

individual firms in the pre-merger world. The external spillovers generate incentives for post-merger price decreases and enhanced investment. Conditions in satellite radio are consistent with significant external demand spillovers, including the fact that consumer recommendations drive demand for the product category generally (and thus for the other service too), the exclusive distribution arrangements with auto OEMs, the importance of exclusive premium content on each service, and because subscribers to one service sometimes recommend the other service.

90. The analysis of market definition and competitive effects for a merger of Sirius and XM must be applied to these factual circumstances if it is to reliably evaluate the real economic questions and follow the directives of the Merger Guidelines.¹⁴⁴ The analysis must not be applied “mechanically,” as if one were pretending that there were different factual circumstances. In this matter, the dynamic demand spillovers are an inherent characteristic of the demand structure facing the individual firms in the pre-merger world, and thus also of the demand structure that the hypothetical monopolist would face. This demand structure affects the rational, profit-maximizing prices chosen by the pre-merger firms, (i.e. the pre-merger current prices) and by the merged firm, and also the profit-maximizing price of the rational hypothetical monopolist assumed for market definition purposes. The analysis in our earlier report showed that when a firm faces demand with dynamic demand spillovers, the price that maximizes overall profits will not be the price that maximizes profits in the short-term, but instead will be a lower price.
91. If dynamic demand conditions are ignored when implementing the hypothetical monopolist test, as they are in Sidak’s analysis, the resulting relevant product market is likely to be incorrectly defined. Demand spillovers significantly change the pricing incentives of the individual firms and the hypothetical monopolist of the *ssnip* test. The profit-maximizing price for the hypothetical monopolist will be lower because reducing price (i.e., penetration pricing) is a way to invest in higher future demand. A hypothetical monopolist test that arbitrarily assumed away dynamic demand and focused only on the short-term would be more likely to find that a *ssnip* above the pre-merger price (which already reflects penetration pricing) was profitable – even though a hypothetical monopolist rationally responding to dynamic demand conditions would not find it profit-maximizing to raise price. The result of the incorrect test would be an incorrectly defined relevant product market.

¹⁴⁴ It goes without saying that many mergers will not have the same mix of facts. It is those facts that make dynamic demand important here. More generally, our approach would be most applicable to mergers like this one, where all or most of these factual conditions exist.

92. Market definition analysis also should consider the fact of rapid subscriber growth. The hypothetical monopolist test calls for evaluating the overall profitability of a *ssnip* “lasting for the foreseeable future,” which means evaluating the longer-term effect of the price increase on profits (when the subscriber base is larger), not just its near-term effect. Rapid growth affects the analysis because it affects the magnitude of the loss of future subscribers and profits from a price increase, as the dynamic spillover effects are played out.¹⁴⁵
93. Thus, if dynamic demand spillovers and growth are ignored, the hypothetical monopolist market definition test will have no grounding in real world market conditions and pricing behavior and will give misleading answers to the real economic questions. In short, the approach to market definition taken in our report applies the principles of the Merger Guidelines to industry facts, as the Guidelines direct. Sidak’s insistence that the *ssnip* test should consider only short-term profits or only current subscribers is not.¹⁴⁶ A hypothetical monopolist of satellite radio services likely would not find it profitable to implement a *ssnip* that increased profits only in the short-term or only from current subscribers, if that price increase led to reduced profits when the impact on potential subscribers (and the longer-term impact on current and potential subscribers) are taken into account.
94. Indeed, when demand spillovers are significant, Sidak’s erroneous approach could lead to a striking result – separate *single-firm* relevant markets, one for XM and one for Sirius. As explained earlier, the individual firms in the pre-merger world set penetration prices because they face dynamic demand spillovers. Penetration prices are set below the short-term profit-maximizing level in order to generate additional future subscribers by creating more satisfied customers who will create a market buzz and evangelize the product to others. Under these circumstances, a *ssnip* by a hypothetical monopolist comprised of a single firm would erroneously appear profitable, if only short-term effects were considered. In addition, switching costs inhibit current subscribers of one satellite radio service from shifting to the other service. Thus, a single-firm would comprise a separate market under the erroneous short-term *ssnip* test recommended by Sidak. This misleading result illustrates the analytic errors that flow from of deviating from the

¹⁴⁵ As discussed in our earlier report, demand for satellite radio likely is becoming more elastic over time because of continuous innovation and feature convergence by competing audio entertainment devices in response to consumer demand. CRA FCC Report at ¶111. This also will affect the overall profitability of a price increase taken now and lasting into the foreseeable future. This is another important factor to take into consideration in evaluating market definition and the competitive effects of this merger.

¹⁴⁶ For a fuller discussion of these points, see the discussion in Section II.A-B *infra*.

