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SOME DYNAMICS OF HIGH-TECH MERGER ANALYSIS
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ABSTRACT

Horizontal merger evaluation is heavily reliant on market definition. While a SSNIP framework formats the analysis, demand elasticity evidence used to apply the test is often sparse, as is often found in high-technology industries. This paper examines other sources of evidence that reveal the dynamics of market structure, data that are also probative in the evaluation of competitive effects. These sources include capital valuations of firms, financial event studies, and the public positions taken with respect to the merger by interested parties. Such evidence is examined in the XM-Sirius merger (2007-08), and shown – in two of the three instances – to be relatively informative in merger welfare analysis.

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I. Introduction

The regulatory approval process for horizontal mergers is premised on market definition.

¹ To formalize the analysis, a SSNIP test (considering a *small but significant non-transitory increase in price*) is employed. A hypothetical firm² is contemplated to control the products of the merging parties. If no SSNIP is likely, then the relevant market extends beyond the firms proposing to combine, as independent sources of supply are constraining prices. It is not idle coincidence that this exercise should be highly correlated with the outcome of the merger analysis, as the ability of the proposed combination to raise quality-adjusted prices is presumably the central concern of the antitrust review.³

Application of the SSNIP test is often problematic. Its reliance on counter-factual data – how demand elasticity would change post-merger – presents a tall order for pre-merger analysis.⁴ When the merging enterprises are horizontal rivals in high-technology fields, such problems are likely exacerbated. Here, product lines may only be emerging, and even then are rapidly changing; technological innovation, not price competition, drives inter-firm rivalry.⁵ Pricing may be geared to building “critical mass” for long-run viability.⁶ All make the empirical issues even more challenging. This complexity is illustrated in the recent merger approval process in XM-Sirius.⁷

The proposed combination consisted of the two U.S. satellite radio operators (a service the Federal Communications Commission calls SDARS – satellite digital audio radio service), and opponents of the deal moved to block the transaction as a “merger to

¹ “Market definition is often the most critical step in evaluating market power...” Jonathan Baker, *Market Definition: An Analytical Overview*, 74 ANTITRUST LAW JOURNAL 129, 129 (2007).

² This is commonly called “the hypothetical monopolist test.” I attempt to avoid that term because it begs the question being asked, namely, whether or not monopoly power is in evidence.

³ The test is commonly conducted as a “critical loss” analysis. See B. Harris and J. Simons, *Focusing Market Definition: How Much Substitution is Necessary?* 12 RESEARCH IN LAW AND ECONOMICS 207 (1989).

⁴ “The fact that typically it is difficult to calculate either marginal cost or economic profits foreshadows that the direct determination of the level of market power shall be hard no matter what definition is used.” Dennis Carlton, *Market Definition: Use and Abuse*, 3:1 COMPETITION POLICY INTERNATIONAL 1, 7 (Spring 2007).

⁵ “It seems clear that it is innovation, not price-setting, to which management gives priority in important sectors of the economy. It is persistently forced to do so by the market. But the central body of micro-economic analysis gives its attention primarily to price determination, and by doing so may, arguably, be omitting a critical feature of the competitive process in more recent periods.” WILLIAM J. BAUMOL, *THE FREE-MARKET INNOVATION MACHINE: ANALYZING THE GROWTH MIRACLE OF CAPITALISM* 15 (2002).

⁶ See Robert S. Pindyck, *The Measurement of Monopoly Power in Dynamic Markets*, 28 JOURNAL OF LAW & ECONOMICS 193 (1985); Paul Klemperer, *The Competitiveness of Markets with Switching Costs*, 18 RAND JOURNAL OF ECONOMICS 138 (1987); and Steven C. Salop, Steven R. Brenner, Lorenzo Coppi, Serge X. Moresi, *Economic Analysis of the Sirius-XM Merger*, paper filed at the Federal Communications Commission, *In the Matter of XM Satellite Radio Holdings Inc., Transferor, and Sirius Satellite Radio Inc., Transferee, Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57 (July 24, 2007) (“Salop I”), pp. A1-A7.

⁷ The merger was formally proposed by the parties on Feb. 19, 2007, and antitrust approval was granted by the U.S. Department of Justice Antitrust Division (DOJ) on March 24, 2008. As of this writing, the Federal Communications Commission (FCC) is still considering whether or not the license transfers required for the merger are in “the public interest.”

monopoly.”⁸ The market definition question was, naturally, central. The most likely candidate for inclusion in the relevant market, beyond satellite broadcasting, was terrestrial broadcasting. Given the economic dominance of AM/FM radio stations, with 2006 revenues of about \$20 billion as compared with the \$1.6 billion in sales for XM and Sirius (see Table 1), this boundary line was likely determinative. If terrestrial broadcasting were included, the merger would be approved. Of course, AM/FM broadcasting, as well as new terrestrial HD stations, MP3 players (including iPods), mobile phones (with embedded MP3 players and/or AM/FM radios), and Internet radio undeniably compete with SDARS. The question was the magnitude of substitutability.

In this instance, serious, well-funded opponents of the merger conducted a SSNIP test, offering the analysis in public proceedings and thereby creating the opportunity to evaluate this form of market definition. Specifically, the National Association of Broadcasters (NAB), a trade association representing terrestrial radio stations, supported expert studies that analyzed the evidence related to the merger,⁹ emphasizing the centrality of the SSNIP test.

This paper has a modest goal: it attempts to demonstrate that important marketplace evidence may be available to complement, or substitute for, the own-price demand elasticity estimates required to perform the “hypothetical monopolist” test. It uses the satellite radio merger as a useful case study in this enterprise. First, the application of the SSNIP model in the XM-Sirius merger analysis is shown to have been incomplete and not compelling. The complex nature of the evolving satellite radio service, coupled with the paucity of demand data, made calculation of the needed metrics impossible. This is reflected in the DOJ decision to approve the “merger to monopoly.” Second, broader forms of market structure evidence are likely to be of increasing importance in dynamic, high-technology markets where the equilibrium assumed for the SSNIP test is notably lacking. Three types of evidence are specifically explored: financial market valuations, financial market event studies, and interest group merger advocacy. Data from these sources, properly evaluated, help define markets in a context that accounts for expectations about inter-modal rivalry. In two of the three instances, such evidence provided probative information for the XM-Sirius merger, illuminating both market boundaries and competitive effects.

⁸ J. Gregory Sidak, *Expert Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* 2 (March 16, 2007) [“Sidak I”]; <http://ssrn.com/abstract=977318>.

⁹ See Sidak I; *Supplemental Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (July 9, 2007) (“Sidak II”); *Second Supplemental Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (July 24, 2007) (“Sidak III”); *Third Supplemental Declaration of J. Gregory Sidak, Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (Oct. 1, 2007) (“Sidak IV”); and *Declaration of Steve S. Wildman Concerning the Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Inc.* (July 23, 2007) (“Wildman 2007”).

