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ABSTRACT

Title: On the Paternity of a Market Delineation Approach

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This paper traces the historical antecedants of the 1982 Merger Guidelines SSNIP (small but significant and non-transitory increase in price) approach to market definition. Surveying the prior literature, it recognizes that the person believed to have proposed the approach was Morris Adelman. The author claims a second-mover slot for his testimony in a 1972 brewing merger case, the IBM case, and the Marathon-Mobil case of 1981, along with a 1980 restatement of market definition principles in his industrial organization textbook. Intermediate contributions are also surveyed.

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ON THE PATERNITY OF A MARKET DELINEATION APPROACH

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In June 1982, the Antitrust Division of the Department of Justice announced in a published brochure new merger guidelines which were to replace guidelines issued in 1968. The 1982 Guidelines laid out innovative approaches to the antitrust analysis of proposed mergers. Despite periodic revisions, the core of the Guidelines has been maintained to the present day. Among the innovations was a new approach to delineating the relevant market that might be affected by a merger. The essence of the approach was characterized (1982, p. 4) as follows:

> Taking the product of the merging firm as a beginning point, the Department will establish a provisional product market. The Department will include in the provisional market those products that the merging firm's customers view as good substitutes at prevailing prices.... The Department will add additional products to the market if a significant percentage of the buyers of products already included would be likely to shift to those other products in response to a small but significant and non-transitory increase in price. As a first approximation, the Department will hypothesize a price increase of five percent and ask how many buyers would be likely to shift to the other products within one year....

An analogous approach was proposed (pp. 7-8) for delineating economically meaningful geographic markets.

Given Washington's love affair with acronyms, the test entailing a Small but Significant and Non-transitory Increase in Price became known as, and is still known as, the SSNIP test.

The 1982 Guidelines provide no citations to a prior economic literature on the intellectual origins of the SSNIP approach. Insight into the foundations upon which the Guidelines were constructed has emerged in a series of retrospectives. The first known article articulating the Guidelines' rationale, published just a year later by an Antitrust Division staff economist "intimately involved" in the development of the guidelines, cited no intellectual precedents for the SSNIP test.[1] Indeed, author Gregory Werden asserts at p. 515 that "economists have contributed little to market delineation in the antitrust context," citing among other things George Stigler's lament that "this battle on market definitions ... has received virtually no attention from us economists."[2] An earlier

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1. Gregory J. Werden, "Market Delineation and the Justice Department's Merger Guidelines," Duke Law Journal, (June 1983), pp. 514-577, at p. 514. The preliminary abstract characterizes the Guidelines approach to market delineation as "Perhaps the most innovative and important aspect of the Guidelines..."

2. From George J. Stigler, "The Economists and the Problem of Monopoly," American Economic Review, Papers and Proceedings, vol. 72 (May 1982), pp. 1-11 at p. 9. My contemporary interpretation of the Stigler assertion was that it was "sour grapes" reflecting Professor Stigler's defeat in an attempt to define gasoline markets as nationwide in

Werden article on shortcomings in market delineation methods used previously also contains no precedential insights on SSNIP.[3]

In a retrospective published two decades after the Guidelines were first issued, Dr. Werden casts his net broader and identifies several antecedents.[4] Most importantly, he shows that Morris Adelman of Massachusetts Institute of Technology, an eminent industrial organization economist, published a prescient formulation in a 1959 article analyzing an early Celler-Kefauver Act case:[5]

> No matter how the boundaries may be drawn in terms of products or areas, there is a single test: if, within the purported market, prices were appreciably raised or volume curtailed, would supply enter in such amounts as to restore approximately the old price and output? If the answer is "yes," then there is no market, and the definition must be expanded. If the answer is "no," the market is at least not wider. ... Any other scheme of definition is not so much "wrong" as meaningless.

Clearly, Adelman has the best first mover claim. Werden goes on to identify three other formulations from which one might infer the SSNIP approach: a 1977 treatise by Lawrence Sullivan, the first (1978, vol. 2) edition of the treatise by Philip Areeda and Donald Turner, and a 1978 Department of Justice report to Congress on the coal industry.[6] The first of these, Sullivan's, states *inter alia* at p. 41:

> ... To define a market in product and geographic terms is to say that if prices were appreciably raised or volume appreciably curtailed for the product within a given area, while demand held constant, supply from other sources could not be expected to enter promptly enough and in large enough amounts to restore the old price or volume. If sufficient supply would promptly enter from other geographic areas, then the "defined market" is not wide enough in geographic terms; if sufficient supply would promptly enter in the form of products made by other producers which had not been included in the product market as defined, then the market would not be wide enough in defined product terms....

