Information, Welfare and Product Diversity." With J. Stiglitz. In Feiwel et al. (eds.), *Arrow and the Foundations of the Theory of Economic Policy*, 1987.

"Antitrust Analysis of Exclusionary Rights: Raising Rivals' Costs to Gain Power Over Price." With T. Krattenmaker. *Yale Law Journal*, December 1986.

"Competition and Cooperation in the Market for Exclusionary Rights." With T. Krattenmaker. *American Economic Review*, May 1986.

"Private Antitrust Litigation: Introduction and Framework." With L. White. *Georgetown University Law Review*, 1986.

"Economics of Private Antitrust Litigation." With L. White. *Antitrust Law Journal*, 1986. Reprinted by the Senate Judiciary Committee.

"Quantifying the Competitive Effects of Production Joint Ventures." With T. Bresnahan. *International Journal of Industrial Organization*, 1986.

"Measuring Ease of Entry." *Antitrust Bulletin*, 1986.

"Firm-Specific Information, Product Differentiation and Industry Equilibrium." With J. Perloff. In Morris et al. (eds.), *Strategic Behavior and Industrial Competition*, 1986.

"Practices that (Credibly) Facilitate Oligopoly Coordination." In Stiglitz et al. (eds.), *New Developments in the Analysis of Market Structure*, 1986.

"Equilibrium with Product Differentiation." With J. Perloff. *Review of Economic Studies,* January 1985.

"A Practical Guide to Merger Analysis." With J. Simons. *Antitrust Bulletin*, Winter 1984.

"A Bidding Model of Special Interest Regulation: Raising Rivals' Costs in a Rent-Seeking Society." With D. Scheffman and W. Schwartz. In *The Political Economy of Regulation: Private Interests in the Regulatory Process*, 1984.

"Judo Economics: Capacity Limitations and Coupon Competition." With J. Gelman. *Bell Journal of Economics*, Autumn 1983.

"Raising Rivals' Cost." With D. Scheffman. *American Economic Review*, May 1983.

"Defects in Disneyland: Quality Control as a Two-Part Tariff." With A. Braverman and J.L. Guasch. *Review of Economic Studies*, January 1983.

"The Theory of Sales: A Simple Model of Equilibrium Price Dispersion with Identical Agents." With J. Stiglitz. *American Economic Review*, December 1982.

"A Framework for Evaluating Consumer Information Regulation." With H. Beales, M. Mazis, and R. Staelin. *Journal of Marketing*, Winter 1981.

"Efficient Regulation of Consumer Information." With H. Beales and R. Craswell. *Journal of Law and Economics*, December 1981.

"Consumer Search and Public Policy." With H. Beales, M. Mazis, and R. Staelin. *Journal of Consumer Research*, June 1981.

"Information Remedies for Consumer Protection." With H. Beales and R. Craswell. *American Economic Review*, Papers and Proceedings, May 1981.

"Introduction." In S.C. Salop (ed.), *Strategy, Predation and Antitrust Analysis*, Federal Trade Commission, 1981.

"Strategic Entry Deterrence." *American Economic Review*, Papers and Proceedings, May 1979.

"Monopolistic Competition with Outside Goods." *Bell Journal*, Spring 1979.

"A Model of the Natural Rate of Unemployment." *American Economic Review*, March 1979.

"Alternative Reservations Contracts." Civil Aeronautics Board, 1978.

"Parables of Information Transmission in Markets." In Mitchell (ed.), *The Effect of Information on Consumer and Market Behavior*, 1978.

"The Noisy Monopolist: Information, Price Dispersion and Price Discrimination." *Review of Economic Studies*, October 1977.

"Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion." With J. Stiglitz. *Review of Economic Studies*, October 1977.

"Self-Selection and Turnover in the Labor Market." With J. Salop. *Quarterly Journal of Economics*, November 1976.

"Information and Monopolistic Competition." *American Economic Review*, Papers and Proceedings, May 1976.

"Wage Differentials in a Dynamic Theory of the Firm." *Journal of Economic Theory,* August 1973.

"Systematic Job Search and Unemployment." *Review of Economic Studies* (April 1973).

Reviews/Comments/Testimony

"Slap Their Wrists? Tie Their Hands? Slice Them Into Pieces? Alternative Remedies for Monopolization in the *Microsoft* Case." *Antitrust*, 1999.

"Efficiencies in Dynamic Merger Analysis." Testimony at FTC Hearings on Global and Innovation-Based Competition (November 1995). A slightly revised version has been published as "Efficiencies in Dynamic Merger Analysis: Summary." With Gary Roberts. *World Competition*, June 1996.

"More Value for the Legal Dollar: A New Look at Attorney-Client Fees and Relationships." With R. Litan. *Judicature*, 1994.

"*Kodak* as Post-Chicago Law and Economics." *CRA Perspectives,* April 1993. Reprinted in Texas Bar Association, *Antitrust and Business Litigation Bulletin*, November 1993.

"Antitrust Goes to College." With Lawrence White. *Journal of Economic Perspectives*, Summer 1991.

"Analysis of Entry in the New Merger Guidelines." *Brookings Papers on Economic Activity*, 1991.

"Mergers and Antitrust." *Journal of Economic Perspectives*, 1987.

"Comment on Golbe and White, 'Time Series Analysis of Mergers.'" In Auerbach et al., *Mergers and Acquisitions*, National Bureau of Economic Research.

"Policy Implications of Conference Papers." In Auerbach et al., *Mergers and Acquisitions*, National Bureau of Economic Research.

"Evaluating Uncertain Evidence with Sir Thomas Bayes." *Journal of Economic Perspectives*, Summer 1987.

"Implications of the Georgetown Project for Treble Damages Reform." Senate Judiciary Committee, March 21, 1986.

"Policing Deceptive Advertising." Serial No. 97-134, 97th Congress.

"Entry Barriers, Consumer Welfare, and Antitrust Reform." In B. Bock et al., *Antitrust and New Views of Microeconomics*. Conference Board, 1986.

"Buy American, Save Your Job?" In J. Tobin et al., *Macroeconomics, Prices, and Quantities*. Brookings Institution, 1983.

"Selling Consumer Information." With H. Beales. In J. Olson et al., *Advances in Consumer Research*, Vol. VII, 1980.

"Comment on R. Schmalensee, 'On the Use of Economic Models in Antitrust.'" In O. Williamson et al., *Antitrust Law and Economics*, 1980.

"Review of K. Lancaster, 'Variety, Equity, and Efficiency,'" *Journal of Economic Literature*, 1980.

SELECTED CONSULTING EXPERIENCE

Telecommunications Transactions

Sprint/Nextel

NewsCorporation/DIRECTV

Time Warner/AOL

CBS/Viacom

PRIMESTAR

SBC/Ameritech

Time Warner/Turner Broadcasting

CBS/Infinity Broadcasting

REDACTED
FOR PUBLIC INSPECTION

CRA INTERNATIONAL

STEVEN R. BRENNER

Vice President

Ph.D. Economics,
Stanford University

B.A. Economics,
Wabash College

Dr. Brenner is an expert in antitrust economics and in the economics of the telecommunications, broadcasting, cable, and recording industries. Since joining CRA in 1988, he has worked on antitrust and merger analyses in a variety of industries; policy issues in the telecommunications, broadcasting, and cable industries; and intellectual property rights issues in the recording industry.

PREVIOUS EXPERIENCE

OECD, Division on Competition and Consumer Policy

Consultant, August 1990–September 1992. Dr. Brenner served as a Consultant to the OECD in Paris while on leave from Charles River Associates. He was principal author of a report on competition policy issues in the broadcast industry drafted for the OECD Committee on Competition Law and Policy, and co-author of a report of the OECD Secretariat analyzing the treatment by competition policy in OECD countries of vertical restrictions in franchise agreements.

Cornell, Pelcovits, & Brenner Economists Inc.

Vice President, February 1982–September 1988. As a microeconomic consultant primarily in the fields of telecommunications, broadcasting, intellectual property rights, and antitrust economics, Dr. Brenner performed the following work:

- Developed and presented expert testimony before state public utility commissions on a variety of telecommunications policy and empirical issues.
- Prepared antitrust damage studies and analyzed antitrust liability issues.
- Analyzed intellectual property rights implications of home audio and video taping.
- Designed and developed tariffs for cellular telephone and mobile satellite service applications before the FCC.

Owen, Cornell, Greenhalgh, & Myslinski Economists, Inc.

Senior Economist, September 1981–February 1982. As a microeconomic consultant in telecommunications, broadcasting, and antitrust economics, Dr. Brenner worked on various projects, including one analyzing the economic impact of broadcasting regulations on the video industry and on its use of new technologies.