II. The SSNIP TEST

A. Basic Framework

The SSNIP test, and its reformulation as a Critical Loss Analysis, offers a framework for defining the relevant antitrust market in a horizontal merger.¹⁰ The method constructs a hypothetical in which a single firm is assumed to supply the outputs of independently-supplied substitutes, leaving production costs unaltered,¹¹ and then estimates whether a retail price increase would be profitable. By examining the gross profit margins for the existing firms, a “critical loss” (*CL*) indicates that level of lost unit sales required to exactly offset the gains (to the hypothetical firm) of a given price increase. For instance, if two firms both enjoy gross margins of 33 percent, a post-merger price increase of 5 percent would imply a *CL* of approximately 13 percent. This means that profits for the combined entity would remain constant (equal to the pre-merger level) were the merged enterprise to raise prices 5 percent and, as a result, see a decline of about 13 percent in its unit sales.¹²

The empirical analysis then considers whether the actual loss (*AL*) from a SSNIP would exceed the *CL*. If the *AL* is greater than the *CL*, the action would be unprofitable and prices would not, presumably, increase, implying that the market effectively includes additional substitutes beyond the hypothetical firm’s portfolio. These products are then iteratively added to the firm’s domain until a profitable price increase is projected, at which point the market boundary (up to and including the last product added) is defined.

The framework is simple and compelling, but conducting the analysis is challenging. The data required to evaluate the hypothetical scenarios are gleaned from market activity offering limited analogies. In particular, whether the hypothetical firm would face a demand curve that becomes considerably less elastic when a product is added is generally not deducible from direct observation. Inferences from changing prices and quantities associated with historical episodes of shifts in market structures are only occasionally available and always imperfect.

B. The SSNIP Applied to XM-Sirius

¹⁰ Recent commentary on the framework has been lively. Michael L. Katz and Carl Shapiro, *Critical Loss: Let’s Tell the Whole Story*, 17-SPRING ANTITRUST 49 (2003); Daniel P. O’Brien and Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST LAW JOURNAL 161 (2003); David T. Sheffman and Joseph J. Simons, *The State of Critical Loss Analysis: Let’s Make Sure We Understand the Whole Story*, THE ANTITRUST SOURCE (Nov. 2003); Baker, *supra* note 1; Carlton, *supra* note 4; Oystein Daljord, Lars Sorgard, and Oyvind Thomassen, *The SSNIP Test and Market Definition with the Aggregate Diversion Ratio: A Reply to Katz and Shapiro*, 4 JOURNAL OF COMPETITION LAW AND ECONOMICS 263 (2007).

¹¹ Changes in production costs associated with a given merger are relevant to the analysis, but are typically factored in separately from the market definition exercise. Hence, it is possible that a merger that was expected to lower retail prices, would involve an increase in market power. See Oliver E. Williamson, *Economies as an Antitrust Defense: The Welfare Trade-offs*, 58 AMERICAN ECONOMIC REVIEW 18 (1968).

¹² Example: If original sales (for the combined entity) are equal to 100 units at a price equal to \$1.00, then operating profits would equal 33. A price increase of five percent coupled with a decrease in sales to 87, would produce operating profits equal to: $(87 * [.33 + .05]) \approx 33$.

The XM-Sirius merger analysis illustrates these problems. A SSNIP test was conducted in a publicly-available analysis by opponents of the merger.¹³ The method was to calculate a “critical elasticity,” analogous to the *CL*, and then to argue that the actual post-merger elasticity of demand faced by XM-Sirius would (in absolute value) fall below this value, making a post-merger price increase profitable. This critical value equaled -1.43 given the assumptions employed regarding price-cost ratios.¹⁴

The equilibrium assumptions used to derive a *CL* or “critical elasticity” can be highly unrealistic when applied to emerging services that need to grow rapidly to spur future sales and/or to attain critical mass. With the pricing of satellite radio services, firm optimization must incorporate long-term strategies, such as assuring subscriber growth rates that promote widespread usage, encouraging complementary marketing efforts (as from retail outlets or auto makers), and achieving scale (including network) economies. The importance of “penetration pricing” renders the Lerner Index, which assumes short-term maximization of operating profits, incomplete.¹⁵

Yet, even assuming away these complicated dynamics, the evidence necessary to forecast post-merger own-price demand elasticity was sparse. Satellite radio was introduced in 2001 (XM) and 2002 (Sirius). The firms featured standard program menus nationwide, eliminating local pricing variations. Prices did not generally vary over time; instead, quality changed as program services were altered. Moreover, the subscription model was distinct from that offered by rivals such as terrestrial broadcasters, who extract revenue from advertisers rather than listeners.¹⁶ When terrestrial radio took competitive actions aimed directly at satellite radio – as when launching new HD channels¹⁷ or limiting the number of commercials per hour¹⁸ – the rivalry was not quantifiable as an own-price or cross-price demand elasticity. The contracts used to distribute satellite radios also complicate substitution estimates, as two-year agreements are widely used by customers while longer-term deals govern arrangements with electronics retailers and auto makers, the primary distribution outlets for satellite radio subscriptions.

¹³ See, in particular, Sidak I.

¹⁴ See Thomas W. Hazlett, *The Economics of the Satellite Radio Merger*, paper submitted to the Federal Communications Commission, *In the Matter of XM Satellite Radio Holdings Inc., Transferor, and Sirius Satellite Radio Inc., Transferee, Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57 (June 14, 2007) (“Hazlett I”) I, p. 30.

¹⁵ See Salop I, pp. 43-48.

¹⁶ Audio products such as MP3 players, cellphone-embedded radios, and Internet radio also use different revenue models.

¹⁷ According to an NAB study: “Digital radio broadcasting is critically important for terrestrial stations in view of the launch of two satellite distributed digital audio radio services in 2001. Hence, the dawning of terrestrial digital radio is driven more by marketplace and competitive concerns as opposed to the digital television conversion timeline mandated by the FCC.” DONALD LOCKETT, *THE ROAD TO DIGITAL RADIO IN THE UNITED STATES* p.xvii (Washington, D.C.: National Association of Broadcasters, 2004).

¹⁸ “Facing increasing competition from satellite radio and iPods, Clear Channel Communications is trying something radically different at a commercial radio station in Texas: getting rid of the commercials.” In lieu of traditional ad spots, sponsorships are sold for program blocks and announcers promote the sponsor’s product “conversationally.” “The product-themed chitchat will account for about two minutes peppered throughout the hour, in contrast to the 12 minutes to 16 minutes of commercials that most stations broadcast each hour.” Andrew Adam Newman, *In Dallas, Commercial Radio Without Commercials*, N.Y. TIMES (April 23, 2007), available at: <http://www.nytimes.com/2007/04/23/business/media/23radio.html?scp=1&sq=%2C+Commercial+Radio+Without+Commercials&st=nyt>.

Such complexities are not uncommon, but are likely to be more extensive and problematic in high technology markets. These industries tend to be young, offering less marketplace experience, and involve innovative products or business models that do not squarely match those of the firms with which they compete or seek to displace. This Schumpeterian rivalry is a dynamic process, which undercuts the equilibrium assumed in a SSNIP test.

