

UNITED STATES V. H&R BLOCK: AN ILLUSTRATION OF THE DOJ'S NEW BUT CONTROVERSIAL APPROACH TO MARKET DEFINITION

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ABSTRACT

Sometimes what appears to be a little, almost imperceptible change can have a huge impact on a policy regime. The recently revised Department of Justice and Federal Trade Commission Horizontal Merger Guidelines contain such a change, as the document recognizes the importance of Critical Loss Analysis in defining a market but introduces a theoretical construct to control the analysis. This approach imposes a structure based on the economist's Lerner index and then applies a specific style of diversion analysis to compute the actual loss to a hypothetical price increase. We show that this methodology almost guarantees narrow markets, a change that could support a very significant increase in the level of merger enforcement. However, we also show how this aggressive policy result depends on specific assumptions that are often not justified. Change these assumptions, and the traditional implications of a Critical Loss Analysis are restored. The recent Department of Justice (DOJ) challenge of H&R Block's proposed acquisition of the TaxACT software is used to illustrate the problem. Unjustified theoretical assumptions allowed the DOJ's expert economist to testify to a narrow market that virtually guaranteed that the merger would be found anticompetitive. In effect, theory, if allowed to control market definition analysis, would significantly reduce the plaintiff's burden of proof and expand the potential for merger enforcement.

JEL: K21; L40

1. INTRODUCTION

Sometimes what appears to be a little, almost imperceptible change can have a huge impact on a policy regime. The recently revised Department of Justice

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and Federal Trade Commission (DOJ/FTC) Horizontal Merger Guidelines (Guidelines or HMGs) explicitly incorporate Critical Loss Analysis (CLA), a technique that has routinely been used by the agencies and the courts for more than two decades, to implement the market definition paradigm of the Guidelines.¹ The Justice Department, however, appears to be pursuing a change in market definition analysis that, although arguably articulated in the new Guidelines, is done in a way that is probably not fully understandable to most antitrust practitioners. This new approach tweaks standard Critical Loss Analysis in a way that substantially reduces the government's burden of proof and potentially results in many more mergers being fully investigated and possibly condemned. In a recently litigated case involving H&R Block's proposed acquisition of TaxACT, the court accepted this analysis and the decision provides an illustration of what may lie ahead if this new approach to market definition becomes standard.² The H&R Block court, at the urging of the Department of Justice's (DOJ's) expert economist, used this new methodology without understanding the controversy surrounding it or its significance.³ As we explain below, the near outcome-determinative nature of this version of CLA may substantially expand the scope of merger enforcement.

The basic HMG market definition algorithm, known as the hypothetical monopolist test, defines a market where a hypothetical monopolist over all of the products in a candidate market can impose a small but significant and non-transitory increase in price (SSNIP). A key component of this test is the identification of how much volume the hypothetical monopolist must lose for the price increase to be unprofitable. Is it 10 percent, 50 percent, 75 percent, or more? If we do not even have a rough sense of the answer to this question, then it is hard to perform the market definition exercise in any kind of rational way. However, the original HMGs provided limited guidance on this score.

As described in 1989 by Barry Harris and Joseph Simons:

This omission has a counterpart in the case law. The Supreme Court has enunciated the standard of "reasonable interchangeability" such that two products are in the same market only if they are reasonably interchangeable The Court has never told us, however, whether products must be interchangeable in 10 percent of their sales, 50 percent of their sales or 75 percent of their sales to be considered in the same market.⁴

In other words, the Court never explained what percent of consumers must be willing to switch to another product in the face of a price increase to require the market to expand to include an additional product or products. This

¹ U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (2010) [hereinafter 2010 Guidelines], available at <http://www.ftc.gov/os/2010/08/100819hmg.pdf>.

² United States v. H&R Block, Inc., 833 F. Supp. 2d 36 (D.D.C. 2011).

³ The court makes clear that although it was briefly made aware of the controversy surrounding this approach, it was presented with no details of the issues and thus could not address the concerns. *Id.* at 64 n.19.

⁴ Barry Harris & Joseph J. Simons, *Focusing Market Definition: How Much Substitution is Necessary?*, 12 J. RES. L. & ECON. 207, 208 (1989).

failure arguably caused the market definition process to be characterized by arbitrary line drawing and gerrymandered markets.

A major benefit of CLA is that it answers the question of how to bound the market in a rational way under both the Supreme Court's reasonable interchangeability standard and the hypothetical monopolist test in the HMGs.⁵ CLA provides a relatively easy method to estimate how much of a volume loss would be necessary to make the hypothetical price increase unprofitable, a percentage we refer to as the Critical Loss (*CL*). The second step in CLA is to predict how much volume would actually be lost, which is known as the Predicted Actual Loss (*PL*).⁶ The third step is to see whether *PL* is greater than *CL*. If so, the price increase is unprofitable, and the boundaries of the market must be expanded.