Office of Plans and Policy, Federal Communications Commission:

Senior Economist, July 1979–September 1981. As the economist on the UHF Comparability Task Force, Dr. Brenner analyzed the economics of UHF broadcasting, wrote parts of Task Force reports and separate reports, designed two large surveys, and carried out econometric analysis of data. Other responsibilities included evaluating broadcast and technical standards policy proposals, analyzing radio frequency interference policy, and making oral presentations to the Commission at formal agenda meetings on UHF comparability and on technical standards for stereophonic AM radio.

Grinnell College

Assistant Professor of Economics, August 1973–July 1979. Dr. Brenner taught courses in industrial organization, statistics, microeconomic analysis, the economics of regulation, international economics, and US economic history.

University of Iowa

Visiting Instructor of Economics, January 1977–May 1977. Taught graduate and undergraduate courses in US economic history.

Stanford University

Lecturer in Economics, January 1972–May 1972. Taught a course in microeconomic theory.

California State College at Hayward

Instructor in Economics, September 1968–December 1971. Taught courses in principles of economics.

PROFESSIONAL AFFILIATIONS

Assistant Editor, *Antitrust Law Journal,* 2001–Present.

PUBLICATIONS

"Potential Competition in Local Telephone Service: The Bell Atlantic–NYNEX Merger." *The Antitrust Revolution*, J. Kwoka, Jr. and L. White, eds., 3rd edition, Oxford University Press, 1999.

"Telecommunications in the US: Evolution to Pluralism." With S. Besen and J. Woodbury. *ISDN in the USA, Japan, Singapore, and Europe*, B. Lange, ed., 1996.

"Access Charge Theory and Implementation: A Slip Twixt Cup and Lip." Co-author. *Proceedings of the Institute of Public Utilities' Fifteenth Annual Conference*, 1984.

"Toward Competition in Phone Service: A Legacy of Regulatory Failure." With N. Cornell and M. Pelcovits. *Regulation*, July/August 1983.

"The Effect of Viewer Behavior on Reception and Viewing of UHF Television." Co-author. *Proceedings of the IEEE* 70, No. 11, November 1982.

"UHF Viewing and Television Channel Selector Type." Co-author. *Staff Report*, UHF Comparability Task Force, Office of Plans and Policy, Federal Communications Commission, February 1982.

"Comparability for UHF Television: A Final Report. Co-author." *Staff Report*, UHF Comparability Task Force, Office of Plans and Policy, Federal Communications Commission, September 1980.

"Comparability for UHF Television: A Preliminary Report." Co-author. *Staff Report*, UHF Comparability Task Force, Office of Plans and Policy, Federal Communications Commission, September 1979.

UNPUBLISHED PAPERS

"Testing for Cross-Subsidies by Regulated Telecommunications Firms." Co-author. Presented at the Institute of Public Utilities' Twentieth Annual Conference, 1988.

"The Economic Choices of Broadcasting and Viewers." Staff Report, UHF Comparability Task Force, Office of Plans and Policy, Federal Communications Commission, placed in General Docket 78–391, June 1982.

"Protectionist Interests and the Trade Agreements Program." Presented at the Eastern Economics Association Meeting, Washington, D.C., May 1978.

"Economic Interests and the Trade Agreements Program." Ph.D. dissertation, Stanford University, 1977.

TESTIMONY—REGULATORY COMMISSIONS

- Public Service Commission of Alabama

- In the matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Alabama, Docket No. 18985, March 1, 1984.

- Arizona Corporation Commission

  - In the Matter of the Application of Satellite Business Systems for Authority to Provide Intrastate Telecommunications Services in Arizona, Docket No. U-2457-85-062, June 14, 1985.

- Public Utilities Commission of California

  - In the matter of the Joint Application of GTE Corporation and Bell Atlantic Corporation to Transfer Control of GTE's California Utility Subsidiaries to Bell Atlantic, Which Will Occur Indirectly as a Result of GTE's Merger with Bell Atlantic, Application 98-12-005, July 22, 1999.

  - In the matter of the Joint Application of Pacific Telesis Group and SBC Communications Inc. for SBC to Control Pacific Bell (U1001C), Which Will Occur Indirectly as a Result of Telesis' Merger With a Wholly Owned Subsidiary of SBC, SBC Communications (NV) Inc., Application No. 96-04-038, November 22 and 25, 1996.

- Public Utilities Commission of the State of Colorado

  - Application No. 36337, Application No. 36360, Application No. 36456, Case No. 6386, November 9, 1984.

- Florida Public Service Commission

  - In Re: Application of AT&T Communications of the Southern States, Inc. for a Certificate of Public Convenience and Necessity/Motion for Waiver of Tariff Filing Requirements, Docket No. 830489-TI, September 4, 1986.

  - In Re: Intrastate Telephone Access Charges for Toll Use of Local Exchange Services, Docket No. 820537-TP, (Phase II) October 1, 1984.

  - In Re: Intrastate Telephone Access Charges for Toll Use of Local Exchange Services, Docket No. 820537-TP, June 6, 1984.

- Georgia Public Service Commission

  - In Re: Petition by MCI for Arbitration of Certain Terms and Conditions of Proposed Agreement with BellSouth Telecommunications, Inc. Concerning Interconnection and Resale Under the Telecommunications Act of 1996, Docket No. 6865-U, November 6, 1996.

- Illinois Commerce Commission

- Illinois Commerce Commission on its Own Motion, Investigation Concerning the Appropriate Methodology for the Calculation of Intrastate Access Charges for All Illinois Telephone Utilities, Docket No. 83-0142, November 29, 1984.

- Public Service Commission of Indiana

  - In the Matter of the Petition of AT&T Communications of Indiana, Inc. for Commission Declination to Exercise Jurisdiction over Telephone Companies Providing Intrastate InterLATA Facilities-Based Telecommunications Services, Cause No. 37911; In the Matter of the Petition of GTE Sprint Communications Corporation for an Investigation and Determination of the Form of Regulation Applicable to Telephone Companies Providing Competitive Intrastate, Intercity Telecommunications Services, but not Local Exchange Services, within Indiana, Cause No. 37557; Petition of MCI Telecommunications Corporation for an Investigation by the Public Service Commission of the State of Indiana into the Type and Scope of Regulation Which Should Be Applied to Nondominant Carriers Providing Intrastate Interexchange Telecommunications Services, Cause No. 37559, May 5, 1986.

- State of Iowa Department of Commerce — Utilities Division

  - In Re: Northwestern Bell Telephone Company, Docket No. RPU-88-9, January 10-11, 1989.

- Public Utilities Commission, State of Kansas

  - In the Matter of a General Investigation into the Rates Tariffs, Policies and Practices of Public Telephone Utilities Relating to Customer Premises Equipment (Regulation of Interexchange Carriers and IntraLATA Competition), Docket No. 127,140-U (Phase IV), October 16, 1984.

- Public Service Commission of Kentucky

  - In Re: Joint Application of Bell Atlantic Corporation and GTE Corporation for Order Authorizing Transfer of Utility, Case No. 98519, March 3, 1999.

- Louisiana Public Service Commission

  - Docket No. U-15955 in conjunction with Docket No. U-15995, Docket No. U-15457, Docket No. U-16012, June 19, 1985.

- Department of Public Utilities, Commonwealth of Massachusetts

  - DPU 1655/1633, January 6, 1984.

  - DPU 89-78 New England Telephone and Telegraph Company — Toll Calling Plans, testimony filed June 1988.

- Michigan Public Service Commission

- In the Matter of the Application of AT&T Communications of Michigan, Inc., for Authority to Amend its Rate Schedules and Tariffs and Miscellaneous Rules and Regulations Governing its Telephone Communications Service, Case No. U-8039, March 25, 1985.

- Minnesota Public Service Commission

  - In Re: A Summary Investigation into Intrastate Switched Access Charges Proposed by Northwestern Bell Telephone Company for its Minnesota Customers, Docket No. P-421/CI-85-352.

- Mississippi Public Service Commission

  - In Re: Petition of MCI Telecommunications Corporation for a Certificate of Public Convenience and Necessity to Render Intrastate Telecommunication Service within Mississippi and for Approval of Proposed Tariff, Docket No. U4633, March 21, 1985.

- State of New York Public Service Commission

  - Proceeding on the Motion of the Commission as to the Rates, Charges, Rules and Regulations of New York Telephone Company, NYNEX Corporation and Bell Atlantic Corporation For a Declaratory Ruling That the Commission Lacks Jurisdiction to Investigate and Approve a Proposed Merger Between NYNEX and a Subsidiary of Bell Atlantic or, in the Alternative, For Approval of the Merger, Case 96-C-0603; and Petition of the Commission as to the Rates, Charges, Rules and Regulations of the New York Citizens Utility Board, the Consumer Federation of America, the American Association of Retired Persons, Consumers Union, Mr. Mark Green, Ms. Catherine Abate, the Long Island Consumer Energy Project and the International Brotherhood of Electrical Workers T-6 Council (collectively the "Consumer Coalition") For An Investigation of the Proposed Merger of NYNEX Corporation and Bell Atlantic Corporation, Case 96-C-0599, December 16, 1996.