C. Data to Inform the XM-Sirius SSNIP Test

In XM-Sirius, the market definition offered by merger opponents relied on one source of “direct evidence”¹⁹ to gauge the magnitude of post-merger elasticity of demand. This source was the episode in April 2005 when XM satellite radio raised its subscription price from \$9.95 per month to \$12.95. The inference drawn was that, because “subscriber growth continued at such a rapid pace [after] the price increase,” the marketplace evidence “underscores the low elasticity of demand faced by SDARS providers.”²⁰ Although no numerical calculation was offered, the data were asserted to establish that satellite radio demand elasticity was below the calculated critical value. Combined with qualitative observations about the difference between satellite radio and other audio services,²¹ the conclusion was then advanced that – under the SSNIP test – satellite radio formed its own separate market. The XM-Sirius merger should be evaluated, and rejected, as a two-to-one horizontal combination.

Yet, the demand elasticity evidence advanced was premised on buyer substitution in response to a pre-merger price increase instituted by XM. Whatever the quantity reaction, the demand function being investigated relates to the firm, XM, and not to satellite radio, XM-Sirius. Hence, the conclusion that post-merger demand is inelastic, or more ambitiously, calculated as $elasticity < |-1.43|$, is unsupported. If XM did raise its price, holding all else constant, and subscriber growth remained constant, the proper inference would be that demand for *XM's radio service* was (perfectly) inelastic over the increment. This would imply not that demand for *satellite radio service* was inelastic, but that Sirius was a highly imperfect substitute for XM, such that the two services occupied separate markets.

This unwarranted conclusion would define the market too narrowly.²² The evidence, properly interpreted, does not suggest that XM demand was inelastic, which would imply that the firm had failed to maximize profits before April 2005. Indeed, the price increase was accompanied by significant programming improvements, including the addition of Major League Baseball games.²³ Such quality adjustments have complicated the evaluation. The result was that no direct evidence provided the basis for any

¹⁹ Sidak I, p. 12.

²⁰ *Id.*

²¹ Satellite radio was asserted to occupy a different product space than terrestrial radio due to the adult content of some channels offered and the distinction between subscription and ad-supported services (Sidak I, pp. 14-25).

²² It would also suggest that the merger be approved, as the combination of XM-Sirius would occur across markets, leaving market power within the relevant market unchanged. This is the reverse of what was argued by merger opponents.

²³ Salop I, f.n. 170. This paper also notes that subscriber growth would have to be evaluated in terms of deviation from trend to properly assess demand response.

quantitative prediction of post-merger demand elasticity. Other evidence on substitutability, including an econometric analysis finding that subscription levels for satellite radio were significantly higher in areas with fewer terrestrial radio stations,²⁴ proved more informative in defining the market and contributed to the DOJ's approval of the merger without conditions.

Viewed narrowly, the SSNIP test did not prove compelling in the satellite radio merger case. In circumstances likely shared with many other transactions in high-tech markets, the scope of analysis naturally extended beyond a comparison of pre- and post-merger demand elasticities. This paper seeks to analyze the importance of three sources of information regarding market definition that can offer highly probative evidence: capital market valuations, financial event studies, and interest advocacy. In the XM-Sirius merger, only two of the three yielded valuable data (financial event studies proved uninformative in this instance). Yet, overall, the information gained was persuasive, and supported the conclusions reached by antitrust regulators.

III. MARKET VALUATION AND THE EXISTENCE OF A PRODUCT MARKET

A. Enterprise Valuations and Market Definition

Market definition is least useful when market shares would not be strongly probative as to market power or anticompetitive effect, while direct evidence as to market power or anticompetitive effect is available and convincing.²⁵

An implication of a well-defined market is that the hypothetical monopolist serving this market exhibits non-negative profitability. A profit-maximizing firm supplying an entire "market" but earning competitive returns, or less, demonstrates that the firm cannot impose a supra-competitive price – that is, a SSNIP, which defines "the smallest set of products, including the products of the parties to the proposed merger, that a monopolist would need to control to profitably increase prices a small but significant amount above competitive levels."²⁶ Thus, the product space by sales of the "hypothetical monopolist" is not a market, given evidence provided by capital markets that no more than competitive profits are anticipated.

The link between market power and firm profits is easily derived from economic theory and is uncontroversial. It has also proven useful in regulatory proceedings. For instance, in reports on the status of competition in cable television issued in 1990 and 1994, the FCC relied heavily on market capitalization data to infer the existence of supra-competitive pricing.²⁷

²⁴ Salop I, ¶ 28.

²⁵ Baker, *supra* note 1, at 131 (footnote omitted).

²⁶ Mary Coleman and David Meyer, *Empirical Analyses of Potential Competitive Effects of a Horizontal Merger: The FTC's Cruise Ships Mergers Investigation*, 23 REVIEW OF INDUSTRIAL ORGANIZATION 121, 122 (2003).

²⁷ Federal Communications Commission, *In the Matter of Competition, Rate Deregulation and the Commission Policies Relating to the Provision of Cable Television Service*, MM Docket No. 89-600 p. 38 (July 26, 1990); Federal Communications Commission, *Annual Assessment of the Status of Competition in*

This cross-check on market definition is particularly revealing in the case of the satellite radio merger. XM and Sirius were, in June 2007, valued at about \$4.4 billion and \$4.8 billion, respectively. These enterprise value (*EV*) estimates include the market value of both equity and debt, and quantify the present value of all future earnings. Each firm has invested significantly more than its *EV*, when capital expenditures and operating losses are calculated in present value terms.²⁸ All told, XM and Sirius have collectively spent upwards of \$11.5 billion. When cash flows are re-invested at the firms' cost of capital (assumed = 12 percent), as is economically appropriate, the present value of expenditures for the two firms exceeds \$16 billion. See Table 2.

These capital market valuations demonstrate that investors do not expect either the current structure of satellite radio services, or the "merger to monopoly," to produce monopoly profits. This verdict holds following the DOJ's merger approval, with investors expecting Sirius to purchase XM and thereby gain a "monopoly" over satellite radio service.²⁹ No reasonable premium for merger consummation materially changes this valuation. The evidence reveals that other products are sufficiently substitutable for satellite radio such that even *competitive* profits are not anticipated.

B. An Inverted Cellophane Fallacy

The "cellophane fallacy"³⁰ emanates from an error potentially made in applying the SSNIP test where monopoly pricing already exists. If a monopolist is profit maximizing, then prices are set at a level where further price increases are unprofitable. Bringing another product within the firm, as in a hypothetical monopolist test, will not alter that equilibrium. Interpreting the lack of a price increase as evidence that the market encompasses (at least) both products is the "cellophane fallacy."

Were evidence to suggest a post-merger price increase in satellite radio, we could be confronted by an inverted cellophane fallacy.³¹ When prices are raised to competitive levels (or less), a SSNIP does not connote supra-competitive pricing – the indicator

the Market for the Delivery of Video Programming, First Report, CS Docket No. 94-48, 9 F.C.C. Rcd. 7442 (Sept. 28, 1994).