Guidelines and focusing exclusively on short-term profitability in an imaginary world that deviates from the real world.¹⁴⁷

B. Sidak's Misunderstandings of the Concept of Dynamic Demand

95. Sidak moves on from his mistaken claim that our analysis of dynamic demand is inconsistent with the Merger Guidelines to address the concept itself. But Sidak's criticisms of the concept of dynamic demand and its relevance for merger analysis betray some fundamental misunderstandings of the effects of internal and external dynamic demand spillovers on the pricing incentives of XM and Sirius and of the merged firm (or, for market definition analysis, of the hypothetical monopolist).
96. First, Sidak asserts that the concept of dynamic demand "provides no basis to claim that the post-merger dynamically optimal price will not be higher," apparently because "one would expect that XM and Sirius have already been engaging in 'penetration pricing' as they compete against each other for subscribers."¹⁴⁸ Sidak's claim seems to be that dynamic demand conditions don't affect whether the merged firm would raise price because the stand-alone Sirius and XM also face dynamic demand and set penetration prices. Sidak's discussion indicates an apparent failure to understand how the full effects of dynamic demand, and especially of external spillovers, affect pricing incentives.
97. In the first place, Sidak's observation that Sirius and XM have been engaging in penetration pricing because they face poorly informed potential subscribers, which leads to dynamic demand spillovers, is neither inconsistent with nor undermines our analysis. We have been quite explicit that Sirius and XM are and have been engaging in penetration pricing – setting price below the level that would maximize short-term profits – because they face dynamic demand. As already discussed, the fact that current prices of the pre-merger XM and Sirius are set below the level that maximizes short-run profits is part of the reason that a hypothetical monopolist test for market definition that considered only the short-run profitability effects of a *snip* lasting for the foreseeable future would be misleading.
98. In suggesting that our analysis fails to explain why dynamic demand would not discourage the post-merger firm from raising prices, Sidak apparently misunderstands our analysis of the *external effect* of dynamic spillovers. His discussion of pricing fails to address our explanation of how and why the *external* spillover effects of dynamic

¹⁴⁷ As discussed earlier, if the market were not defined as single-firm markets, the proper market would be expanded beyond just satellite radio. This is because substitution among current subscribers between XM and Sirius is very low because of switching costs. See CRA FCC Report at ¶23.

¹⁴⁸ Sidak 3rd Supplemental at ¶78.

demand alter the pricing incentives of the merged firm relative to those of the separate, pre-merger firms.¹⁴⁹ As we explained, dynamic demand for satellite radio creates two types of spillovers that have different effects on pricing incentives of the hypothetical monopolist (and the merged firm).

99. First, higher current sales of a service lead to more sales of that same service in the future. Such spillovers – which we call internal dynamic demand spillovers – give the pre-merger XM and Sirius, and the merged firm (and the hypothetical monopolist), incentives to set lower, penetration prices than they would absent the internal spillovers.

100. Second, external dynamic spillovers give the merged firm (and the hypothetical monopolist) an incentive to set lower prices, an effect that would not be taken into account by the individual firms in the pre-merger world. As our report explained,

[S]ome 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.¹⁵⁰

101. For example, suppose that XM reduces its prices in the pre-merger world. Because XM does not benefit much from this external effect of its lower prices on Sirius, XM will not consider Sirius' benefit in choosing its most profitable pre-merger price.¹⁵¹ The merged firm, however, will directly benefit from the effect of lower XM prices on future Sirius subscriptions (and similarly the direct effect of lower Sirius prices on future XM subscriptions), which gives it an incentive to engage in deeper penetration pricing than the stand-alone firms. This effect of external dynamic spillovers on the pricing of the

¹⁴⁹ In the next paragraph, Sidak does quote our statement that external dynamic demand spillovers reduce incentives of the separate firms to engage in demand-enhancing investment, including penetration pricing. (Sidak 3rd Supplemental at ¶79) This point is ignored, however, in his claim at ¶78 that dynamic demand “provides no basis to claim that the post-merger dynamically optimal price will not be higher.”

¹⁵⁰ CRA FCC Report at ¶119.

¹⁵¹ XM may consider the small secondary effect that more Sirius subscribers ultimately will increase the number of XM subscribers through a follow-on external spillover. But, the magnitude of this effect would be “second-order,” and would not nearly eliminate the externality.

merged firm is discussed in our report, but it is ignored in Sidak's discussion of how dynamic demand affects post-merger prices.¹⁵²

102. This analysis also applies to the hypothetical monopolist test used in the market definition analysis. The hypothetical monopolist, like the merged firm, would take external spillover benefits into account in deciding whether it was in its economic interest to raise price. The internalization of the external spillover effects reduces its economic incentives to raise price and leads to an expanded relevant market, *ceteris paribus*.
103. Sidak also mistakenly asserts that the analysis of external dynamic demand spillovers in our report is "inconsistent" with our conclusion that the relevant product market includes audio entertainment other than satellite radio.¹⁵³ The inconsistency, according to Sidak, is that the merger will not internalize all external spillovers from XM and Sirius unless those spillovers do not extend to other audio entertainment services. But, says Sidak, if *dynamic spillovers only extend to satellite radio, then the product market must be limited to satellite radio.*
104. This claim misunderstands the concept and source of dynamic spillovers, and their relationship to market definition. External spillovers need not affect all other competing firms in the market. External spillovers exist because information about Sirius also has some application to XM and vice versa, and such information is valuable to consumers. However, that same information would not help consumers learn more about terrestrial radio, wireless phones, iPods or other MP3 players.¹⁵⁴ For example, suppose that seeing more green Chevys on the road leads relatively more consumers to learn how attractive green cars are and thus to desire green Fords or Toyotas over silver ones. That type of external demand spillover involving different brands of green cars would not mean that there must be a relevant market comprised solely of green cars.

