Lightening Up on Market Definition

David S. Evans*

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Email: devans@globaleconomicsgroup.com

* Chairman, Global Economics Group; Lecturer, University of Chicago Law School; Executive Director, Jevons Institute for Competition Law and Economics and Visiting Professor, University College London. I would like to thank Howard Chang, Dale Collins, Douglas Ginsburg, Michael Salinger, and Richard Schmalensee for helpful comments and Dhiren Patki for excellent research support.

ABSTRACT

This chapter proposes a resolution to the longstanding controversy between courts, economists, and antitrust authorities over the appropriate role of market delineation. Market definition should remain the first step in antitrust and merger analysis. It provides information on competitive constraints and other aspects of the economic landscape that are essential for understanding whether the practice at issue could harm consumers. However, there is no basis in economics for, as a general matter, drawing hard market boundaries and making strong inferences about market power from shares calculated based on those boundaries. The courts should abandon these practices, which are not required by the antitrust statutes, as they have done with other antitrust jurisprudence, such as maximum price fixing, that has been shown to be inconsistent with economics. They can write coherent analyses of antitrust issues without relying on hard market boundaries. The antitrust authorities should examine the competitive effects of business practices such as mergers only after a market inquiry that focuses on understanding the competitive landscape and the potential competitive constraints on business practices; but that inquiry does not need to settle on a hard boundary.

I. INTRODUCTION

"Market definition" refers to the process of determining the set of products, and locations from which those products are sold, that are relevant for analyzing the antitrust issue at hand. That set of products and locations defines "*the* market." Courts have long-treated market definition as the first step in analyzing an antitrust matter.[1] Among other things they rely on the relevant antitrust market to calculate market shares from which they infer the existence of market power. At least since *Alcoa,*[2] the courts have drawn hard market boundaries. A product is either in or out of the market. The placement of this fence often determines the final outcome of the matter.[3] As a result, market definition sets up a battle between the "we-win because it is a narrow market" plaintiffs and the "you-lose because it is a broad market" defendants.[4] Both sides naturally invest significant resources in trying to persuade the courts where to build the fence.

Many economists have argued that there is seldom a solid market boundary in practice.[5] Products from different vendors are often heterogeneous and compete along a continuum. Economists have also observed that there is no particular need to define a rigid boundary. Ultimately antitrust is about ascertaining effects on prices, output, and other factors that influence consumer welfare. It is possible to address those effects directly without taking a firm position on a market boundary. In recent years the U.S. Department of Justice and the Federal Trade Commission have, in the merger context, agreed with this

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[1] See PHILLIP E. AREEDA, JOHN L. SOLOW, & HERBERT HOVENKAMP, IIA ANTITRUST LAW 187-88 (2nd ed. Aspen Law & Business 2002) [hereinafter ANTITRUST LAW].

[2] United States v. Aluminum Co. of America, 148 F.2d 416 (2d Cir. 1945).

[3] Robert Pitofsky, *New Definitions of Relevant Market and the Assault on Antitrust*, 90 COLUMBIA L. REV. 1805, 1807 (1990). ("Knowledgeable antitrust practitioners have long known that the most important single issue in most enforcement actions – because so much depends on it–is market definition.")

[4] See for example the discussion of FTC v. Staples, *infra* note 73 below. The federal district court and the D.C. Circuit Court of Appeals both concluded that the outcome hinged entirely on market definition.

[5] For an excellent summary see Gregory J. Werden, *The History of Antitrust Market Delineation*, 76 MARQ. L. REV. 123 (1992). For older and newer statements of the complaint by economists see FRANKLIN M FISHER, JOHN J MCGOWAN & JOEN E GREENWOOD, FOLDED, SPINDLED, & MUTILATED: ECONOMIC ANALYSIS & U.S. V. IBM (MIT Press 1983) and Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition* (2008), *available at* http://ssrn.com/abstract=1313782.

view.[6] They have tried to block several transactions in which they focused mainly on demonstrating the effect of the combination. The courts have insisted on defining *the* market in reviewing motions to enjoin these mergers.[7]

This chapter proposes a workable truce to the market definition war that has raged with varying intensity for almost seven decades. Market definition should remain the first step in the analysis of mergers and anticompetitive practices. The exercise should focus on understanding the economic relationships that would have a bearing on the practice at issue before the court or agency. For many modern firms this exercise entails learning about the complex ecosystem in which the firm operates.[8] A key part of this broader inquiry concerns how other products are substitutes or complements for the products at issue in the inquiry. It will often prove informative to calculate shares based on tentative but credible delineations of the relevant players. The courts should not, however, draw a firm boundary around a particular set of products and make all subsequent steps in their analysis depend on where that boundary is drawn or on calculations of precise market shares. Plaintiffs and defendants, and their economic experts, would of course assist the court, as they do now, in understanding market relationships.

Quite simply the truce merely involves taking the "*the"* out of "the market". That definite article has led to wooden analysis. It is time to lighten up.

This truce would make the court's approach toward market definition consistent with modern economic thinking. The U.S. courts have embraced economic reasoning in

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[6] See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, COMMENTARY ON THE HORIZONTAL MERGER GUIDELINES (2006) *available at* http://www.ftc.gov/os/2006/03/CommentaryontheHorizontalMergerGuidelinesMarch2006.pdf. Also see U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES (2010) *available at* http://www.ftc.gov/os/2010/08/100819hmg.pdf ("The measurement of market shares and market concentration is not an end in itself, but is useful to the extent it illuminates the merger's likely anticompetitive effects."), Section 4.

[7] See United States v. Oracle Corp., 331 F. Supp. 2d 1098 (N.D. Cal. 2004) and FTC v. Whole Foods Mkt., Inc., 533 F.3d 869 (D.C. Cir. 2008).

[8] See David S. Evans, *Two Sided Market* Definition, forthcoming in MARKET DEFINITION IN ANTITRUST: THEORY AND CASE STUDIES (ABA SECTION OF ANTITRUST LAW), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1396751.

almost every aspect of their approach to antitrust.[9] Market definition—and the related subject of market power—is one of the few remaining areas in which the courts rely on an approach that is not supported by economic science.[10] To align themselves with the modern economic approach to antitrust the courts would have to make but a modest change from their longstanding jurisprudence. They would merely need to abandon their insistence on drawing hard boundaries and making all subsequent analytical steps depend on where those lines are drawn. They would continue to have market definition as the first step in the analysis and build their subsequent narratives off of it. They would only have to avoid economically unsupported conclusions drawn from artificial market boundaries. Nothing in the antitrust statutes prevents this result. Section 7 of the Clayton Act refers to "lines of commerce" but it is hard to imagine Congress intended that to require drawing hard boundaries.[11] The Sherman Act is silent on the subject of markets referring only generally to "trade or commerce."[12] Competition authorities have demonstrated the ability to draft coherent decisions on mergers without drawing hard market boundaries.[13] There is no reason the courts cannot do so as well.

To arrive at this truce this chapter proceeds as follows.

Section II describes the current practice of market definition. It shows that drawing hard market boundaries generally does not make economic sense because most businesses differentiate their products from rivals so the products are imperfect substitutes that compete along a continuum. This section is brief because the point is oft-told and widely recognized. Section III then shows that the main role of market definition in antitrust

[9] See e.g., Leegin Creative Leather Prods. v. PSKS, Inc., 551 U.S. 877 (U.S. 2007)

[10] As some of the earlier references indicate this is hardly a new point. For a particularly insightful analysis see Richard Schmalensee, *On the Use of Economic Models in Antitrust*, 127 U. PA. L. REV. 994, 1004 (1978) ("… the standard market share approach to the measurement of monopoly power is inherently incapable of providing definite answers to the relevant economic questions in the ReaLemon case, even though both sides apparently assumed that it could do so.")

[11] Clayton Act, 15 U.S.C. §18 (1914).

[12] Sherman Act, 15 U.S.C. §2 (1890).

[13] See, for example, U.K. Office of Fair Trading, *Anticipated acquisition of the online DVD rental subscription business of Amazon Inc. by LOVEFiLM International Limited* ME/3534/08, May 8, 2008.

analysis is to help identify competitive constraints and assess the extent of market power. The crux of most antitrust matters is the extent to which competitive forces limit market power and more generally the ability to inflict consumer harm. Drawing hard market boundaries provides an awkward approach for assessing the subset of these competitive constraints resulting from demand-side substitution. Section IV reviews current approaches for market definition. The courts have mainly relied on informal analyses of demand and supply substitution. The U.S. antitrust authorities introduced the seemingly more rigorous hypothetical monopoly test for market definition. Economists have developed sophisticated technical methods for implementing this definition. The analyses have tried to nail down something that seldom exists: a hard market boundary. Section V argues that from the standpoint of reaching the right conclusion, and minimizing error costs, there are few benefits and significant costs to drawing precise market boundaries. Section VI develops the truce in detail and explains why it is ultimately in the interest of the consumers that the antitrust laws seek to protect. Section VII makes some concluding observations.[14]

II. THE NATURE OF COMPETITION AND HARD BOUNDARIES

The traditional approach to market definition involves making informed but ultimately subjective judgments concerning the extent to which, on the demand-side, products are interchangeable or have high cross-price elasticities of demand and, on the supply side, the extent to which firms can easily switch production to offer substitutable

[14] The chapter focuses only on the United States. However, the same criticisms apply to the use of market definition to assess dominance under Section 102 the EU Treaty and as well as merger control in the European Union.

products. The courts do not require perfect interchangeability or perfect supply-side substitution.[15] This approach can provide an accurate assessment of competitive constraints resulting from demand-side and supply-side substitutes when firms produce very similar products and compete mainly on price. In this case, it is straightforward to determine which products are reasonably interchangeable with each other. These similar products should also have positive and significant cross-elasticities with each other and not with any other products.

Few markets, however, involve competition over homogeneous products. Consider the market for wheat which is often cited as the textbook example of a homogeneous product industry.[16] According to www.wheatflourbook.org[17]

> One of the major strengths of the U.S. grain production and marketing system is the variety of grades, classes, and prices that it can offer customers around the world. Dramatic differences in topography, soils, and climate from one region to another make this variety possible. By building on these natural advantages, seed breeders, researchers, farmers, grain handlers, and merchandisers are continually seeking to expand both the type and quality of wheat the United States can make available to its customers.

In evaluating whether products are differentiated it is important to recognize that almost all products are multidimensional in that they involve a product that has several attributes, including quality, and comes bundled with various kinds of services and other

[15] See generally ANTITRUST LAW, *supra* note 1, at 293-310.

[16] See DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 203 (Addison Wesley 2005)..

[17] http://www.wheatflourbook.org/Main.aspx?p=52

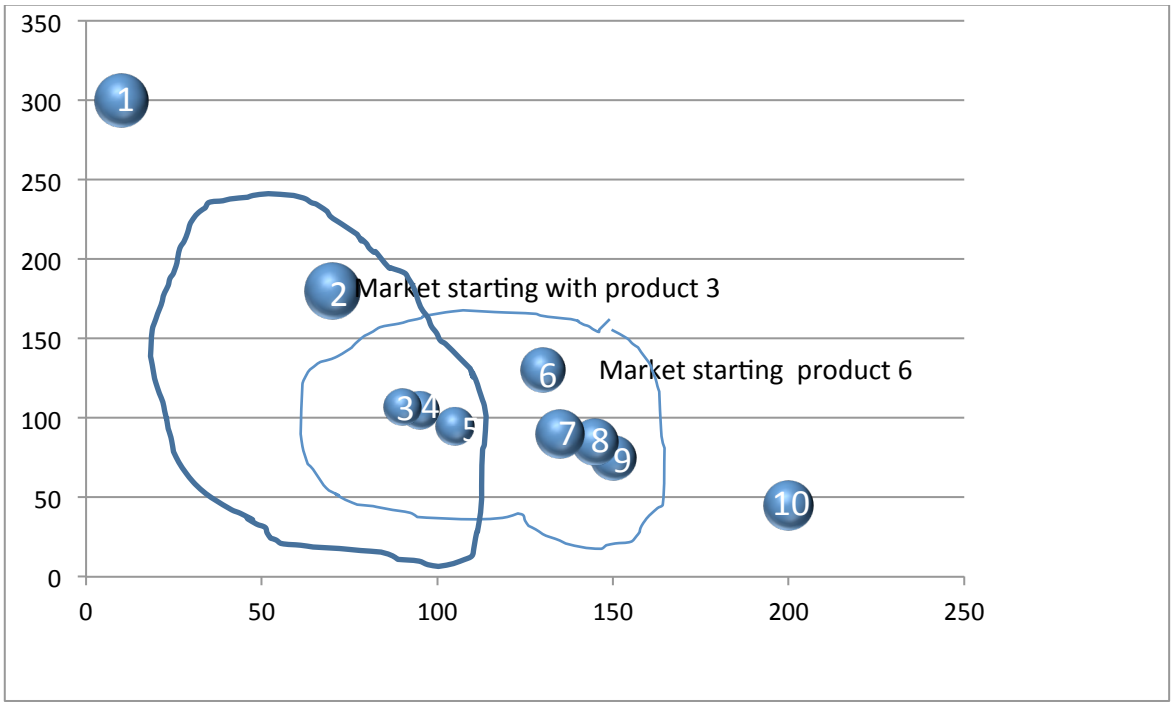
complementary products. Aspirin, for example, is a homogenous product from a chemical standpoint yet there are significant price differences between different brands.