Sullivan provides no citations to prior literature for his concept, but only a page later in a related context he cites the 1959 Adelman paper, suggesting an inference that he was influenced by

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Marathon Oil Co. v. Mobil Corporation et al., N.D. Ohio, 530 F. Supp. 315 (1981). See note 19 infra.

3. Gregory J. Werden, "The Use and Misuse of Shipments Data in Defining Geographic Markets," Antitrust Bulletin, vol. 26 (Winter 1981), pp. 719-737.

4. Werden, "The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm," Antitrust Law Journal, vol. 71 (2003), pp. 253-269, at p. 253.

5. M. A. Adelman, "Economic Aspects of the Bethlehem Opinion," Virginia Law Review, vol. 45 (1959), pp. 684-696, at p. 686.

6. Lawrence A. Sullivan, Handbook of the Law of Antitrust (1977); Phillip Areeda and Donald F. Turner, Antitrust Law (1978), para. 518 at p. 347; and U.S. Department of Justice, Antitrust Division, Competition in the Coal Industry (May 1978).

Adelman's seminal construction.

Both the Areeda-Turner and coal analyses define markets as economic spaces within which monopoly price-raising would be feasible and presumably profitable, and thus encompass much of what emerged in the 1982 Guidelines. Werden admits that at the time he drafted the market definition section of the coal industry report, he "at the time had read neither Adelman nor Sullivan (and Areeda and Turner was not yet available)."[7]

In a similar two-decade retrospective, Lawrence J. White, chief economist of the Antitrust Division at the time the Guidelines were formulated and issued, observes that:[8]

> Prior to that time the conceptual basis for market delineation was, at best, limited. Most industrial organization economists understood that the definition of markets rested on cross-elasticities of supply and demand.... Market delineation for merger analysis and enforcement by the Division and by the FTC was largely ad hoc.

He adds in a footnote (2) that "(as of 1982) there was no one at the Division who knew of Adelman's suggestion."

Neglected Insights

My dormant curiosity on the paternity of the SSNIP test was piqued through a still more recent retrospective by Professor White on which I was asked by the author to comment.[9] The original basis for my puzzlement was testimony I presented in Federal District Court for the Eastern District of Michigan during April 1972 concerning a proposed preliminary injunction against acquisition of the Associated Brewing Company by the G. W. Heileman Brewing Company.[10] My appearance in the proceeding -- my first experience as a witness in a litigation -- was precipitated by an interview I conducted a year earlier with the president of Associated and my distress that what seemed an eminently sensible rescue of a fading, if not failing, firm was being opposed by the government. The interview was one of 125 conducted as part of research for my book, The Economics of Multi-Plant Operation, which required me to become familiar inter alia with the

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7. Supra note 4 at 256, note 9.

8. Lawrence J. White, "Present at the Beginning of a New Era for Antitrust: Reflections on 1982-1983," Review of Industrial Organization, vol. 16 (2000), pp. 131-149, at p. 132.

9. "Economics, Economists, and Antitrust: A Tale of Growing Influence," in John Siegfried, ed., Living Better Through Economics (Harvard University Press: forthcoming).

10. CCH 1972 Trade Cases para. 74,080. I no longer have the transcript, but memorialized parts in a book cited in note 12 *infra*. My testimony complemented that of Kenneth Elzinga, who emphasized the incoming and outgoing shipments test introduced in Elzinga and Thomas Hogarty, "The Problem of Geographic Market Definition in Antimerger Suits," Antitrust Bulletin, vol. 18 (Spring 1973), pp. 45-81.

Loeschian economics of geographic space.[11] My testimony, presented *pro bono* two days after the initial contact by Associated, offered evidence on the magnitude of transportation costs in shipping beer from one part of the country to another -- e.g., eight cents per dollar of f.o.b. plant value to ship 350 miles -- and the ability of identified third parties to ship from locations outside the individual states and eight-state territory alternatively alleged by the government to be relevant markets for antitrust purposes. Explaining why the eight-cent cost and distance evidence was relevant, I engaged in the following colloquy:[12]