- Nevada Public Service Commission

  - In the Matter of the Petition of AT&T Communications of Nevada, Inc., for Adoption of Rules and Regulations Governing Competitive Telecommunications Services in the State of Nevada, Docket No. 84-758, December 20, 1984.

  - In Docket No. 84-443 on behalf of MCI Telecommunications Corporation, and in Docket No. 84-605 on behalf of GTE Sprint Communications Corporation; testimony filed August 1, 1984.

- Oklahoma Corporation Commission

  - In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Oklahoma, Cause No. 28780, May 15, 1984.

- Pennsylvania Public Utility Commission

- In Re: Joint Application of Bell Atlantic Corporation and GTE Corporation for Approval of Agreement and Plan of Merger, PUC Docket Nos. A-310200F0002, A-310222F0002, A-310291F003, A-311350F0002, June 4, 1999.

- Tennessee Public Service Commission

  - In Re: Application for Certificate of Public Convenience and Necessity of GTE Sprint Communications Corporation, Docket No. U-84-7326, January 17, 1985.

  - In the Matter of: Tariff Filing by AT&T Communications to Establish Rates and Charges for MEGACOM and MEGACOM 800 Services; Tariff Filing by US Sprint to Establish Rates and Charges for ULTRAWATS; Tariff Filing by MCI Telecommunications for PRISM I and PRISM II; Tariff Filing by US Sprint to Establish Rates and Charges for DIRECT 800 and ULTRA 800 Services; Docket Nos. U-87-7492, U-87-7512, U-87-7513, U-87-7514, U-87-7515, September 3, 1987.

- Tennessee Regulatory Authority

  - Docket No. 96-01152, October 21-22, 1996.

- Public Utility Commission of Texas

  - Hearing on the Stipulation, Docket 8585, May 24, 1990.

  - Application of AT&T Communications of the Southwest, Inc. to Remove the Tariff Restriction on its "Reach Out Texas" Offering, Docket No. 6761, January 19, 1987.

  - Petition of the General Counsel for Initiation of an Evidentiary Proceeding to Establish Telecommunications Submarkets, Docket No. 6264, September 27, 1986 and September 30, 1986.

  - Petition of Southwestern Bell Company for Approval of Tariff to Allow Customers to Install and Maintain Inside Wire, Docket No. 5141, October 24, 1983.

- Public Service Commission of Utah

  - In the Matter of the Investigation of Access Charges for Intrastate IntraLATA and InterLATA Telephone Services, Case No. 83-999-11, November 20, 1984.

- State of Vermont Public Service Board

  - In Re: Investigation of Telephone Toll Settlements and Investigation into Telephone Intrastate Tariffs for Access to the Local Exchange Network and Petition of Burlington Telephone Company Requesting the Board to Find that the Restriction of Resale of Wide Area Telephone Service (WATS) in New England Telephone Company Tariff PSB VT. - 20 Section 10.2.1.A Is Invalid, Case Nos. 5092, 5114, 4946, April 2, 1987.

- Public Service Commission of Wisconsin

- Investigation of the Proposed InterLATA Access Charge Tariff of Wisconsin Bell, Inc., The Intrastate Capacity Plan and Other Related InterLATA Compensation Matters. Case No. 6720-TR-100, February 26, 1987.

TESTIMONY—COURT CASES

- Federal Trade Commission vs. McKesson Corporation and AmeriSource Corporation, in United States District Court for the District of Columbia, Civil Action No. 98-596, May 4, 1998, May 5, 1998, May 8, 1998, and July 13, 1998.

- Hayes Microcomputer Products, Inc., a/k/a Practical Peripherals, Inc., in United States Bankruptcy Court for the Northern District of Georgia, Atlanta Division, Case No. 94-75900, Affidavit Filed and Appearance, November 9, 1995.

- City of Chicago vs. Western Union ATS, Inc., in US District Court for the Northern District of Illinois, Case No. 91C156, Deposition Testimony, March 17, 1993.

- Williams Telecommunications Company vs. Larry C. Gragg and Phyllis J. Gragg, St. Lawrence Catholic Center et al. vs. Williams Pipe Line Company et al., in the District Court of Shawnee County, Kansas, Division Six, Case Nos. 86-CV-1130, 86-CV-1205 (Consolidated), December 17, 1986.

TESTIMONY—CONGRESSIONAL

- Before the House Judiciary Committee, Subcommittee on Courts, Civil Liberties, and the Administration of Justice (Repeal of the First Sale Doctrine), October 6, 1983.

REDACTED
FOR PUBLIC INSPECTION

INTERNATIONAL

LORENZO COPPI

Vice President

Ph.D. Economics,
London School of Economics
and Political Sciences

M.Sc. Economics,
London School of Economics
and Political Sciences

Laurea Economics,
Università Commerciale Luigi
Bocconi, *Cum Laude*

Previously a member of CRA's European Competition Practice, Dr. Coppi is now a member of the firm's Competition Practice in Washington, DC. Dr. Coppi specializes in applied industrial organization, game theory, microeconomics, antitrust economics, and regulation. He has worked on a variety of US, EC and UK mergers as well as on projects involving various allegations of anticompetitive practices under Sections 1 and 2 of the Sherman Act; Articles 81 and 82 of the EU Treaty; and Chapter II provisions of the UK Competition Act. Dr. Coppi's analytic focus has been on merger analysis, market definition, assessment of market power, abusive pricing practices, collusion and cartel detection, and tying/bundling. His sector expertise includes various high technology industries, telecommunications, media, the beverage and distilled spirits industries, retailing, chemicals, and several consumer good industries.

PROFESSIONAL EXPERIENCE

Mergers

DOJ/FTC

- **Procter & Gamble/Gillette:** Economic support and econometric analysis during the second request.
- **GE/Ionics:** Economic support during the HSR filings.
- **Steel Manufacturer:** Competition policy advice to a steel manufacturer contemplating an acquisition.
- **GE/Instrumentarium:** Economic support during the second request.
- **Veeco/FEI:** Economic support during the second request.

- **Manufacturers of Fire Safety Products:** Pre-filing anti-trust analysis of the transaction.
- **Nucor/Birmingham:** Preparation of a white paper on geographical market definition.
- **Walmart/Amigo:** Economic support during the second request. Preparation of white papers regargarding product and geographical market definition.
- **Hewlett Packard/Compaq:** Economic support in the context of the merger review by the FTC.

DGComp (European Union)

- **Apollo/Bakelite:** Economic support in the context of the merger review by the European Commission.
- **GE/Instrumentarium:** Economic support in the context of the merger review by the MTF.
- **Hewlett Packard/Compaq**: Ongoing economic support in the context of the firms' proposed merger review.
- **Interbrew/Becks**: Preparation of an expert report on market definition in the UK beer market, showing that a narrow market definition (premium lager beer) was contradicted by the available empirical evidence.
- **Pernod Ricard–Diageo/Seagram**: Economic support and competition policy advice on the issue of portfolio power/range effects, as well as preparation of market share data and brand analysis for the Phase 1 merger notification.
- **MCI-WorldCom/Sprint**: Preparation of a submission on joint dominance during Phase 2 of the merger investigation. Joint dominance was eliminated from the final (adverse) decision.
- **Vivendi/BskyB**: Preparation of a third-party submission in the context of the Phase 2 merger investigation. Market definition and dominance in the pay-TV rights markets were the central issues.
- **Tobacco manufacturer**: Economic support and competition policy advice to a tobacco manufacturer seeking to acquire a rival. Preparation of a report exploring the strengths and weaknesses of alternative market definitions. Wider competition policy advice was also provided.
- **BT/AT&T**: Preparation of a submission regarding the market definition implications of the convergence of fixed and mobile telephony markets. Presented to the EC in the context of a Phase 2 merger investigation, this submission led to the deal being approved with conditions.
- **Cement manufacturer**: Competition policy advice to counsel and auditing of economic reports in the context of a Phase 2 investigation of the proposed merger of two large cement producers.

European National Authorities

- **Interbrew/Bass**: Competition policy advice during the merger inquiry by the Competition Commission. Joint dominance and vertical foreclosure were the main issues.
- **Saft/Tadiran**: Economic advice to Alcatel (Saft's parent) during a merger investigation by the Bundeskartellamt in Germany. Coordinated effects were the focus of the investigation.
- **ntl/CWC**: Economic support, competition policy advice, and drafting of the submission for the Competition Commission. Market definition and open access to the network were the main issues.
- **Thorn/Granada**: Competition policy advice and economic support to the parties, two electrical goods rental companies, in the context of their merger notification to the Office of Fair Trading (OFT). Market definition and price discrimination were the main issues.
- **RAC/Green Flag**: Economic support and competition policy advice to two of the three large motoring organizations during a merger inquiry by the MMC (now Competition Commission). Market definition and failing-firm defense were the main issues.

