account *all* relevant evidence, including, but *not* limited to, the following," and then lists several categories of evidence, including: (1) evidence that buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables; (2) evidence that sellers base business decisions on the prospect of buyer substitution between products in response to relative changes in price or other competitive variables; (3) the influence of downstream competition faced by buyers in their output markets;[59] and (4) the timing and costs of switching products.[60]

41. The Merger Guidelines are not alone in allowing a variety of types of evidence to be used. The FCC also has considered other evidence where it was not possible to perform a "quantitative demand" analysis. For example, in its Memorandum Opinion and Order considering the merger of Verizon and MCI, the Commission stated:

> "We note that the evidence in the record is insufficient for us to perform a quantitative demand analysis to estimate the likely consumer response to a small but significant change in the price of a particular service. Instead, we consider indicia of demand substitution between possible services, including: (1) the attributes and relative prices of possible competing services; (2) evidence that consumers view the possible competing services similarly, and have shifted or have considered shifting purchases between these services in response to relative changes in price or other competitive variables; (3) evidence that service providers consider the prospect of buyer substitution between services in response to relative changes in price or other competitive variables; and (4) the costs a consumer could incur to substitute between traditional services and services provided on an alternative platform."[61]

42. In a recent article on market definition cited in our report and apparently endorsed by Sidak, Professor Baker identifies five categories of evidence that may be used to evaluate buyer substitution patterns in the event of an increase in price.[62] One category consists of the responses of buyers to changes of relative prices in the past, a category which will be

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[59] This evidence is less relevant here because most subscriptions are to final consumers.

[60] Merger Guidelines at §1.11.

[61] Federal Communications Commission, *Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control, Memorandum Opinion and Order,* WC Docket No. 05-75 (November 17, 2005) at n. 251, citing the Merger Guidelines at §1.11.

[62] Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 139-141. Cited by CRA FCC Report at ¶29; also *see* Sidak 3rd Supplemental at ¶57 and n. 74.

in short supply in this case for the reasons just discussed. But Professor Baker also identifies other categories of useful evidence on buyer substitution. These are: (a) survey evidence on buyers' responses to price changes; (b) information about the characteristics of products, including information about switching costs, from which buyer substitution patterns may be inferred; (c) evidence on how sellers respond, including evidence of how "firms monitor and respond to the price changes and new product introduction of rival sellers," and (d) evidence of the views of industry experts.[63] Professor Baker's last two categories involve "relying on informed actors other than buyers to assess and integrate the direct evidence as to buyer substitution."[64]

43. Furthermore, Professor Baker is clear that, within each category, various types of evidence may be used, even though, in Professor Baker's words some types of evidence "can be used to calibrate the magnitude of the likely buyer response to a specific percentage price increase more closely than can others."[65] Professor Baker notes that the "quantitative aspects of the market definition approach of the Merger Guidelines provide conceptual clarity, but they do not mandate a systematic preference for quantitative evidence."[66]

44. This is the approach that we followed in our analysis, drawing on the evidence that was available as a practical matter. Nevertheless, Sidak claims that the Commission should not use or even examine this evidence, even though such evidence is routinely used by the antirust enforcement agencies in accordance with the Merger Guidelines and is accepted by the courts.

2. Cross Section Econometric Evidence of Demand Substitution between Terrestrial and Satellite Radio

45. While it is impossible to obtain reliable econometric estimates of demand elasticities here, we were able to use a natural experiment – geographic variation in the number of terrestrial radio signals – to generate reliable econometric evidence that consumers view satellite and terrestrial radio as substitutes. We found a systematic inverse relationship between satellite radio penetration and the number of terrestrial radio signals available in different areas – satellite radio penetration was lower where there were more AM and FM

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[63] Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 139-141.

[64] *Id.*

[65] Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J 129 (2007) at n. 63.

[66] *Id.*

stations. This analysis was discussed in our previous report filed with the FCC; further details are provided in Appendix A to this report.[67]

46. This analysis examined the geographic variation across ZCTAs (Census Bureau areas that closely approximate ZIP codes) in satellite radio penetration and the number of terrestrial radio signals received. We analyzed how variation in the number of terrestrial radio signals received – and thus in the relative quality of terrestrial radio versus satellite radio – affects the demand for satellite radio service, holding constant the price of satellite radio.[68] A larger number of terrestrial radio signals reduces the quality advantage of satellite radio relative to terrestrial radio.

47. If consumers view satellite radio and terrestrial radio as substitutes, the proportion of consumers purchasing satellite radio should fall with increases in the number of AM/FM signals (which is a proxy for the relative quality of terrestrial radio), *ceteris paribus*.[69] This inverse relationship is exactly what is displayed in Figure B2 of our earlier Report. Controlling for other factors that affect the demand for satellite radio – such as income, the percentage of people in each ZCTA who live in urban areas, the percentage who are female, the percentage who commute by car, and the interaction between the percent commuting by car and the percentage living in urban areas – satellite radio penetration falls as the number of AM/FM signals available to consumers increases.[70] This is strong evidence that satellite radio and terrestrial radio are seen by consumers as substitutes.

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[67] CRA FCC Report at ¶28 and Exhibit B.

[68] Sidak seems to concede that our analysis could provide information on buyer substitution in response to changes in the relative quality of terrestrial radio and satellite radio. He does not, however, acknowledge that this is evidence that consumers view the two as substitutes. Sidak 3rd Supplemental at ¶29-30.

[69] We can use a simple analogy to illustrate the idea. Assume that Hershey Chocolate Bars sell for the same price everywhere, while the price of Mars Bars varies from city to city. One could infer that consumers consider Mars Bars and Hershey Chocolate Bars to be substitutes by observing whether, all else equal, the sales of Mars Bars are lower in areas where its relative price is higher. One could exploit time-series or cross-sectional variation in the relative prices and sales to analyze buyer substitution econometrically and to obtain estimates of demand elasticity. Alternatively, assume that there is no variation in the prices of Mars Bars and Hershey Chocolate Bars, but instead that the size of Mars Bars varies geographically, while that of a Hershey Chocolate Bar does not. In this situation, the relative quality of the two products changes as the size of a Mars Bar changes. Evidence that, all else equal, consumers purchase fewer Hershey Bars in areas where Mars Bars are larger, and thus its relative quality is greater, is likewise evidence that consumers view the products as substitutes. This is true even though size is not a perfect proxy for value. By exploiting geographic variation in the number of terrestrial radio signals and satellite radio penetration, our econometric analysis does this. Note, however, that this analysis provides information on substitution only between satellite radio and terrestrial radio as the relative quality of these two substitutes change. An increase in the price of satellite radio would induce substitution not only to terrestrial radio, but also to the other substitutes we have cited.

[70] CRA FCC Report at ¶28 and Table B2.