> Q: What does an economist look at when he is trying to evaluate the nature of competition? ... Strictly from an economist's standpoint, not a lawyer's standpoint?
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> A: What an economist looks at when he examines a situation that may contain a monopoly is the ability to raise prices; that is, to raise prices above the cost of doing business. That is what the whole thing is about.
>
> Q: How does that tie into our case?
>
> A: In trying to define what the relevant market is one has to ask, does a seller in some territory, or do a group of sellers in some territory, have the ability to raise prices above their cost of doing business and keep those prices there? That is the relevance to the question of market definition. That is what we are interested in. We are interested in defining the market in such a way as to answer the question: can the sellers in the territory, if they get a large enough share of the territory's sales, can they, by virtue of their large share of those sales, raise prices above the cost of doing business? That is the key question.
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> Q: How did you answer that question in relation to what the government has defined as the geographic market?
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> A: The relevance is this. At any moment in time, say the year 1971, which I believe is the year on which Mr. Dobson's memorandum focused, it may well be that certain sellers have a large share of some state's sales. That is an important thing to look at. That is an interesting thing to look at. But the problem of market definition is this: suppose they do get a large share of the sales in, let us say, a state. Does that give them the ability to raise prices above the cost of doing business? That is what market definition is all about. It seems to me that the state-wide definition is really too narrow in this case.
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> Consider, for example, the state of Illinois. I don't know who the leading sellers are in the state of Illinois. I suspect from Mr. Dobson's memorandum that whoever the top four are, they have a pretty high share of the market. What if they tried to exploit their high

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11. With Alan Beckenstein, Erich Kaufer, R. D. Murphy, and Francine Bourgeon-Masssen (Harvard University Press: 1975).

12. It and additional segments of my testimony are reproduced in Scherer, Competition Policy, Domestic and International (Edward Elgar: 2000), pp. 233-238.

share of Illinois sales by raising prices? That is the key question.

> Here we have 15 companies all pretty well able to penetrate various states in this whole eight-state area in response to some kind of price stimulus. If the price is raised, that will stimulate, let us say, Memphis to start shipping beer more and more to the north in response to that profit opportunity. That will stimulate maybe Falstaff on the far border of Iowa to ship beer into Illinois. It will certainly stimulate Duquesne or Pittsburgh Brewing Company to begin shipping more beer westward in response to that price stimulus.
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> Thus, in that critical respect, when there are brewers with quite feasible shipping radii who are able, even though they don't sell currently, as soon as firms try to raise the price the Illinois sales territory becomes interesting, and one transports beer in response to that price stimulus.
>
> As soon as somebody tries to raise the price, that will bring beer flowing toward the raised price and create a competitive situation that will make it difficult to sustain the increased price.

The next section of my testimony was qualified by referring to raising the price "significantly" above the cost -- i.e., the eight percent value associated with 350-mile shipments.

Presiding over the Associated proceedings, District Judge de Mascio observed that "defendants offered sophisticated economic testimony to dispute the government's contention that its [single-state or eight-state] area is a relevant market."[13] He ruled the testimony unpersuasive, however, citing the Supreme Court's acceptance of similar markets in the Blatz-Pabst case and other mergers.[14] The merger was nevertheless allowed to proceed (with later minor brand divestitures) because of Associated's precarious financial condition -- the first reversal of a string of brewing company merger prohibitions that included but also predated the Supreme Court's acceptance of a single-state market definition in the Pabst-Blatz case.

To me, the Associated testimony seemed a distinct intellectual precursor to the 1982 SSNIP rule. But there was no reason to assume that the team drafting the 1982 Merger Guidelines was aware of it. Douglas Dobson, the Justice Department economist who testified at the 1972 Associated Brewing trial, moved shortly after the trial to the Federal Trade Commission Bureau of Economics, presumably taking his accumulated knowledge with him. Therefore, as I explained when I published excerpts from my Associated Brewing testimony in a collection of my papers on competition policy during 2000, at which date I remained unaware of the Adelman and other earlier formulations:[15]

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13. U.S. v. G. Heileman Brewing Co. et al., 1972 CCH Trade Cases, Para. 74,080 at 92,463 (1972).

14. U.S. v. Pabst Brewing Co. et al., 184 U.S. 546 (1966). See also Kenneth Elzinga and Anthony Swisher, "The Supreme Court and Beer Mergers," Review of Industrial Organization, vol. 26 (May 2005), pp. 245-267.

15. Supra note 12 at p. 7.

I have seen no clear chain of causation running from my testimony to the Merger Guidelines, but the approach makes compelling analytic sense, and correct analytical concepts must sooner or later triumph. The most I can claim is that following my testimony the approach was 'in the air' for the taking.