²⁸ There are different means of calculating profitability of firms, of course. The basic approach used here is to use market values of firm debt and equity establish the present value for all anticipated future cash flows, and to compare that to the total investments made by the firms. The q-ratio approach similarly compares market value to investment cost, but defines the latter value as the replacement cost of capital. See Eric B. Lindenberg and Stephen A. Ross, *Tobin's q Ratio and Industrial Organization*, 54 THE JOURNAL OF BUSINESS 1 (1981). The approaches converge where the cost of investment (as calculated by actual capital expenditures) is equal to current replacement cost.

²⁹ As of the May 23, 2008 close of trading, XM's *EV* had risen to \$4.99 billion, and Sirius' to \$4.91 billion. Yahoo!Finance website (May 25, 2008), available at: <http://finance.yahoo.com/q/ks?s=XMSR>; <http://finance.yahoo.com/q/ks?s=SIRI>.

³⁰ The paradigm was established in the Supreme Court's decision in *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956). See MASSIMO MOTTA, *COMPETITION POLICY: THEORY AND PRACTICE* 105 (2004).

³¹ I would use the term "reverse Cellophane Fallacy," but that phrase has already been appropriated. Although it similarly references a situation in which markets are too narrowly defined, the source of the trouble is found in the change in elasticity of demand along a demand curve. Luke M. Froeb and Gregory J. Werden, *The Reverse Cellophane Fallacy in Market Delineation*, 7 REVIEW OF INDUSTRIAL ORGANIZATION 241 (1992).

required for market definition. The cellophane fallacy under-identifies markets; the reserve cellophane fallacy over-identifies them.

The evidence from financial markets thus provides a valuable reference point that can avert this error. As seen in the satellite radio merger, investor valuations indicate that economic profits are not in evidence. This translates to a verdict that “duopoly” prices are not supra-competitive. Given reasonable estimates of post-merger valuations, the same verdict holds for “monopoly” prices. Whatever predictions are derived from the “hypothetical monopolist” test, a SSNIP would be insufficient to establish prices in excess of competitive levels; in this instance, the hypothetical monopolist fails to obtain market power. This would mean that the SSNIP test predicted a market where financial investors believe no market exists.

C. XM-Sirius as Viewed on Wall Street

The consensus belief among securities analysts is that inter-modal rivalry is limiting the ability of XM or Sirius to achieve competitive returns. This is important information to consider when determining whether a hypothetical monopolist would be able “to increase prices profitably by a small but significant amount above competitive levels.”³² The financial problem for XM and Sirius was explicitly explained in terms of the product market:

Sure, XM (XMSR) and Sirius (SIRI) would wring out plenty of cost savings as one company. But the two have yet to earn a penny of profit. Their combined losses for 2006 are expected to hit \$1.7 billion. And competition is everywhere. Car salesmen are pushing new iPod jacks. More than 57 million Americans now listen to some form of Web radio each week, says radio-audience tracker Bridge Ratings, compared with 14 million subscribers for XM and Sirius combined. Broadcasters are beginning to offer high definition, or HD, radio. While consumers need to buy a special receiver to get HD, which squeezes more programming into the same frequency, the service is free.³³

Asset valuations are not used here in a “failing company” argument, but in assessing substitutes to inform market definition. Specifically, failing company valuations in the years before the merger announcement were taken by analysts as evidence of the emergence of important substitute products.

The market's concern about the two companies is not simply that they lose money. Satellite radio had little competition in 2000, when the Sirius stock was above \$80. But new wireless products like the Microsoft Zune will be able to work on WiFi signals, and as these get distributed around cities, the need for a satellite feed may become less acute. Apple has also set up

³² Coleman & Meyer, *supra* note 26, at 122.

³³ Tom Lowry and Paula Lehman, *XM & Sirius: What A Merger Won't Fix*, BUSINESS WEEK, March 5, 2007, at 31.

its iPod so that it can play through a car stereo. And, traditional radio broadcasters are introducing digital radio with better fidelity.

The world is no longer just XM and Sirius battling for share.³⁴

IV. FINANCIAL EVENT STUDIES

A. General Case

A merger that will create or dissipate market power will affect the profits of competing firms outside the merger. Specifically, an efficient, output-expanding combination will tend to reduce prices and competitors' profits, while an inefficient merger will increase them.³⁵ This gives rise to a wealth of information expressed in the form of securities' price changes (equity returns) that occur in response to merger events. In general, if rivals of the merging firms suffer negative market-adjusted returns during windows when announcements are made that raise the probability of a merger, the implication is that investors consider the firms' products to be substitutes and the merger to achieve efficiencies.

Event study methodology has been developed by a number of scholars,³⁶ employed specifically in merger evaluation,³⁷ and used in antitrust cases not involving mergers.³⁸ The most nagging challenge in employing an event study to inform market definition in a merger case is that publicly listed "pure plays" must be available in specific product lines. When firms are integrated into multiple product markets, or vertically, share price reactions to merger announcements will be difficult to interpret.

Where product lines are well-defined in publicly listed firms, however, an event study may provide useful data for market definition and competitive effects. The standard approach is to use the stock price movements of the target firm in the merger transaction to help calibrate the relevant windows. This reveals precisely when information about a merger announcement (or other related event) is actually transmitted to investors.³⁹ Both

³⁴ Douglas McIntyre, *Weekend Edition: M&A Nation: Sirius and XM*, WALL ST. 24/7 (Sept. 16, 2006), available at: http://247wallst.blogspot.com/2006_09_01_247wallst_archive.html

³⁵ Motta, *supra* note 30, 239.

³⁶ John J. Binder, *Measuring the Effects of Regulation with Stock Price Data*, 16 RAND JOURNAL OF ECONOMICS 167 (1985).

³⁷ Robert Stillman, *Examining Antitrust Policy Towards Horizontal Mergers*, 11 JOURNAL OF FINANCIAL ECONOMICS 225 (1983); B. Espen Eckbo, *Horizontal Mergers, Collusion, and Stockholder Wealth*, 11 JOURNAL OF FINANCIAL ECONOMICS 241 (1983); Robert H. McGuckin, Frederick R. Warren-Boulton, and Peter Waldstein, *The Use of Stock Market Returns in Antitrust Analysis of Mergers*, 7 REVIEW OF INDUSTRIAL ORGANIZATION 1 (1992).

³⁸ George Bittlingmayer & Thomas W. Hazlett, *DOS Kapital: Has Antitrust Action Against Microsoft Created Value in the Computer Industry? Did Antitrust Actions Against Microsoft Create Value in the Computer Sector?* 55 JOURNAL OF FINANCIAL ECONOMICS 329 (2000).