48. Sidak, however, denies that our results are evidence that satellite radio and terrestrial radio are substitutes. He presents three objections. First, he says the relationship "ultimately is uninformative because it does not capture buyer substitution between terrestrial radio and SDARS in response to a relative change in price."[71] Second, he denies that the number of terrestrial radio stations is a proxy for the quality of terrestrial radio service. Third, he claims the analysis in our report fails to control adequately for various factors. All of these objections are flawed.

49. Of course the nominal prices of terrestrial radio and satellite radio do not vary across localities, so Sidak is correct that our analysis does not show the effects of changes in nominal prices. Sidak errs, however, in arguing that the systematic inverse relationship between satellite radio penetration and terrestrial radio is not evidence of buyer substitution between the two services. The Merger Guidelines explicitly recognize the relevance of evidence that buyers shift purchases between products "in response to relative changes in price *or other competitive variables.*"[72] The Merger Guidelines do not provide a list of such competitive variables, but it is clear that, as a matter of basic economics, product quality is a relevant competitive variable.

50. Despite the explicit reference in the Merger Guidelines, Sidak is very suspicious of evidence of responses to "other competitive variables." He states that, "A Westlaw search produces no cases that contain the words 'other competitive variables' and 'Merger Guidelines.' There is no specific or extensive discussion of what that phrase means in any antitrust treatise. Therefore, as a practical matter, any attempt to invoke the phrase should immediately tip off the antitrust agencies that the parties cannot produce evidence of buyer substitution in response to a relative change in price."[73] Sidak's Westlaw search and assertion ignore several recent antitrust cases that consider other (non-price) competitive variables.[74]

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[71] Sidak 3rd Supplemental at n. 32.

[72] Merger Guidelines at §1.11, emphasis added.

[73] Sidak 3rd Supplemental at note 19.

[74] For example, see *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098 (N.D. Cal.2004) at 1121 ("a differentiated product 'market' is a market in which sellers compete along more dimensions than price"); *FTC v. Tenet Health Care Corp.*, 186 F.3d 1045 (8th Cir. 1999) at 1054 ("The district court rejected the Cape Girardeau hospitals as practicable alternatives because they were more costly. In so doing, it underestimated the impact of nonprice competitive factors, such as quality."); *FTC v. Whole Foods Market, Inc.*, 502 F. Supp. 1 (D.D.C. 2007) at 25-26 (discussing the importance of quality of service at various markets and customer substitution in response to changes in the relative quality).

51. Sidak's second objection is that the number of AM/FM stations may not be a "reasonable proxy" for the quality of listening to terrestrial radio in a given area.[75] It is surprising to find this criticism in a Declaration on behalf of the Consumer Coalition for Competition in Satellite Radio ("C3SR"). After all, the C3SR submitted for the record on this merger application data on the number of AM/FM stations in different geographic areas, using these data to measure the number of consumers in areas it labeled "unserved" and "underserved."[76] What possible relevance could this evidence have if the number of AM/FM signals were not a reasonable proxy for the quality of service available over AM/FM?

52. Sidak offers two reasons why the number of AM/FM signals might not be a good proxy for quality of AM/FM service: (1) adding stations with duplicative formats might not improve quality; and (2) our analysis did not control for variations in commercial time across stations. Neither is a reason to undermine confidence in our econometric results. There is no basis, as a matter of statistical inference, to expect that the use of the number of AM/FM signals as a proxy for quality biases the empirical results in our report in favor of finding an inverse relationship between terrestrial radio penetration and AM/FM coverage where none exists. Nor does Sidak provide a basis for concluding there would be such a bias.

53. Consider first Sidak's objection that additional stations may duplicate formats already available. We agree that quality depends on more than just the number of channels and that the number of channels is not a perfect proxy for quality. However, while this fact may weaken the relationship between the number of AM/FM stations and quality, it does not eliminate it. Not *all* additional stations duplicate available formats; one certainly expects that the number of formats available will be generally greater with 10 AM/FM signals than with two, and with 40 AM/FM signals rather than 10. Moreover, even the addition of stations with similar formats provides some increase in listener choice. It is reasonable to expect that the quality of AM/FM generally improves as the number of AM/FM stations increases, in which case the number of signals is a reasonable proxy for listening quality.

54. Indeed, Sidak's objection appears to be inconsistent with positions taken in his earlier declarations. In his first Declaration in this matter, Sidak argued that satellite radio has advantages over AM/FM because it has more channels, which appears to be based on the

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[75] Sidak 3rd Supplemental at ¶30.

[76] C3SR, *Consumer Vulnerability to a Satellite Radio Monopoly in Rural, Unserved and Underserved Geographic Area* (July 9, 2007), Attached to *Petition to Deny of the Consumer Coalition for Competition in Satellite Radio,* FCC Filing, MB Docket No. 07-57 (July 9, 2007).

view that service quality increases with the number of channels available.[77] In his second Declaration, he claimed that a "significant number of satellite radio subscribers...are less likely to have a sufficient amount of terrestrial radio service by virtue of their geographic location....and would be vulnerable to an increase in the price of satellite radio" because, he claims, many "satellite radio subscribers reside in areas of below-average terrestrial radio coverage."[78] This too suggests that quality of terrestrial radio service is lower and provides a poorer alternative to satellite radio where consumers can receive fewer terrestrial radio channels.

55. Moreover, Sidak misses the basic econometric point because his argument that additional signals may be duplicative cuts against his claim regarding statistical bias. To the extent that additional stations duplicate available formats, it reduces the magnitude of the increase in quality associated with an increase in the number of AM/FM stations. The smaller the change in relative quality associated with any given increase in the number of AM/FM signals, the less power our econometric analysis has to detect empirically a relationship between satellite radio penetration and AM/FM quality (using number of AM/FM stations as a proxy). The fact that our analysis finds a robust inverse relationship between satellite radio penetration and number of the AM/FM stations, even though the latter is not a perfect proxy for quality, reinforces confidence in our basic conclusion, not the opposite.

56. Sidak's next objection is that our analysis failed to control for other factors that could affect variations in terrestrial radio quality across different areas, such as the amount of commercial time.[79] Omitting this variable, however, does not undermine the reliability of our conclusions under any of the three alternative statistical scenarios.

- First, it could be that the amount of commercial time and the number of terrestrial stations are statistically independent. In that case its omission could not bias our estimates of the relationship between the number of terrestrial radio stations and satellite radio penetration.
- Second, it could be that terrestrial stations tend to run more commercials where there are more stations, and thus the dimensions of quality indicated by (a) the number of AM/FM signals and (b) the amount of commercial time are negatively related. In that case, failing to control separately for commercial time would imply that the number of AM/FM signals captures only the *net* effect of these offsetting influences on

[77] Sidak Declaration at ¶44.

[78] *Supplemental Declaration of J. Gregory Sidak*, Exhibit B, C3SR Petition (July 9, 2007) (hereinafter "Sidak Supplemental") at ¶24-25.