Antitrust Litigation

US Courts / Agencies

- **Media Research Services:** Competition policy support in a private litigation involving an alleged violation of Section 2 of the Sherman Act
- **Online music:** Competition policy support in a private litigation involving an alleged violation of Section 1 and 2 of the Sherman Act.
- **Printer Cartridges:** Empirical and competition policy support in a private litigation involving an alleged violation of Section 1 and 2 of the Sherman Act.
- **Online marketplaces:** Competition policy support in an antitrust investigation of online marketplaces by a State AG office.
- **Wireless technologies:** Competition policy support in a private litigation involving an alleged violation of Section 2 of the Sherman Act.
- **Icann:** Competition policy advice and economic support to Icann in the context of DOJ's review of their Internet domain registry contracts.
- **Sun/Microsoft:** Competition policy advice and economic support to Sun in their antitrust litigation against Microsoft.
- **Hydrogen peroxide:** Empirical analysis in the context of a price-fixing class action.

- **New Cars:** Empirical analysis in the context of a DOJ criminal price-fixing investigation, and related class action.
- **ConAgra:** Empirical support in an alleged infringement of Sherman Act, §2.
- **Rubber Chemicals:** Empirical analysis in the context of a DOJ criminal price-fixing investigation, and related class action.
- **Plastics Additives:** Empirical analysis in the context of a DOJ criminal price-fixing investigation, and related class action.
- **Eurimex:** Supported the expert in preparing his expert witness report on market definition and monopolization in the distribution of granite for architectural use.

European Courts / Regulators

- **Eni/TTPC:** Expert report in the context of Eni's court appeal (TAR) of the Italian Authority (AGCM) decision to fine Eni for a violation of Art. 82 (abuse of a dominant position).
- **Wireless technologies:** Competition policy support in an investigation by the European Commission on a possible violation of Art. 82.
- **TTPC:** Report to the Italian Authority (AGCM) on the appropriate tariff to remedy an alleged breach of Art. 82 (abuse of a dominant position).
- **PC semiconductors:** Competition policy support in an investigation by the European Commission on a possible violation of Art. 81 and Art. 82.
- **Printer cartridges:** Prepared and coauthored an expert report on market definition in the context of an Art. 82 investigation on an alleged abuse of a dominant position.
- **World Snooker Association**: Collaborated in the preparation of an expert witness report on market definition, dominance, and whether restrictions on players were anticompetitive.
- **Office of the Rail Regulator**: Assisted the ORR in its investigation of EWS, the largest UK player in rail freight. Prepared a report on market definition and assessment of dominance in the markets for locomotives and rail freight.
- **Newspaper distributor**: Economic support and competition policy advice on the implications of a competitor's proposed arrangements in the area of magazine distribution in the UK. Also prepared a report on market definition.
- **Bacardi**: Preparation of an expert report on market definition in the spirits industry in the context of an investigation of exclusive discounts.

- **National Federation of Retail Newsagents**: Economic support and competition policy advice on the implications of present newspaper distribution arrangements in the UK. Preparation of a report on the economics of vertical restraints, with special emphasis on exclusive geographical distribution.

- **AC Nielsen**: Supported the client in the context of litigation in the United States regarding the competitive implications of the firm's discount policy in the European Union. Bundling, "fidelising discounts," and predation were the issues under consideration.

- **Glaxo-Wellcome**: Helped preparing a submission to the European Commission on the issue of parallel imports from other EU countries. Asked to justify the resale restrictions imposed on wholesalers.

- **United International Pictures**: Prepared a submission to the European Commission in the context of the request for an exemption to the rules prohibiting horizontal agreement.

Regulatory

- **Telecom Italia**: Report to the Italian Telecom Regulator (AGCOM) on the proposed regulation of Telecom Italia's tariffs to large business clients.

- **Pay-TV operator**: Advised and supported the client in the context of an OFT inquiry into BSkyB's wholesale practices.

- **Tesco**: Competition policy advice to the largest UK multiple grocer during a market review by the OFT and, subsequently, by the Competition Commission. No adverse public interest effects were found.

- **Calor Gas II**: Assessing competition law compliance by the distribution and franchise arrangements of the largest UK supplier of liquefied gas products. The arrangements were not challenged by the OFT.

- **Calor Gas I**: On behalf of a major supplier of liquefied gas products, submission to the OFT on whether past non-price discrimination undertakings were being respected. The OFT decided the client was in compliance.

- **Valpak**: Submission to the OFT on behalf of a major player in the UK recycling sector challenging a competitive scheme. The competitive scheme was not authorized.

Other Competition

- **Internet search engine:** Economic and competition policy support.

- **Brighton Palace Pier**: Economic and competition policy support for a UK leisure operator in its State Aid complaint against the use of State funds to refurbish and relaunch a competitive pier leisure site in Brighton.

- **Mediaset**: Support to an Italian commercial television broadcaster in its State Aid complaint against RAI, the government-owned public service broadcaster. Prepared a report analyzing whether RAI's restructuring plan satisfied the Community criteria against State Aid.

- **ntl**: Submission to the European Commission on the inclusion of a joint dominance test in the provisions regarding operators with Significant Market Power.

- **AGCOM**: Collaborated on a report for the Italian telecom regulator regarding the economic implications of exclusivity in broadcasting sports rights.

- **Tesco**: Competition policy advice to Tesco, the largest UK multiple grocer, seeking to acquire a competitor. Prepared a report on the positioning of different players in the market. The deal was never concluded.

- **Blue Circle**: Competition policy advice and empirical support to Blue Circle, a large cement producer, seeking to acquire a competitor. Collaborated in preparing an econometric study concerning the effect of the merger on prices in different regions. The deal was abandoned.

- **ntl and CWC**: On behalf of two major cable operators, economic support and preparation of a variety of submissions to the ITC and Oftel regarding the bundling of telephony and pay-TV services.

- **Westel**: Competition policy and regulatory advice to a Hungarian GSM mobile operator regarding the licensing of 1800 MHz spectrum.

Other Areas

- **Bass**: Collaborated in providing pricing advice to a major UK brewer.

- **RAI**: Strategic advice on the acquisition of sports rights for a major European public service broadcaster.

- **BBC**: Advice to the UK public service broadcaster on different sources of funding in the context of consultations on the future of public service.

- **British Gas**: Strategic advice on the introduction of new LNG transport technologies.

SELECTED PUBLICATIONS AND PRESENTATIONS

'Remarks on the Monopolization of Automotive Aftermarkets' – *The American Antitrust Institute Annual Conference*, June 21, 2007

'Aftermarket Monopolization: the Emerging Consensus in Economics' – *The Antitrust Bulletin*, Spring-Summer 2007

'Abuse of Joint Dominant Position and Joint Monopolization: What's the point?' – *The Sedona Conference*, October 25-26, 2006

'Competition Issues in B2B Exchanges' presented at the *FTC Internet Auction Conference*, October 27, 2005

'Plugging the Hole: "New" Unilateral Effects Analysis in the EU' presented at the *George Mason Law Review Antitrust Symposium*, September 20, 2005

'Substantial convergence or parallel paths? – Similarities and differences in the economic analysis of horizontal mergers in US and EU competition law' – *The Antitrust Bulletin*, Spring-Summer 2004, with M. Walker

'Merger Assessment in Oligopolistic Markets: Lessons from Interbrew/Bass' – *Loughborough University, Business School Research Series Paper* 2002: 5, Dec. 2002, with Prof. P. Dobson

'The Importance of Market Conduct in the Economic Analysis of Mergers' – *European Competition Law Review*, vol. 23, issue 8, Aug. 2002, with Prof. P. Dobson

WORKING PAPERS

'Competitive Price Discrimination with Differentiated Goods', mimeo, with Prof. P. Dobson

'Constrained Equilibria in the Global Beer Industry', mimeo

'Does Technological Convergence Lead to an Escalation of R&D Expenditure?', mimeo

PRIOR EMPLOYMENT POSITIONS

1997–2000 *Senior Consultant*, London Economics

REDACTED
FOR PUBLIC INSPECTION

CRA INTERNATIONAL

SERGE MORESI

Vice President

Ph.D. Economics
Massachusetts Institute of Technology

M.A. Economics
Université de Lausanne (Switzerland)

B.A. Economics
Université de Lausanne (Switzerland)

Dr. Moresi is the Director of Competition Modelling. He is an expert in the theory of industrial organization and specializes in applied game theory, including auction and bargaining models. In addition to developing theoretical models and simulation programs dealing with strategic pricing behavior, Dr. Moresi has provided clients with expert economic consulting services in many antitrust and merger cases. He has contributed to several staff filings before federal agencies in a variety of industries. Before joining CRA, Dr. Moresi taught economics at Georgetown University. His research interests include several topics in the economics of information and uncertainty.