³⁹ For instance, while Sirius announced formally that it planned to purchase XM on Monday, Feb. 19, 2007, XM share prices began increasing markedly on Friday, Feb. 16. This revealed (supported by online news reports time-stamped during trading hours on that Friday) that news of the merger had leaked to investors who were then trading on the information. See Hazlett II, p. 21.

positive (pro-merger) and negative (merger-detering) event windows can then be evaluated. When rival firms' shares move with the target firms' shares, and complementary producers (including input vendors) move against them, potential evidence suggesting merger inefficiency is gleaned. Several pitfalls must be avoided, including the problem of differentiating a contagious take-over premium (which signals higher demand for companies in a particular sector) from higher yields anticipated from reduced competition.⁴⁰

B. An Event Study of XM-Sirius

Although the XM-Sirius merger produced event windows that evidenced decidedly positive news (and abnormal returns) for XM and Sirius shares, these windows did not yield valuable interpretative information as to merger efficiency. The lack of publicly listed pure plays that would be materially affected by the merger accounts for this. The closest product substitute, terrestrial radio, is supplied by several publicly-listed companies. But events expected to increase or decrease satellite radio subscriber growth would affect only a tiny share of radio sales, given that 2006 satellite radio revenue was only about 6.4 percent of total radio broadcasting. See Table 1. This market share relationship reflects the fact that just five percent of consumers listen to satellite radio on a weekly basis, as compared with over ninety percent who use terrestrial radio. See Table 3. Hence, the fact that terrestrial station owners did not realize significant abnormal returns around the XM-Sirius merger announcement does not yield probative evidence.⁴¹

Several large customers of XM and/or Sirius, including major automakers and electronics retailers, are publicly listed. But, again, the revenues of these firms are only trivially affected by growth changes in satellite radio. The lack of a "pure play" is not here remediable. Smaller publicly listed manufacturing firms supply satellite radios to XM and Sirius, and four such firms were identified: Visteon, Directed, AudioVox, and Delphi.⁴² Yet, none of the firms specialized in satellite radios. The "pure play" problem remained unsolved. But it did not matter. Given extreme volatility in the share returns for these smaller firms, abnormal company returns during 1-day, 3-day, or 5-day windows surrounding the event date (February 16, 2007) were not statistically significant from zero at standard confidence levels, a conclusion that encompasses twelve individual company-windows (four firms; 1-, 3-, and 5-day windows) or six alternative calculations of the mean portfolio returns. See Table 4. Even if these firms were pure plays, the share returns would yield no useful information. The economic interests of rivals and complementary suppliers would have to be found elsewhere. It was.

V. INTEREST GROUP ADVOCACY

A. General Case

⁴⁰ See McGuckin et al., *supra* note 37.

⁴¹ See Hazlett II, pp. 21-2.

⁴² See Sidak III, p. 26.

The evidentiary value of interest group advocacy follows from the logic of financial event studies. When a firm asserts that a merger should be permitted or blocked, the policy recommendation is assumed to reflect a profit-maximizing outcome for the firm. This mirrors the approach taken in evaluating information share returns during event studies, where actions of wealth-maximizing investors are appraised. When proper care is taken to evaluate underlying industry economics and to interpret advocacy strategies,⁴³ the visibility as to financial effects sought in an event study may be revealed in examining interest group policy positions and how they align with observed industry structure.

The information yielded by the opposition of competitive rivals is obvious. But the simple case has often been stated in the negative: because competitors that protest an efficient combination are advocating a position contrary to the public interest (interpreted as advancing consumer welfare), the information ought to be excluded from the analysis. To wit, Motta writes:

The result that welfare increases and outsiders' profits decrease when efficiency gains are large should also have another important implication on the reliance anti-trust authorities place on the information they receive from interested parties. Clearly, claims from rival firms that the merger will be anti-competitive should be received with great skepticism from the authorities: The fact that rivals complain about the merger probably signals that there might be significant efficiency gains...⁴⁴

The implication is that the information is highly valuable to authorities; rather than being "received with great skepticism," it supplies potentially valuable information for merger analysis.⁴⁵ When scrutinized, such opposition briefs may strongly suggest that the market includes the products of the merging parties and those of the complaining parties are substitutes, assisting both in market definition and the competitive effects analysis. This idea has been emphasized by a wide variety of economists,⁴⁶ as well as by Judge Richard Posner. In a case involving an FTC review of a hospital merger, he wrote:

⁴³ Clearly, the announced positions taken by firms must reflect the actual interests of shareholders. It is conceivable, for example, that managers err in advancing firm interests. Alternatively managers could strategically strike a policy position that was in reality inimical to shareholder interests to confuse regulators. In "losing" the regulatory issue, firm owners gain wealth. Hence, interest advocacy positions should be probed for fealty to actual shareholder interests. One standard method is to compare and contrast the positions advocated by multiple, heterogeneous firms. Indeed, a general analysis is called for to discern if positions advocated by similarly situated firms are themselves similar.

⁴⁴ Motta, *supra* note 30, at 240.

⁴⁵ An argument for excluding competitors' legal complaints, however, does make economic sense. This position has been advanced by economist Greg Werden of the DOJ Antitrust Division: "[T]he predominant effect of any anticompetitive horizontal merger would be to raise prices as under the traditional theories. Since competitors benefit from collusive or dominant firm behavior, which raises prices, it is difficult to conceive how they ever could have standing to challenge a horizontal merger." Gregory J. Werden, *Challenges to Horizontal Mergers By Competitors Under Section 7 of the Clayton Act*, U.S. Dept. of Justice Antitrust Division, Economic Policy Office Discussion Paper No. 85-16 (Dec. 6, 1985).

⁴⁶ William J. Baumol and Janusz A. Ordover, *Use of Antitrust to Subvert Competition*, 28 JOURNAL OF LAW & ECONOMICS 247 (May 1985); R. Preston McAfee and Nicolas Vakkur, *The Strategic Abuse of the Antitrust Laws*, 2 JOURNAL OF STRATEGIC MANAGEMENT EDUCATION 1 (2005); B. Espen Eckbo, *The*

Hospital Corporation's most telling point is that the impetus for the Commission's complaint came from a competitor... The hospital that complained to the Commission must have thought that the acquisition would lead to lower rather than higher prices – which would benefit consumers, and hence, under contemporary principles of antitrust law, would support the view that the acquisitions were lawful.⁴⁷

B. Interests Opposing and Supporting the XM-Sirius Merger

Although publicly listed firms owning radio stations did not exhibit significant abnormal returns during merger event windows, such firms lobbied vigorously against the merger. In public filings, Clear Channel, the largest owner of U.S. radio stations and a firm considerably larger (in *EV*) than XM and Sirius combined (see Table 1), stated its opposition to the DOJ's decision to approve the merger.⁴⁸ The National Association of Broadcasters has pressured regulators so fervently to block the merger that it has been derided in the press as seeking to suppress a potential rival.⁴⁹

When the NAB attacks the combination as bad for consumers, how can it be taken seriously? If prices inch higher and diversity thins out – as the NAB has contested in the past – wouldn't that be a blessing to conventional stations, which are seeing their more avid listeners flock to XM and Sirius? How can it pretend to be neutral, when it actually fears the opposite of what it's publicly proclaiming?⁵⁰

The XM-Sirius merger process featured a public debate over the source of competitor opposition. The NAB's economic experts advanced the theory that the broadcaster's anti-merger position was based on the expectation that the transaction would increase the number of commercials on satellite radio programming, thereby harming radio stations (competitors for advertising sales) and radio listeners, who would effectively face higher prices (through more ad minutes, and less audio entertainment, per

Anticompetitive Significance of Merger Revisited, paper for The Market for Corporate Control Regulation and Corporate Governance Issues, Univ. of Lille 2 (March 22, 2007).