The new Guidelines state that the estimate of *PL* must be consistent with the margin of the firms in the candidate market, but they do not provide an explanation of how to use the margin data. To a layman, this language might not seem of great moment, but various economists have interpreted it to drastically change the application of CLA.⁷ Instead of asking whether *PL* is greater than *CL*, some economists (including the DOJ's expert in the H&R Block case) advocate using assumptions about the margins and demand conditions to change the inquiry; instead of estimating the actual loss, the analyst would check whether *A* is greater than *CL*, where *A* represents a concept known as the aggregate diversion ratio.⁸ This version of the test is derived from an estimate of *PL* using the Lerner Index, and we refer to it as the Lerner-diversion approach. As we will discuss below, the assumptions used in this Lerner-diversion approach are problematic, and the resulting market definitions may be dramatically narrower than those that would result from the traditional approach. However, this was the technique used by the DOJ's expert economist in the H&R Block case, and although the Court seemed only to rely on it indirectly, the technique appears to have permeated much of the court's analysis. The widespread use of this new approach would dramatically reduce the government's burden of proof and potentially exploit the market-based presumption to successfully challenge a very large universe of mergers.⁹ Such a policy

⁵ See David Scheffman, Malcolm Coate & Louis Silvia, *Twenty Years of Merger Guidelines Enforcement at the FTC: An Economic Perspective*, 71 ANTITRUST L.J. 277, 285–86 (2003).

⁶ The Predicted Loss is also sometimes referred to as the "Actual Loss" or "*AL*."

⁷ See, e.g., Carl Shapiro, *The 2010 Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years*, 77 ANTITRUST L.J. 701, 743–45 (2010).

⁸ Aggregate diversion is defined by adding up the sales lost to all the other firms within the proposed market in response to the imposition of some type of SSNIP by a firm. It is converted into a ratio by dividing by the firm's total loss in sales from the SSNIP.

⁹ Once the plaintiff establishes a concentrated market, the case law defines a rebuttable presumption of a competitive concern. Hence, by weakening the burden of proof on market definition, the revised analysis, if accepted by the courts, would increase the probability that the plaintiff prevails in litigation. See *United States v. Baker Hughes Inc.*, 908 F.2d 981, 982 (D.C. Cir. 1990).

has not been seen since the government's widely discredited antitrust merger enforcement binge in the 1960s.

The remainder of this article is organized as follows. Part II provides a basic description of the market definition test of the Merger Guidelines and the use of CLA to implement that test. Part III describes the Lerner-diversion approach to implementing CLA analysis. Part IV addresses the empirical basis for broadly applying this analysis. Part V provides some simulations to illustrate the potential impact of the Lerner-diversion methodology. Part VI discusses the court's opinion in the H&R Block case as a specific example. Part VII offers a brief conclusion.

II. THE FUNDAMENTALS OF MARKET DEFINITION AND CRITICAL LOSS ANALYSIS

Although one would have never known it at the time, the introduction of the 1982 DOJ Merger Guidelines was a red letter day for market definition. Those Guidelines defined the basic algorithm that has been widely used by the Justice Department, the Federal Trade Commission, and the courts to define markets in merger cases over the last 30 years.¹⁰ Previously, the courts had relied on the concept of "reasonable interchangeability" and "cross-elasticity of demand." Although those concepts were obviously related to identifying substitute products, they did not provide a rigorous way to determine the relevant benchmarks for how much interchangeability was reasonable or how high the cross elasticity had to be to define a market. In other words, the preexisting tools failed to explain where to draw the line separating those products in the market from those outside. This approach often resulted in a system of ad-hoc line drawing, which was widely recognized as frequently producing gerrymandered markets.

The 1982 Merger Guidelines brought rigor to the market definition process by introducing the hypothetical monopolist paradigm to bound the market. They defined a market as:

a group of products such that a hypothetical firm that was the only present and future seller of those products could raise price profitably. That is, assuming that buyers could respond to an increase in price for a tentatively identified product group only by shifting to other products, what would happen? If readily available alternatives were, in the aggregate, sufficiently attractive to enough buyers, an attempt to raise price would not prove profitable, and the "market" would prove to have been too narrowly defined . . .