[79] Sidak 3rd Supplemental at ¶30.

quality, which would be smaller than the effect of the number of signals alone. Such a relation would reduce the ability of our analysis to detect a negative relationship between satellite radio penetration and the number of AM/FM signals, and the magnitude of any estimated relationship would be biased toward finding *no relationship*. Again, our ability to find a strong inverse relationship between satellite radio penetration and number of AM/FM stations, *despite* failing to control for commercial time, would be reason to increase confidence in our conclusions.

- Third, it could be that terrestrial stations tend to run fewer commercials in areas with more stations, so the quality dimensions measured by number of AM/FM signals and commercial time are positively related. In that case, our analysis would be biased toward overstating the effect of the number of AM/FM stations *alone* on satellite radio penetration because those variables would capture *both* the direct effect on terrestrial radio quality of more AM/FM stations *and* the indirect effect of less commercial time. Since both of these effects are indicators of terrestrial radio quality, the finding of an inverse relationship between satellite radio penetration and terrestrial radio signals would still indicate an inverse relationship between satellite radio penetration and terrestrial radio quality.

57. Sidak also faults our econometric analysis for failing to control adequately for "demographic heterogeneity."[80] Yet, he fails to identify which additional demographic controls should have been included to measure this unstated heterogeneity or to justify their inclusion.[81] In fact, our econometric analysis controls for several standard demographic variables, such as median household income, percent female, and the percent of population that live in urban areas and commute by car. Nonetheless, we investigated the effect of adding additional demographic variables to our econometric analysis.[82] We find that the analysis continues to show a strong inverse relationship between satellite radio penetration and number of AM/FM signals. This relationship is essentially the same as that presented in our previous FCC Report. The results of this analysis are reported in Appendix A.

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[80] *Id.*

[81] Sidak indicates that such controls should be included because one would expect them to be correlated with the number of terrestrial stations. The unaddressed, relevant question, however, is which variables should have been included because they are expected to have a direct and independent effect on satellite radio penetration for which variables included in the analysis do not control.

[82] These additional variables are: (1) age composition by gender; (2) variation in educational attainment; and (3) the percentage of people who commute more than 45 minutes but do not use public transportation (interacted with the percentage of population who go to work by car).

58. Finally, Sidak objects that our econometric analysis fails to control for the size and growth of local "markets." The only justification Sidak offers for including such measures as controls is that the size and growth of these areas are positively related to the number of AM/FM stations. That, however, would not be a sufficient econometric justification for including them as explanatory variables. An explanatory variable should only be included if it has a *direct and independent effect* on satellite radio penetration, *separate* from the impact of terrestrial radio quality, for which the analysis does not otherwise control.[83] Sidak provides no basis for thinking that size and growth of local areas have such a direct and independent effect on satellite radio penetration. Nor is there any obvious reason why they would.

59. Indeed, in the absence of a basis to expect that size and growth have a direct and independent effect on satellite radio penetration, Sidak's justification for inclusion of these controls is, in fact, justification that these variables not be included. Including controls for which there is no justification, particularly those related only to the number of terrestrial radio stations, risks unnecessarily obscuring the relationship between terrestrial radio stations and satellite radio penetration.[84]

60. In our earlier FCC filing, we presented econometric evidence that consumers view satellite and terrestrial radio as competitive substitutes. Evidence of this type is recognized by the Merger Guidelines and is consistent with that recognized in recent antitrust cases. Sidak presents no arguments to undermine our evidence.

3. Survey Evidence of Demand Substitution

61. Our report presented relevant historical switching information based on the behavior of XM and Sirius subscribers when they deactivated their subscriptions. Briefly stated, the evidence shows that [redacted]

- [redacted]

[83] The regression analysis presented in our report did control for some demographic characteristics that likely vary across local areas and could directly and independently affect satellite radio penetration: the percentage of population that is female, the percentage of population in each ZCTA who live in urban areas, the percentage who commute by car, and the percentage commuting by car interacted with the percentage living in urban areas. CRA FCC Report at ¶28, n. 28, Table B2.

[84] *See* Michael D. Intriligator, ECONOMETRIC MODELS, TECHNIQUES, & APPLICATIONS (Prentice Hall 1978) at 189: "In general, the best approach is to include only explanatory variables that, on theoretical grounds, *directly* influence the dependent variable and that are not accounted for by other included variables." Emphasis in original. *Also see* William H Greene, ECONOMETRIC ANALYSIS, 4th Edition (Prentice Hall 2000) at 338 on the cost of including irrelevant variables.

[redacted]

- [redacted]
- [redacted]

This is evidence that satellite and terrestrial radio are viewed by consumers as substitutes.

62. The substitution patterns indicated by the survey evidence from deactivating subscribers are corroborated by information on switching costs. The Merger Guidelines discuss the relevance of information on switching costs.[88] Analysis of switching costs suggests that relatively few subscribers likely would disconnect from one satellite radio service and switch to the other in response to a small change in relative price. Suppose that XM attempted a *ssnip* of 5%, from a price of $12.95 up to $13.60 per month, an increase of nearly $8 per year. Current XM subscribers would face substantial switching costs, relative to the magnitude of the *ssnip*, if they substituted to Sirius. XM subscribers would have to purchase new aftermarket Sirius receivers. We understand that the typical retail cost of new aftermarket satellite radio receiver is around $100. This would amount to a substantial switching cost. It would take those subscribers over a decade to recover the price increase, even ignoring the time value of money.[89] OEM customers might suffer a loss in product quality, as well as switching costs, by moving to an aftermarket satellite radio from one that was fully integrated into the vehicle audio system.

63. In contrast, XM subscribers dissatisfied with the XM price increase would face no switching costs if they instead substituted to terrestrial radio or CD players, both of which

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[redacted]

[redacted]

[redacted]

[88] Merger Guidelines at §1.11. As noted earlier, Professor Baker's analysis also lists switching costs as a relevant source of information on buyer substitution. Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 140.

[89] There are some "entry-level" radios with fewer features that may be available for $30 or so. Even at that price, it would take nearly four years to recoup that switching cost.

come installed in every vehicle. Those XM subscribers who already own an iPod or MP3 player, or a wireless phone with memory to store MP3s and subscriptions to the relevant services, would face no switching costs to listen to these alternatives outside of vehicles.[90] Their only switching costs to listen in vehicles would be the cost of the cables or FM transmitter to connect the vehicle sound system, if they did not already have them.[91] That switching cost would be far below the $100 or more switching cost to purchase a Sirius receiver.

64. Sidak discounts our conclusions based on the conjecture that most of the disconnecting subscribers in the surveys we cite were reaching the end of an OEM trial period. The behavior of such consumers, he says, provides no information on self-paying satellite radio subscribers who end their subscriptions.[92] Sidak's conjecture is wrong. [redacted]

65. Our report also provided information on how consumer listening behavior changed after they subscribed to satellite radio.