⁴⁷ Hospital Corporation of America v. Federal Trade Commission, 807 F.2d 1381, 1391-92.

⁴⁸ Matthew Lasar, *Senator, Clear Channel dispute DOJ logic on XM/Sirius merger*, ARS Technica (April 22, 2008); <http://arstechnica.com/news.ars/post/20080422-senator-clear-channel-dispute-doj-logic-on-xm-sirius-merger.html>.

⁴⁹ “Defending its terrestrial life. The NAB [National Association of Broadcasters] is obviously threatened. As the mouthpiece for its terrestrial-radio constituency, it realizes that a lot of money – potentially in the billions – can be realized in deal synergies if XM and Sirius are allowed to combine. That's why it's comical to see the NAB take XM and Sirius to task as a potential monopoly, when the combination is actually threatening the livelihood of the free AM and FM radio stations the association watches over.” Rick Aristotle Munarriz, *Get It On, XM and Sirius*, THE MOTLEY FOOL (Sept. 13, 2007); <http://www.fool.com/investing/high-growth/2007/09/13/get-it-on-xm-and-sirius.aspx> (emphasis original).

⁵⁰ Rick Aristotle Munarriz, *Get It On, XM and Sirius*, THE MOTLEY FOOL (Sept. 13, 2007); <http://www.fool.com/investing/high-growth/2007/09/13/get-it-on-xm-and-sirius.aspx> (emphasis original).

hour of listening).⁵¹ Broadcasters were asserted not to compete for satellite radio listeners (and thereby be in the same product market), but to compete for advertising spots with satellite radio operators.

This two-sided analysis collapsed under its own weight.⁵² It conceded the essential point that the opposition of broadcasters was anti-competitive, albeit in one side of a two-sided market. But it ignored the fact that the two sides are linked. If the post-merger firm increased ad minutes, raising quality-adjusted subscription rates, subscriber growth would fall. This would help terrestrial radio station audiences and ad sales. Forrester Research analyst Josh Bernoff notes that, according to a survey, only about 13 percent of adults are potential satellite radio subscribers, and that number “would head south in a hurry if the two services started selling ads.”⁵³

Given the tiny scale of satellite advertising, the outcome of such a test was predictable. Satellite generated only \$66 million in 2006 ad sales against over \$20 billion for terrestrial stations, meaning that the combination accounted for only 0.33 percent of the “radio advertising market.”⁵⁴ Not only would that define a market in which the merger had no appreciable share, it signals that the broadcasters’ concerns are driven by the far larger influence of listenership loss. In the competition for listeners, satellite radio’s impact is more than an order of magnitude larger, and audience size has been found to be an eighty percent determinant of radio ad revenues.⁵⁵

Broadcast industry executives themselves contradicted the theory, arguing that the satellite radio merger was a price-lowering combination,⁵⁶ and public radio broadcasters – without fear of enhanced ad market competition – formally opposed the merger.⁵⁷ Insofar as market definition is concerned, were consumers really in different product markets, advertising competition would concern radio broadcasters no more than newspapers, TV stations, web sites, or other ad sellers. But the radio merger was of keen interest only to broadcast stations. This is because listeners freely substitute between the two media. The two sides of the radio broadcasting market (competition for listeners,

⁵¹ Sidak II, pp. 32-36; Sidak IV, pp. 70-75; J. Gregory Sidak and Hal J. Singer, *Written Ex Parte Presentation with the Consolidated Application for Authority to Transfer Control in Connection with the Sirius/XM Merger*, MB Docket No. 07-57 (Oct. 8, 2007), letter to Mr. Roy Stewart.

⁵² See Hazlett II, pp. 28-30; and Steven C. Salop et al., *Further Economic Analysis of the Sirius-XM Merger*, paper filed at the Federal Communications Commission, *In the Matter of XM Satellite Radio Holdings Inc., Transferor, and Sirius Satellite Radio Inc., Transferee, Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Inc.*, MB Docket No. 07-57 (Nov. 9, 2007) (“Salop II”), 59-62.

⁵³ Ron Grover, *Satellite Radio Falls on Deaf Ears*, BUSINESS WEEK (Feb. 21, 2007), available at: http://www.businessweek.com/bwdaily/dnflash/content/feb2007/db20070221_580780.htm.

⁵⁴ This actually over-states the competitive threat presented by satellite commercials. In 2006, 77 percent of radio station revenues were local ad sales, whereas ads offered by satellite radio are, by FCC mandate, aired nationwide. *Radio Facts*, Radio Advertising Bureau; <http://www.rab.com/public/pr/yearly.cfm>

⁵⁵ Kenneth C. Wilbur, *A Two-Sided, Empirical Model of Television Advertising and Viewing Markets* 24 (June 2, 2007), available at: <http://ssrn.com/abstract=885465>.

⁵⁶ “[T]he [satellite radio] monopoly will attempt to accelerate the acquisition of new subscribers by offering them a lower-cost point of entry...” Testimony of David Rehr, President and CEO of the National Association of Broadcasters, *Statement Before the U.S. House of Representatives Committee on the Judiciary, Antitrust Task Force* (Feb. 28, 2007), p. 17.

⁵⁷ *Comments of National Public Radio, Inc., In the Matter of XM Satellite Radio Holding Inc., Transferor and Sirius Satellite Radio Inc., Transferee*, MB Dkt. No. 07-57 (submitted to the FCC Aug. 10, 2007).

competition for advertisements) square this circle. Broadcaster opposition, no matter the source, links the services in product space.

Fortunately, the XM-Sirius merger attracted formal comment from a large number of other interested parties, allowing analysts to triangulate on the position of commercial AM/FM station owners. The filings reveal a large consensus in support of the merger among car makers and electronics retailers, the key customers and complementary service suppliers.⁵⁸ The largest customers of satellite radio are auto makers – several of which filed comments in support of the merger; none were opposed.⁵⁹ The largest retailer of satellite radios, Circuit City, likewise supported the transaction,⁶⁰ as did Radio Shack.⁶¹ As one analyst noted, “Anything that will help to sell more autos and consumer electronics would be good for these companies.”⁶² In general, customers and complementary producers will gain from efficient combinations and lose from inefficient ones.

A grid can be constructed that displays the information gleaned. See Table 5. It suggests that terrestrial broadcast competitors to satellite radio saw the merger as affecting their product market by expanding output, the interpretation that fits with positions advocated by other interests. Both customers (automakers) and complementary suppliers (retailers) categorically supported the merger. Were the broadcasters’ theory that their merger opposition was based on the expectation of an inefficient increase in commercial minutes post-merger, the pro-merger positions taken by large customers and retail outlets would be reversed.