PRIOR PROFESSIONAL EXPERIENCE

1997 *Economic Consultant*, The Brattle Group, Washington, D.C.

- Electricity industry restructuring projects (simulation models, auction design).
- Antitrust cases: price fixing (gasoline), discrimination (gas pipeline).

1991–1998 *Assistant Professor*, Georgetown University, Washington, D.C.

- Ph.D. courses: general equilibrium theory, game theory, contract theory.
- B.A. courses: microeconomic theory, applied game theory.

1995 *Invited Professor*, Université de Lausanne, Switzerland

- Graduate lectures on the microstructure of financial markets.

1994 *Visiting Researcher*, University of Maryland, College Park, MD

- Research on the competitiveness of decentralized markets.

1994 *Economic Consultant*, World Bank, Washington, D.C.

- Analysis of the international competitiveness of Morocco.

1989 *Economic Consultant*, State of Ticino, Switzerland

- Econometric analysis of the housing rental market.

SELECTED CONSULTING EXPERIENCE

In the context of the Harland/Clarke merger: Development of theoretical economic models of tournament competition (e.g., "beauty contests" and "bidding contests") with risky investments in product quality.

In the context of the Sprint/Nextel merger: Development of a merger simulation model with capacity constraints and potential coordinated effects.

In the context of DOT's NPRM proposals regarding computer reservation system regulations: Development of theoretical and simulation models of vertical foreclosure in bargaining markets.

In the context of the proposed GE/Honeywell merger: Development of theoretical economic models of mixed bundling strategies.

In the context of the proposed Heinz/Beechnut merger: Development of a merger simulation model that accounts for (a) potential price effects at both the manufacturing level and the retailing level, and (b) potential efficiencies in the form of cost savings and quality increases.

In the context of the CBS/Viacom merger: Development of a theoretical economic model of the entry investment process in the programming industry.

SELECTED CONSULTING REPORTS

"Listening To and Understanding Customers' Views: M & F Worldwide Corp.'s Proposed Acquisition of John H. Harland Company." With Andrew Dick. Submitted to the Department of Justice on behalf of M & F Worldwide Corp., 2007.

"Vertical Competition Issues in the Proposed Toll/Patrick Merger." With Henry Ergas, Gary Roberts, Mike Smart, Chris Pleatsikas and Astrid Jung. Submitted to the Australian Competition and Consumer Commission on behalf of Toll Group, 2005.

"News Corporation's Partial Acquisition of DIRECTV: Economic Analysis of Vertical Foreclosure Claims." With Steven C. Salop, Carl Shapiro, David Majerus and E. Jane Murdoch. Submitted to the Federal Communications Commission on behalf of DIRECTV, 2003.

Technical appendix to "Economic Analysis of DOT's NPRM Proposals." With Steven C. Salop and John R. Woodbury. Submitted to the Department of Transportation on behalf of Sabre, Inc., 2003.

Co-authored report on the potential unilateral effects of a merger in the personal care industry. Submitted to the Department of Justice, 2001.

Co-authored report on the potential effects of partial ownership interests in the luxury goods industry. Submitted to the European Commission, 2001.

"An Economic Analysis of the Effects of the AT&T-MediaOne Merger on Competition in the Supply and Distribution of Video Program Services: Response to the Critics." With Stanley M. Besen and John R. Woodbury. Submitted to the Federal Communications Commission on behalf of Sprint Communications Company, L.P., 1999.

"An Economic Analysis of the Effects of Partial Ownership Interests in Cable Systems." With Stanley M. Besen, Daniel P. O'Brien and John R. Woodbury. Submitted to the Federal Communications Commission on behalf of Tele-Communications, Inc., 1998.

PUBLICATIONS

"A Few Righteous Men: Imperfect Information, Quit-for-Tat and Critical Mass in the Dynamics of Cooperation," With Steven C. Salop. *Economics for an Imperfect World: Essays in Honor of Joseph E. Stiglitz.* Edited by R. Arnott, B. Greenwald, R. Kanbur, and B. Nalebuff. MIT Press, Cambridge, Massachusetts, 2003.

"Information Acquisition and Research Differentiation Prior to an Open-Bid Auction." *International Journal of Industrial Organization*, 2000.

"Uncertain Lifetime, Risk Aversion and Intertemporal Substitution." *Economics Letters,* 1999.

"Front-Running by Mutual Fund Managers: A Mixed Bag" (with Jean-Pierre Danthine). *European Finance Review*, 1998.

"Optimal Taxation and Firm Formation: A Model of Asymmetric Information." *European Economic Review*, 1998.

"Pure and Utilitarian Prisoner's Dilemmas." With Steven Kuhn. *Economics and Philosophy*, 1995.

"Volatility, Information, and Noise Trading." With Jean-Pierre Danthine. *European Economic Review*, 1993.

UNPUBLISHED ARTICLES

"Ricardian Equilibrium with Stochastic Free Entry." With Steven C. Salop. Mimeo, 2001.

"Decentralized Trading and the Walrasian Outcome: On the Importance of Search Costs." Mimeo, 1997.

"Optimal Consumption When Mortality Rates Are Not Constant: Time Consistency and the Role of Life Insurance Markets." With John Cuddington. Working Paper No. 95-06, Georgetown University, 1995.

"Insider Trading: Fundamentals-Information versus Trade-Information." With Jean-Pierre Danthine. Working Paper No. 94-01, Georgetown University, 1994.

"Intermediation in Markets with Sequential Bargaining and Heterogeneous Buyers and Sellers." Ph.D. Thesis: Essay 1. MIT, 1991.

"Enchères et Contrats Linéaires Optimaux." M.A. Thesis: No. 12. DEEP, Université de Lausanne, Switzerland, 1986.

WORK IN PROGRESS

"A Model of Sequential Bargaining." With Steven C. Salop and Yianis Sarafidis.

"Mergers in Bargaining Markets." With Steven C. Salop.

"Bilateral Bargaining: A Pedagogical Note." With Steven C. Salop.

REFEREE REPORTS

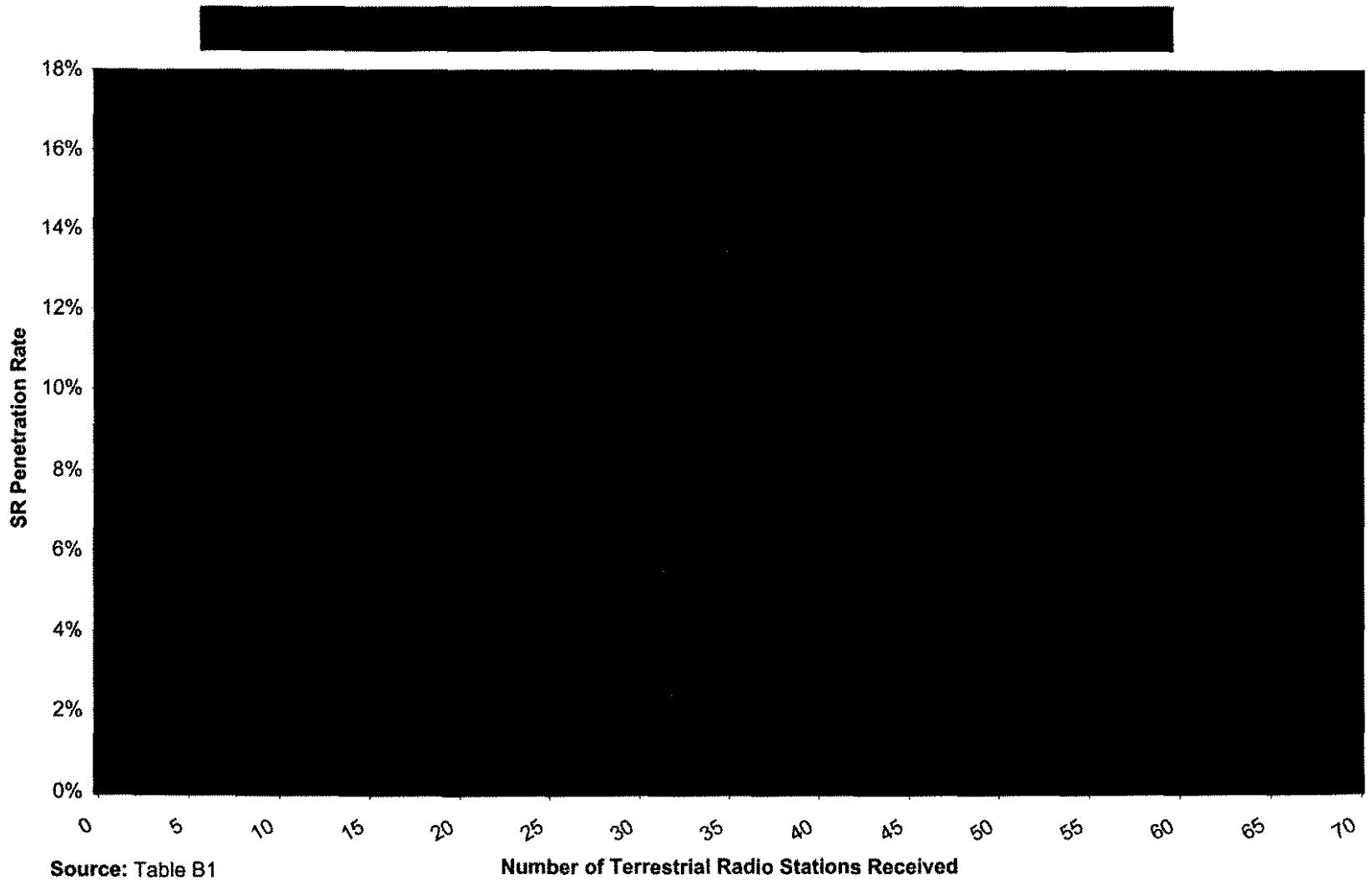
American Economic Review, Economic Theory, European Economic Review, International Economic Review, Journal of Economic Theory, Journal of Economics, RAND Journal of Economics.