Product heterogeneity is the norm, not the exception. It is seldom the case that consumers are selecting among equivalent products mainly on the basis of price. Sometimes firms produce different products because they lack the know-how or resources to produce the same product as a competitor. A wheat farmer may have land whose topography only supports a particular kind and grade of wheat. More generally firms do not want to compete intensely with each other. They often try to figure out ways to differentiate their products from other firms through physical differentiation, service, quality, advertising, branding, location, and many other factors. Firms are aided in their efforts to distinguish themselves in part because consumers—whether people or other businesses—are heterogeneous as well. Consumers have varying tastes for the many possible dimensions of a product. Firms try to devise sets of product attributes that are desired by groups of consumers. Consumers also may differ in their ability to pay for higher quality products. As incomes increase people switch from inferior to superior products.

To see why drawing hard market boundaries is problematic in real-world markets it is useful to consider the simple case shown in Figure 1. The product under consideration, say product ***6***, has two attributes (such as horsepower and mileage; sweetness and crunchiness; battery life and screen resolution) which are measured on the horizontal and vertical axes as well a price which is measured by the size of the bubble. Other products have higher or lower prices but provide different combinations of the other two attributes. Consumers in this example do not have uniform views on the value of the attributes so at the same price products with high and low values of attributes can find enough customers to sustain provision of the product. Some products seem more similar to the product in

question: product ***5*** seems closer to product ***6*** than product ***9***. But an increase in the price of ***6*** could lead a significant portion of consumers of product ***6*** to switch to product ***1***. For example, product ***6*** could be a Nokia smart phone and with an increase in price people switch to an iPhone. There is no obvious basis for drawing a fence at any particular distance from the original product.[18] We will see later that the hypothetical monopolist test was a valiant but problematic effort to draw that boundary.

Figure 1: Market definition for a group of differentiated products[19]



The example also helps show that there is no such thing as "*the* market". No method for drawing a fence around some group of heterogeneous product can lead to a unique "market" for those products. Suppose product ***6*** is at the center of an antitrust inquiry and that one of the standard approaches to market definition (such as the hypothetical

[18] As we will see later the extent to which some of the products may provide competitive constraints to the product at issue in the matter depends in part on how easily the makers of these products could alter their attributes—reposition them in the parlance of marketing professionals—in response to a price increase for the product at issue.

[19] Each product has two attributes with values as shown by the horizontal and vertical axes. The size of the bubble reflects the price which ranges from 30 for product ***10*** to 14 for product ***2***.

monopoly test) determines that the market encompasses the products shown. Now suppose that product ***3*** which was included in the market for product ***6*** is at the center of an inquiry. The same approach to market definition will almost certainly find that the market for product ***3*** includes products that were not in the market for product ***6*** and that the market for product ***6*** does not include products (including possibly product ***3***) that were included.

This point is well recognized by the courts and antitrust professionals. Careful writers use the phrase "*the* 'relevant antitrust' market" to reflect the fact that what is "relevant" varies from case to case and that the word "market" refers to a concept that is different than how this word is understood in common as well as business parlance. The courts[20] and authorities[21] observe that the relevant antitrust market can be different than how businesses that compete with each other use the term market.

"*The* market" varies depending upon the reference point from which is considered. It is therefore unlike assessing objective (non-situational) concepts such as price or whether a there is a tie. In fact, the purpose of market definition is to identify substitutes that are relevant for evaluating the competitive constraints on the party at issue. The collection of these demand (and possibly supply)-side substitutes is called *the* market for the case at hand. For other cases those competitive constraints may differ and therefore it is not surprising that *the* market for a matter involving a somewhat similar product could be different.

Although the language of market definition seems to suggest that it is attempting to identify an invariant fact—*the* market—it is really a process for identifying certain competitive constraints that are relevant to the matter at hand and for assessing market

[20] See, e.g., FTC v. Staples, 970 F. Supp. 1066, 1075 (D.D.C. 1997) where the court noted that "[t]he mere fact that a firm may be termed a competitor in the overall marketplace does not necessarily require that it be included in the relevant product market for antitrust purposes."

[21] See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N (2010), *supra* note 6, Section 4.

power. Unfortunately, locating hard market boundaries and calculating shares based on those boundaries are not reliable methods for assessing the extent of competitive constraints or the degree of market power. In fact, as we will argue later, it is better to reposition market definition so that it involves analyzing a broad range of competitive constraints whose presence or absence can determine the significance of the matter at issue on welfare.

III. COMPETITIVE CONSTRAINTS AND MARKET POWER

Antitrust jurisprudence recognizes that whether a particular suspect practice harms consumers, benefits them or has no material effect on them depends on the facts and circumstances of the case. Economics shows that the answer hinges on the strength of the "competitive constraints" on the ability and incentives of the firm(s) at issue to increase its profits by engaging in the practice at hand.[22] Sometimes the practice involves removing a competitive constraint. In that case the antitrust question revolves around the significance of the competitive constraint that has been, or will be, eliminated and the strength of the competitive constraints that will remain. The courts, and economists that specialize in antitrust, sometimes use the notion of "market power"[23] to summarize the net effect of these constraints.[24] A firm is said to have significant market power if it faces relatively weak competitive constraints and is therefore able to raise prices above the level that

[22] See MASSIMO MOTTA, COMPETITION POLICY THEORY AND PRACTICE 45-48 (Cambridge University Press 2004).

[23] Depending on the context this may be referred to as monopoly power or significant market power.

[24] As we will discuss below, however, market power not a well-defined analytical concept.

would prevail under competition.[25] The main goal of market definition is to help understand these competitive constraints and thus the degree of market power. This section provides the background for assessing the extent to which locating hard market boundaries and calculating market shows helps achieve this goal. It also provides background for introducing the techniques of market definition in the next section.

Part A describes the main practices in antitrust and explains how competitive constraints are helpful in sorting out whether these practices are harmful to consumers. Part B then provides a summary of the sources of competitive constraints. Part C relates these constraints to the notion of market power.

A. Business Practices and Competitive Constraints

Consider two products ***x*** and ***y*** which are produced by separate firms ***A*** and ***B***. Some consumers would substitute ***x*** for ***y*** if the price of ***y*** went up and the price of ***x*** did not (and vice versa). There is therefore a positive cross-price elasticity of demand between ***x*** and ***y***.[26] When firm ***A*** decides on the price of product ***x*** it would need to consider the extent to which customers would switch to product ***y*** provided by firm ***B***. Firm ***A*** would tend to charge a lower price the more sales it loses to firm ***B***. Firm ***B***'s product ***y*** similarly imposes a competitive constraint on firm ***A***'s product ***x***. Both firm ***A*** and firm ***B*** may face competition from other sources and they may face other competitive constraints that limit their ability to make decisions that adversely affect consumers as we discuss in more detail

[25] Alternatively, market power is sometimes defined as the ability to control price since in a truly competitive market firms must take price as given and therefore do not have any control over it. See U.S. DEP'T OF JUSTICE, COMPETITION & MONOPOLY: SINGLE-FIRM CONDUCT UNDER SECTION 2 OF THE SHERMAN ACT (2008) *available at* http://www.justice.gov/atr/public/reports/236681.pdf.

[26] See equation 2 below and the discussion preceding it for a technical definition of cross-price elasticity of demand.

below. Call these other competitive constraints ***z*** from a collection of sources we denote by ***C***.[27] The competitive constraints ***z*** are not necessarily substitutes for ***x*** or ***y***. For example, as we discuss below, firm ***A*** may produce a complement to ***x*** in which case the loss of profits from the sales of this complement constrains the willingness of ***A*** to increase the price of ***x***.

The competitive constraints between ***A***, ***B***, and ***C*** are generally relevant for assessing whether suspect actions taken by ***A***, ***B***, or both are harmful to consumers. Consider a proposed merger between ***A*** and ***B***. To evaluate the effect of this economists would want to know the extent to which ***A*** and ***B*** constrain each other's decisions towards products ***x*** and ***y***. If they impose a significant constraint on each other the merger, in effect, removes that constraint and could allow them to raise prices.[28] To put this in the language of merger analysis, before the merger a further price increase by ***A*** for ***x*** is unprofitable because it leads to a loss of sales and profits to ***B***; after the merger a further price increase by ***AB*** for ***x*** could be profitable because the combined firm captures the increase in profits resulting from the increased sales of ***y***. If these products do not impose significant constraints on each other, and if the combination generates enough efficiencies[29] to offset whatever minimal price increase that might occur, we would conclude that the merger would not likely harm consumers. We would also want to know the extent to which ***C*** constrains ***A*** and ***B***. Many factors could limit the combined firm from adversely affecting the terms of trade with consumers even if ***x*** and ***y*** constrained ***A*** and ***B***'s practices before the merger. Consumers could substitute to other products, new firms could enter, existing

[27] ***C*** in this formulation also includes factors that would reduce competitive constraints such as entry barriers.

[28] Michael L. Katz & Carl Shapiro, *Critical Loss: Let's Tell the Whole Story*, ANTITRUST MAGAZINE, Spring 2003, at 43.

[29] These could be cost efficiencies which provide an incentive to decrease price and thereby offset the demand-side incentives to increase price or they could be quality improvements so that the consumer's willingness to pay increases by more than the price increase.

firms could expand supply, existing firms could reposition themselves, or the likelihood of a drastic innovation that would displace ***x*** and ***y*** could increase.

In many respects the same considerations come into play in other antitrust matters. Consider exclusionary practices cases in which price or non-price methods are used to soften the competitive constraints on ***A*** coming from ***B*** or ***C***. In a predatory pricing case the issue involves the elimination of ***B***'s production of ***y*** by ***A***. This could harm consumers only if ***y*** imposes a significant constraint on ***x*** and if ***z*** does not discourage ***A*** from adversely affecting consumers. More generally, for the discussion of antitrust, we can think of firm ***B*** and product ***y*** as standing in for all the firms and products that firm ***A*** is excluding, in whole or in part, from competing against it for sales of ***x***. The core issue involves the extent to which the competitive constraints coming from ***y*** are significant, the extent to which the practice softens those competitive constraints, and the extent to which ***z*** provides enough competitive constraints to prevent consumer harm.

The key point is that antitrust inquiries are ultimately about competitive constraints. They involve looking into whether the competitive constraint that is eliminated is important and whether the remaining competitive constraints are sufficient to prevent the firm(s) engaged in the business practice from harming consumers. Market definition is useful to the extent it helps understand these competitive constraints. As we will see, while the process of market definition provides useful insights into these constraints, the requirement that this process end with the erection of a wall that precludes consideration of anything beyond this boundary can lead to a distorted view of competitive constraints. Moreover, for the purposes of merger assessment, the antitrust authorities limit market definition to a particular set of competitive constraints arising from demand-side substitutability.

B. Competitive Constraints

We have used the phrase "competitive constraint" loosely but it is helpful to have a formal definition. A competitive constraint is any factor that tends to reduce the expected profit that a firm can earn from taking some action that would harm consumers. If Firm ***A*** increased the price[30] for ***x*** it might realize lower profits as a result of losing sales of ***x***, losing sales of complementary products, foregoing indirect network or scale effects, spurring entry, and many other reasons. The following is a non-exhaustive survey of the possible sources of competitive constraints.

1. The role of substitutes in demand

If a firm tried to turn the terms of trade against consumers it would first and foremost need to worry that consumers would reduce spending on its product. That could happen through some combination of consumers purchasing less, switching to alternative products that meet their needs, or switching to some other product altogether. It is helpful for us to focus on this source of constraint because it enables us to introduce several of the standard economic tools that are used in the analysis of market definition and market power.

If the price of Chimay Ale[31] goes up, for example, you might consume fewer bottles, switch to another beer, change to wine, or stop drinking alcohol altogether. All of these factors are summarized as a matter of theory in the demand schedule that a firm

[30] We will generally use an increase in price as a stand-in for any action that reduces the consumer surplus that the consumer receives where surplus is defined as the difference between the value the consumer receives for the good (which is the consumer's maximum willingness to pay) and the cost of that good (which includes the price the consumer pays for the good plus any other costs).