This conclusion is strongly supported in the long series of regulatory filings made in FCC proceedings crafting rules for satellite radio. Since 1990, when SDARS licenses were first requested by applicants, broadcast stations have persistently characterized XM and Sirius as arch rivals for listeners, arguing for restrictions on satellite to protect local broadcasting stations from consumer substitution. This reveals that the stations have long believed satellite broadcasting to encroach on “their” market. The FCC’s SDARS proceeding is replete with revelatory statements.⁶³ For instance, in 1993, the NAB warned regulators:

⁵⁸ Links to supportive comments are found on the XM website: http://www.xmmerger.com/site/resources#supportive_fcc_filings. Links to public statements in opposition to the merger are posted on the NAB website: http://www.xmsiriusmonopoly.org/ticker_full.html.

⁵⁹ *Comment Letter filed by Toyota Motor North America, Inc.*, submitted to the FCC July 9, 2007, *Reply to July 25, 2007 Letter of National Association of Broadcaster (NAB) filed by Toyota Motor Sales, U.S.A., Inc.* submitted to the FCC August 3, 2007, and *Comments filed by Hyundai Motor Corporation*, submitted to the FCC July 10, 2007. Also filing supportive comments: Chrysler, General Motors, Ford, Honda, and Kia. See XM website: http://www.xmmerger.com/uploads/DOJ-Release_3-21.pdf.

⁶⁰ *Ibid.*

⁶¹ *RadioShack voices support for the Sirius, XM merger*, ORBITCAST.COM (August 17, 2007); <http://www.orbitcast.com/archives/radioshack-voices-support-for-the-sirius-xm-merger.html>

⁶² George Reed-Dellinger, *XM-Sirius and the DOJ*, WASHINGTON ANALYSIS (July 25, 2007).

⁶³ A broad sampling is provided in Hazlett I, Appendix 1.

[S]atellite DARS systems will immeasurably injure terrestrial radio stations by siphoning off listeners with their thirty or more channels of new programming.⁶⁴

More recently, the NAB charged that satellite operators have, indeed, competed fiercely and offered close substitutes that are “duplicative” of AM/FM broadcasting service:

In lieu of the promised niche audiences... they have instead devoted substantial bandwidth to compete directly with local broadcasters with local content, without being subject to any public interest obligations... A centralized “localized” service, which is essentially duplicative of existing programming, does little to foster diversity and localism: it can only exist to the detriment of the dissemination of free and over-the-air local services to local communities.⁶⁵

C. The Value of Information Held by Interested Parties

Antitrust enforcement agencies are well aware of the importance of interest group advocacy. Even when not explicitly factored into the analysis, it deeply colors the standard merger investigation, which relies heavily on the testimony, formal and informal, gathered from customers, suppliers, and rivals of the merger enterprises. Customer interviews (generally involving company purchasers) are, in particular, given great weight due to the expert knowledge possessed by customers and because their economic interest generally favors an efficient outcome.⁶⁶ This testimony is so integral to the merger approval process that an antitrust manual counsels merging firms, “Customer reaction matters... When customers are unhappy about a merger, it is more likely that there will be a full investigation, significant divestitures will be required and the merger will be challenged by the agency or even blocked in court.”⁶⁷

Regulators make use of the revelatory component in competitor challenges, as well. A former FCC Chairman, Mark Fowler, was led to enter the debate over the XM-Sirius merger specifically, by his account, due to such information.

⁶⁴ National Association of Broadcasters, *Response of NAB to American Mobile Radio Corporations' Reply and Opposition to Petitions to Deny in File Nos. 26/27-DSS-LA-93; IO/I-DSS-P-93*, filed with the Federal Communications Commission (June 25, 1993), p. 3.

⁶⁵ Federal Communications Commission, *In the Matter of Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band Radio Service Terrestrial Repeaters Network, National Association of Broadcasters Petition for Declaratory Ruling*, IB Docket No. 95-91 GEN Docket No. 90-357 (April 14, 2004), Executive Summary.

⁶⁶ The DOJ and FTC note that, in evaluating horizontal mergers, “The Agencies carefully consider the views of informed customers on market structure, the competitive process, and anticipated effects from the merger.” U.S. Department of Justice and Federal Trade Commission, *Commentary on the Horizontal Merger Guidelines* (March 2006), p. 3; <http://www.usdoj.gov/atr/public/guidelines/215247.pdf>.

⁶⁷ Michael H. Byowitz, *The View of an Antitrust M&A Practitioner*, in *WINNING ANTITRUST STRATEGIES: LEADING ATTORNEYS ON MASTERING THE LAWS THAT REGULATE, PROMOTE AND PROTECT COMPETITION* 181, 191 (2004).

As chairman of the Federal Communications Commission in 1981, I was visited by a lobbyist for the broadcast industry. Over-the-air broadcasters vehemently opposed the FCC's authorization of Direct Broadcast Satellite television services, and the lobbyist quickly launched into his preamble: "We are all for competition, Mr. Chairman, but... "

Meaning, "forget what I said up to the word 'but,' and now listen carefully..."

In observing the broadcasters' intense negative reaction to the proposed merger of the two satellite radio companies, XM and SIRIUS, it struck me that little has changed in 26 years. Each year, the skies over Washington darken as the Lear jets bring industry lobbyists to the latest battlefield against competition and its offshoot – mergers that enhance competition.⁶⁸

Reading the opposition of rivals as incumbent protectionism, the assessment of the market's product boundaries and the merger's likely competitive effect are neatly summarized. The information, as shown in this case, may prove highly compelling both absolutely and relatively to alternative methodologies, such as those generally pursued in the evaluation of a "hypothetical monopolist" test.⁶⁹

VI. CONCLUSION

Horizontal merger analysis has a seductively simple goal: prevent combinations that injure consumers by creating market power. Yet the execution of that charge is fraught with challenge. To clarify and standardize analyses, a framework has developed that places central importance on market definition. The most common approach in that pursuit attempts to describe how closely rival products compete by quantifying the post-merger change in price likely to occur were nothing to change save the product scope of a "hypothetical monopolist."

Under the "critical loss" formulation, this has become a standard way to define markets. That formulation has not kept controversy from surrounding applications in given cases, of course, and the range of disagreement generally widens as the data necessary to quantify the optimal post-merger price becomes scarcer. In high-tech markets, where products are emergent and organizational structures are typically in a pronounced state of disequilibrium, analytical problems mount. As in the satellite radio merger, the effort to quantify post-merger demand elasticity may prove futile.

⁶⁸ Mark Fowler, *Competitive Electronics*, NEW YORK SUN (Sept. 5, 2007), available at: <http://www.nysun.com/opinion/competitive-electronics/61892/> (Footnotes omitted).

⁶⁹ The informative nature of interest advocacy was also compelling cable television rate regulation. When broadcast TV interests supported the re-regulation of cable TV rates, going so far as to finance a nationwide advertising campaign urging Congress to pass the statutory enabling measure in 1992, it signaled that rate controls were anticipated to reduce cable subscriber growth. This, in fact, was the realized result in 1993-94, pursuant to the 1992 Cable Act. See THOMAS W. HAZLETT & MATTHEW L. SPITZER, PUBLIC POLICY TOWARD CABLE TELEVISION (1997), pp. 102-94.