EXHIBIT B

REDACTED

FOR PUBLIC INSPECTION

FIGURE B1



Source: Table B1

EXHIBIT B

REDACTED

FOR PUBLIC INSPECTION

TABLE B1

[redacted]

Terrestrial Radio Stations Received (1)	SR Penetration Rate (2)	Average SR Penetration For TR Stations Less Than or Equal to Col (1) (3)	Average SR Penetration For TR Stations Greater Than Col (1) (4)	Cumulative Share of Population (5)	Cumulative Share of SR Subscribers (6)	Percentage of SR Subscribers in ZCTAs receiving TR Stations Less Than or Equal to Col (1) in ZCTAs with SR Penetration Less Than Col (4) (7)
0	[redacted]	[redacted]	[redacted]	0.0%	[redacted]	[redacted]
1				0.1%		
2				0.2%		
3				0.5%		
4				0.8%		
5				1.3%		
6				2.0%		
7				2.9%		
8				4.1%		
9				5.5%		
10				7.1%		
11				8.9%		
12				10.8%		
13				12.9%		
14				15.1%		
15				17.3%		
16				19.8%		
17				22.1%		
18				24.3%		
19				26.5%		
20				28.9%		
21				31.5%		
22				34.0%		
23				36.4%		
24				38.6%		
25				40.9%		
26				43.2%		
27				45.4%		
28				47.6%		
29				49.9%		
30				52.0%		
31				53.6%		
32				55.5%		
33				57.7%		
34				59.8%		
35				61.8%		
36				64.2%		
37				66.1%		
38				67.8%		
39				69.6%		
40				71.6%		
41				73.2%		
42				74.9%		
43				76.8%		
44				78.3%		
45				79.8%		
46				81.4%		
47				83.5%		
48				85.2%		
49				86.8%		
50				88.6%		
51				89.8%		
52				91.2%		
53				92.4%		

EXHIBIT B

REDACTED

FOR PUBLIC INSPECTION

TABLE B1

[redacted]

Terrestrial Radio Stations Received	SR Penetration Rate	Average SR Penetration For TR Stations Less Than or Equal to Col (1)	Average SR Penetration For TR Stations Greater Than Col (1)	Cumulative Share of Population	Cumulative Share of SR Subscribers	Percentage of SR Subscribers in ZCTAs receiving TR Stations Less Than or Equal to Col (1) in ZCTAs with SR Penetration Less Than Col (4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
54	[redacted]	[redacted]	[redacted]	93.6%	[redacted]	[redacted]
55	[redacted]	[redacted]	[redacted]	94.5%	[redacted]	[redacted]
56	[redacted]	[redacted]	[redacted]	95.2%	[redacted]	[redacted]
57	[redacted]	[redacted]	[redacted]	95.7%	[redacted]	[redacted]
58	[redacted]	[redacted]	[redacted]	96.1%	[redacted]	[redacted]
59	[redacted]	[redacted]	[redacted]	96.6%	[redacted]	[redacted]
60	[redacted]	[redacted]	[redacted]	97.4%	[redacted]	[redacted]
61	[redacted]	[redacted]	[redacted]	98.3%	[redacted]	[redacted]
62	[redacted]	[redacted]	[redacted]	98.9%	[redacted]	[redacted]
63	[redacted]	[redacted]	[redacted]	99.2%	[redacted]	[redacted]
64	[redacted]	[redacted]	[redacted]	99.5%	[redacted]	[redacted]
65	[redacted]	[redacted]	[redacted]	99.7%	[redacted]	[redacted]
66	[redacted]	[redacted]	[redacted]	99.8%	[redacted]	[redacted]
67	[redacted]	[redacted]	[redacted]	100.0%	[redacted]	[redacted]
68	[redacted]	[redacted]	[redacted]	100.0%	[redacted]	[redacted]

Notes:

1. Subscribers with valid ZIP codes were assigned to the ZCTA that corresponds to their ZIP code, and the number of subscribers in each ZCTA was divided by ZCTA population to determine the satellite radio penetration in each ZCTA. ZIP Code Tabulation Areas (ZCTAs) were developed by the Census Bureau to allow ZIP code and census block data to be merged.
2. Data on the number of AM/FM stations received in a census block are from BIA Research, Inc. and use the 2 mV/m contour for AM stations and the 60 dBu contour for FM stations to determine the number of AM or FM stations reaching the centroid of each census block in the lower 48 states.
3. The number of AM/FM stations received in each ZCTA is the population-weighted average of the number of AM/FM stations received in each of the census blocks contained within the ZCTA. Thus, the average satellite radio penetration reported for ZCTAs receiving 2 AM/FM stations is the average penetration for all ZCTAs receiving (on average) 1.5 to fewer than 2.5 AM/FM stations.
4. Column 5 reports the cumulative share of population in the lower 48 states.
5. Column 6 reports the cumulative share of satellite radio [redacted] subscribers that could be assigned to ZCTAs and thus are in the data set used for these calculations. [redacted]

Sources:

Terrestrial radio coverage and population data from BIA Research, Inc.

Data on XM and Sirius subscribers as of 4/25/2007

Census, ZIP code, ZCTA, and population data from U.S. Census 2000 State Geography Files. For technical documentation on mapping between Census Block, ZIP code, and ZCTA, see Summary File 1, 2000 Census of Population and Housing, Technical Documentation, Issued March 2005.