[31] At least in the United States Chimay Ale is a high quality expensive ale. At Beacon Hill Liquors on Charles Street in Boston one bottles of Chimay cost $5.20 for slightly less than a 12 ounce bottle vs $6.25 for a six-pack of Miller 12 ounce cans.

faces. Each point on that schedule summarizes how much consumers would purchase at various prices. As price goes up or down the demand schedule reflects the extent to which consumers would increase or decrease spending for all possible reasons. The own-price elasticity of demand at the price that the firm is charging before considering raising its price summarizes the effect of a small price change. The own-price elasticity of demand e_x for product **x** is defined as the percent change in the quantity sold that would result from a one percent increase in price:

$$(1) \qquad e_x = \frac{dq_x/q_x}{dp_x/p_x}$$

where roughly speaking "d" is the calculus symbol for "small change in",[32] q_x is the quantity of product ***x***, and p_x is the price of product ***x***. A larger own-price elasticity means that consumers reduce purchases to a greater degree for the various reasons mentioned above.[33]

We can say more about what determines the elasticity of demand by introducing another measure known as the cross-price elasticity of demand. It equals the percent change in the quantity of a good that results from a 1 percent change in the price of a given good. A 1 percent increase in the price of y would lead an increase in the demand for x given by the cross-elasticity of demand between x and y:

$$(2) \qquad e_{xy} = \frac{dq_x/q_x}{dp_y/p_y}$$

[32] Technically the d's are all referring to partial derivatives.

[33] The convention is to use the absolute value of the price elasticity of demand which in effect puts a minus sign in front of the expression in (1). A price elasticity of 2 implies that a 1 percent increase in price leads to a 2% reduction in the quantity demand.

When the cross- price elasticity is positive the goods are substitutes in the sense that an increase in the price of one results in consumers moving spending to the other. When the cross-elasticity is negative the goods are complements in the sense that an increase in the price of one results in consumers spending less on the other.

As a matter of simple accounting the elasticity of demand is a linear function of the cross-elasticities of demand for all other goods. Your demand for Chimay Ale could be more elastic—that is you could be more sensitive to price—if you thought you had a very good substitute for Chimay Ale or if there were several other products that you could collectively divert spending to. The same considerations apply when we consider the overall demand facing a firm. In the face of a price increase consumers could switch to a few close substitutes, or spread their spending across many, and anything in between.

2. The role of suppliers of substitutes

When firm ***A*** increases the price for ***x*,** firms that produce substitutes may change their current actions. What they do affects competitive constraints. There are at least three considerations.

First, do competitors increase their output in response to the higher price? If they can expand their output they may respond to the higher price charged by firm ***A*** by trying to take over some demand from ***A*** by, for example, pouching ***A***'s customers. A key consideration is the extent to which these competitors can and will increase their output. If they face capacity constraints they might have limited ability to expand; if they have a great deal of excess capacity they might be able to expand easily and quickly. Economists often point to the dominant firm with a competitive fringe model to illustrate this. The

elasticity of demand facing firm ***A*** would depend on the industry demand elasticity, the share held by the dominant firm, and the elasticity of supply of the competitive fringe firms (i.e. the percent change in output that would follow from a 1 percent increase in market price):[34]

(3) $$e_x = \frac{e_M + (1 - S_x)e_f}{S_x}$$

Where e_M is the market demand schedule, S_x is the share of the firm under consideration, and e_f is the elasticity of supply of the competitive fringe. Firm A's elasticity of demand for ***x***—again, the measure of the extent to which it would lose sales if prices go up—is larger when the fringe firms have a larger share and those fringe firms have more elastic supply.

Second, do competitors increase their prices in response to the price increase by firm ***A***? In a highly competitive market we would expect that firms would not increase their prices at all if another small player tried to increase its price. Many standard economic models of oligopoly, however, predict that the competitors will tend to increase their prices in response to a unilateral increase in price by another firm.[35] But this does not have to be the case. Firms may decide to use the price increase as an opportunity to steal their rival's customers and increase their own market share.

Third, would competitors reposition their product as a result of the price increase? In many industries firms offer products that are differentiated from one another often to appeal to a particular group of customers.[36] Consumers sort themselves out across the various alternatives based on the price and product attributes being offered. If one firm

[34] See William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARVARD L. REV. 937 (1981).

[35] See Gregory J. Werden & Luke M. Froeb, *Unilateral Competitive Effects of Horizontal Mergers*, *in* HANDBOOK OF ANTITRUST ECONOMICS (Paolo Buccirossi ed., 2008).

[36] See DENNIS W. CARLTON & JEFFREY M. PERLOFF, *supra* note 16 at 203-205.

raises price it presents an opportunity for other firms to go after that product niche. For example if a magazine targeted towards well-off fashion conscious women raised its price a competing magazine that targeted a more down-market crowd could consider altering its content.

These factors all affect competitive constraints. The firm may anticipate these responses and temper its decision to alter the terms of trade with consumers. Alternatively, the competitive response of other firms may mitigate the harm to consumers.

(3) The role of entry

Increasing prices may alter the incentives for other firms to start producing substitute products. Existing firms may diversify into the product at issue (what the courts consider supply-side substitution) or new firms may form. In considering raising its price Firm ***A*** would therefore want to consider the possibility that the price increase will attract entry. That entry would reduce Firm ***A***'s expected future profits and offset any gains from its price increase. It would therefore temper firm ***A***'s enthusiasm for a price increase.

Whether a price increase would likely attract entry depends, according to economic theory, on a complex set of factors. A price increase would attract entry if competitors could come in quickly to capture demand and exit easily if the incumbents lower price. That depends in part of whether there are sunk—that is unrecoverable—costs of entry. With imperfect information among firms on demand and costs an increase in price provides a signal to entrepreneurs that there may be profit opportunities. That can encourage entry.

As a related matter prices can also affect the incentives to engage in incremental or disruptive innovation. Firms face competition when entrepreneurs introduce better products or come up with an entirely new way to satisfy consumer needs. Current prices provide signals to innovators on where they should place efforts. A firm may find that it is better to keep prices low especially if it faces the risk of innovation that could effectively displace it. On the other hand it may have intellectual property or scale advantages that make this unlikely.

(4) The role of complements, indirect network effects, and two-sided markets

Many firms produce multiple products and have numerous sources of revenue. When firm $\boldsymbol{A}$ increases the product $\boldsymbol{x}$ it may lose revenue from the sale of complementary products.[37] Consider a company that produces a music player and also has an online music store. An increase in the prices for the online music store would tend to reduce the sales of its music player.

In addition the number of users of one product may increase the value of the other product; that is there may be indirect network effects, or positive feedback effects, between the two products.[38] Video game console makes for example sell video game consoles to consumers and licenses game makers. An increase in the game royalties would tend to reduce the supply of games, and increase their prices, and thereby reduce the demand for the consoles.

Many firms operate multi-sided platforms—what are sometimes called "two-sided markets"—which depend on getting multiple groups of interdependent customers together

[37] In the simple framework we used these would be included in z—the group of other products that are the sources of competitive constraints.

[38] See Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. OF ECON. PERSPECTIVES 93 (1994).

in some say.[39] An increase in the price to one group of customers will typically reduce the value to the other group of customers. That was the case with video consoles. It is also the case with advertising supported media. An increase in the effective price to readers (which adjusts for the value of the content they are receiving) would reduce the revenue that the media business would obtain from advertisers.

In common for all these cases is that an increase in the price of one product results directly or indirectly in the reduction of revenue. Those possible reductions therefore impose a competitive constraint in the sense that they reduce the incentive to increase price.

(5) Other competitive constraints

There are many reasons why firms may face greater or lesser constraints on their pricing ability. The ones listed above are not meant to be exhaustive. To take one example the government may factor in to the firm's calculations. A firm may be able to rely on government regulations that make it more difficult for firms to challenge it. That was historically the case in the telecommunications industry in the United States and many other countries. Such restrictions would factor into the analysis of entry. Alternatively increases in price may spur the government to impose regulations that could limit a firm's profitability. An increase in price might result in demands for legislation. But in any event it is these competitive constraints that are relevant for assessing the matter at hand.

[39] See David S. Evans, *supra* note 8; David S. Evans & Richard Schmalensee, *Markets with Two-Sided Platforms*, in 1 ISSUES IN COMPETITION LAW AND POLICY (ABA SECTION OF ANTITRUST LAW 2008) 667, *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1094820.

C. Market Power

Antitrust analysis often uses the concept of market power to summarize the degree of competitive constraints that are faced by a firm.[40] According to Kaplow and Shapiro[41]

> The concept of market power is fundamental to antitrust economics and to the law. Except for conduct subject to *per se* treatment, antitrust violations typically require the government or a private plaintiff to show that the defendant created, enhanced, or extended in time its market power. …. [T]he inquiry into market power is usually a threshold question; if sufficient market power is established, it is then asked whether the conduct in question—say, a horizontal merger or an alleged act of monopolization—constitutes an antitrust violation. If sufficient market power is not demonstrated, the inquiry terminates with a victory for the defendant.

Unfortunately, market power is a poorly defined concept in antitrust law and economics.[42] Its use can obscure the role of competitive constraints that are relevant for the analysis. These problems are accentuated by the delineation of hard market boundaries and the calculation of market shares.

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[40] The U.S. courts and antitrust authorities use market power in various ways. For the purposes of merger analysis the U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines define market power as follows: "A merger enhances market power if it is likely to encourage one or more firms to raise price, reduce output, diminish innovation, or otherwise harm customers as a result of diminished competitive constraints or incentives." U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N (2010), *supra* note 6, at Section 1. Under Section 1 of the Sherman Act market power is defined as concerted refusal to deal. See NW Wholesale Stationers v. Pac. Stationery, 472 U.S. 284, 284 (1985). Under Section 2 of the Sherman Act monopoly power is defined as the "power to control prices or exclude competition." See U.S. v. du Pont (Cellophane), 351 U.S. 377, 391. Monopoly power requires substantial market power. See MASSIMO MOTTA, *supra* note 22, at 39.

[41] See Louis Kaplow & Carl Shapiro, *Antitrust* 2 (Harvard Law and Economics Discussion Paper No. 575, 2007) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=961264&download=yes.

[42] See EINER ELHAUGE & DAMIEN GERADIN, GLOBAL COMPETITION LAW AND ECONOMICS 257-268 (Hart Publishing 2007) for discussion.

Market power is generally defined by economists as the ability of a firm to charge a price that exceeds the competitive level. In practice the competitive level is usually defined as the price that equals marginal cost. For example, in the textbook model of perfect competition firms are price takers and produce at the point where the market price just equals their marginal cost of production. It is widely recognized that virtually all firms charge prices in excess of marginal cost even though they operate in industries that seem quite competitive. Therefore most discussions of market power refer to "significant market power."

The Lerner Index is a commonly used measure of market power especially in the analysis of mergers. Profit maximizing firms set price and output so that marginal revenue equals marginal cost. Under certain assumptions that apply in simple markets[43] that profit-maximizing condition results in the standard Lerner Index:

$$(4) \qquad m_x = \frac{p_x - c_x}{p_x} = \frac{1}{e_x}$$

where c_x is marginal cost. The left-hand side is a measure of profitability: the profit margin as a percent of price. This measure of profitability is inversely related to the firm's elasticity of demand which reflects all factors including competitive responses that would result in a loss of sales.[44] A firm realizes a smaller margin when it has a larger elasticity of demand. This formula captures the notion of demand-side substitutes discussed above. When consumers can readily switch to one or more alternatives as price increases (as shown in equation (3)) the firm faces greater limitations on increasing its price.

[43] The result that the price-cost margin is inversely proportional to the own-price elasticity of demand assumes, among other things, that there are no complementary products and indirect network efforts and that there are no strategic considerations such as entry concerns that would lead a firm to reduce the margin. Therefore one must be cautious about inferring the own-price elasticity of demand from the observed price cost margin or from estimating the price-cost margin from estimates of the own-price elasticity of demand. As we will discuss below, there are empirical issues concerning how costs are measured

[44] This is generally called the "residual demand elasticity." See Jonathan B. Baker & David Reitman, *Research Topics in Unilateral Effects Analysis*, *forthcoming in* RESEARCH HANDBOOK ON THE ECONOMICS OF ANTITRUST LAW (Einer Elhauge ed.).