- [redacted]

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[90] [redacted] the 30% of all Americans age 12 or over who own iPods or MP3 players, according to another recent survey. Arbitron/Edison Media Research, *The Infinite Dial 2007: Radio's Digital Platforms* at 14.

[91] Those who wished to connect by cable also would have to have an appropriate input. As the CRA Report indicated, however, many vehicles sold in the last few years came equipped with easily accessible auxiliary input jacks into which such devices can be plugged with a simple cable. CRA FCC Report at ¶19, 42. Contrary to Sidak's suggestion, they would not need to have or install a USB port, or a dedicated iPod docking station. *See* Sidak 3rd Supplemental at ¶66.

[92] Sidak 3rd Supplemental at ¶28.

[93] [redacted]

[redacted]

- [redacted] These are dramatic changes that suggest strong substitution between satellite radio and other forms of audio entertainment.[95]

66. Sidak, however, calls this type of evidence "inconsequential" on the grounds that "what else could they have listened to before the advent of SDARS?"[96] The answer is that consumers could have listened to nothing. For example, vehicle owners without satellite radio could have spent most of their time talking on wireless phones or to traveling companions. That is, this evidence is probative is precisely because it shows that consumers view satellite radio as a substitute for terrestrial radio and other audio entertainment devices. Sidak's suggestion that the evidence means nothing because people must have listened to these alternatives is simply a concession of how obvious it is that people substitute among different forms of audio entertainment.

67. [redacted]

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[94] [redacted]

[95] [redacted]

[96] Sidak 3rd Supplemental at ¶31.

[97] Sidak seems to ignore this issue of the relative closeness of substitutes. In his water/whisky example, he says that "All connoisseurs of single-malt scotch whiskey were former consumers of water, but no one would argue that water and single-malt scotch whiskey belong to the same product market." Sidak 3rd Supplemental at ¶31. Sidak's example is peculiar because we would not expect much substitution from water to single-malt scotch. We would expect that there would be much more substitution away from blended scotch whiskey and other alcoholic beverages than from water.

68. Sidak also objects that the survey information on pre-activation versus post-activation listening shows only that the *share* of minutes spent listening to terrestrial radio and other audio entertainment alternatives falls when consumers subscribe to satellite radio. That, he says, doesn't demonstrate that the *amount* of listening to terrestrial radio declines significantly when consumers sign up for satellite radio.[98] Granted, this is an arithmetic possibility, but it is an extremely implausible interpretation of the results.

- [redacted]
- [redacted]

[98] Sidak 3rd Supplemental at ¶27; also see ¶35.

[99] [redacted]

[100] [redacted]

[101] Sidak refers to the results of one survey by Arbitron that indicate satellite radio subscribers may spend more time listening to AM/FM radio than non-subscribers. Sidak 3rd Supplemental at ¶27. However, in our initial Report, we pointed out that these results compare listening by two different groups of consumers, and is therefore not evidence of how listening behavior changes when individuals become subscribers. CRA Report at ¶73. [redacted] And, of course, there is evidence that the NAB is and has been concerned that satellite radio will take listeners (and listening time) away from AM/FM and HD radio. *See* CRA FCC Report at ¶146-148.

69. Sidak also argues that this survey information on the effect of activation and deactivation behavior on listening cannot measure elasticity of demand because consumers are not making these decisions in response to small changes in the price of satellite radio. It is true that history has provided only one natural experiment of how consumers respond to changes in the price of satellite radio, and we have already discussed the difficulties this history creates for reliable econometric estimates of demand elasticity. The only practical response, however, is to work with the information that is available, rather than to reject all less-than-ideal evidence.

70. This information on the substitution patterns of consumers who activate and deactivate satellite radio provides relevant information, even if it is not ideal. Consumers making these substitution decisions are influenced by changes in the perceived qualities and/or prices of the satellite radio services relative to each other and relative to other audio entertainment devices and services. When Sidak says that people "subscribe because they find that the value of SDARS exceeds $12.99 a month,"[102] he should have been more precise. Their choices are based on their judgments about the value of either XM or Sirius service, not generic satellite radio service. In addition, their choices depend on the perceived value of XM or Sirius relative to the prices and values of other audio entertainment devices, including the other brand of satellite radio. In other words, perceived quality-adjusted relative prices change as the devices and content evolve over time and as consumers' information and circumstances change. [redacted] The magnitude and various causes of this churn would be highly relevant to the merged firm. For example, if the merged firm is worried that a significant number of subscribers likely will decide after a while that the "value" of Sirius is worth less, say $12.50, those likely deactivations could be avoided if the merged firm chose to charge $11.95 instead of $12.95 after the merger.

71. The consumer choices behind these data may not be driven by changes in nominal prices, but they do include reactions to changes in the relative quality of the two satellite services. XM and Sirius do not have constant (or identical) relative quality, and consumer preferences for these two services differ. For example, people could choose to deactivate Sirius and subscribe to XM if they decide that they are tired of Howard Stern, or if they decide that they would prefer the MLB instead of the NFL, or Deep Tracks instead of The Vault. People also might choose to deactivate Sirius and subscribe to XM if they are getting poor reception on Sirius, or if their Sirius receiver is unsatisfactory, or if they are having an insoluble consumer service problem. The observed substitution captures the potential impact of all these factors, as well as effects of changes in the

[102] Sidak 3rd Supplemental at ¶27.

relative quality of alternatives to satellite radio, such as responses to the hot new iPod, improvements in Rhapsody or buying a new HD radio. The presence of all these potential substitution drivers do not make the substitution patterns irrelevant. [redacted]

72. The trend in new subscriber activations provides additional evidence of limited substitution between Sirius and XM. Satellite radio growth is increasingly coming from OEM rather than aftermarket subscribers. OEM subscribers are accounting for a sharply increasing proportion of net subscriber additions for both companies, and the trend is expected to continue. According to publicly released figures, OEM subscribers accounted for 91% of XM's total net subscriber additions over the first three quarters of 2007, compared to 57% for the first three quarters of 2006.[103] Similarly, Sirius OEM subscribers accounted for 77% of net additions over the first three quarters of 2007 compared to 44% for the same three quarters of 2006.[104] These are continuations of earlier trends.[105] Both the companies and analysts expect the OEM channel to continue to account for a very substantial and increasing proportion of subscriber additions.[106]

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[103] XM Satellite Radio, *Forms 10-Q* (Q1-Q3 2006 and Q1-Q3 2007). Indeed, the OEM channel accounted for all (and more) of XM's net additions in Q3 2007 as retail net additions were negative. All figures for XM's OEM net additions include a small number of rental car net additions, as XM reports a combined figure for these net additions.