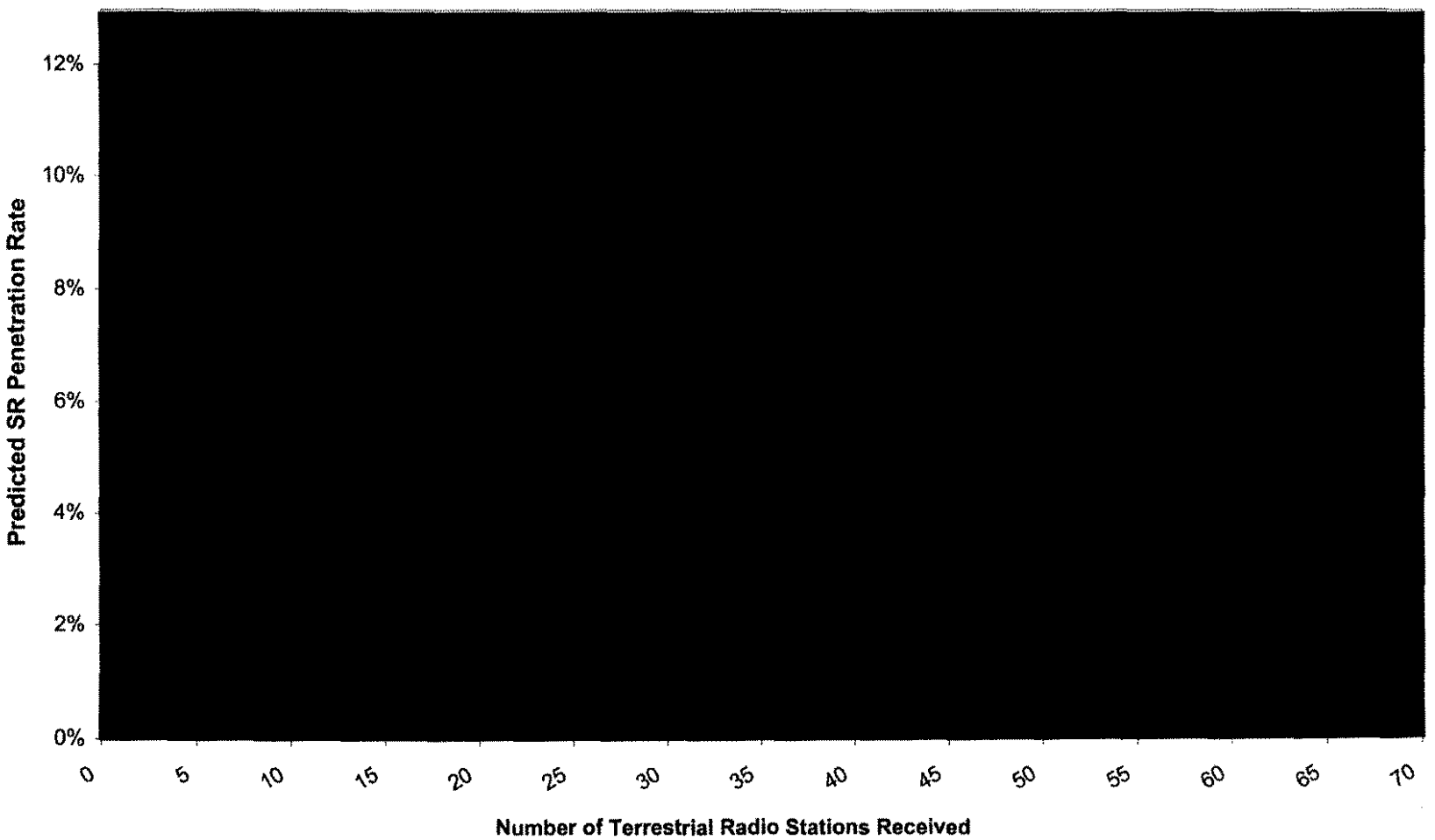
EXHIBIT B

REDACTED

FOR PUBLIC INSPECTION

FIGURE B2

[redacted]



Note: Predicted SR penetration calculated from the maximum likelihood grouped data probit estimates reported in Table B2, with other regressors set equal to their median value.

TABLE B2

[redacted]

Maximum Likelihood Grouped Data Probit Estimates

Dependent Variable = SR Penetration Rate

Regressors	Coefficients and t Statistics
TR Signals	[redacted]
TR Signals^2	[redacted]
TR Signals^3	[redacted]
TR Signals^4	[redacted]
TR Signals^5	[redacted]
Income	[redacted]
Income^2	[redacted]
% Go to Work by Car	[redacted]
% Live in Urban Area	[redacted]
% Go to Work by Car * % Live in Urban Area	[redacted]
% Female	[redacted]
Constant	[redacted]
Number of Observations	[redacted]

Notes:
1. Coefficients are in bold, and t statistics are in brackets: * Significant at 10%; ** Significant at 5%; *** Significant at 1%
2. Errors clustered by 3-digit ZCTAs.
3. "TR Signals" defined as the average number of AM/FM stations available in a ZCTA divided by 10.

Source: Source data for Table B1 and U.S. Census 2000 American Fact Finder data.

EXHIBIT C

REDACTED

FOR PUBLIC INSPECTION

TABLE C1

Audio Entertainment Market 2006

Summary of Share Estimates

Audio Source	Time Spent Listening	Revenue	Number of Users			Household Ownership
	Estimate 1		Estimate 1	Estimate 2	Estimate 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Satellite Radio	[redacted]	4.7%	[redacted]	[redacted]	[redacted]	4.7%
Sirius	[redacted]	*1.9%*	[redacted]	[redacted]	[redacted]	*2.2%*
XM	[redacted]	*2.8%*	[redacted]	[redacted]	[redacted]	*2.6%*
Terrestrial Radio	[redacted]	64.7%	[redacted]	[redacted]	[redacted]	48.0%
Internet Radio	[redacted]	-	[redacted]	[redacted]	[redacted]	N/A
Physical Audio Media (CD's etc.)	[redacted]	27.5%	[redacted]	[redacted]	[redacted]	-
Digital Audio Media (Downloads, etc.)	[redacted]	2.6%	[redacted]	[redacted]	[redacted]	-
Subscription Services	[redacted]	0.6%	[redacted]	[redacted]	[redacted]	-
MP3 Player	[redacted]	-	[redacted]	[redacted]	[redacted]	13.7%
Mobile Phone w/music etc.	[redacted]	-	[redacted]	[redacted]	[redacted]	9.5%
Podcasting	[redacted]	-	[redacted]	[redacted]	[redacted]	N/A
Broadband Access	[redacted]	-	[redacted]	[redacted]	[redacted]	24.0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Change in HHI	[redacted]	11	[redacted]	[redacted]	[redacted]	11

Source: Tables C3-C6

TABLE C2

Audio Entertainment Market 2006

Summary of Terrestrial Plus Satellite Radio Shares

Audio Source	Time Spent Listening			Revenue	Number of Users		Household Ownership
	Estimate 1	Estimate 2	Estimate 3		Estimate 1	Estimate 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Satellite Radio	[redacted]	[redacted]	3.4%	6.8%	[redacted]	[redacted]	9.0%
Sirius			*1.5%*	*2.7%*			*4.1%*
XM			*1.9%*	*4.0%*			*4.8%*
Terrestrial Radio			96.6%	93.2%			91.0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Change in HHI	[redacted]	[redacted]	**6**	**22**	[redacted]	[redacted]	**40**

Source: Tables C3-C6

EXHIBIT C **REDACTED**

FOR PUBLIC INSPECTION

Audio Entertainment Market 2006
Shares of Time Spent Listening

	Estimate 1			Estimate 2		Estimate 3
Audio Source	**Weekly TSL (hrs)** (1)	**Shares** (2)	**Shares (Terrestrial & Satellite Radio Only)** (3)	**Weekly TSL (hrs)** (4)	**Shares (Terrestrial & Satellite Radio Only)** (5)	**Shares (Terrestrial & Satellite Radio Only)** (6)
Satellite Radio	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	3.4%
Sirius	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	*1.5%*
XM	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	*1.9%*
Terrestrial Radio	4,363,313,402	[redacted]	[redacted]	4,447,691,395	[redacted]	96.6%
MP3 Player	949,094,764	[redacted]		-		
Internet Radio	682,969,853	[redacted]		-		
Podcasting	-	[redacted]		-		
Mobile Phone w/music etc.	68,291,390	[redacted]		-		
CD Players	-	[redacted]		-		
Total	[redacted]	**100%**	**100%**	[redacted]	**100%**	**100%**
Change in HHI		[redacted]	[redacted]		[redacted]	**6**

Notes and Sources:

The change in HHI is calculated as equal to 2 x (XM share) x (Sirius share). Appropriate overall HHI levels for the market, either pre-merger or post-merger, cannot be calculated from these shares. With the exception of XM and Sirius, these are the shares of various sources of audio entertainment rather than of individual suppliers.

Estimate 1

1. Weekly hours of listening to XM: Calculated from [redacted]

2. Weekly hours of listening to Sirius: [redacted]

3. Weekly hours of listening to terrestrial radio, MP3 players, and internet radio: Calculated from the percent of the population using each and the weekly time spent listening to each medium (from Bridge Ratings Press Release, *2007 Competitive Media Usage Overview* (January 3, 2007), *available at* http://www.bridgeratings.com/press.01.03.07.CompMediaUse.htm (last visited July 17, 2007) and estimate of U.S. population aged 12+ as of January 1, 2007 (from Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4).

4. Weekly hours of listening on mobile phones: Calculated using estimates of the percentages of wireless subscribers using various mobile audio features in past 30 days and of the weekly time spent listening to various sources of music on mobile phones (from Arbitron/Telephia, *The Mobile Audio Media Study* (2007) at 6, 8). The percentage of mobile phone owners in the population age 12+ from Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 3.

Estimate 2

1. Weekly hours of listening to satellite radio: Estimated as for Estimate 1.

2. Weekly hours of listening to terrestrial radio per listener and percentage of population 12+ listening to terrestrial radio in the past week from Arbitron, *Radio Today, How America Listens to Radio: 2007 Edition* at 90-91.

3. Estimate of U.S. population aged 12+ as of January 1, 2007 from Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4.

Estimate 3

1. Arbitron Press Release, *Satellite Radio Channels Account for 3.4 Percent of All Radio Listening in Fall 2006 Arbitron Survey* (February 27, 2007), *available at* http://onlinepressroom.net/arbitron/ (last visited July 5, 2007). Satellite radio listening was allocated between XM and Sirius in the proportion of their subscribers (as reported in each company's Form 10-K for 2006). The remaining 96.6% was attributed to terrestrial radio although it includes some hours of listening to simulcast AM/FM channels on the internet.