The fundamental problem with the economic treatments of market power is that these treatments attempt to replace the analysis of competitive constraints with metrics that are sometimes subject to serious measurement or conceptual problems. Consider the Lerner Index. The analyst needs to measure marginal cost which can be difficult to do as we discuss in some detail below. Furthermore, once the analyst has calculated the Lerner Index it is not possible to infer that the observed margin reflects a significant departure from competition without a further inquiry into the margins that are necessary for the firm to recover its fixed costs.[45] Alternatively, consider determining whether the firm's prices exceed the level that would enable the firm to recover its risky investments and cover its fixed costs. In practice, these calculations are subject to a number of difficulties. For example the level of risk that entrepreneurs and investors faced in making investments in an industry are generally unknown. In principle one could infer that risk from assessing examining the failure rate of entrants and their investments but these data are seldom available.[46]

There are also conceptual problems. The measures of market power that are based on deviations from a hypothetical competitive level may not be useful for the purpose for which they are intended. On the one hand, a firm may have the ability and incentive to exclude a more efficient rival even though it is earning a competitive rate of return after adjusting for fixed costs or after adjusting for risky investments as well as fixed costs. By excluding the rival it prevents a decline in its profits; it is immaterial that its profits are currently at the competitive level. On the other hand, a firm may lack the ability and

[45] For example, in an industry in which firms incur fixed costs to operate, and average variable costs are not increasing, it is not possible for firms to maintain long-run viability if they charge a price equal to marginal cost. Kaplow and Shapiro show in the simple case of linear demand and constant average variable costs that the firm's price cost margin would have to equal the ratio of the firm's fixed cost to its revenue for the firm to break even. Thus, if fixed costs were 20 percent of annual revenue the firm would have to earn a margin of 20 percent See Louis Kaplow & Carl Shapiro, *supra* note 41. The importance of fixed costs depends on the time horizon considered. In the very long run all costs are variable. The price-cost margin is a more reliable indicator of market power when long-run marginal costs are considered and these costs include a return on risk-taking.

[46] One can also estimate market power by examining the extent to which a firm's rate of return exceeds the risk-adjusted competitive rate of return. There are various measurement issues for rates of return as well. See Franklin M. Fisher & John J. McGowan, *On the Misuse of Accounting Rates of Return to Infer Monopoly Profits*, 73 AM. ECON. REV. 82 (1983) for the classic treatment of this.

incentive to exclude a more efficient rival even though it is charging a price that is considerably higher than marginal cost. If the rival also has to charge a high price to recover its fixed costs its entry may not reduce the market price much; or it may be so easy to enter the industry that it is implausible that the firm could prevent competitive entry.

This brings us back to competitive constraints. Most antitrust matters ultimately hinge on the nature and degree of the competitive constraints that the firm faces. Market power can be used as shorthand to summarize these competitive constraints. Investigating market power therefore requires examining all of the constraints mentioned above and assessing their significance for the matter at hand. Metrics such as price-cost margins and measures of risk-adjusted rates of return can provide further information on the importance of these constraints but must be used carefully.

Antitrust runs the greatest risk of error when it places too much weight on a single indicator of competitive constraints. We have already seen that with respect to the various measures of market power used by economists and the courts. They may provide relatively limited information on whether firms have the ability or incentive to engage in practices that cause consumer harm. Analysts can also make mistakes by focusing narrowly on one factor such as demand substitutability. The "cellophane fallacy" is the classic example of this.[47] Starting from the competitive level a firm with market power will raise its price until so many consumers would switch to other products that a further price increase would be unprofitable.[48] Thus a firm with significant market power would continue raising its price until at the margin some consumers would find other products

[47] See Morris A. Adelman, *Economic Aspects of the Bethlehem Option*, 45 VA. L. REV. 684 (1959); Gregory J. Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, 71 ANTITRUST L. J. 253 (2003); Antitrust Law, *supra* note 1, at 241-246.

[48] Technically, with positive marginal costs a firm that faces a downward sloping demand schedule and therefore has pricing discretion will always set price at a point on that demand schedule at which the absolute value of own-price elasticity of demand is greater than 1.0 (i.e., demand is "elastic" so that a 1 percent increase in price leads to a more than 1% decrease in the quantity demanded).

substitutable. The fact that consumers have substitutes to which to turn—parchment paper instead of cellophane—does not necessarily mean that the firm lacks market power.

D. Market Power, Market Definition, and Market Shares

Antitrust analysts can guard against these mistakes by focusing on the broad range of competitive constraints that are relevant to analyzing the matter at hand. The courts have, however, tended to infer the existence of market power primarily from market shares. To do this they first define a market as we discuss in the next section. They infer the magnitude of market power from the share of this market possessed by the firm. They then decide whether these shares are large enough—and presumably indicate large enough market power—to trigger further analysis. Judge Learned Hand famously observed that for determining whether a firm had monopoly power 33 percent was not enough, 60 percent was doubtful, and 90 percent was sufficient.[49] For tying cases the Supreme Court decided that a 30 percent share was not enough for a per se tying prohibition.[50]

The economic literature provides no support for any of these bright-line tests either as a matter of theory or of empirical fact. Nor, more generally, does the literature find that market shares are reliable predictors of the magnitude of competitive constraints.[51] As noted earlier, most firms try to make their products different from rivals. In this case

[49] United States v. Aluminum Co. of America, *supra* note 2, at 424. (The percentage we have already mentioned — over ninety — results only if we both include all "Alcoa's" production and exclude "secondary". That percentage is enough to constitute a monopoly; it is doubtful whether sixty or sixty-four percent would be enough; and certainly thirty-three per cent is not. Hence it is necessary to settle what he shall treat as competing in the ingot market.)

[50] Jefferson Parish Hosp. Dist. v. Hyde, 466 U.S. 2, 7 (1984)

[51] See KEITH N. HYLTON, ANTITRUST LAW: ECONOMIC THEORY & COMMON LAW EVOLUTION 243 (Cambridge University Press 2003) ("…market share by itself says very little about the degree of market power possessed by a firm.") and Richard Schmalensee, *Studies of Structure and Performance, in* 2 HANDBOOK OF INDUSTRIAL ORGANIZATION 984-5 (Richard Schmalensee & Robert Willig eds., 1992) (1989).

economic models generally find no systematic relationship between market shares and measures of market power.[52] In addition, dynamic models of competition find that high market shares can result from more efficient and innovative firms gaining more customers.[53] Most importantly, there is no basis in economics for inferring anything about the degree of competitive constraints from precise share figures as some courts have done. Nor is there any basis for concluding that a single critical market share figure could be applied to all market situations.[54] Market share cannot be used like a thermometer based on universal laws on when water freezes or boils.

The current practice of market definition provides a limited and distorted view of competitive constraints. It largely focuses primarily on demand-side substitutes which, while important, are only one source of competitive constraints.[55] It draws a hard boundary between products for consideration as substitutes even when there is no economic basis for concluding that a particular product should be classified as in or out. It then uses this boundary to calculate market shares which may provide a limited basis for assessing competitive effects. Although courts and authorities consider other sources of competitive constraints, *the* market and its associated shares tends to weigh most heavily in the analysis.

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[52] See Gregory J. Werden & Luke M. Froeb, *supra* note 35, and Jonathan B. Baker & David Reitman, *supra* note 44.

[53] See, e.g., F. MICHAEL SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 288-292 (Houghton Mifflin Company 1980); Richard Blundell, Rachel Griffith & John Van Reenen, *Market Share, Market Value and Innovation in a Panel of British Manufacturing Firms*, 66 REV. ECON. STUDIES 529 (1999); Zoltan J. Acs & David B. Audretsch, *Innovation, Market Structure, and Firm Size*, 69 REV. ECON. & STAT. 567 (1987).

[54] There is an extensive empirical literature in economics, largely conducted from the early 1950s to the early 1980s, that attempted to examine whether there was a systematic relationship between measures of firm profitability, and the degree of industry concentration. That literature finds that manufacturing industries with higher concentration tended to be more profitable. However, there are many possible reasons for that and the literature did not reach robust conclusions on the extent to which those industries were more profitable because the leading firms in those industries were more efficient, as opposed to being more profitable because they faced fewer competitive constraints. Moreover, this literature does not provide a basis for making any precise predictions about the relationship between market shares and market power. See DENNIS W. CARLTON & JEFFREY M. PERLOFF, *supra* note 16, at 259-67; F. MICHAEL SCHERER, *supra* note 53, at 288-92 and Richard Schmalensee, *supra* note 51, at 984-5.

[55] The U.S. merger guidelines analyze only consider demand-side substitutability in defining the market. See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 6, Section 4.

IV. MARKET DEFINITION

When the courts first started looking at antitrust cases they naturally began using the term market. In 1898 Justice Peckham concluded that there was a broad market for selling cattle and rejected a much narrower definition by the plaintiffs.[56] The focus on market shares seems to have begun with Learned Hand's opinion in *Alcoa* in 1945. He concluded that a firm had to have a high enough share of the market to be a monopolist. To determine if it reached that threshold it was therefore necessary to determine which products were in the market.[57] Over time that approach evolved into the practice of making the definition of hard market boundaries and the calculations of market share the first step in antitrust analysis.

Market shares are a handy way of summarizing data about an industry. They tell us something about the relative importance of different firms and something about the structure of competition. Looking at market shares is a perfectly sensible thing to do as part of the overall analysis of competitive constraints facing a firm. The consideration of market shares has led, however, to two unfortunate developments. One of these has been the tendency to use market shares as standalone metrics for assessing the degree of market power and establishing flash points to identify significant market power or monopoly

[56] A search of the keywords "market" and "Sherman" finds the first reference to market in a Sherman Act case was in 1898.

[57] See United States v. Aluminum Co. of America, *supra* note 49.

power. As noted above, there is no basis in economic theory or empirical evidence that could support this "market share as thermometer" approach as a general matter.[58]

The other, which results from the desire to use market shares to infer market power, is the focus on identifying the denominator for calculating market shares. That has led to market definition becoming a central focus in antitrust cases and one that can determine the outcome. As Jonathan Baker has observed, "Throughout the history of U.S. antitrust litigation, the outcome of more cases has surely turned on market definition than any other substantive issue. Market definition is often the most critical step in evaluating market power and determining whether business conduct has or likely will have anticompetitive effects."[59]

This section surveys the state of the current approaches to market definition.[60]

A. Market Definition in the Courts

The courts have tried to define markets primarily by focusing on demand and to a lesser extent supply substitutability.[61] On the demand side, one line of attack examines whether products are interchangeable in the sense that they are functionally equivalent from the standpoint of the consumer. Another approach involves looking at the cross price elasticities of demand among various products. These are ways of assessing whether consumers have other alternatives to which they could switch. On the supply side, the

[58] In an industry with homogeneous products a small market share indicates the lack of market power.

[59] See Jonathan B. Baker, *Market Definition: An Analytical Overview*, 74 ANTITRUST L. J. 129. Robert Pitofsky observes, "Knowledgeable antitrust practitioners have long known that the most important single issue in most enforcement actions—because so much depends on it—is market definition." See Robert Pitofsky, *supra* note 3.

[60] For comprehensive discussions of market definition see Jonathan B. Baker, *supra* note 59; Jonathan B. Baker & Timothy F. Bresnahan, *Economic Evidence in Antitrust: Defining Markets and Measuring Market Power* (Stanford Law and Economics Olin Working Paper No. 328, 2006), *available at* http://ssrn.com/abstract=931225.

[61] See ANTITRUST LAW, *supra* note 1, at 184.

courts consider whether firms that are producing dissimilar products would switch production to compete if prices increased above the competitive level.[62]

The degree of interchangeability, the cross-price elasticities of demand, and the elasticities of supply are all continuous variables. The courts, however, make binary decisions on whether particular products, alternative suppliers, or geographic locations should be considered as either "in" the market or "out of" the market. The capacity that is "in" the market is then used as the denominator for calculating market shares.

The analysis of market power is built off of this edifice. First, the court calculates market shares which provide a reading on the market share thermometer for assessing whether the firm has significant market power or monopoly power under the relevant case law. Second, the market delineation largely determines the set of competitive constraints that the court will consider in examining the possibility that the practice at issue will harm consumers. Demand and supply substitutes that are excluded at the market definition stage are not considered in further analyses. The courts do, however, consider whether the prospect of entry into the market will temper the market power that might otherwise be inferred from the shares.

B. The Hypothetical Monopolist Test

[62] Starting with the *Brown Shoe*, *infra* note 80, decision the courts have considered the possibility of a broad market that has submarkets that should be treated as distinct markets for antitrust purposes. These would be situations in which a particular group of customers would have difficulty switching to an alternative or which a firm could engage in price discrimination with respect to that group of customers. A number of antitrust law and economics scholars have argued against this approach which has lost disfavor in the courts. See Antitrust Law, *supra* note 1, at 185; EINER ELHAUGE & DAMIEN GERADIN, *supra* note 42. Judge Brown's opinion for the D.C. Circuit's in *Whole Foods* resurrected the concept in overturning a lower court decision to deny the FTC's motion for a preliminary injunction to enjoin the Whole Foods acquisition of organic supermarket competitor Wild Oats. FTC v. Whole Foods Mkt., *supra* note 7.