¹⁵² Sidak also misrepresents our analysis by claiming that our argument that the merger will generate benefits by internalizing external dynamic spillovers amounts to an argument that "competition is a bad thing." Sidak 3rd Supplemental at ¶79. In fact, our analysis was part of a competitive effects analysis designed to determine whether, on balance, the merger will increase or decrease consumers and competition. We explained that the positive effects on consumers of internalizing of external spillovers is one of several consequences of the merger that should be considered in an analysis of the effects of this merger on competition; we do not claim that the existence of external dynamic spillover effects alone justifies the merger. We do conclude that this fact, along with others including the substantial competition the merged firm faces from other audio entertainment sources, means that the merger will benefit consumers. See CRA FCC Report at ¶119-120, which is contained within the discussion of competitive effects in Section IV.

¹⁵³ Sidak 3rd Supplemental at ¶80.

¹⁵⁴ Of course consumers also are much more likely to be familiar with many of these alternatives, and especially with terrestrial radio.

105. Finally, Sidak also misunderstands our explanation of how the merger will solve free riding problems and promote the marketing of interoperable radios. Sidak says that the individual firms have not introduced interoperable radios because of a free riding problem, but because such radios would make it easier for customers to switch between XM and Sirius.¹⁵⁵ Interoperable radios would make it easier for subscribers to switch. That switching, however, generates the free riding problem.¹⁵⁶ New Sirius subscribers with interoperable radios might well subscribe to Sirius for a shorter time on average than those with non-interoperable radios, giving the service less time to recover its investment in acquisition costs. And, when a subscriber with an interoperable radio switches to the other satellite radio service, that other service would benefit by acquiring a new subscriber whose radio it did not need to subsidize. Thus, each individual firm would have the incentive to free ride by reducing the costs it incurs to market and subsidize interoperable radios, while enjoying the subsequent flow of switching subscribers who bought an interoperable radio from the other firm. Absent the merger, each firm's fear of such free riding creates a barrier to subsidizing interoperable radios.¹⁵⁷
106. Sidak, however, claims that there is "no reason to believe that such switching would occur *asymmetrically*" and thus that there is no free rider problem and no problem of monitoring costs.¹⁵⁸ The two companies could, Sidak claims, simply share development and marketing costs equally, knowing they each would receive an equal spillover benefit.¹⁵⁹ But Sidak has the analysis backwards. The pre-merger XM and Sirius would worry about asymmetric switching flows precisely *because* there is a free riding problem. Each individual company knows that if it sells fewer interoperable radios to new subscribers than the other does, it can expect to receive more switching subscribers than it gives up to the other. This gives each individual firm a free-riding incentive to sell fewer interoperable radios than the other – *e.g.*, by pricing them higher with less subsidy, featuring them less prominently in their marketing, etc. – in order to benefit from the resulting asymmetry in switching subscribers.
107. These free riding incentives mean that the two companies cannot simply agree to exert equal effort; they also would have to engage in substantial monitoring and contractual

¹⁵⁵ Sidak 3rd Supplemental at ¶81, citing CRA FCC Report at ¶127 and n. 236.

¹⁵⁶ CRA FCC Report at ¶127.

¹⁵⁷ If, despite free riding, a firm marketed interoperable radios, the other firm that is free-riding might have the incentive to reduce its subscription price to reflect its lower costs and to increase its free-riding benefits, but that would still reflect free riding.

¹⁵⁸ Sidak 3rd Supplemental at ¶81.

¹⁵⁹ *Id.*

enforcement to ensure that each made equal effort – as our previous report pointed out.¹⁶⁰ They also would need to agree on a level of the subsidy and promotional expenditures, an agreement which would raise potential antitrust concerns when carried out by independent firms. In sum, Sidak is wrong. Switching could be asymmetric and there is a free riding problem that the pre-merger firms cannot easily solve by agreement.

C. Evidence of Dynamic Demand Spillovers, Penetration Pricing and Growth

108. Contrary to Sidak’s mistaken claim that our dynamic demand analysis is “wholly theoretical,” our earlier report presented evidence on the importance of word-of-mouth information diffusion in generating future sales and on the companies engaging in penetration pricing.¹⁶¹ This section expands on that evidence. We begin with evidence of penetration pricing and growth. We then turn to the surveys that Sirius and XM have carried out in the normal course of business, surveys that provide further evidence of the pervasive importance of dynamic spillovers for the growth of satellite radio subscribers – that more subscribers today lead to more subscribers tomorrow. In particular, the surveys of the two companies show that [REDACTED]

109. This evidence indicates how information from current subscribers influences others to subscribe, increasing the number of future subscribers. Those dynamic demand spillovers in turn affect the pricing incentives for satellite radio service.

1. Penetration Pricing and Market Growth

110. Our analysis showed that it would not be rational, profit-maximizing behavior for a firm to set price solely to maximize short-run profits. Instead, it is rational to set lower penetration prices when a firm faces dynamic demand spillovers. As we noted in our initial report, company statements indicate that satellite radio firms focus on the impact of price changes on prospective new subscribers, rather than simply on their impact on short-term profits and current subscribers.