EXHIBIT C

REDACTED

FOR PUBLIC INSPECTION

TABLE C4

Audio Entertainment Market 2006
Shares of Revenue

Audio Source	Revenue (millions) (1)	Shares (2)	Shares (Terrestrial & Satellite Radio Only) (3)
Satellite Radio	$1,571	4.7%	6.8%
Sirius	*$637*	*1.9%*	*2.7%*
XM	*$933*	*2.8%*	*4.0%*
Terrestrial Radio	$21,669	64.7%	93.2%
Internet Radio	-	-	
Physical Audio Media (CD's etc.)	$9,200	27.5%	
Digital Audio Media (Downloads, etc.)	$858	2.6%	
Subscription Services	$206	0.6%	
Total	**33,505**	**100%**	**100%**
Change in HHI		**11**	**22**

Notes and Sources

1. The change in HHI is calculated as equal to 2 x (XM share) x (Sirius share). Appropriate overall HHI levels for the market, either pre-merger or post-merger, cannot be calculated from these shares. With the exception of XM and Sirius, these are the shares of various sources of audio entertainment rather than of individual suppliers.

2. Sirius and XM Revenue: XM and Sirius Form 10-K data (Period ending December 31, 2006).

3. Terrestrial Radio Revenue: Radio Advertising Bureau, *Radio Facts, Annual Revenue, available at* http://www.rab.com/public/pr/revenue Trends.xls (last visited July 7, 2007).

4. Physical and digital audio media and subscription services from RIAA, *2006 Year-End Statistics, available at* http://76.74.24.142/6BC 7251F-5E09-5359-8EBD-948C37FB6AE8.pdf (last visited July 7, 2007).

5. Revenue reported for physical audio media includes revenues from CD's, Cassettes, LP/EP, DVD Audio and SACD, but excludes DVD video revenue.

6. Revenue reported for digital audio media includes revenues from downloads and kiosks, but excludes revenue for digital music videos.

7. Revenues reported above exclude revenue from sales of equipment except in the case of satellite radio where it includes revenue from direct sales of radios and accessories.

EXHIBIT C

REDACTED

FOR PUBLIC INSPECTION

Audio Entertainment Market 2006
Shares of Number of Users

Audio Source	Estimate 1			Estimate 2			Estimate 3	
	Number of Users (Millions) (1)	Shares (2)	Shares (Terrestrial & Satellite Radio Only) (3)	Number of Users (Millions) (6)	Shares (7)	Shares (Terrestrial & Satellite Radio Only) (8)	Number of Users (Millions) (4)	Shares (5)
Satellite Radio	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Sirius								
XM								
Terrestrial Radio	234.1	[redacted]	[redacted]	237.1	[redacted]	[redacted]	235.9	[redacted]
Internet Radio	27.7	[redacted]		60.4	[redacted]		47.9	
MP3 Player	46.0	[redacted]		-	[redacted]		75.9	
Podcasts	-	[redacted]		2.5	[redacted]		-	
CD Player	-	[redacted]		-	[redacted]		-	
Mobile Phone w/music etc.	11.2	[redacted]		3.5	[redacted]		-	
Total	[redacted]	**100%**	**100%**	[redacted]	**100%**	**100%**	[redacted]	**100%**
Change in HHI		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]

Notes and Sources:

The change in HHI is calculated as equal to 2 x (XM share) x (Sirius share). Appropriate overall HHI levels for the market, either pre-merger or post-merger, cannot be calculated from these shares. With the exception of XM and Sirius, these are the shares of various sources of audio entertainment rather than of individual suppliers.

Estimate 1

1. Estimates are of the number of users in the past week age 12+ where available, and except where otherwise noted.
2. Users of satellite radio service: Note that the number of listeners exceeds the number of subscribers because multiple people may listen to device. Users equal the sum of primary and secondary listeners, [redacted] bers and listening patterns. Number of primary XM listeners is [redacted] Information on the number of subscribers and the proportion that are family plan subscriptions from the XM and Sirius Form 10-K data (2006).
3. Users of terrestrial radio service: Percentage of the population 12+ listening in the past week from Arbitron, *Radio Today, How America Listens to Radio: 2007 Edition* at 90.
4. Users of internet radio: Percentage of the population 12+ listening in the past week from Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 5.
5. Users of MP3 players: Percentage of the population 12+ using MP3 players from Jupiter Research, *U.S. Music Forecast: 2006 to 2011* (August 2006) at 8. The Infinite Dial 2007 at 14 reports that 30% of the population 12+ owns an MP3 player, but not the percentage that used their MP3 player. Jupiter estimates the users of MP3 players, and that approximately 31% of the population 12+ owns MP3 players.
6. Users of mobile phones with music: Calculated from the percentage of wireless subscribers who used mobile audio features of their mobile phone in the past 30 days (from Arbitron/Telephia, *The Mobile Audio Media Study* (2007) at 6) multiplied by the percentage of mobile phone owners in the population 12+ (from Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 3).
7. Estimate of U.S. population aged 12+ as of January 1, 2007 from Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4.

Estimate 2

1. Weekly users of devices: Calculated from Bridge Ratings, *Digital Media Growth Projections* (updated 04/25/2007), *available at* http://www.bridgeratings.com/press_042507-digitalprojectionsupd.htm (last visited July 17, 2007) except where otherwise noted. Bridge appears to estimate numbers representative of the entire U.S. population. These estimates have been multiplied by the population age 12+ divided by total population to be conservative and for comparability with other reported estimates.
2. Bridge estimate for mobile phones is for the number of users of mobile phones for streaming and does not include downloading.
3. Users of satellite radio: Calculated as for Estimate 1, which [redacted] *Digital Media Growth Projections* (updated 04/25/2007), *available at* http://www.bridgeratings.com/press_042507-digitalprojectionsupd.htm (last visited July 17, 2006).
4. Estimate of U.S. population aged 12+ as of January 1, 2007 from Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4. Estimate of total U.S. population from U.S. Census Bureau Press Release, *Census Bureau Projects Population of 300.9 Million on New Year's Day* (December 28, 2006), *available at* http://www.census.gov/Press-Release/www/releases/archives/population/007996.html (last visited July 7, 2007).

Estimate 3

1. Weekly users of devices: Calculated from users as a percentage of the population age 12+ reported by Bridge Ratings Press Release, *2007 Competitive Media Usage Overview* (January 3, 2007), *available at* http://www.bridgeratings.com/press.01.03.07.CompMediaUse.htm (last visited July 17, 2007), except where otherwise noted.
2. Estimate of U.S. population aged 12+ as of January 1, 2007 from Arbitron, *Radio Nationwide Reference Guide* (Fall 2006) at 4.
3. Users of satellite radio: Calculated as for Estimate 1, which [redacted] Press Release, *2007 Competitive Media Usage Overview* (January 3, 2007), *available at* http://www.bridgeratings.com/press.01.03.07.CompMediaUse.htm (last visited July 17, 2007).

TABLE C6

U.S. Audio Entertainment Market 2006
Shares of Household Ownership

Audio Source	Households (millions) (1)	Shares (2)	Shares (Terrestrial & Satellite Radio Only) (3)
Satellite Radio	11.0	4.7%	9.0%
Sirius	*5.1*	*2.2%*	*4.1%*
XM	*5.9*	*2.6%*	*4.8%*
Terrestrial Radio	111.3	48.0%	91.0%
MP3 Player	31.8	13.7%	
Broadband Internet Access	55.6	24.0%	
CD Players	-	-	
Mobile Phone w/music etc.	22.1	9.5%	
Total	**231.7**	**100%**	**100%**
Change in HHI		**11**	**40**

Notes and Sources:

1. The change in HHI is calculated as equal to 2 x (XM share) x (Sirius share). Appropriate overall HHI levels for the market, either pre-merger or post-merger, cannot be calculated from these shares. With the exception of XM and Sirius, these are the shares of various sources of audio entertainment rather than of individual suppliers.

2. Number of households owning devices: From Forrester Research, *The State of Consumers and Technology: Benchmark 2006* (July 27, 2006) at 3, except where otherwise noted.

3. Number of households owning satellite radio: To account for some households having more than one subscribed radio, the figure reported equals the number of non-family plan subscriptions, calculated from the number of subscribers and proportion of family plan subscriptions as reported in the XM and Sirius Form 10-K data (2006).

4. Number of households with terrestrial radio: Estimated from percentage of households utilizing radio in 2004 (from U.S. Census Bureau, *Statistical Abstract of the United States: 2007, Information and Communications*, Table 1111, *available at* http://www.census.gov/prod/2006pubs/07statab/infocomm.pdf (last visited July 5, 2007)) multiplied by the number of households from Forrester Research, *The State of Consumers and Technology: Benchmark 2006* (July 27, 2006) at 3. We assume the percentage of households with radio in 2006 is the same as that in 2004.

5. Number of households with mobile phones with music: Equals the percentage of mobile phone owners with multi-media capabilities – the ability to download full songs as well as video (from Ipsos, *Tempo: Keeping Pace with Digital Music Behavior, 2006 Quarter 3 Report* (December 2006) at 59) times the number of households reported as owning phones from Forrester Research, *The State of Consumers and Technology: Benchmark 2006* (July 27, 2006) at 3.