[104] Sirius Satellite Radio, *Forms 10-Q* (Q1-Q3 2006 and Q1-Q3 2007).

[105] XM OEM net additions accounted for 52% of XM's net additions over the full year 2006, up from 36% for 2005. XM Satellite Radio, *Form 10-K* (2006). For Sirius, OEM net additions were 42% of total net additions for the full year of 2006 up from 29% for 2005. Sirius Satellite Radio, *Form 10-K* (2006).

[106] *See, for example, Q2 2007 XM Satellite Radio Earnings Conference Call – Final* (July 26, 2007), *available at* http://www.seekingalpha.com/article/42535-xm-satellite-radio-q2-2007-earnings-call-transcript (last visited November 8, 2007), statements of XM President Nate Davis ("our business-mix is increasingly OEM-centric, and while the retail sector continues to provide subscriber growth, it is an increasingly smaller portion of our gross and net additions....the OEM ramp is here now and will only get stronger in the coming quarters."); *Q3 2007 Sirius Radio Earnings Conference Call – Final* (October 30, 2007), *available at* http://www.seekingalpha.com/article/52018-sirius-satellite-radio-q3-2007-earnings-call-transcript (last visited November 8, 2007), statements of Sirius CEO Mel Karmazin ("...this is a positive signal for the continued long-term growth in the OEM channel....having production penetration rates moving significantly higher is very positive for our long-term future....Only two years ago in 2005, SIRIUS' production penetration rate was approximately 10% of our exclusive OEM partners' total production. That figure is expected to grow to over 50% next year and is poised to rise even higher over the next few years."); and Q2 *2007 Sirius Radio Earnings Conference Call – Final* (July 31, 2007), http://www.seekingalpha.com/article/43015-sirius-satellite-radio-q2-2007-earnings-call-transcript (last visited November 8, 2007), statements of Sirius CEO Mel Karmazin ("During the first six months of 2007, OEM subscriber growth continues to be stronger than expected and present in excess of 70% of our year-to-date subscriber growth....investors should view this as a big, positive development for the long-term growth of our business."). For analyst views, see Jonathan A. Jacoby, *BofA Broadcast Bits – Will Price Talk be a Problem*

73. This trend has important implications for market definition and competitive effects analysis. There obviously is much less scope for substitution between XM and Sirius in response to price and quality changes for OEM subscribers than for aftermarket subscribers. This is because nearly all automobile OEMs now offer only one factory-installed satellite radio brand integrated into the vehicle's audio system. The consumer's choices for audio entertainment integrated into the vehicle's audio system are that one satellite radio brand, the integrated AM/FM radio or CD player, and, increasingly often, connecting an iPod or MP3 player through an integrated port or auxiliary jack. Subscribing to the other satellite radio service requires instead bearing the cost and inconvenience of purchasing and installing an aftermarket radio, which often includes a visible antenna cord and a power cord to the cigarette lighter outlet. For the same reasons, as noted above, the switching costs for a disconnecting OEM subscriber to acquire and install the other satellite radio service are higher than to use the vehicle's AM/FM radio or CD player. As we discussed in our earlier report, this OEM exclusivity and switching costs create a type of significant product differentiation between Sirius and XM.[107]

74. 

(February 28, 2007), Bank of America, at 2 ("'07 will be the transition year from a retail driven model to an OEM driven subscriber model. Going forward, we expect new OEM gross adds to be greater than retail gross adds in every quarter – including the traditionally retail-heavy fourth quarter."); James G. Dix, *Satellite Radio 2Q07 Preview* (25 July 2007), Deutsche Bank ("Retail continues to be weak, as model (*sic*) continues shift to OEM paradigm"); Goldman Sachs, *Sirius 3Q2007 largely in line, OEM shift accelerates maintain Sell* (October 30, 2007) at 4, referring primarily to Sirius: "Our assumption is that the OEM channel will drive nearly all (if not more than 100% if retail goes net negative like it has at XM) of the net longer-term subscriber growth." Also see CRA FCC Report, at n. 203, citing similar views in a February 2007 report of Goldman Sachs.

[107] *See*, for example, CRA FCC Report at ¶55-56.

[108] Merger Guidelines at §1.11.

[109] Sidak might argue that it is irrelevant to cite evidence on the price sensitivity of potential satellite radio subscribers who have decided (at least so far) not to subscribe. Such an approach is inconsistent with the Merger Guidelines focus on effects over the "foreseeable future," as discussed above, and far too rigid. Evidence that some consumers who have been unwilling to subscribe at the current price might be willing to do so at a lower price also suggests a sensitivity to a price increase among potential subscribers who may be willing to subscribe at the current price but not at a higher price. This sensitivity would affect the incentives of the merged firm (and the hypothetical monopolist). Furthermore, the evidence of dynamic demand indicates that consumers revise their views of the value

- [redacted]
  - [redacted]
  - [redacted]
- [redacted]
- [redacted]
  - [redacted]
  - [redacted]

of satellite radio and their willingness to subscribe as they learn more about the services, but price sensitivity is likely to remain. In other words, since satellite radio is growing, one expects some current non-subscribers to sign up in the future, but, because they are sensitive to price, the number who do so will depend on prices.

110 [redacted]

111 [redacted]

112 [redacted]

- [redacted]
  - [redacted]
  - [redacted]

4. Demand Substitution Evidence Based on Sellers' Business Decisions

75. According to Sidak, our analysis is flawed because it relies on what he labels "supply-side evidence." Reliance on such evidence, he insists, is inconsistent with the Merger Guidelines requirement that market definition be based on demand-side substitution.[114] Sidak describes the difference between demand-side substitution and supply-side substitution and appeals to the Merger Guidelines and Merger Commentary for the proposition that product market definition should be based only on demand-side substitution.[115] Our analysis, he suggests, violates these precepts by providing what he calls "supply-side" evidence.

76. The "supply-side" label, however, is Sidak's, not ours, and he mischaracterizes our evidence by associating it with the issue of supply-substitution. We did not claim to present evidence on supply substitution or argue that market definition should be based on supply substitution. Indeed, our so-called "supply-side" evidence in our report comes directly from one of the categories of demand-substitution evidence listed in the Merger

[113] [redacted]

[114] *See* Sidak 3rd Supplemental at ¶20, n. 14 and n. 15, citing the Merger Guidelines and Merger Commentary for the proposition that product market definition depends on demand substitution. Similarly, the slide presentation by Sidak and Hal Singer to the FCC Commission staff introduce their critique of CRA's analysis of market definition with two slides titled "Demand-Side Evidence Required," which repeats the same citations to the Merger Guidelines and Merger Commentary. J. Gregory Sidak and Hal J. Singer, *Analysis of the CRA Submission* (October 3, 2007), *Notice of Oral Ex Parte Presentations on Behalf of C3SR*, MD Docket No. 07-57 (hereinafter "Sidak-Singer Ex Parte Presentation 10/3/2007").