Professor White's most recent retrospective led me to look back and see whether I had suggested a SSNIP-like approach in other pre-1982 testimony or writings. In fact, three examples surfaced.

In June 1975, I testified pro bono as initial economist witness in the U.S. v. International Business Machines Corporation monopolization case.[16] My remit was to lay out broad principles to guide the trial of a monopolization case, including principles for market definition. My testimony, somewhat disorganized after only one day of preparatory coordination with government counsel, included the following:[17]

> ... [I]n defining economically meaningful markets we are really interested in defining the boundaries within which competition takes place or does not take place.... A monopoly situation is believed to exist when a firm has the power to elevate price and to hold it above cost.... [W]e want in defining an economically meaningful market -- let's deal with the seller's side of it -- we want to include that set of sellers ... who can be expected to respond to changes in price... [W]hen we define an economically meaningful market ... we are concerned on the one hand with defining the geographic bounds of the market, and secondly, we are concerned with defining the product bounds ... [I]n terms of geographic space the key variable is transportation cost ... [W]e are interested in how much must the price be elevated in order to draw a supply from greater and greater distances.

The testimony went on to deal with the more complex problem of product market definition, with the anti-friction bearings industry (one of my multi-plant study foci) taken as an illustration. Excerpts included:[18]

> ... [F]or the producer of tapered bearings for railroad wheel applications -- it would be necessary for him to raise his price very substantially before railroad car manufacturers found it less costly to substitute ball bearings for tapered bearings.... In making fractional horsepower electric motors, ball bearings seem to have a very substantial technological advantage, and ... the manufacturers of ball bearings would have to raise their prices very substantially above cost before it would be possible for tapered bearings to make significant

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16. At the time I was chief economist at the Federal Trade Commission, and testified as an independent individual on leave from my Commission duties.

17. United States v. International Business Machines Corporation, 69 Civ. 200 (June 16, 1975), Trial Transcript, pp. 2312-3, 2316, 2317, 2318.

18. *Supra* note 21 at 2321, 2322.

> inroads into that particular application.... So what I have suggested is that there may be some applications in which one physically different product has such a significant technological advantage that its price would have to be raised very much above cost before the other technologically discrete type could make significant inroads. On the other hand, there are other applications where the two may substitute one for the other on rather narrow terms without significant [price] differentials.

Further illustrations were presented for energy resources. No attempt was made to apply the basic concepts to computers, on which I had done no prior research, nor had I analyzed discovered documents.

The IBM case was, of course, one of the most important antitrust initiatives of its time. The government's economic team, however, was separate from the main group of Antitrust Division economists, and so it is possible Antitrust Division economists were unaware what their own agency was presenting in court.

I revisited the market definition problem again in 1981 for the Marathon - Mobil merger case. Given its unusual size and charges that, following sharp increases in crude oil prices, the major oil companies were "drilling for oil on the floor of the New York Stock Exchange," the case was followed closely in the business press. I argued for Marathon Oil that the market should be defined regionally; Professor Stigler proposed for Mobil that the market was nationwide.[19] Asked by counsel for Marathon what factors I as an economist would take into account in determining the relevant geographic market, I testified inter alia:[20]

> [H]ere you have to ask the question as follows: What happens if the price -- what happens if the price, say, the price of gasoline in Cleveland is raised -- because of say some breakdown of competition among the sellers of gasoline in Cleveland? What happens if the price is raised? Who are the people who might move into this gap to supply more product, to offer more product on the market and bring down that price until the price has [been] competed back down to the competitive level? So you really want to know who the relevant people are in a position to compete down the price. That in turn depends in an industry like gasoline, or the other petroleum products, that depends critically on transportation costs.

There followed an extensive analysis of transportation costs, including comparative truck, water, and pipeline costs; the locations of petroleum pipeline terminals and limitations on pipeline access; and of both historical and contemporary differentials in gasoline prices and their persistence across narrowly-defined geographic areas. My analysis showed that price differentials on the order of one to two cents per gallon persisted across many terminal points and metropolitan areas. I testified further that a one-cent differential amounted to roughly five percent of the refiner's processing plus

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19. *Compare* note 2 *supra*.