The U.S. Department of Justice introduced a different approach for establishing market boundaries in its 1982 Merger Guidelines.[63] After some slight changes in language the guidelines say:[64]

> A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a "small but significant and nontransitory" increase in price, assuming the terms of sale of all other products are held constant.

This has become known as the "hypothetical monopolist test" or the SSNIP test. Small and significant is generally taken to mean at least 5 percent.[65]

The test provides some rigor to the decision on where to draw the market boundary. The idea is that if the hypothetical profit-maximizing firm in the definition could not raise price much then there must be demand substitutes that constrain it. If it attempted to raise price by a small but significant amount its profits would fall because too many customers would desert it. As the hypothetical firm takes over more demand substitutes it eventually reaches the point at which it can impose a small but significant price increase because there are no longer enough demand substitutes, not under its control, to which consumers

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[63] U.S. DEP'T OF JUSTICE, 1982 MERGER GUIDELINES (1982) *available at* http://www.justice.gov/atr/hmerger/11248.pdf.

[64] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES 4 (1992) *available at* http://www.justice.gov/atr/public/guidelines/hmg.pdf.

[65] The market obtained from the hypothetical monopolist test depends on the benchmark for assessing the price increase. For merger analysis the increase in price is ordinarily taken relative to prevailing prices at the time of a merger. The argument for doing so is that the purpose of market definition is to help determine whether the merger would result in an increase in price. Therefore even if a product would not constrain a competitive firm from increasing its price it may constrain firms that have already increased price and therefore pushed customers to consider more distant substitutes. See Gregory J. Werden, *Market Delineation and the Justice Department's Merger Guidelines*, Duke L. J. 1983: 514 – 579 (1983). For monopolization cases.there is an argument for using the competitive price as the benchmark. Otherwise one would commit the cellophane fallacy of concluding that a monopolist faces competition because it has raised price so high that consumers would consider highly inferior substitutes at the margin. See DENNIS W. CARLTON & JEFFREY M. PERLOFF, *supra* note 16, at 646-47.

could turn. The SSNIP test draws a hard market boundary at this level. The products beyond the boundary are individually and collectively weak substitutes in the sense that their presence would not constrain the hypothetical firm from increasing prices.

The introduction of the SSNIP test has led to a technical literature by economists on how to implement it along with a vibrant literature by antitrust law and economics scholars on the reliability of various approaches.[66] Critical loss analysis is the most popular technique for implementing the SSNIP test.[67] For the conjectured hypothetical monopolist the analyst calculates the loss of sales that would result in a 5 percent price increase having no net effect on profits. This *critical loss* can be calculated based on information of the profit margin for the hypothetical firm.

$$(5) \qquad L_x = \frac{g}{g + m_x}$$

Where g is the small but significant price increase considered (for example, g=.05 or 5%) and m_x is the price-cost margin from equation (4).

If the *actual loss* of sales that would result based on a consideration of demand-side substitution would exceed this then that price increase would be unprofitable. The actual loss can be calculated based on information concerning the residual demand elasticity, cross-price elasticities of demand, or proxies for this based on estimates of the diversion of sales to alternative producers. For example, suppose it was possible to observe the portion

[66] For a summary see Louis Kaplow & Carl Shapiro, *supra* note 41.

[67] See Barry C. Harris & Joseph J. Simons, *Focusing Market Definition: How Much Substitution is Necessary*, 12 RES. L & ECON. 207 (1989); Michael L. Katz & Carl Shapiro, *supra* note 28.

of sales D_{xy} that would be diverted to target of the acquisition. Then Katz and Shapiro show that the actual loss would be:[68]

$$(6) \qquad A_x = \left(1 - \mathrm{D_{xy}}\right) \times \frac{\mathrm{g}}{\mathrm{m_x}}$$

where D_{xy} is fraction of sales lost by firm **A** for product **x** to firm B's product **y.**
If the actual loss exceeds the critical loss then he market would then be expanded because there must be demand substitutes not in control of the hypothetical firm. If the actual loss is less than the critical loss then that price increase would be profitable. The analyst would conclude that the market must be at least as narrow as what has been considered for the hypothetical monopolist. In theory the analyst begins with the products at issue and then expands the market out until actual loss just falls short of critical loss. Under the merger guidelines the market is defined entirely by reference to demand substitutability.[69] Firms that would supply output to this market in response to a 5 percent price increase are then included.

While the hypothetical monopoly test was viewed as a significant methodological advance when it was introduced in 1982, the antitrust profession has become less enamored with it over time.[70] To implement the hypothetical monopoly test it is necessary to construct a firm consisting of multiple products and measure the profit margin of that firm as well as substitution from all of the products for that firm to all of the other products that have not been consolidated into the hypothetical firm. In practice it is

[68] Michael L. Katz & Carl Shapiro, *supra* note 28, at 56.

[69] See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 64.

[70] For a recent discussion by two authors who have contributed some of the key technical papers see Joseph Farrell & Carl Shapiro, *supra* note 5.

difficult enough to obtain accurate measures of these parameters for a single firm. Obtaining them for many firms and simulating the behavior of the hypothetical firm is a challenge. The outcome of the hypothetical monopolist test—that is the location of the market boundary—depends on the order in which additional products are added to the hypothetical firm.

The other reason economists and competition authorities have become less enchanted with the hypothetical monopolist test for mergers is that, if there is enough information to determine the market under the SSNIP test, there is almost surely enough information to determine directly whether the merger will, within the framework of the simple economic model behind the test, result in a unilateral increase in the prices charged by the firm that has been created through the merger. We turn to this next.

C. Going Right to Effects

Courts and antitrust authorities use market definition as a screen for focusing resources on cases in which it is plausible that the practices in question could harm consumers. They define a market, calculate shares, and infer the degree of market power from these shares. If a firm lacks market power in a monopolization case or if merged firms would lack market power then there is no need to invest further resources in evaluating the effects of the practice on consumers. But suppose the courts and antitrust authorities had readily at their disposal all of the information necessary for evaluating effects. In that case it would not, one could argue, make any sense to expend effort on market delineation and assessing market power. In principle it would be possible to spend fewer resources (by eliminating the market definition inquiry and just looking at effects)

and to make fewer mistakes (since the screen will necessarily result in some false negatives that would lead to stopping the inquiry into effects too soon).[71]

At least in the merger context it became apparent to the antitrust authorities that this was precisely the situation they were in. Once they have collected the information necessary for conducting the SSNIP they have enough information for assessing the unilateral effects of the merger on price. For example, suppose the authority has collected information on the price-cost margins for the merging parties and evidence on the diversion of sales between the acquiring firm and the target; this is all data it would need for a SSNIP test of market definition. In the case of linear demand the predicted effect on price would be:[72]

$$(7) \qquad \frac{dp_x}{p_x} = \frac{\mathrm{m_x D_{xy}}}{2(1 - \mathrm{D_{xy}})}$$

There may be other situations in which the authorities have direct evidence on the likely effects of a merger. In *Staples* the Federal Trade Commission was able to compare local areas in which Staples and Office Depot both operated with ones in which only one operated.[73] They found that areas in which only one store operated had higher prices than where two stores operated. From this they inferred that the merger would reduce prices significantly.

[71] For an earlier discussion of this point see FRANKLIN M. FISHER, JOHN J. MCGOWAN & JOEN E. GREENWOOD, *supra* note 5.

[72] See Louis Kaplow & Carl Shapiro, *supra* note 41, at 10.

[73] FTC v. Staples, 970 F. Supp. 1066 (D.D.C. 1997).

As a result, the U.S. Department of Justice and the Federal Trade Commission have deemphasized market definition.[74] In their joint Commentary on the Guidelines they argued that "market definition is not isolated from the other analytic components in the Guidelines. The Agencies do not settle on a relevant market definition before proceeding to address other issues." In effect they allow for the possibility that they will analyze the competitive effects of the merger first and then construct a market in which those competitive effects would occur.

The chief economists of the U.S. Department of Justice and the Federal Trade Commission have gone farther in a paper they wrote shortly before assuming their current positions.[75] Farrell and Shapiro argue against relying on binary market definition and the use of concentration measures for evaluating mergers. As an alternative screening device they propose a measure (based largely on the same economic considerations that underlie critical loss test and diversion ratios) of whether the contemplated merger would place an upward pressure on price. In the case where the merging firms are symmetric one version of the formula is

$$(8) \qquad D_{xy}m_x - E_x(1 - m_x) > 0$$

E_x is the fraction by which marginal cost would decline as a result of the merger. Symmetry means that the margins, diversion ratios and efficiencies are the same for both merging firms. The left-hand side is a measure of the "upward pricing pressure" from the merger. Under their approach the agency would adopt a default assumption concerning the

[74] See William Baer & Deborah Feinstein, *Changing Emphasis: How Whole Foods Advances the FTC's Efforts to Transform Merger Litigation*, GLOBAL COMPETITION POL'Y, Sep. 1, 2008, at 9.

[75] See Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, (UC Berkeley, Competition Policy Center, Institute of Business and Economic Research, 2008) *available at* http://escholarship.org/uc/item/8z51b1q8 Joseph Farrell & Carl Shapiro, *supra* note 5.

likely efficiencies resulting from mergers; as an example they use 10 percent in their paper. As a practical this approach results screening mergers based diversion ratios and margins. The agency invests resources in investigating the merger further only if these are "high enough" based on whatever default efficiency level is assumed by the agency. For example, with a diversion ratio of .4, a margin of .5, and efficiency of .1 the left hand side is .15 and therefore the agency would consider the merger further; if on the other hand the diversion ratio was .2 and the margin was .3 the left hand side would be -.01 and the merger would not be considered further.

D. The Standoff with the Courts

The U.S. Department of Justice and the Federal Trade Commission have made several attempts to downplay market definition and focus mainly on competitive effects.[76] The *Whole Foods* case provides a good indication of the where economists, the authorities, and the courts stand on market definition in the case of mergers. Whole Foods wanted to buy Wild Oats. They are both premium natural organic supermarkets. They sell the similar array of products as traditional supermarkets but, in some cases, sell a natural organic variant in place of usual products. The FTC concluded that the merger would result in raising prices largely because the two stores were closer competitors to each other than they were to other supermarkets. The FTC submitted evidence that Whole Foods lost more to Wild Oats than did supermarkets when a Wild Oats entered and econometric evidence that Whole Foods earned higher margins in markets in which it did not face

[76] See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N (2010), *supra* note 6, Section 4.

competition from Wild Oats. It became apparent on appeal that the FTC believed that market definition was at best a distraction from its findings on competitive effects.

The FTC sought a preliminary injunction. At the lower court level market definition was the determinative issue. As the District Court judge observed:[77]

> [If] the relevant product market is, as the FTC alleges, a product market of "premium natural and organic supermarkets" consisting only of the two defendants and two other non-national firms, there can be little doubt that the acquisition of the second largest firm in the market by the largest firm in the market will tend to harm competition in that market. If, on the other hand, the defendants are merely differentiated firms operating within the larger relevant product market of "supermarkets," the proposed merger will not tend to harm competition.

The judge found the consumers could readily turn to other supermarkets in the face of a price increase by the premium natural organic supermarkets. As a result he defined a market that consisted of all supermarkets and denied the preliminary injunction.

The FTC appealed. One of its grounds was that the lower court had erred in making market definition a threshold question. In a split 2-1 decision, the D.C. Circuit first took the FTC to task for advancing this claim.[78] According to Judge Brown:[79]

> Inexplicably, the FTC now asserts a market definition is not necessary in a § 7 case, Appellant's Br. 37–38, in contravention of the statute itself, *see* 15 U.S.C. § 18 (barring an acquisition "where in any line of commerce . . . the effect of such acquisition may be substantially to lessen competition") … The FTC

[77] FTC v. Whole Foods Mkt., Inc., 502 F. Supp. 2d 1, 8 (D.D.C. 2007).

[78] The opinion of the court was delivered by Judge Brown. Judge Tatel delivered an opinion that concurred that the district court erred and Judge Kavanaugh a dissenting one.

[79] FTC v. Whole Foods Mkt., *supra* note 7, at 875.

> suggests "market definition . . . is a means to an end—to enable some measurement of market power—not an end in itself." Appellant's Br. 38 n.26. But measuring market power is not the only purpose of a market definition; only "examination of the particular market—its structure, history[,] and probable future—can provide the appropriate setting for judging the probable anticompetitive effect of the merger." *Brown Shoe*, 370 U.S. at 322 n.38.