[115] For example, *see* Sidak 3rd Supplemental at ¶57 (describing Professor Baker's analysis of the relevance of supply-side substitution for market definition), and Sidak-Singer Ex Parte Presentation 10/3/2007 at slide 6 (defining demand and supply substitutes).

Guidelines: "evidence that sellers base business decisions on the prospect of buyer substitution between products in response to relative changes in price or other competitive variables."[116] Contrary to Sidak's argument, the Guidelines clearly consider this relevant evidence of *buyer substitution*, even though it focuses on the *decisions of sellers*.

77. Sidak claims that "Professor Baker's analysis likely would reject CRA's use of supply-side evidence to define the relevant product market."[117] In fact, as noted above, Professor Baker lists seller responses as one of his five categories of evidence on buyer substitution: evidence on how sellers respond, including evidence of how "firms monitor and respond to the price changes and new product introduction of rival sellers...."[118] Professor Baker's article is not internally contradictory. Sidak's conclusion simply switches terminology:

> In summary, the single source of authority that CRA's economists cite for their assertion that *supply-side evidence* should inform market definition is more likely to undermine than support their argument. "In practice," Professor Baker notes, "courts rarely employ *supply substitution* to help define market in the context of merger analysis."[119]

Thus, Sidak uses Baker's criticism of basing product market definition on the concept of *supply substitution* to criticize the demand substitution evidence that Sidak chooses to label *supply-side* evidence. As the subtle shift in language signals, however, supply substitution and supply-side evidence are not the same. Our report did not claim that the evidence it provided on competitor responses (which Sidak labels as *supply-side*) was evidence of supply substitution.[120] Nor did we argue that market definition should be based on supply substitution.

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[116] Merger Guidelines at §1.11.

[117] Sidak 3rd Supplemental at ¶57.

[118] Jonathan B. Baker, Market Definition: *An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 141.

[119] Sidak 3rd Supplemental at ¶59, emphasis added.

[120] Sidak elsewhere seems to recognize that we were not presenting evidence of supply substitution, although he ignores the implications of this for his critique. At several places, he criticizes our "supply-side" evidence for failing to constitute evidence of supply substitution, namely, that the producers of other service would shift capacity to produce satellite radio services. Therefore, he says, our evidence does not qualify as evidence of supply substitution (which he elsewhere argues would not be relevant for market definition in any case). Sidak 3rd Supplemental at n. 21 (none of the "supply-side" evidence we presented would qualify as evidence of supply substitution under the definition adopted in the industrial organization text of Dennis Carlton and Jeffrey Perloff); *see* also Sidak 3rd Supplemental at ¶57 (description of Baker's analysis of supply-side substitution followed with

78. Our report argued that evidence of seller responses is valuable because sellers are knowledgeable about buyer substitution and are betting their own money on the accuracy of their information and expertise.[121] Sidak misunderstands our point, claiming that we are asking the FCC to believe that mobile telephone or internet providers are experts on the preferences of satellite radio subscribers.[122] This characterization distorts the role of the evidence. The correct economic point is that sellers of various types of audio entertainment are experts on the preferences of audio entertainment customers who are or have been or might become their *own* customers. These suppliers have every business incentive to learn about the preferences of these customers. The competitive responses of these firms indicate that they believe that their own actual or potential customers are being attracted by the availability and improving quality over time of satellite radio and other audio entertainment devices and services. In other words, what is relevant is that these competing suppliers have expertise on what attracts satellite radio customers to their services and how to prevent their customers from substituting to satellite radio and other audio entertainment devices and services.

79. Sidak next argues that some of these new services may not be direct responses to satellite radio.[123] This is too narrow an understanding of what evidence is relevant for determining if satellite radio and other audio entertainment are substitutes. Seller responses should be viewed to see if they are linked and inter-related responses among competitors, rather than treating them as mutually exclusive, pairwise direct responses. Competition is multidimensional and involves multiple audio entertainment devices and services. Sellers of every device and service respond both directly and indirectly to actions taken by all the other devices.[124] These seller responses collectively form a linked pattern of

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the observation that none of CRA's evidence indicates that supply substitution is likely to occur); Sidak-Singer Ex Parte Presentation 10/3/2007 at slide 11.

[121] For example, see, CRA FCC Report at ¶29 and n. 30.

[122] Sidak 3rd Supplemental at ¶54.

[123] For example, *see* Sidak 3rd Supplemental at ¶33 and n. 36.

[124] For example, XM may add storage or partner with Napster primarily in response to iPods. However, XM's response also would affect Sirius, other MP3 players, subscription services and terrestrial radio. The responses of these firms in turn might lead to further responses by wireless phone designers and service providers, which could lead to further reactions by XM and the others. To take another concrete example, Clear Channel, Sirius and XM all offer their content on a wholesale basis to wireless phone carriers. Clear Channel also is beginning to allow its HD Radio content to be flagged for downloading via iTunes. This content competes with content from subscription services like Rhapsody and other sources that are offered to the owners of MP3 players, and with the ability of XM subscribers to tag content and download it from Napster. The HD Digital Radio Alliance, composed of major terrestrial radio station owners, promotes HD radio in order to preserve terrestrial radio audiences against the competition of other audio entertainment, including but not limited to satellite radio. Specifically, the Alliance commits to maintain HD2 stations as commercial-free, to approve and coordinate their content to promote format diversity, and to spend an additional $230 million in 2008 to promote HD Radio, bringing its total promotional

convergence of characteristics, indicating that buyers consider these services to be part of a lengthening list of alternatives.

80. Sidak also argues that evidence of competitor responses is relevant only if it reflects the reactions of consumers to a small change in relative prices or to the equivalent.[125] Sidak's restrictive interpretation of the Merger Guidelines would exclude relevant information on buyer substitution, such as responses to new product introductions, since they would not reflect small changes in relative prices.[126] Professor Baker, however, specifically refers to relevant evidence such as when "firms monitor and respond to the price changes *and new product introductions* of rival sellers...."[127] Competitors' responses can provide valuable information on which products buyers view as substitutes, even when competitors react to something other than a small change in relative prices, and even when those responses cannot provide a precise quantitative measure of buyers' responses to a small price change. Moreover, competition over product quality and product features is important to consumers, just as is price competition.