20. Marathon Oil Company v. Mobil Corporation et al., Civil Action No. C81-2193, November 23, 1981, approximately p. 225 of the trial transcript (page numbers on copy illegible).

transportation cost margin, net of crude oil costs, and "in a good year" 25 percent of the refiner's net profit margin. Presiding Judge John Manos concluded that the magnitude of intercity price differentials was in fact "significant when compared to a petroleum company's profits" and provisionally, pending the presentation of more detailed evidence, that states could be viewed as meaningful markets.[21] The criterion he accepted for a "significant" price differential entailed a much lower price elevation than the five percent value adopted as "a first approximation" in the 1982 Merger Guidelines, but given the economic facts in petroleum refining, it made good economic sense. Following further proceedings adverse to Mobil,[22] a merger between Marathon and United States Steel Corporation was consummated. Many years later the merger was voluntarily reversed, and Marathon Oil continues to be an independent participant in U.S. petroleum product markets.

It is possible, of course, that the persons drafting the 1982 Merger Guidelines were unaware of this testimony, as they might also have been unaware of my Associated Brewing and IBM testimony. On reading Professor White's most recent retrospective, the question occurred to me for the first time, might I have presented a similar conceptualization in another venue with more widespread visibility? The main possibility was my industrial organization textbook, which I then scrutinized for DNA clues.[23] In the first edition, my treatment of market definition methodology focused on traditional shibboleths: cross elasticities of demand and Joan Robinson's search for a "clear gap in the chain of substitution." But to my surprise (one does forget what one has written!), the 1980 revision had been decisively influenced by my Associated Brewing and IBM experiences. The relevant passage (p. 60) read:

> The ideal definition of a market must take into account substitution possibilities in both consumption and production. On the demand side, firms are competitors or rivals if the products they offer are good substitutes for one another in the eyes of buyers. But how, exactly, does one draw the line between "good" and "not good enough" substitutes? The essence of the matter is what happens when price relationships change. If the price of product A is raised by a small percentage and as a result consumers substitute product B for product A in significant quantities, then A and B are good substitutes and ought to be included under a common market definition.

The discussion then proceeded to deal with possible implementation problems -- notably, what has come to be known as "the Cellophane fallacy," under which a firm with monopoly power in some product line raises its price near, but not all the way up to, the level at which alternative products become significant substitutes, causing an analyst applying the price increase rule to infer that the market is competitive when in fact it is not.

There is considerable parallelism between the last two sentences of my textbook formulation quoted above and the language of the 1982 Merger Guidelines: the relevant market should be

21. 530 F. Supp. 315, 322 (1981).

22. Marathon Oil Company v. Mobil Corporation et al., 669 F. 2d 378 (1981).

23. F. M. Scherer, Industrial Market Structure and Economic Performance, 1st edition 1970, 2nd edition 1980.

expanded "if a significant percentage of the buyers of products already included would be likely to shift to those other products in response to a small but significant and non-transitory increase in price." One might reasonably accept the alternative hypothesis of independent (even though not simultaneous) invention. But there is evidence that Department of Justice staff were at least aware of my textbook approach. In his nearly contemporary exposition of principles underlying the 1982 Merger Guidelines, Gregory Werden identifies the Herfindahl-Hirschman (HHI) index as the variable chosen to measure concentration. He observes in a footnote that there are many other such measures of the size distribution of sellers, and advises, "*See generally* F. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 56-59 (2nd ed. 1980)."[24] What is striking about this nearly contemporary reference is that the 1980 textbook pages explicitly cited are followed only one page later by my statement articulating "the ideal definition of a market." It seems plausible that, reading those previous pages as a general authority on concentration indices, Werden also became aware of my "essence of the matter" principle for defining relevant markets one page later.

Conclusion

To be sure, one cannot conclusively rule out simultaneous but independent invention of the SSNIP approach to market definition. What is undeniable is that there were other antecedents not cited by Drs. Werden and White in their retrospectives. I clearly was not the first inventor. If there were business methods patents at the time, my friend Morris Adelman would have been accorded provisional priority. Sullivan, Areeda and Turner, and Werden -- works unknown to me until recently -- were significant late movers. But under U.S. patent precedents, "invention" depends both upon conception of the idea and diligent reduction to practice. Had I challenged Morris Adelman's priority by claiming due diligence in reducing the concept to practice, I might have won the patent. Obviously, there are no patents and there will be no legal challenge. But standards of scholarship demand that all relevant priority claims be recognized.

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24. *Supra* note 1 at 517, note 13. From a search of prior references, I have been unable to find any that used the exact words "Herfindahl-Hirschman Index" to name the index before my 1980 edition did so.