111. Indeed, in 2005, Sirius CEO Mel Karmazin stated this plainly:

“...[W]e know that there is price elasticity. What our focus today is on growing the category. It is a relatively small number of

¹⁶⁰ CRA FCC Report at ¶127.

¹⁶¹ See, for example, CRA FCC Report at n. 168 and ¶80-81.

people that are subscribing to satellite radio. We want that number to grow huge, and we think that being attractively price at retail, providing great content at good value is the way we grow the market....”

[O]ur 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.”¹⁶²

112. This penetration pricing makes economic sense because satellite radio is a young market, far from demand saturation. As discussed above, Wall Street analysts project that the demand for satellite radio will grow dramatically over a projection period through 2015. We have collected a number of analyst reports. The average projected subscription level of satellite radio in 2015 for a group of recent analyst reports was about 38 million subscribers, compared to about 14 million subscribers at the end of 2006. These projections are shown in the table attached as an Exhibit. In these circumstances, taking a longer-term view to pricing makes economic sense.

2. Recommendations by Subscribers

113. As discussed above, satellite radio depends heavily on word-of-mouth information diffusion and recommendations from satisfied subscribers to help drive its demand growth. There is abundant survey evidence that [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

¹⁶² Sirius Satellite Radio, *Q1 2005 Earnings Call Transcript*, April 28, 2005. Cited in CRA FCC Report at n. 168.

¹⁶³ [REDACTED]

[REDACTED]

○ [REDACTED]

• [REDACTED]

• [REDACTED]

114. [REDACTED]

• [REDACTED]

164 [REDACTED]

165 [REDACTED]

166 [REDACTED]

167 [REDACTED]

168 [REDACTED]

[REDACTED]

- [REDACTED]

115. [REDACTED]

- [REDACTED]
- [REDACTED]

3. Word-of-Mouth Learning by Non-Subscribers

116. Satisfied satellite radio subscribers recommend the service to others and more generally can “talk up” the service, helping to create “market buzz.” The companies have understood from the beginning that word-of-mouth recommendations and market buzz would play an important role in driving subscriber growth for satellite radio, as have industry analysts.¹⁷² A Credit Suisse First Boston analysis of Sirius in 2000 concluded

¹⁶⁹ [REDACTED]

¹⁷⁰ [REDACTED]

¹⁷¹ [REDACTED]

¹⁷² As noted above, the views of industry experts constitute one of Professor Baker’s categories of relevant information. Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 139-141.

○ [REDACTED]

○ [REDACTED]

118. [REDACTED]

• [REDACTED]

• [REDACTED]

178 [REDACTED]

179 [REDACTED]

180 [REDACTED]

181 [REDACTED]

182 [REDACTED]

4. OEM Subscribers

119. Word-of-mouth information diffusion and recommendations, and thus dynamic demand spillovers, also help drive OEM subscriptions, even though those radios come with trial periods. First, some automobile buyers must choose whether or not to pay for a trim level that includes satellite radio. Second, even those buyers whose cars contain satellite radios as standard equipment must decide whether or not to seriously consider satellite radio and to make an effort to explore the range of programming available on satellite radio and listen regularly during the trial period.

120. [REDACTED]

- [REDACTED]
- [REDACTED]

121. [REDACTED]

- [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

5. Family Plan Subscriptions and Gifts

122. Subscriptions for additional satellite radios in the same family, or subscriptions arising out of gifts, also represent dynamic demand spillovers. Most such subscriptions likely are the consequence of the first subscription in the family, or the subscription of the gift-

184 [REDACTED]
Also see comments of XM President Nate Davis, Thomson StreetEvents, XMSR-Q3 2007 XM Satellite Radio Earnings Conference Call Final Transcript (October 25, 2007) at 3-4, citing the results for aftermarket subscribers.

185 [REDACTED]

186 [REDACTED]

187 [REDACTED]

188 [REDACTED]

189 [REDACTED]

giver. There is clear evidence that substantial proportions of satellite radio subscriptions come from families adding radios or from gift subscriptions, and thus are the result of dynamic demand spillovers.

123. Consumers who subscribe to additional radios after learning from experience how much they enjoy satellite radio service from their first subscription represent a form of dynamic spillover. Both companies report the number of additional radio subscriptions they have – what XM calls Family Plan subscriptions and Sirius calls multi-unit plans. Additional radio subscriptions account for a substantial and growing proportion of all satellite radio subscriptions. Family Plan subscribers accounted for 23.5% of total XM subscriptions as of June 30, 2007, up from 20.7% a year earlier.¹⁹⁰ Multi-unit subscriptions accounted for 18% of Sirius subscriptions as of the end of June 30, 2007, up from 13% a year earlier.¹⁹¹

124. A similar dynamic spillover mechanism operates when a satisfied subscriber gives a gift to others. Gaining additional subscribers today would lead to more satellite radios being gifted in the future. The seasonal pattern of gross additions for both companies, with the greatest increases coming in the fourth quarter of each year, leads one to suspect that gift-giving plays a substantial role in the growth of satellite radio. Surveys corroborate this conjecture.