Taking the product of the merging firm as a beginning point, the Department will establish a provisional product market. The Department will include in the provisional market those products that the merging firm's customers view as good substitutes at prevailing prices. The potential weakness of such a market based solely on existing patterns of supply and demand is that those patterns might change substantially if the prices of the products included in the provisional market were to increase. For this reason, the Department will

¹⁰ See Scheffman, Coate & Silvia, *supra* note 5, at 286–87.

test further and, if necessary, expand the provisional market. The Department will add additional products to the market if a significant percentage of the buyers of products already included would be likely to shift to those other products in response to a small but significant and non-transitory increase in price. As a first approximation, the Department will hypothesize a price increase of five percent and ask how many buyers would be likely to shift to the other products within one year. The Department will continue expanding the provisional market until it satisfies the general profitability standard stated above.¹¹

This algorithm became known as the hypothetical monopolist test or HMT, and it allowed the DOJ to identify the products and firms producing those products that would be necessary to form a profitable cartel (the “hypothetical monopolist”) in order to determine whether the merger under examination had any likelihood of raising prices usually through the facilitation of tacit collusion. The logic for this approach was quite compelling. If a monopolist over a group of products could not profitably raise price, then there would be no need to worry about whether tacit collusion could be successful. If the number of firms in the market were small enough or the concentration high enough to suggest some possible anticompetitive effect, further analysis would be required.

Originally, this test was thought to be purely theoretical and incapable of direct application.¹² The 1982 Guidelines provided no explanation of how to determine when a hypothetical monopolist would be capable of implementing such a price increase, commonly referred to as SSNIP. Instead, the Guidelines expected the analyst to infer the scope of the market from evidence related to buyer’s perceptions, product attributes, pricing patterns, and producer behavior.¹³

With the introduction of Critical Loss Analysis in the late 1980s, however, direct application of the HMT became relatively straightforward and common not only at the antitrust agencies but in the courts as well.¹⁴ CLA is similar to the break-even analyses done every day by businesses throughout our economy. In evaluating a potential price increase, it identifies the volume of sales that would have to be lost in order to make a specific price increase unprofitable. That is, CLA identifies the break-even point by finding the volume level at which the sum of the margins on the sales lost by the hypothetical monopolist equals the additional revenues that the monopolist realizes from the price increase on the sales retained by the hypothetical monopolist.¹⁵

¹¹ U.S. Dep’t of Justice, Merger Guidelines (1982), *reprinted in* 4 Trade Reg. Rep. ¶ 13.102 (CCH) [hereinafter 1982 Guidelines], *available at* <http://www.justice.gov/atr/hmerger/11248.pdf>.

¹² Harris & Simons, *supra* note 4, at 210.

¹³ 1982 Guidelines, *supra* note 11.

¹⁴ Scheffman, Coate & Silvia, *supra* note 5, at 288–99 (citing case law); Gregory J. Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, 71 ANTITRUST L.J. 253, 266–68 (2003) (citing case law).

¹⁵ An alternative Critical Loss Analysis focuses on the profit-maximizing output level associated with a SSNIP. See Michael Baumann & Paul E. Godek, *Could and Would Understood: Critical Elasticities and the Merger Guidelines*, 40 ANTITRUST BULL. 885 (1995). For a linear demand, the two analyses are identical if the relevant SSNIP is cut in half for the profit-maximization model. Because the break-even Critical Loss is easier to implement, it is applied in practice.

Once the break-even point or Critical Loss (*CL*) is identified, the analysis then turns to predicting the loss in volume likely to be caused by the hypothesized price increase; this number is known as the Predicted Actual Loss (*PL*). If more than that break-even volume is likely to be lost (that is, if *PL* is greater than *CL*), then the price increase is unprofitable and more products must be added to the candidate market and the process repeated. *PL* is estimated through a variety of mechanisms, and *CLA* does not dictate any particular one or combination. Courts and the antitrust agencies have historically used econometrics, natural experiments, price correlations, witness testimony, and documentary evidence from buyers and sellers, among other types of evidence, to predict actual loss.

How is the Critical Loss determined? Other than the hypothesized price increase (which is usually 5 percent to 10 percent), the only information required is the margin on the potentially lost volume. The process can be done by trial and error (as illustrated below), or with a very simple formula when the firm’s unit costs are relatively constant. If unit costs vary substantially for the relevant output levels, a slightly more complicated calculation is necessary.¹⁶

An example helps to illustrate the fundamentals of determining the Critical Loss. The second column of Figure 1 assumes we have a product that sells for \$10 and has marginal costs of \$7, which produces a profit of \$3 on the sale of each \$10 product (the margin is 0.3 or 30 percent). If the firms comprising that hypothetical monopolist initially sell 100 units, then a total contribution to profit of \$300 (100 x \$3) is generated. To perform a Critical Loss Analysis,

Potential % Loss in Volume	N/A	10%	20%	25%	30%
Price	10	11	11	11	11
Variable Cost (VC)	-7	-7	-7	-7	-7
Margin (P - VC)	3	4	4	4	4
# of Units Demanded	x100	x90	x80	x75	x70
Profit (Margin x # of Units)	300	360	320	300	280
Added Profit	n/a	60	20	0	-20