The D.C. Circuit then examined the lower court's analysis of market definition. The two judges in the majority argued that the lower court had not adequately considered the possibility of a submarket of consumers who did not see regular supermarkets as possible substitutes for premium natural organic supermarkets. According to Judge Brown,

> In sum, the district court believed the antitrust laws are addressed only to marginal consumers. This was an error of law, because in some situations core consumers, demanding exclusively a particular product or package of products, distinguish a submarket. The FTC described the core PNOS customers, explained how PNOS cater to these customers, and showed these customers provided the bulk of PNOS's business. The FTC put forward economic evidence—which the district court ignored—showing directly how PNOS discriminate on price between their core and marginal customers, thus treating the former as a distinct market.

Both he and Judge Tatel endorsed the submarket approach from *Brown Shoe*.[80]

Despite the FTC's desire to focus on competitive effects, market definition became the central focus of the *Whole Foods* case as it wound its way through the courts. The

[80] Brown Shoe Co., Inc. v. United States, 370 U.S. 294 (1962).

district court said as much as did Judge Tatel who concurred in the decision of the D.C. Circuit. [81] The courts felt they had to choose between two extremes: either the regular supermarkets competed so much with the premium natural organic supermarkets that they were essentially interchangeable and therefore in the same market; or the premium natural organic supermarkets were not interchangeable for some set of customers and therefore in different markets than the regular supermarkets. The courts could not consider the possibility the regular supermarkets and the premium natural organic supermarkets were imperfect substitutes and examine whether the regular supermarkets would, or would not, provide a sufficient competitive constraint. More importantly, the analysis of market definition was ill suited to helping assess the competitive effects of the proposed merger. As Farrell and Shapiro note:[82]

> Whether or not the merger between Whole Foods and Wild Oats was anticompetitive, the market definition inquiry addressed that question at best indirectly. Only clumsily could it ask how strongly Whole Foods and Wild Oats were differentiated from traditional supermarkets. To this key question, it was open to only two answers: either they are so strongly differentiated that they are (almost) their own separate market, making it a merger (almost) to monopoly, or they are so weakly differentiated that one should treat them as two rather small players among all supermarkets. Neither answer seems a good way of expressing substantial-but-not-overwhelming product differentiation.

[81] "I agree with the district court that this "'case hinges'— almost entirely—'on the proper definition of the relevant product market,'" for if a separate natural and organic market exists, "there can be little doubt that the acquisition of the second largest firm in the market by the largest firm in the market will tend to harm competition in that market." FTC v. Whole Foods Mkt., Inc., *supra* note 7, at 883.

[82] Joseph Farrell & Carl Shapiro, *supra*, note 74.

V. MARKET DEFINITION, ERROR COSTS, AND THE CURSE OF FALSE PRECISION

Market definition would not be so important if it were not so important. Any analysis of business practices has to start with an understanding of the competitive landscape. That is largely what market definition is all about. The battle over the contours of the landscape, however, often determines who wins the war. The reason is simple. Courts use market definition to calculate market-share "tests". Defendants who convince the courts to load more substitutes into the market sail smoothly into a safe harbor by making their shares small. Plaintiffs who convince the courts to exclude more things get the wind behind their sails for the race to the finish line: they establish market power and remove from consideration potential competitive constraints that could affect the analysis of competitive effects. As we saw above Whole Foods can consummate its merger if the courts are convinced to look at a landscape that includes all supermarkets while the FTC can block the merger if the courts look only at Whole Foods and Wild Oats.

This section looks at the accuracy of market definition and the costs that ensue when the courts get the boundaries wrong. The Supreme Court has recognized the importance of error costs in several landmark antitrust decisions and has modified judicial rules as a result of finding that they were likely to result in costly mistakes.[83] In Part A we introduce the error-cost framework and apply it to market definition. Then, in Part B, we consider the error risks for the traditional approach taken by the courts to market definition and market power, which focuses heavily on the interchangeable of products and the use of market shares. We turn in Part C to the prospects of errors for the hypothetical monopoly test and its various empirical implementations. Our conclusion is that using

[83] See Matsushita Electric Industrial Co, Ltd v Zenith Radio Corp, 475 US 574 (1986), Brooke Group Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209 (1993), Verizon Communications Inc v Law Offices of Curtis V. Trinko, *LLP*, 540 US 398, 407 (2004) and Pac. Bell Tel. Co. v. LinkLine Commun's., Inc., 129 S. Ct. 1109 (U.S. 2009).

market definition analyses to draw hard boundaries and to infer market power from shares based on those boundaries, results in significant and unnecessary error an antitrust analysis.

A. Error Costs

The error-cost framework has become the backbone of American antitrust analysis. It recognizes that when imperfect human beings base decisions on imperfect information they make mistakes and that those mistakes have costs. There is no way to avoid errors. But we can devise rules that help us make the decisions that maximize our well being net of the costs of making mistakes. In developing these rules we need to take the likelihood and cost of errors into account. False positives result when a rule, or test, finds that the subject has the condition when in fact they do not. False negatives result when a test finds that the subject does not have the condition when in fact they do. Both errors lead to costs. Judge Richard Posner first applied error-cost analysis, which is based on decision theory, to the law in 1973.[84] Judge Easterbrook pioneered its application to antitrust rulemaking in his classic article on predatory pricing.[85]

The Supreme Court hinted at the error-cost framework in dismissing the predatory pricing claims against 21 Japanese companies. It noted "mistaken inferences in cases such as this one are especially costly, because they chill the very conduct the antitrust laws are

[84] See Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUDIES 399 (1973).

[85] See Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX L. REV. 1 (1984); Frank H. Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. CHI. L. REV. 263 (1981).

designed to protect."[86] In *Brooke Group* the Court placed it conclusions in *Matsushita* more explicitly in the error cost framework:[87]

> As we have said in the Sherman Act context, "predatory pricing schemes are rarely tried, and even more rarely successful," *Matsushita*, *supra*, at 589, and the costs of an erroneous finding of liability are high. "[T]he mechanism by which a firm engages in predatory pricing--lowering prices--is the same mechanism by which a firm stimulates competition; because `cutting prices in order to increase business often is the very essence of competition . . . [;] mistaken inferences . . . are especially costly, because they chill the very conduct the antitrust laws are designed to protect.' " *Cargill*, *supra*, at 122, n. 17 (quoting *Matsushita, supra,* at 594). It would be ironic indeed if the standards for predatory pricing liability were so low that antitrust suits themselves became a tool for keeping prices high.

In *Brooke Group* the Court required that plaintiffs establish the likelihood that the defendant would recoup allegedly predatory loses. This rule change made it less likely that courts would wrongly condemn pro-competitive low pricing. Other decisions have followed this approach.[88]

The Supreme Court has invoked the error-cost framework mainly to limit "false positives" in which defendants lose even though their actions are pro-competitive. The framework itself does not require that result.[89] When anticompetitive actions are frequent, false positives uncommon and cheap, and false negatives are infrequent or expensive the

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[86] Matsushita Electric Industrial Co, Ltd v Zenith Radio Corp , *supra* note 83, at 594.

[87] See Brooke Group Ltd. v. Brown & Williamson, *supra* note 83, at 226.

[88] See Verizon Communications Inc v Law Offices of Curtis V. Trinko, *LLP*, *supra* note 83, Pac. Bell Tel. Co. v. LinkLine Commun's., *supra* note 83 and Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co., 549 U.S. 312 (U.S. 2007).

[89] See David S. Evans, *Why Different Jurisdictions Do Not (and Should Not) Adopt the Same Antitrust Rules*, 10 CHI. J. INT'L L. 161 (2009) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1342797.

error-cost framework implies that businesses should face very high hurdles for defending those actions.[90] Hard-core horizontal price fixing is *per se* unlawful because the courts believe the benefits are seldom large and the cost of allowing price fixing is significant.[91] If the courts developed more accurate tests of anticompetitive behavior, perhaps because of advances in economics, or if businesses developed more egregious or hard-to-detect methods for anticompetitive exclusion, the error-cost framework would imply that the courts should focus more on limiting false negatives. Academics whose views span the spectrum on the desirable vigor of antitrust enforcement advocate the application of the error-cost framework to analyzing antitrust rules.[92] Jonathan Baker for example has argued for a stricter approach to monopolies because the failure to detect anticompetitive behavior by a monopolist can lead to reduced innovation and therefore significant welfare losses.[93]

Market definition can result in mistakes in the outcome of antitrust matters largely because it affects the information that is considered in subsequent steps of the analysis. The seriousness of the errors depends on the interaction between analyses of market definition, market power, and competitive effects. At the market definition stage the court decides whether a demand or supply-side substitute is either in or out of the market. That could result in including a product that does not provide a significant competitive constraint, or excluding a product that does provide a significant competitive constraint.

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[90] See David S. Evans, *Economics and the Design of Competition Law* in ISSUES IN COMPETITION LAW AND POLICY (W. Dale Collins ed. 2008) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=827465..

[91] See KEITH N. HYLTON, *supra* note 51, at 116.

[92] See, for example, C. Frederick Beckner III & Steven C. Salop, *Decision Theory and Antitrust Rules*, 67 ANTITRUST L. J. 41 (1999); David S. Evans & Jorge A. Padilla, *Designing Antitrust Rules For Assessing Unilateral Practices: A Neo-Chicago Approach*, 72 U. Chi. L. Rev. 73 (2005) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=580882.

[93] Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L. J. 575 (2007) *available at* http://ssrn.com/abstract=962261.

The courts typically rely on market shares as one way, and sometimes the main way, to assess market power. Consider the finding that the market that consists of products **x**, **y**, $\mathbf{z_1}$ but not $\mathbf{z_2}$**.** The market power of **x** is effectively measured by

$$(9) \quad S_x = \frac{q_x}{q_x + q_y + q_{z_1}}$$

The quantities could be measured by units sold or revenue earned.[94] Product $\mathbf{z_2}$ has been excluded and therefore effectively receives a weight of 0 in the share calculation. The magnitude of the competitive constraint resulting from a product included in the market is measured through its inclusion in the denominator of the share for S_x. The inclusion of a product that is not a significant constraint inflates the denominator of the share measure for the product under consideration and thereby understates market power. The exclusion of a product that is a competitive constraint overstates market power by making the denominator too small.

There is a further potential source of error at this point. The share calculations are based on the assumption that quantity or revenue is a proxy for the competitive constraint that results from a substitute. That may not be the case. For example, product $\mathbf{z_1}$ may have a larger share than product **y** but its customers may be less likely to switch to product **x** than would the customers of product **y.**[95] Although the courts may consider factors other than market share in considering market power they do not consider demand substitutes that have been excluded at the market definition stage and they generally ignore demand substitutes that have been included at the market definition stage. Thus market definition can result in false positives (finding significant market power for a firm that lacks it) or

[94] Revenue is usually the preferable measure and has the merit that it implicitly takes some quality differences into account and in a very crude way adjusts for product differentiation.

[95] The variation in within-market substitution is ordinarily ignored in traditional market definition analysis.

false negatives (not finding significant market power for a firm that has it) at this stage. Both errors have material impacts on the results of the case. A false negative result leads to a win for the defendant and in some cases false positive result almost guarantees a win for the plaintiff.

Mistakes in market definition also affect the analysis of competitive effects. When a substitute is excluded from the market the court usually does not consider it further in assessing the ability and incentive of the party under consideration to engage in a practice that is anticompetitive. Alternatively, by wrongly including a substitute the court may overstate the constraints that would limit a defendant, for example, from profitably excluding a rival. The next two parts of this section consider the extent to which major methods of market definition are likely to make mistakes.

B. Hard Boundaries and Market Shares in the Courts

The traditional approach to market definition lacks defining principles when it must deal with differentiated products. Products differ in their degrees of interchangeability and the magnitudes of the cross-elasticities of demand. Suppose the defendant proposes that product $\mathbf{z_2}$ is a substitute for product **x** that is the main focus of the case. The jurisprudence has not developed any meaningful guidance for telling a judge, or a jury, the degree of interchangeability or cross-elasticity of demand that would warrant the inclusion of that candidate product in the market. That absence of guidance is reflected in the common decision by the parties to advocate wildly divergent positions.

We would therefore expect that the traditional approach would be quite prone to error. The battle may take place over extreme positions. Depending on which party is more persuasive the court of the jury may include products that pose no competitive constraints in the market or exclude products that pose significant competitive constraints from the market. There is no apparent reason to expect that false positives or false negatives are more likely.

C. The Hypothetical Monopolist Test

The hypothetical monopolist test was designed to provide guiding principles based on economics for market definition. It adopts an operational definition for deciding whether products provide strong enough competitive constraints to be included in the market. If product $\mathbf{z_2}$ would prevent a hypothetical monopolist over **x**, **y,** and $\mathbf{z_1}$ from raising its price by 5 percent or more that product must be strong substitute; it should therefore be included in the market. If product $\mathbf{z_2}$ would prevent not a monopolist over **x**, **y,** and $\mathbf{z_1}$ from raising its price by 5 percent or more then that product is not a serious competitive constraint; it should therefore be excluded. This algorithm can in principle lead the antitrust analyst to a market that includes all of the demand-side substitutes that are important.