- [REDACTED]
- [REDACTED]

6. Evidence of External Spillovers

125. As explained above and in our earlier report, some dynamic demand spillovers are external spillovers, where increased sales of one satellite service today lead to increased future sales of the *other* service. The level of external spillovers are relevant for

¹⁹⁰ XM, Form 10-Q (Q2 2007) at 43.

¹⁹¹ Sirius, Form 10-Q (Q2 2007).

¹⁹² [REDACTED]

¹⁹³ [REDACTED]

competitive effects analysis because they affect the pricing and investment incentives of the merged firm. They are relevant for market definition because they affect the pricing incentives of the hypothetical monopolist. The idea of external spillovers, like that of dynamic spillovers in general, is grounded in the facts of satellite radio.

126. Survey evidence indicates that [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

- [REDACTED]
[REDACTED]
- [REDACTED]
[REDACTED]

127. [REDACTED]
[REDACTED]
[REDACTED]
• [REDACTED]
[REDACTED]
• [REDACTED]
[REDACTED]

128. Industry analysts also have concluded that both services likely benefit when either service adds important content because of the attention drawn to satellite radio as a whole. These

194 [REDACTED]
[REDACTED]

195 [REDACTED]
[REDACTED]

196 [REDACTED]
[REDACTED]

197 [REDACTED]
[REDACTED]

198 [REDACTED]
[REDACTED]

are indications of external spillovers. Industry analysts concluded that Howard Stern's move to Sirius benefited satellite radio as a whole, XM as well as Sirius.¹⁹⁹ A later report worried that satellite radio sales overall, those of XM as well as Sirius, would suffer in 2006 without publicity such as that generated by Howard Stern. Another thought that Oprah coming to XM could benefit satellite radio in general.²⁰⁰

129. Dynamic demand spillovers that influence OEM subscriptions are particularly likely to be external spillovers. Because virtually all OEMs now offer only one brand of factory-installed, integrated satellite radio, most potential OEM subscribers will find their choice of satellite radio service determined by their choice of vehicle, not by whether XM or Sirius was recommended to them. For example, a consumer purchasing a GM vehicle who is interested in satellite radio because of recommendations from a Sirius subscriber would find that only XM is available as factory-installed, integrated equipment in a new GM car. Given the increasing relative size of the OEM channel, this source of external spillovers is becoming increasingly important.
130. This discussion has concentrated on initial or direct external spillover effects. External spillovers include, however, not only the initial subscription induced, but additional subscriptions by others that result from that initial external spillover. For example, suppose that consumer A subscribes to XM and provides information that induces consumer B to subscribe to Sirius. That is a direct external spillover. Suppose that consumer B's subscription to Sirius has its own further (internal) spillover effect, leading to a subsequent subscription by consumer C. The subscription by C also is the result of the initial external spillover to Sirius from A's subscription to XM. Of course, the subscriptions to consumers like C may be second-order effects in terms of magnitude.

D. Conclusions on Dynamic Demand Spillovers and Penetration Pricing

131. Contrary to Sidak's claims, we do not reject the principles of conventional merger analysis. Instead, we have applied the appropriate economic analysis to the "particular facts and circumstances" of the merger, as called for by economic analysis and the

¹⁹⁹ Lucas Binder, *Satellite Radio Into 2007: Beyond the Holiday Season*, UBS Investment Research (November 2006) (with Howard Stern's move to satellite radio, "XM benefited from the increased awareness of satellite radio in 4Q05."); Jonathan A. Jacoby, *Equity Research: Radio and TV Broadcasting*, Bank of America (May 25, 2006) (finding a shift in demand for satellite radio in 4Q'05 due to the "Stern Effect:" "The satellite radio buzz created by Howard Stern likely pulled forward some demand.").

²⁰⁰ Wachovia Securities, *XMSR: Here Comes Oprah; Would Wait on the Sidelines for Now* (Feb. 9, 2006) ("We believe that net this is a positive for XM and satellite radio in general, as it should bring more 'buzz' to the product.").

Merger Guidelines. The application of dynamic demand spillovers theory to this merger is appropriate because of the specific facts of this merger. Many other mergers will not have these or similar facts, and the theory of dynamic demand spillovers will not be applicable to the analysis of those mergers.

IV. SIDAK'S ADVERTISING WELFARE ANALYSIS

132. In several submissions to the Commission, Sidak has argued that the merger will reduce consumer welfare by leading to an increase in the number of commercials aired on satellite radio.²⁰¹ To analyze this issue, Sidak developed a formal economic model of satellite radio subscriber demand that depends on the number of commercials as well as price. However, Sidak's analysis is flawed by faulty empirical assumptions and a failure to take account of the profit-maximizing pricing incentives of the firm. When his analysis is corrected, it leads to the opposite result – that consumer welfare rises.
133. Sidak creates his premise – that the merged firm would substantially increase commercial minutes – by an unsupported extrapolation from statements of Sirius CEO Mel Karmazin. One source cited by Sidak is a September *Forbes* magazine article covering Karmazin's presentation at an investor conference:

Karmazin would like to see advertising revenue eventually make up about 10% of Sirius' total revenue, up from the current 4% to 5%. He acknowledges that one challenge in boosting the numbers is the company's relatively limited reach as a subscription service. The proposed merger with XM would help. "The more critical mass we get, the more we'll have an opportunity to exponentially add advertising revenue to our model," he said.²⁰²

But, said Mr. Karmazin, it is "cast in stone" that advertising will not be introduced on music channels that are commercial-free.²⁰³

134. Mr. Karmazin also pointed to the importance of reach for allowing the merged firm to increase advertising revenue in an earlier statement made when the merger was

²⁰¹ Sidak Supplemental at ¶42-44; Sidak 3rd Supplemental at 70-75; J. Gregory Sidak and Hal J. Singer, *Written Ex Parte Presentation in Connection with the Consolidated Application for Authority to Transfer Control in Connection with the Sirius/XM Merger (MB Docket No. 07-57)* (October 8, 2007), letter to Mr. Roy Stewart (hereinafter "Sidak-Singer 10-8-2007 Ex Parte Letter").

²⁰² Louis Hau, *Sirius CEO Discusses The Biz*, *Forbes* (9-17-2007), available at http://www.forbes.com/2007/09/17/sirius-xmradio-advertising-biz-media-cx_lh_0917karmazin_print.html (last visited October 15, 2007). Cited by Sidak 3rd Supplemental at ¶74.

²⁰³ *Id.*

announced. He explained that the merged firm would earn more revenue because the “reach” of the advertising would increase, “[a]dvertisers look for reach, and as one company, we will have twice the reach of what either company has on its own, and as a consequence access to a greater number of advertising accounts than we have on our own.”²⁰⁴ Higher “reach” increases 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.²⁰⁵ In light of the reach premium, a doubling of the share of advertising revenues in total revenue could be achieved with less than a doubling of advertising minutes sold.

135. Sidak quotes these statements of Mr. Karmazin, but extrapolates them into a much more expansive interpretation of the merged firm’s plans for advertising. In an earlier Declaration, Sidak argued that the merged firm might *quintuple* the amount of advertising.²⁰⁶ His most recent declaration continues to claim that, “the increase in commercial time posited above – from one minute per hour to five minutes per hour – is not unreasonable.”²⁰⁷ However, Sidak’s “quintupling assumption” is not reasonable.²⁰⁸ The doubling of advertising revenue as a percent of total revenue to which Mr. Karmazin referred certainly does not imply or require a quintupling of commercial minutes per hour, particularly if reach and other increases in value make advertisers willing to pay a somewhat higher price per thousand listeners for satellite radio ad spots.²⁰⁹ Yet his latest

²⁰⁴ 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).

²⁰⁵ See CRA FCC Report at ¶131.

²⁰⁶ Sidak Supplemental at ¶43.

²⁰⁷ Sidak 3rd Supplemental at ¶74.

²⁰⁸ We criticized the realism of Sidak’s “quintupling assumption” in our initial report. CRA FCC Report at ¶151. Based on the later submissions, it appears that he may well have in mind a sextupling. In some places, he defines the variable *t* as the increase in the number of commercial minutes per hour. For example, see Sidak Supplemental at ¶43; Sidak 3rd Supplemental at ¶71, 72, 73. In other places, he seems to define *t* as the number of commercial minutes per hour. See Sidak-Singer 10-8-2007 Ex Parte Letter at page 5 (“assume that SDARS customers on average are exposed to one minute of commercials from third parties per hour of listening.”). Still other submissions describe *t* both ways. See Sidak-Singer Ex Parte Presentation 10/3/2007 at slide 15 (“*t* = number of commercial minutes per hour;” *k(t)* refers to “an increase of *t* commercials per minute [*sic*.”) (emphasis added). Of course, this inconsistent exposition makes it harder to pin down the benchmark being used, and he never reports the equations and calculations in a self-contained technical appendix. However, the model seems to compare positive values for *t* to *t*=0.

²⁰⁹ Sidak says that Mr. Karmazin’s objective would require a “significant increase in total advertising” since satellite radio subscriptions are expected to grow rapidly. Sidak 3rd Supplemental at ¶74. But since the revenue from an advertising spot increases more or less automatically with the number of listeners given the price per thousand for advertising spots, no increase in the amount of commercial time is required for advertising revenue to keep pace with subscription revenue as the number of subscribers increases. If anything, revenue from advertising spots

iteration still assumes a *tripling* of advertising minutes per hour.²¹⁰ This is still inexplicably larger than Mel Karmazin's aspiration.

136. We also criticized the realism of Sidak's model because of its expansive assumption that *half* of the value consumers place on satellite radio results from it being commercial-free.²¹¹ His assumption is highly unrealistic and unreasonable in light of several facts.

[REDACTED]

[REDACTED] Third, Mr. Karmazin did not propose to eliminate commercial-free satellite radio channels. He said that it was "cast in stone" that music channels would be kept commercial-free, so that any additional advertising would be on the currently commercial-supported channels.²¹⁴ Therefore, even after the merger, those subscribers who dislike commercials and listen to commercial-free music channels still will not hear any advertising.