81. Furthermore, when competitors respond by adjusting the characteristics of their service to make them more similar to the features of satellite radio – as, for example, terrestrial radio did by reducing commercials, or iPods by adding WiFi access, or wireless phones by offering audio streaming and downloading – they are revealing that they believe their customers will respond to marginal changes in the relative attractiveness of their service versus satellite radio. Along the same lines, satellite radio providers have adjusted their features to better compete with these substitutes, as when they added portability and memory to allow subscribers to time shift and to store MP3 files on satellite radio receivers, or when they added content such as traffic and weather. All of this is evidence – contrary to Sidak's assertions – that consumers would substitute between these services and satellite radio in response to small changes in relative quality-adjusted prices.[128]

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spending to $680 million. *See generally,* Section 11.A.3 of CRA FCC Report. On the HD Digital Radio Alliance, *see* Press Release, *HD Digital Radio Alliance Renews Charter with Marketing Commitment that Takes Total to $680 Million* (October 15, 2007) *available at* http://www.hdradio.com/i/Alliance_Charter.pdf (last visited November 7, 2007).

[125] For example, *see* Sidak 3rd Supplemental at ¶21-22.

[126] See Sidak 3rd Supplemental at ¶23 (arguing that responses to entry provide no useful information about buyer substitution). On this point, Sidak apparently ignores the plain language of the Merger Guidelines, which states the relevance of changes in "other competitive variables," as well as price. Merger Guidelines at §1.11.

[127] Jonathan B. Baker, *Market Definition: An Analytical Overview* 74 Antitrust L.J. 129 (2007) at 141, emphasis added. Furthermore, Professor Baker notes that "evidence as to which rival products are monitored and responded to by sellers may not correspond readily to a particular percentage price increase or suggest a precise percentage for the buyer response, yet this evidence could nonetheless be strongly probative as to market definition." *Id.* at n. 63.

[128] For example, *see*, Sidak 3rd Supplemental at ¶21-22.

82. In this regard, XM and Sirius have dramatically increased their penetration over time, with subscriptions growing much faster than US population. One reason is the fact that the quality of the products offered by Sirius and XM have continually improved over time, one marginal step at a time. (Another important reason is the word-of-mouth information and recommendations generated by earlier subscribers, what we referred to as the dynamic demand spillover effect and discuss in more detail below.) These continuous quality improvements each represent marginal reductions in quality-adjusted prices. These improvements include increases in the number of channels and increases in premium content, such as MLB, NFL and Howard Stern. XM and Sirius also have improved signal quality. They also have improved the quality of aftermarket radios, for example by adding memory to permit time shifting. XM also has partnered with Napster to facilitate downloads. In response to these reductions in quality-adjusted prices, additional subscribers substituted away from terrestrial radio and other audio entertainment products. The fear of loss of actual and potential subscribers in response to marginally increased quality-adjusted prices would constrain the ability of the merged firm to exercise market power.[129]

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[129] For Sidak's view, see Sidak 3rd Supplemental at ¶22. Sidak also mischaracterizes the evidence that we provide that increased competition from other forms of audio entertainment has led industry analysts to revise downwards their projections for 2010. Sidak 3rd Supplemental at ¶36, citing CRA FCC Report at ¶47. Sidak claims we make the error of inferring causation from the fact that satellite radio growth projections are being revised downward at same time as sales of iPods and MP3 players is growing. In fact, we were citing the views of industry analysts following the satellite industry that the growth of this competition helped cause the downward revisions. As discussed above, the views of industry experts constitute a category of evidence on buyer substitution identified by Professor Baker. Jonathan B. Baker, *Market Definition: An Analytical Overview*, 74 Antitrust L.J. 129 (2007) at 141. We cited the views of Goldman Sachs; see Goldman Sachs, *Conundrum Squared: Why XM And Sirius Should Wait* (February 11, 2007) at 3 ("Consensus subscriber estimates remain too high, in our view, with an already competitive environment slowing retail net adds..."); at 4 ("We are lowering our subscriber estimates for both XM and Sirius in an expectation of continued slower subscriber growth owing to softening retail demand for both XM and Sirius."); at 7 ("Satellite radio already competes with an increasing array of products within the $200-$500 price range, with some of the products having contributed to the slowing industry subscriber growth" and exhibiting a chart showing consumer media products including iPods and MP3 players and media phones (such as the iPhone) alongside another chart showing slowing retail growth). We also cited the views of JP Morgan, *XM Satellite Holdings Inc* (January 16, 2007) at 2 ("we are now assuming that retail gross adds have peaked for XM and the industry." "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.") Finally, Sidak also charged that we "cherry-picked" reports to suggest that the demand for satellite radio was declining and cited other sources for the proposition that satellite radio growth is expected to continue. Sidak 3rd Supplemental at ¶37. This is a distortion; as we clearly stated, the cited reports projected a slower rate of growth for satellite radio, not a fall in absolute demand. Indeed, as we have made clear in both this and the earlier report, we agree that satellite radio will continue to grow. That is why the analysis of market definition and competitive effects for this merger should take these conditions of growth into account.

III. MARKET DEFINITION ANALYSIS AND EVIDENCE WHEN THERE ARE DYNAMIC DEMAND SPILLOERS

83. Our earlier Report explained how the hypothetical monopolist test of the Merger Guidelines should be applied to this proposed merger in light of the dynamic demand characteristics of satellite radio.[130] Sidak claims that our report employs a "novel and wholly theoretical concept" of dynamic demand, that we "start from the proposition that the market-definition principles of the Merger Guidelines are fundamentally flawed," and that we "attempt to evade conventional merger analysis."[131] This section explains that Sidak's rhetorical onslaught is unfounded and incorrect. Our analysis does not reject the Merger Guidelines, but instead applies its principles to the facts and circumstances of this merger.

A. Dynamic Demand and the Merger Guidelines

84. Sidak asserts that our report is an attack on, or an evasion of, the principles of the Merger Guidelines and conventional merger analysis. It is not. Rather, we conduct a conventional merger analysis by *applying* the principles of the Merger Guidelines to the facts of this merger, precisely what the Merger Guidelines direct should be done. The first section of the Guidelines makes the following admonition and directive:

> Because the specific standards set forth in the Guidelines must be applied to a broad range of possible factual circumstances, mechanical application of those standards may provide misleading answers to the economic questions raised under the antitrust laws. Moreover, information is often incomplete and the picture of competitive conditions that develops from historical evidence may provide an incomplete answer to the forward-looking inquiry of the Guidelines. Therefore, the Agency will apply the standards of the Guidelines reasonably and flexibly to the particular facts and circumstances of each proposed merger.[132]

The approach to market definition in our report followed this instruction. We applied the general principles of the Merger Guidelines to the "particular facts and circumstances" of this merger.

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[130] See CRA FCC Report at ¶76-79 and Appendix A.

[131] Sidak 3rd Supplemental at ¶7, 11, 8.

[132] Merger Guidelines at §0.