This test was seen as a major methodological advance when it was introduced. Over time it has become apparent that it is hard to implement reliably and it tends to lead to markets that seem implausibly narrow as we discuss below.

1. Empirical Implementations of the Hypothetical Monopolist Test

Critical loss analysis is the major method used in practice to implement the SSNIP test. To determine the critical loss it is only necessary to know the profit margin for the products in question. For the economic theory under which the critical loss test has been derived that profit margin should reflect the incremental profit realized from the change in output over the time period contemplated by the test. The SSNIP test envisions a small increase in price such as 5 percent. With a demand elasticity of 2.0 (which would imply a 50 percent profit margin based on the Lerner Index) a 5 percent change in price would result in a 10 percent change in output. The SSNIP test also envisions that the change in price would take place over a time period of about a year. As a result the estimated incremental profit margin for the purpose of the test should pertain to a small but significant—probably 10 percent or more—change in output over about a year.

Analysts often use the operating margin for a company's product to estimate the price-cost margin for the critical loss analysis. That operating margin generally equals the average difference between revenue and variable costs for the product. It therefore does not necessarily estimate the *incremental* margin except in the case where there are constant returns to scale.[96] It also does not necessarily estimate the *incremental* margin for a relatively large increase in output over a year. For a 10 percent change in output over a year for example we would expect that fixed costs such as marketing and advertising would change as well. It is possible to estimate the correct metric but in practice that may be difficult.

Conceptually, the critical loss analysis requires an estimate of the incremental price-cost margin for every product that is considered for the hypothetical monopolist test. Two problems arise. It is often difficult to obtain these data. The parties to a merger would not

[96] If there are diseconomies of scale marginal cost is higher than average variable cost which is lower than average total cost.

be able to obtain them in most cases. The authorities could but would have to identify and collect these data for all products to be considered and then estimate the correct incremental price-cost margin for each. It may be appropriate in some cases to assume that all firms have similar margins but in many cases, especially when the products are differentiated, there may be sound reasons to expect that the margins will differ across firms.

A significant problem in practice involves estimating actual loss. This calculation is often straightforward in the case of two firms. It is possible to estimate the actual loss from a small but significant price increase from diversion ratios for two products produced by the two firms. Company records on wins on losses for their sales teams, bid results, or market studies sometimes provide estimates of diversion. Under some simplifying assumptions this information can be used to determine whether a hypothetical monopolist consisting of these two firms would raise price by 5 percent or more (all else equal). This calculation is equivalent, to a first approximation, to assessing whether a merger of these two firms would have unilateral effects. Things become more complicated and conjectural as the market is expanded out beyond two firms. Then it is necessary to estimate the extent to which the sales of a hypothetical merger of multiple firms would be diverted to other firms in the event of a price increase. Unlike the two-firm cases this diversion estimate cannot be read directly from historical data. One needs to estimate the extent to which sales would be diverted from each hypothetical monopolist considered to the next product considered for inclusion. The hypothetical monopolist consists of several firms under one roof; the analyst needs to assess how the sales would be allocated among these firms and the prices set since that will determine the diversion to the next firm considered for inclusion.

Implementing actual and critical loss analysis generally requires making an assumption about the shape of the demand schedules around the price and quantity levels being considered. Over the years it has become apparent that the results of the analysis are highly dependent on what is assumed about this shape which among other things determines the extent to which cost changes are passed through to consumers.[97] A common assumption is that the demand schedule can be approximated by a straight line at the equilibrium. For small changes that is mathematically quite sensible. Unfortunately, a 5 percent change in price (and a larger change in quantity ordinarily) is not a small change. The result of the hypothetical monopolist test depends on the curvature of the demand schedule. For a unilateral effects analysis involving MCI and Sprint, Froeb et al. found that the estimated price effect was seven times greater using a constant-elasticity demand schedule (where the log of quantity is a function of the log of price) than using a linear demand schedule (where quantity is a linear function of price).[98] The curvature of the demand schedule is often difficult to determine for a single firm and more so as we consider hypothetical combinations of firms.[99]

2. The Plausibility of the SSNIP-Based Markets

The SSNIP test as it is implemented under the merger guidelines asks a quite narrow question. To see this it helps to focus on a hypothetical monopolist consisting of two firms that seek to merge. In this case the market definition question and the unilateral effects questions are similar. The SSNIP test asks whether single owner of these two firms would

[97] This issue is related to the degree to which a firm will "pass-through" a cost increase to consumers. See E. Glen Weyl & Michal Fabinger, *Pass-Through as an Economic Tool* (2009) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1324426.

[98] Luke Froeb, Stephen Tschantz & Gregory Werden, *Pass-Through Rates and the Price Effects of Mergers*, 23 INT'L J. INDUS. ORG. 703 (2005).

[99] See generally E. Glen Weyl & Michal Fabinger, *supra* note 97.

have the ability and incentive to increase price. Assuming that the products of these two firms are substitutes, and setting efficiencies aside, the answer to this question is always that the merger would result in an increase in price. Before the merger an increase in price would result in sales and profits being lost to the competing product while after the merger an increase in price would result in these sales profits being captured by the combined firm. If each firm is maximizing profit before the merger the fact that they internalize these losses after the merger means that they have an incentive to raise price.

The theoretical prediction that mergers inevitably raise price does not seem to accord with reality. Mergers take place all the time in the economy and there is no evidence that they lead to inexorable price increases. Mergers result in efficiencies, such as scale economies, that could offset these predicted price increases. Other changes in the market—such as competitive responses including product repositioning by other firms discourage merged firms from raising prices or defeat price increases that are tried. Competition authorities do not in fact take this theoretical prediction seriously and rarely block mergers.[100]

In implementing the hypothetical test it is possible to "adjust" for these ignored factors by increasing the size of the price increase required for finding that a price increase is significant. By choosing 5 percent the authorities have already afforded a margin of error. However, there is no economic basis for selecting 5 percent as the "fudge factor" nor is there any reason to believe that the fudge factor should be the same across market circumstances.

When firms have relatively high price-cost margins the SSNIP test will often find markets that "seem" quite narrow. As mentioned earlier the price-cost margins that can

[100] Between 1999 and 2008 almost 23,000 merger actions were filed with the FTC/DOJ; of these, 309 saw some sort of enforcement action thus representing an enforcement rate of about 1.3 percent. See FTC Competition Enforcement Database, http://www.ftc.gov/bc/caselist/merger/index.shtml; U.S. Dep't of Justice, Antitrust Division, Workload Statistics, http://www.justice.gov/atr/public/workstats.pdf and FTC, Bureau of Competition: Annual Competition Enforcement Reports, http://www.ftc.gov/bc/anncompreports.shtm.

support competitive firms depend on the level of fixed costs incurred when average variable costs are not increasing. Firms that have relatively high fixed costs must have relatively high margins to fund those costs. There is no necessary relationship between the price-cost margin and whether the firm can earn a supracompetitive profit.[101] Farrell and Shapiro explain the issue nicely in the context of their analysis in which, for the quote below, *A* reflects aggregate diversion for the hypothetical monopolist and *s*=.05 reflects the price increase:[102]

> Proposition 1 implies that a seemingly narrow group of products will often form a market according to the Guidelines. With the standard SSNIP of s = .05 and with a moderate margin of m = .45, a group of products forms a market if $A \geq 0.1$. In many intuitively defined "industries," the Aggregate Diversion Ratio would be far higher, so narrower markets may well exist within the industry. For instance, if the price of one model, or brand, of cars were to rise by a SSNIP, quite a few customers would no doubt substitute away—but we would expect that most of them would substitute away to some other car. Thus, if gross margins are about 45 percent, there would be a product market considerably narrower than "cars." For example, if 20 percent of BMW customers would substitute to Mercedes or Audi following a SSNIP by BMW, and conversely, then the hypothetical monopolist test suggests that "German luxury cars" would be a market.

[101] See ANTITRUST LAW, *supra* note 1, at 115-16 and Richard Schmalensee, *supra* note 51, at 973.

[102] See Joseph Farrell & Carl Shapiro, *supra* note 74, at 5.

It is also possible, of course, that the Mercedes 500 series and the BMW 740 Series—their respective large luxury models—could form a market as well.[103]

The issue is not with that math. Within the narrow construct of the question being asked it could well be that the correct answer is that a hypothetical monopolist over a seemingly narrow set of products would have the incentive to raise price. The problem is that the SSNIP test provides a very narrow view of the competitive landscape. It assumes away at the market definition stage many relevant competitive constraints with a promise, under the guidelines, that they could be considered in the analysis of competitive effects.

At least at the market definition stage of the inquiry, the hypothetical monopolist test has the potential of excluding demand-side substitutes that could constrain market power. Unlike the court's test it is biased towards false positives. Not surprisingly the courts have been reluctant to rely on markets based on this test. As Farrell and Shapiro observe:[104]

> When gross margins are substantial, [the SSNIP] algorithm often leads to relatively narrow markets. But the merging parties (who typically argue for broader markets, in which their shares are smaller) can point to some competition between their products and products outside a Guidelines market or other relatively narrow proposed market. Courts have been inclined to define markets relatively broadly, including all "reasonable substitutes" to the products offered by the merging firms. Thus the agencies have not always succeeded when they have gone to court advancing relevant markets based on the algorithm from the Guidelines.

[103] I would speculate that the antitrust authorities often do not advance the narrowest market that they could under the hypothetical monopolist test because such market would seem so grossly implausible. That is no defense of the test and in fact suggests that it can invoked to justify any narrow market that one would like to advance.

[104] *Supra*, note 74.

D. Hard Boundaries and Errors

It is not possible to design a method for drawing hard market boundaries that produces few false positives or false negatives for the simple reason that hard market boundaries seldom exist in the real world of business. It is therefore hardly surprising that no one has developed a satisfactory method of market definition or that the two leading approaches can result in significant errors. Those who search for rigorous market definition are often chasing a chimera. It is time to abandon hard market boundaries and market share divinations.

VI. A PROPOSED TRUCE BETWEEN COURTS, AUTHORITIES AND ECONOMISTS

The current process of market definition provides many great ingredients for cooking an antitrust decision. Locating demand and supply-side substitutes is important for understanding the competitive constraints that determine market power and provide information for analyzing competitive effects. No serious economic analyst would want to skip this inquiry into substitutes. It is true that one could analyze the competitive effects of the merger by examining only the diversion of sales between the two firms along with a few other economic facts about these two companies. But that would involve doing economic analysis with blinders on. Diversion ratios and other parameters used in the analysis of competitive effects are invariably measured with error because neither data nor the techniques for making inferences from data are precise. It is therefore important to consider other information that could be used to check an economic analysis of competitive effects. In

addition, a myriad of factors outside the purview of the two firms in the merger could affect the likelihood that a price increase would occur. The same considerations apply in monopolization and other antitrust cases. One cannot conduct a reliable assessment whether a firm has market power, or whether a practice has anticompetitive effects, without a full appreciation of competitive constraints including the demand and supply-side substitutes that are often considered as part of the market definition inquiry.

A. First Pillar of the Truce: Market Comes Definition First

The market definition examination should therefore remain the first step in merger and antitrust inquiries. This inquiry should, however, be opened up and expanded so that it provides a fuller context for understanding the panoply of competitive constraints—or lack thereof— that might affect the ability and incentive of the subjects of the inquiry to harm consumers. Judge Vaughn Walker, for example, has argued that it would be useful for lawyers for the parties to provide more history background:[105]

> All companies and industries have a history and background. Companies and industries don't just happen; they originate, grow, and develop. The shape and habits of companies and industries are, at least in part, owed to their pasts. In most instances, these histories are rich in narratives. All companies of any size and certainly any industry of any scope will admit a past that is replete with sagas of accomplishment, success, and failure.

[105] See Vaughn Walker, *Merger Trials: Looking for the Third Dimension*, Competition Policy International, Volume 5, Number 1, Spring 2009. Also see *supra* note **Error! Bookmark not defined.**, at 43.