The Horizontal Merger Guidelines state that the economic analysis should avail itself of a wide range of data: “the Agency will apply the standards of the Guidelines reasonably and flexibly to the particular facts and circumstances of each proposed merger.”⁷⁰ When attempting to understand how markets are structured, judges will naturally inquire about evidence that incorporates much more than a tightly packaged SSNIP test. In the recent *Whole Foods* merger case, for instance, Judge Paul L. Friedman pursued his economic intuition on market definition well beyond estimates of critical elasticity, seeking to interpret the actions and perspectives of self-interested actors:

[A]nother factor that leads to the conclusion that the relevant product market in this case must be larger than premium and organic supermarkets and, indeed, that it is at least as broad as supermarkets: how the players in the marketplace view each other and how their conduct reflects those views.⁷¹

Compelling economic data were likewise available in XM-Sirius. That investors did not value the separate or combined XM and Sirius assets equal to or greater than the capital cost implied that the existing market structure was not generating duopoly rents and that the transaction was not expected to generate monopoly rents. The forensic clue of negative returns suggests a market definition that includes products beyond satellite radio.

Although compelling merger-related evidence was not available through financial event studies, interest group advocacy provided an informative alternative source. Because competitors of the merging parties solidly opposed the transaction, and customers and complementary product producers consistently favored it, it established both that the relevant product market included competitors such as broadcast radio and that the merger was anticipated to expand competitiveness in that market. Such testimony is implicitly incorporated into merger analysis, where regulators do rely to a large extent on interviews with sophisticated buyers and firms producing competing or complementary products. A broader and more explicit incorporation may be warranted.

⁷⁰ U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines* §0 (Rev'd April 8, 1997); <http://www.usdoj.gov/atr/public/guidelines/hmg.htm>.

⁷¹ *FTC v. Whole Foods and Wild Oats*, Civil Action No. 07-1021 (PLF), United States District Court, District of Columbia Opinion (filed Aug. 16, 2007), pp. 63-4.

TABLE 1. COMPARATIVE ENTERPRISE VALUE, REVENUE AND EMPLOYMENT AT RADIO STATIONS AND XM-SIRIUS⁷²

	<i>Enterprise Value June 8, 2007 (millions)</i>	<i>2006 Revenue (millions)</i>
Publicly-listed terrestrial broadcasters except Clear Channel	\$9,303	\$2,453
Clear Channel	\$26,340	\$7,070
All terrestrial broadcasters	\$82,170	\$21,669
XM & Sirius	\$9,220	\$1,571
Total Industry	\$91,390	\$23,240
<i>XM & Sirius as percent of total terrestrial & satellite All broadcasters</i>	10.0%	6.8%

Notes: Pure-play publicly traded terrestrial broadcasters include: Beasley, Citadel, Cox Radio, Cumulus, Entercom, Radio One, Regent, and Salem. This group's EV/Revenue equals 3.79. Clear Channel data apply to all of Clear Channel, which derived 52 percent of its 2006 revenues from radio broadcasting. Clear Channel's EV/Revenue equals 3.73. The enterprise value of all terrestrial broadcasters (\$82.17 billion) is estimated by applying the pure-play multiple of 3.79 to 2006 terrestrial broadcasting revenues (\$21.7 billion). Source: *Yahoo!Finance*.

TABLE 2. CUMULATIVE DEFICITS AND ENTERPRISE VALUES FOR XM AND SIRIUS, AS OF JUNE 2007 (\$MIL.)

	<i>Cumulative Cash Flows</i>			<i>Value of Deficit, CF's invested at:</i>		<i>Enterprise Value</i>
	<i>Sales</i>	<i>Capital, Operating & Interest Expense</i>	<i>Deficit</i>	<i>U.S. Treasury Bill rate</i>	<i>12% hurdle rate:</i>	
Sirius	1,910.0	7,620.3	-5,710.3	6,488.6	9,132.5	4,800.0
XM	2,994.6	7,660.5	-4,665.9	5,147.4	7,158.9	4,420.0

Note: Cumulative sales and expenses through 2006 calculated from Sirius (1993-2007) and XM (1998-2007) annual reports. Sales and expenses for 2007 projected in Moffett, Rifkin and Parker, *XMSR and SIRI: Heads I Win, Tails You Lose*, Bernstein Research (April 23, 2007). T-bill returns for 2007 assumed to equal median annual return, 1992-2006. Enterprise values from *Yahoo!Finance* (June 8, 2007).

⁷² Data for publicly traded stations are from Yahoo!Finance <http://biz.yahoo.com/p/724conameu.html>. Total terrestrial radio revenue from Radio Advertising Bureau <http://www.rab.com/public/pr/yearly.cfm>.

TABLE 3. PERCENTAGE OF AMERICANS USING AUDIO MEDIA (WEEKLY)

	<i>HD Radio</i>	<i>Satellite Radio</i>	<i>Internet Radio</i>	<i>MP3 Players</i>	<i>AM/FM</i>
May 2007	0.0015	4.8	21.0	30.4	93.7
June 2006	0.0010	4.6	19.0	30.1	93.5

Source: *Population Break-Down of Audio Listenership*, ORBITCAST (May 29, 2007) (reporting survey by Bridge Ratings); <http://www.orbitcast.com/archives/population-breakdown-of-audio-listenership.html>.

TABLE 4. EVENT STUDY: XM-SIRIUS RADIO VENDORS
(RETURNS AROUND MERGER ANNOUNCEMENT OF FEB. 16, 2007)

		<i>Audiovox</i>	<i>Delphi</i>	<i>Directed</i>	<i>Visteon</i>	<i>Avg</i>	<i>EV</i>
Alpha		0.000	0.013	0.000	0.002	0.004	0.004
Beta		1.976	0.315	0.985	2.373	1.412	1.556
1-day	CAR	-0.554%	0.513%	0.751%	6.738%	1.862%	2.875%
	z-stat	-0.258	0.066	0.317	1.871	0.787	1.074
	p value	0.796	0.947	0.751	0.061	0.431	0.283
3-day	CAR	1.145%	-3.528%	-5.089%	5.780%	-0.423%	0.938%
	z-stat	0.347	-0.257	-1.278	0.951	-0.103	0.200
	p value	0.729	0.797	0.201	0.341	0.918	0.841
5-day	CAR	-2.919%	-9.581%	-2.930%	4.151%	-2.820%	-2.288%
	z-stat	-0.675	-0.521	-0.587	0.501	-0.521	-0.374
	p value	0.500	0.603	0.557	0.617	0.602	0.709

Notes: Abnormal returns during event windows are obtained setting risk-free return equal to 30 day Treasury Note and defining event date (t_0) as Feb. 16. CAR = cumulative annual return; EV = window returns weighted by Enterprise Value of firms.

TABLE 5. INTERESTED PARTY ADVOCACY IN XM-SIRIUS

	Parties filing	Favor, Oppose	Implies Merger Efficiency?
Rivals	NAB, NPR	Oppose	Yes
Distributors	auto makers	Favor	Yes
Retail Outlets	Circuit City, RS	Favor	Yes