137. However, Sidak's calculations are wrong for another more fundamental *analytic* reason. Sidak apparently assumes that the subscription price is not reduced in response to the increase in advertising.²¹⁵ An assumption of constant price is analytically incorrect. As we pointed out in our initial report, higher per subscriber advertising revenue would incentivize the merged firm to reduce the subscription price in order to generate more subscribers.²¹⁶

138. This is an important oversight because those profit-maximizing price reductions in principle may provide a partial or complete offset to the magnitude of alleged consumer

should grow more rapidly than subscribers as growth increases the reach and thus the price per thousand, even without any increase in commercial minutes. Sidak, however, ignores the "reach" premium as a reason why advertising rates and revenue might rise. Sidak-Singer 10-8-2007 Ex Parte Letter.

²¹⁰ *Id.* at 5.

²¹¹ CRA FCC Report at ¶151.

²¹² [REDACTED]

²¹³ [REDACTED]

²¹⁴ Louis Hau, Sirius CEO Discusses The Biz, *Forbes* (9-17-2007), available at http://www.forbes.com/2007/09/17/sirius-xmradio-advertising-biz-media-cx_lh_0917karmazin_print.html (last visited October 15, 2007).

²¹⁵ Sidak 3rd Supplemental at ¶71, 75.

²¹⁶ This is a standard result in 2-sided markets where there are two revenue streams. The increase in ancillary advertising revenues has exactly the same effect as a reduction in variable costs. Of course, here the demand curve also shifts down. See CRA FCC Report at ¶150.

harm from additional commercials. In Appendix B of this report, we have analyzed the profit-maximizing price for our understanding of Sidak's model. In fact, that model has the property that the firm would have the incentive to reduce its price in response to the introduction of more commercials.

139. Sidak assumed that the introduction of more commercials would lead to a reduction in the number of subscribers, perhaps a very large reduction. When the subscription price is reduced, however, the subscriber loss would be mitigated or might even become a subscriber gain. In fact, when we solved Sidak's model, we found that the profit-maximizing price would fall sufficiently that the number of subscribers would rise above the initial level, as shown in Appendix B.
140. Sidak claims to show that the increase in the number of commercials would lead to a reduction in consumer welfare. If the profit-maximizing subscription price is reduced and the number of subscribers increases, the welfare loss would be mitigated. Indeed, the price decrease could cause consumer welfare to rise despite the assumed distaste for commercials. In fact, when we solved Sidak's model and allowed price to find its profit-maximizing level, we found that consumer welfare rises when advertising increases. This occurs for all the parameter values for which the increase in commercials is profitable, as shown in Appendix B.
141. These results demonstrate the fundamental errors in the conclusions Sidak has drawn from his model. Solving his model correctly leads to a conclusion of consumer benefit, not consumer harm.

V. CONCLUSIONS

142. Thus, we continue to conclude that the market is broader than satellite radio, including other audio entertainment devices, content and services. In this market, the market share of the merged firm is sufficiently low that the merger would fall within the safe harbors of the Merger Guidelines.²¹⁷ Moreover, our analysis goes beyond market definition. Our competitive analysis demonstrates that the merger of Sirius and XM is highly unlikely to reduce competition and harm consumers. (Indeed, our conclusion on competitive effects would remain the same even if the relevant market definition were erroneously defined as consisting solely of satellite radio.) The merger of Sirius and XM 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. There are several reasons for this conclusion. First, continued and increasing intermodal

²¹⁷ See CRA FCC Report at ¶91-94, Exhibit C.

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competition will prevent the merged firm from exercising market power. Second, the merger will reduce prices by lowering costs and benefit consumers by raising product quality. Third, the merger will lead to further consumer welfare gains by increasing the incentives for cost-reducing and quality-enhancing investments, and will increase the incentives for lower penetration pricing. Fourth, the higher product quality, lower costs and increased investment incentives of the merged firm likely also will spur greater investment and innovation by other audio entertainment competitors. For all these reasons, the merger will benefit consumers and competition.²¹⁸

143. In short, our analysis implies – and we conclude – that the merger of Sirius and XM will lead to an increase in consumer welfare. The merger will lead to (a) an increase in the number of subscribers of the merged firm, (b) a reduction in the level of prices, and (c) an increase in product quality, all relative to what likely would prevail if the merger does not occur. These are the three key markers for an increase in consumer welfare.

²¹⁸ Our competitive effects analysis did not analyze the efficacy of the parties' pricing commitments as a behavioral relief because we concluded that no remedy is necessary. Our analysis also is fully consistent with Salop's article cited by Sidak. Steven C. Salop, *Question: What is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard* (November 2005) (Unpublished Paper submitted to the AMC). Sidak 3rd Supplemental at ¶86.