85. Similarly, the *Merger Commentary* of the Department of Justice and FTC observes that "[m]erger analysis depends heavily on the specific facts of each case.... Staff evaluates potential competitive factors ... by gathering additional information and conducting intensive factual analysis to assess both the applicability of individual analytical frameworks and their implications for the likely competitive effects of the merger." It also states that, "[t]he Agencies examine whatever evidence is available and apply whatever tools of economics would be productive in an effort to arrive at the most reliable assessment of the likely effects of proposed mergers."[133]

86. Sidak cites the report to Congress by the Antitrust Modernization Commission (AMC) for the proposition that "[n]o substantial changes to merger enforcement policy are necessary to account for industries in which innovation, intellectual property, and technological change are central features." This means, says Sidak, that it is not necessary to "rewrit[e] merger law," as he claims we are doing in our report.[134] But, Sidak fails to note why the AMC said that changes are not needed: "[a]ntitrust analysis...is sufficiently flexible to provide a sound competitive assessment in such industries." The AMC explains that, "as in other industries, of course, antitrust enforcers evaluating business conduct in new economy industries must ensure proper attention is paid to particular market dynamics and economic characteristics that may play a role in determining likely competitive effects."[135]

87. Sidak claims that the concept of dynamic demand in our report is "wholly theoretical."[136] It is not. We apply the concept here because it fits the facts of the proposed merger. We readily grant, however, that there is a theoretical component to our analysis, as there ought to be. Economists utilize theoretical analysis to understand the competitive

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[133] Merger Commentary, at 3 and 17.

[134] Sidak 3rd Supplemental at ¶3.

[135] Antitrust Modernization Committee, *Report and Recommendations* (April 2007) available at http://www.amc.gov/report_recommendation/toc.htm (last visited November 5, 2007) at 32.

[136] Sidak 3rd Supplemental at ¶76. Sidak also claims here that the concept of dynamic demand is "novel." This also is incorrect. Dynamic demand is not a "novel" concept that we created for this case. The concepts of dynamic demand and product diffusion have been analyzed for years in the economics literature and the marketing literature. Appendix A to our earlier report provided both an introduction to this literature and numerous references. These references included the microeconomic textbook of Jean Tirole and the classic work of Frank Bass. See Appendix A, CRA FCC Report, citing, among other works, Everett M. Rogers, DIFFUSION OF INNOVATIONS (1983); Frank M. Bass, *A New Product Growth Model for Consumer Durables*, 15 Mgmt. Sci. 1825 (1967); and Jean Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (MIT Press 1990) at 71 (discussing a "goodwill effect" similar in concept to dynamic demand). Nor did we invent the terminology "word-of-mouth" or the idea that word-of-mouth information from current consumers can promote future purchases by others, which gives rise to dynamic demand. As discussed below, this common-place idea was applied to satellite radio by analysts long before the merger was announced.

implications of particular conditions. Appendices A and B in our initial report provided the economic framework and a rigorous theoretical analysis of the implications of dynamic demand spillovers for the profit-maximizing pricing behavior of both individual firms and a merged firm like Sirius/XM. That analysis showed that dynamic demand gives firms an economic incentive to set lower prices (penetration pricing) as an investment in future demand. This understanding of the implications of dynamic demand on pricing and investment is central to analyzing the competitive effects of the merger. It is also central to constructing a hypothetical monopolist test for market definition that fits the facts and circumstances of this merger and therefore will define the relevant market in a way that informs rather than obscures an understanding of the competitive effects of the merger.[137]

88. We apply the concept of dynamic demand here because it is an analytical description of the facts that characterize demand and growth in satellite radio. Those demand characteristics in turn shape the pricing decisions of the individual pre-merger firms, of the merged firm, and of the hypothetical monopolist analyzed to determine market definition. Consequently, ignoring those demand characteristics, as Sidak does, leads to faulty analyses of the competitive effects of the merger and the appropriate market definition.

89. Sidak asserts that "nowhere does CRA articulate the conditions that would have to exist for the analysis to be applicable...."[138] Sidak apparently ignores multiple explanations in our report of the characteristics and consequences of dynamic demand.[139] Satellite radio demand exhibits several significant factual conditions relating to dynamic demand.

- First, satellite radio is still early in its life cycle and demand is not close to saturation. Growth has been rapid, but penetration at the end of 2006 was only about 5% of U.S. population, so there is still significant growth opportunity. As indicated in the table attached as an Exhibit to this report, analysts project demand rising from about 14 million at the end of 2006 to an average of 38 million in 2015.[140] Even then, penetration may not have reached its steady-state point where new subscribers merely

[137] This approach is consistent with the Merger Guidelines and standard antitrust practice. As noted above, the Merger Commentary states that the Agencies are open to applying "whatever tools of economics would be productive in an effort to arrive at the most reliable assessment of the likely effects of proposed mergers." Merger Commentary at 17.

[138] Sidak 3rd Supplemental at ¶78.

[139] Dynamic demand and the spillovers that characterize such demand conditions are described in the CRA Report in the text and Appendix A. For example, *see* CRA FCC Report at ¶81-82 and Appendix A.

[140] See the discussion below of these results.

cover those that deactivate. The projected rapid growth affects the pricing incentives of the hypothetical monopolist used in the *ssnip* test for market definition.

- Second, satellite radio is a relatively new technology and concept (pay-radio), whose value is not obvious to many potential customers. Many people have not experienced satellite radio. As a result, satellite radio depends heavily on word-of-mouth information diffusion and recommendations from satisfied subscribers to help drive its demand growth. Potential subscribers rely on the information and recommendations of existing subscribers before subscribing themselves. Demand also is driven by the "market buzz" generated by consumer excitement and retailer investments. Retailer investments in turn also are driven by the expectation of growth. In our report, we referred to these circumstances as "dynamic demand spillovers."
- Third, demand spillovers have significant effects on the pricing incentives of the individual firms in the pre-merger world as well as the hypothetical monopolist of the *ssnip* test for market definition. In our report, we explained the incentive for "penetration pricing," that is, setting prices lower in order to generate a larger subscriber base and faster subscriber growth, which in turn would lead to additional growth as current subscribers recommend the product to others and retailers invest more.[141] As discussed earlier, this use of penetration pricing was described by Sirius CEO Mel Karmazin in 2006, when he said that Sirius sets lower prices in order to generate a larger subscriber base and faster subscriber growth.[142] This growth in turn leads to additional growth as current subscribers recommend the product to others and retailers invest more.
- Fourth, this process of information diffusion and recommendations involves two distinct types of dynamic demand spillovers – "internal" and "external" spillovers. The distinction between internal and external spillovers involves the recipient of the future sales when the current sales of a particular firm increase. Internal demand spillovers increase the firm's own future sales. In contrast, external demand spillovers increase the sales of some or all other firms.[143] The evidence indicates the significance of both types of spillovers.
- Fifth, these external demand spillovers have a differential effect on the pricing incentives of the hypothetical monopolist (and the merged firm) versus those of the

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[141] *See* CRA FCC Report at, for example, ¶82-84 and Appendix A.

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

[143] As discussed below, and contrary to Sidak's claim, external spillovers need not affect all other competing firms in the market.