Many businesses operate in complex ecosystems. Their success depends on providers of complementary products as well as providers of substitutes and on a variety of vertical relationships. Reducing competitive constraints these businesses face to a list of demand and supply-side substitutes can eliminate many important nuances about the environment in which these businesses operate. A number of industries, including many businesses that involve software or the web, are centered on multi-sided platforms (also known as "two-sided markets") that serve as intermediaries between several groups of customers and providers of complementary products. These relationships are often best described through the narrative form suggested by Judge Walker than through quantitative measures such as shares or other mechanical devices.[106]

Market definition in this form would provide the historical and current background for understanding the panoply of competitive constraints that are relevant for analyzing the practices at hand. This exercise would ordinarily involve calculations for revealing the relative significance of businesses in various competitive dimensions. In some cases the most convenient way to express these calculations would involve shares. In *Whole Foods*, for example, a trier-of-fact or other decisionmaker might want to know the share of Whole Foods and Wild Oats among supermarkets that specialize in premium natural organize foods, among large supermarket chains more broadly, and perhaps even among a broader category of grocery sellers. The other aspects of competitive constraints would also be considered. This market inquiry should for example look at the ability of firms to reposition their products and therefore change the patterns of substitution. Of course, the parties to the dispute would provide evidence and testimony on these issues so the court could assess the weight to accord to various competitive constraints. We would not

[106] See David S. Evans, *supra* note 39, at 35.

exclude the possibility that the parties could advance and the court could pick a hard market boundary. But it should not be insisted upon.

This approach to market definition is much broader, and more tied to assessing competitive constraints, than is the current approach. The U.S. Department of Justice/FTC Horizontal Merger Guidelines, for example, only consider demand-side substitution in the analysis of market definition. Other factors, such as product repositioning and entry, are considered mainly in assessing competitive effects. This approach, to the extent it is followed, has the effect of setting up a presumption that the chosen market defines the arena of competition and the main sources of competitive constraints. It can, in practice, shift the burden to the merging parties to demonstrate that constraints beyond demand-side substitutability are important. Similarly, in Sherman Section 2 cases, the focus on demand and supply-side substitutability can result in a market that excludes many other sources of competitive constraints. While in principle these other factors could be raised at other points in the analysis the hard market boundaries chosen has the effect of setting up presumptions for the remainder of the case.

B. The Second Pillar of the Truce: Market Boundaries Are Soft

The courts should not, however, insist on establishing hard market boundaries when the facts of the industry do not support this. Most of the problems with market definition have come from an effort to identify something that seldom exists in real-world markets. For building their narratives of a case the courts could still talk about markets. In some cases the courts might find that a group of products are quite substitutable and that other products are relatively weak substitutes. They could therefore comfortably talk about a market for those products and note the existence of imperfect substitutes outside of that

market. In other cases the courts may find that it is more difficult to draw a line. Even here they could make a preliminary determination that a group of products forms a market so long as they note that other products closely substitute. By dropping the use of hard market boundaries the courts avoid having to make a firm decision on whether to consider certain products near the boundary either in or out of the market. They also reduce the incentives of the parties to argue so vigorously about the precise placement of the boundary.

The courts should also not place significant reliance on market shares. As noted earlier there is no basis in economics for using market shares, as a general matter, by themselves to draw inferences about the presence or significance of market power. Tentative market shares could be used to establish the relative importance of competitors, to help describe the competitive landscape, and as one of several sources of information for assessing competitive constraints.

It is true that many antitrust cases since *Alcoa* have insisted on the determination of hard market boundaries and relied on shares. But as mentioned earlier the statutes do not require this exercise. The courts have moved away from antitrust precedent when it has had good reason to doubt the intellectual rigor of its previous cases.[107] There seems to be far more consensus among economists on the unreliability of drawing hard boundaries and using market shares in product differentiated markets than the circumstances under which vertical restraints such as resale price maintenance should be lawful.

The U.K.'s Office of Fair Trading decision in the proposed merger of the between Amazon and LOVEFiLM's online DVD rental subscription businesses provides an example of drafting a decision that does not take a hard position on market boundaries. Amazon and LOVEFiLM were the only providers of online DVD rentals in the UK. There

[107] For recent cases, see Leegin Creative Leather Prods. v. PSKS, Inc., *supra* note 9, Verizon Communications Inc v Law Offices of Curtis V. Trinko, *supra* note 83, and State Oil Co. v. Khan, 522 U.S. 3 (1997).

were many other channels by which consumers could obtain film and television video content. Consumers could rent DVDs at bricks and mortar stores such as Blockbuster, buy DVDs at places such as WHSmith, watch on pay-per-view channels or specialty film channels provided with their cable packages, download movies over the internet, or watch movies and television shows on free television stations.

None of these alternatives is a perfect substitute for online DVD rentals. A traditional market definition approach would largely determine the case. If the market were defined as online DVD rentals then the parties would have a 92 percent share (effectively a merger to monopoly) while if the market were defined to include all the alternatives listed above the merged firm would have only a 9 percent share. Rather than making a decision on a firm market boundary the OFT reported this information, which was obviously helpful in understanding the marketplace, but did not take a position on the market boundary. They noted that a critical loss analysis was consistent with a narrow market but that the data showed that this conclusion was a close call and that the presence of competition from other channels made that the conclusion that there was a narrow market open to debate.

In this particular matter, the OFT took an approach that more or less followed that suggested by Farrell and Shapiro.[108] They used a diversion ratio analysis submitted by the parties to assess the whether there was evidence that the merger could raise prices. They found that "[t]aken at face value the illustrative price increases" calculated from the diversion ratios and margins (following equation (7) above)) showed that there was a presumption that the merger could increase the prices based on this evidence.[109] However, they then considered extensive evidence from the files of the companies that demonstrated that Amazon's online DVD rental business was a relatively weak constraint

[108] *Supra*, note 13.

[109] *Supra*, note 13, at para. 41.

on LOVEFiLM and that the merging parties acted as if they faced considerable competition from the other channels including the bricks and mortar stores. The OFT therefore presented a narrative that demonstrated that, in effect, there were enough constraints coming from the other providers of video and television shows that the merged firm would not be able to raise price significantly.

It would seem that U.S. courts should also to be able to write decisions that, as the OFT has done in LOVEFiLM, provide a coherent analysis of whether there is a competitive problem without deciding on hard market boundaries.[110] U.S. courts write many decisions that are not based on establishing bright-line tests. One should be optimistic that the courts could write antitrust decisions without pinning down hard market boundaries and relying on market shares.

C. The Third Pillar of the Truce: Economists Exhibit Care in Identifying and Validating Assumptions

Economics has revolutionized modern antitrust. Supreme Court as well as lower court decisions frequently cite either the economics literature or law review articles that rely on that literature. Many of the modifications in older approaches have resulted from the courts learning from and adopting economic reasoning. Almost all antitrust cases

[110] It is likewise very difficult to see how the market definition approach taken by the U.S. courts, as applied to LOVEFiLM, could have resulted in a sound decision. A U.S. court, following the approach taken by the courts in *Whole Foods*, would have most likely have decided the issue based on a debate over whether there was an online DVD subscription market (the position that would have likely been advanced by a plaintiff) or a broader market for videos and television shows (the position that would likely have been advanced by a defendant) even though neither really captures the relevant market dynamics.

involve economic experts. Nevertheless the courts are sometimes skeptical of economic analysis.[111]

The history of hypothetical monopoly test helps explain why. When first proposed the test sounded like a significant methodological advance. Over the years, economists developed models for implementing the test. Some of these models such as critical loss were quite attractive because they seemed to enable economists to reach conclusions market definition with a relative minimum of data that were often available. However, as with all economic models these were based on assumptions. In our enthusiasm for putting the models to work it took some time to expose these assumptions and to assess their importance. It took a surprisingly long time for economists to focus on such important and obvious assumptions as the actual shape of the demand curve. Twenty years after critical loss analysis was proposed[112] the chief economists of the two U.S. antitrust authorities have proposed, as academic economists, abandoning the hypothetical monopolist test altogether.[113]

Economists need to come to grips with the tradeoffs between false precision and imprecision. Analysis that examines qualitative evidence can seldom yield precise answers. The traditional approach to market definition with its emphasis on the interchangeability of products can at best result in a subjective and impressionistic understanding of demand and supply-side substitutes. It is necessarily imprecise. Analysis that is based on mathematical models and estimated with hard data can yield precise answers such as where to draw a market boundary or the percent by which price will rise—down to many digits after the decimal point— as a result of an action. In practice this precision can be a mirage because it is based on assumptions that may not hold and

[111] See Vaughn Walker, *Merger Trials: Looking for the Third Dimension*, Competition Policy International, Volume 5, Number 1, Spring 2009. Also see *supra* note **Error! Bookmark not defined.**.

[112] See Barry C. Harris & Joseph J. Simons, *supra* note 67.

[113] Joseph Farrell & Carl Shapiro, *supra* note 5.

data that are measured with error. This is false precision. Model and data-based methods that yield precise numerical answers could be more or less reliable, on average, than qualitative methods that do not yield precise numerical answers. Unfortunately, economists, and those who rely on economists, have not invested much in ascertaining the reliability of the techniques. The limited work on estimates of price effects for mergers have not been encouraging.[114]

That does not mean that economists should soften up and forgo the use of math and data. The economics profession has made tremendous progress in understanding product differentiated markets, estimating demand, understanding the nuances of competitive effects through rigorous modeling and data analysis. However, the problem of false precision does have three implications for market definition. First, economists should be more explicit about the assumptions behind their theoretical models and statistical techniques; do more to validate those assumptions as part of their analysis; and evaluate the reliability of data they are using. Second, economists need to do more work on assessing the reliability of tools that they are developing for policymaking. Third, economists should more carefully consider the tradeoff between imprecision and false precision and adopt more qualitative approaches when these are likely to be more informative than highly quantitative approaches.

D. Fourth Pillar: Antitrust Authorities Should Not Go Directly to Competitive Effects

[114] See Orley Ashenfelter et al., *Empirical Methods in Merger Analysis: Econometric Analysis of Pricing in FTC vs. Staples*, 13 INT'L J. ECON. BUS. 265 (2006); Matthew Weinberg, *The Price Effects of Horizontal Mergers*, 4 J. COMPETITION L. & ECON. 433 (2007); MATTHEW WEINBERG & DANIEL HOSKEN, USING MERGERS TO TEST A MODEL OF OLIGOPOLY (FTC 2008) *available at* http://www.ftc.gov/be/workshops/microeconomics/2008/docs/weinberg.pdf. Orley Ashenfelter, Daniel Hosken & Matthew Weinberg, *Generating Evidence to Guide Merger Enforcement*, 5 COMPETITION POL'Y INT'L 57 (2009) and Dennis Carlton, *The Need to Measure the Effect of Merger Policy and How to Do It*, (U.S. Dep't of Justice, Antitrust Division, Economic Analysis Group Discussion Paper 07-15, 2007) *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1075707.

The antitrust authorities should not focus on competitive effects and relegate market definition to an ancillary role as they have done in recent cases and as they seem to have proposed in the 2010 Merger Guidelines. Doing so runs the risk of having tunnel vision in analyzing the possible effects of business practices.

That is particularly likely as the authorities and their economists focus on estimates of unilateral effects based on diversion ratios and margins. While these techniques and data provide a useful source of evidence they are based on numerous assumptions and run the risk of giving the lawyers and economists a false sense of precision. By going directly to effects, the authorities could focus on data analyses without ever looking in detail at the industry, or business ecosystem, in question. They would never see information that would allow them to question the plausibility to the data analyses or assess whether there are countervailing factors.

One could argue that this concern is a straw man because the authorities would ordinarily study the industry in detail as part of any inquiry. In some cases that may well be correct. The OFT in *LOVEFiLM* focused on competitive effects rather than market definition. But they supplemented a data-driven unilateral effects pricing analysis with documentary evidence on the competitive dynamics faced by the merging parties. In other cases, however, one can imagine that the authorities would latch onto evidence of competitive effects based on narrow pricing studies and use that use that to insist that there are no significant competitive constraints.

The advantage of beginning with market definition is that, done properly and without focusing on hard boundaries, it provides an understanding of the business ecosystem and its competitive dynamics and therefore a basis for evaluating the plausibility of evidence on competitive effects.

VII. CONCLUSION

Market definition—in the sense of understanding the environment in which a firm operates—is an important element of antitrust analysis. The courts should not drop it nor should the competition authorities. It provides critical background for understanding competitive constraints that ultimately determine whether the practice at issue will cause the kind of consumer harm that antitrust is designed to prevent. The difficulty with market definition results from two specific problems that can be solved without abandoning what the courts have considered the primary step in antitrust.

The first problem involves drawing hard market boundaries that do not exist in many situations. Product differentiation is the norm of business and as a result products usually substitute along a continuum.

The second problem involves calculating market shares and relying on those shares for triggering safe harbor provisions. There is no basis in economics, as a general matter at least, for drawing hard boundaries or putting so much analytical weight on market shares.

The solution proposed here is to keep market definition but to eliminate the two problems that have made it controversial and subject to derision. Doing so would have no material impact on the ability of courts to collect market definition information and to build this into the narratives of their decisions.