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Appendix A

Econometric Analysis of the Relationship between Satellite Radio Penetration and Terrestrial Radio Coverage

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Martino De Stefano

Steven R. Brenner

CRA International

1. INTRODUCTION

Our earlier report filed with the FCC presented a cross-section analysis of geographic variation across ZCTAs (Census Bureau areas that closely approximate ZIP codes) in satellite radio ("SR") penetration and the number of terrestrial radio ("TR") signals received.¹ Included was an econometric analysis of the SR-TR relationship that controlled for a number of other important factors including income, gender mix, and the percentage of the population commuting by car.²

The analysis examined how changes in the number of TR signals received – and thus in the relative quality of terrestrial radio and satellite radio – affect the demand for SR service, holding constant the price of SR. A larger number of TR signals reduces the quality advantage of SR relative to TR.³ The analysis found a clear inverse relationship between SR penetration and the number of TR signals, which supports the conclusion that consumers view AM/FM radio and satellite radio as good substitutes. If consumers view SR and TR as substitutes, the proportion of consumers purchasing SR should fall with increases in the number of TR signals (which is a proxy for the relative quality of TR), *ceteris paribus*.

This appendix describes in greater detail the econometric analysis in our earlier report and the data on which it is based. It also presents extensions of that analysis to examine

¹ CRA FCC Report at ¶¶24-28 and Exhibit B. Curriculum Vitae for Timothy Savage and Martino De Stefano are attached as an Exhibit to this Appendix. The Curriculum Vita for Steven Brenner was attached to the earlier report.

² In this memorandum, we refer to the econometric analysis in the FCC paper as the "baseline specification."

³ Sidak disagrees. Sidak 3rd Supplemental at ¶30. We analyze, and reject, Sidak's objection at Section II.C.2 of this report.

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the robustness of its results. We find that the inverse relationship between SR penetration and TR signals is not sensitive to the inclusion of additional explanatory variables or to alternative functional forms and statistical specifications.

2. DATA

The analysis discussed in the FCC paper uses data on the number of XM plus Sirius [REDACTED] subscribers by ZIP code [REDACTED]. The objective was to analyze how the availability of TR service affects consumer decisions to subscribe to SR. [REDACTED] subscribers are those subscribers who choose to pay for their subscriptions. [REDACTED]

XM and Sirius purchased data from BIA Research, Inc. ("BIA") on the number of AM/FM radio stations reaching each Census block.⁴ BIA used the 2 mV/m contours for AM stations and the 60dBu contours for FM stations to determine the number of AM and FM stations reaching the centroid of each Census block. The BIA data also included counts of the total resident population of each Census block based on the 2000 U.S. Census. In order to merge the Census block data on the number of TR stations with SR subscriber data by ZIP code, we used ZIP Code Tabulation Areas ("ZCTAs"), which were developed by the Census Bureau.⁵ ZCTAs closely approximate ZIP codes and are exact aggregations of Census blocks. From the number of AM and FM signals received in each Census block, we calculated the weighted average number of TR signals received in each ZCTA using the population of each Census block (as a share of the total ZCTA population) as weights.

Data on the average number of TR stations received in each ZCTA were then merged with data on the number of [REDACTED] SR subscribers in the corresponding ZIP code. In the process, data for [REDACTED] SR subscribers whose ZIP code information could not be matched to a ZCTA were dropped. These included subscribers for whom no valid ZIP code was reported and subscribers whose reported ZIP code corresponds to a point, such as a P.O. box. In addition, all data for ZCTAs with a Census population count of zero

⁴ Our analysis uses only information for Census blocks in the lower-48 states, as XM and Sirius historically has not been as generally available in Hawaii, Alaska, or Puerto Rico.

⁵ For a complete description of ZCTAs, see <http://www.census.gov/geo/ZCTA/zctafaq.html>. There are approximately 45,000 ZIP codes in the U.S., but only approximately 33,000 ZCTAs. The difference between the two is driven by those ZIP codes used for particular points, such as P.O. boxes, rather than those used for geographic areas.

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were excluded (including any subscribers with those ZIP codes).⁶

The steps described to this point were used to construct the dataset used in our FCC analysis. For the analysis here, one change was made to the procedure used to construct the dataset used for the FCC analysis. [REDACTED]

[REDACTED]⁷ The resulting dataset contained information for [REDACTED] of all XM and Sirius [REDACTED] subscribers.⁸

Finally, using extracts from the 2000 U.S. Census, we merge data for variables, as described below, that measure other factors we believe may directly influence SR penetration.⁹ As a result of these multiple steps, our final analytic dataset contains ZCTA-level information on the number of XM and Sirius [REDACTED] subscribers, the weighted average number of TR signals they are able to receive, and other factors that affect SR penetration.

Using this dataset, Figure A1 at the end of this Appendix plots average SR penetration rates against the number of TR signals. Figure A1 here corresponds to Figure B1 in our earlier FCC report.¹⁰ This plot clearly shows an inverse relationship between average SR penetration and the number of TR signals. We recognize, however, that SR penetration may vary across areas for reasons other than the number of TR signals received, which motivated our further econometric analysis.

The analysis in our earlier FCC report exploits geographic variation in SR penetration to investigate the relationship between SR penetration and the number of TR signals, accounting for important factors such as income. In this analysis, we do not observe individual choices; rather, we have data on the aggregate response of groups of

⁶ [REDACTED]

⁷ [REDACTED]

⁸ This is [REDACTED] included in the dataset for the analysis presented in the FCC paper; [REDACTED]. The dataset used here includes [REDACTED]

⁹ Table A1 contains summary statistics for the SR penetration rates that we analyze and for other variables used in the analyses. Tables and figures are attached at the end of this appendix.

¹⁰ [REDACTED]