Critical Loss = 25 units

$$\text{Critical Loss Formula} = \frac{\% \text{ SSNIP}}{(\% \text{ SSNIP} + \% \text{ Margin})} = \frac{10}{(10 + 30)} = 0.25 \text{ or } 25\%$$

Thus, Critical Loss = 100 x 0.25 = 25 units

Figure 1. Numeric illustration of Critical Loss

¹⁶ Harris & Simons, *supra* note 4, at 214 equation 10; see Malcolm B. Coate & Mark Williams, *Generalized Critical Loss for Market Definition*, 22 RES. L. & ECON. 41 (2007) (containing an example of such analysis).

we hypothesize a 10 percent price increase, which moves the price from \$10 to \$11. Columns three through six illustrate the impact on profits of losing 10 percent, 20 percent, 25 percent, and 30 percent of sales due to the hypothesized 10 percent price increase. Notice for all such cases, that when we move the price to \$11, the margin is \$4 per unit. Starting with a possible loss of 10 percent or 10 units, we see from column three that the hypothetical monopolist would be left with sales of 90 units. Given the \$4 margin per unit, the total contribution would be \$360, which is \$60 more than the original profit. Clearly, the hypothetical monopolist can afford to lose more units and still break even. For a 20 percent loss in volume as depicted in column four, the hypothetical monopolist keeps 80 units, generating a profit of \$320—still more than the original \$300 profit. However, we are getting closer to the break-even point. For a 25 percent loss as depicted in column five, the hypothetical monopolist keeps 75 units. This generates a profit of exactly \$300 (75 units x \$4 margin per unit), the same as the original profit—thus identifying the Critical Loss. For an even higher loss (here 30 units), the profit level falls below \$300, and thus the price increase is unprofitable.

This process is summarized in the simple formula shown at the bottom of Figure 1. This formula can be used to calculate the Critical Loss for the full range of potential margins and price increases.

Table 1 calculates the Critical Loss for margins ranging from 10 percent to 90 percent and for SSNIP values given at 5 percent and 10 percent. With higher values for the Critical Loss, markets will be broader if the SSNIP is set at 10 percent

Notice that throughout this process there was no need to determine: (1) which economic model is most applicable to the industry in question (for example, Bertrand or Cournot), (2) the shape of the demand curve (for example, linear, concave, convex), or (3) anything relating to how much substitution may occur between products or producers in the candidate market. In other words, there is no need to specify an economic model of competition or define a

Table 1. Critical Loss calculations by margin

Margin	5% SSNIP	10% SSNIP
0.9	5.26	10.00
0.8	5.88	11.11
0.7	6.67	12.50
0.6	7.69	14.29
0.5	9.09	16.67
0.4	11.11	20.00
0.3	14.29	25.00
0.2	20.00	33.33
0.1	33.33	50.00

Source: Authors' calculations.

market demand system. CLA is agnostic as to those things and can be applied for any type of economic model, demand curve, or demand system.

III. THE LERNER-DIVERSION APPROACH TO CRITICAL LOSS ANALYSIS

Several economists published articles in 2003 arguing that the standard Critical Loss Analysis was often applied in a manner that was internally inconsistent with textbook economics.¹⁷ They suggested that industries with high margins were unlikely to have relatively elastic demand structures (that is, the Predicted Actual Loss was unlikely to exceed the Critical Loss), because that would contradict a theoretical relationship between the margin and the demand elasticity. This relationship is commonly known as the Lerner Index; it provides that the firm's margin is equal to the inverse of the firm's demand elasticity.¹⁸ Due to the inverse nature of this relationship, it predicts that high margins result in relatively low demand elasticities and, thus, a low Actual Loss. Accordingly, these economists argued that the margin estimate in the Critical Loss Analysis must be consistent with the Predicted Actual Loss conclusion. If the margin were high, the Predicted Actual Loss would be low.

Then theorists took the approach one step further. Under a set of specific demand conditions, these economists explained that the hypothetical monopolist test is met when the aggregate diversion ratio (A) exceeds the Critical Loss (that is, A is greater than CL).¹⁹ Thus, they advocate for changing the basic CLA inquiry from whether PL is greater than CL to whether A is greater than CL . This analysis appears limited to differentiated products, although we understand that some have argued for a broader more general application.²⁰

To understand this new diversion-focused approach better, we need to explore: (1) the applicability and reliability of the Lerner-based analysis, (2) the nature and applicability of the aggregate diversion concept, and (3)

¹⁷ Michael L. Katz & Carl Shapiro, *Critical Loss: Let's Tell the Whole Story*, 17 ANTITRUST 49 (2003); Daniel P. O'Brien & Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST L.J. 161 (2003).

¹⁸ The Lerner index was developed for the monopoly model in 1934 but is now applied more broadly. Abba Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157 (1934).

¹⁹ Joseph Farrell & Carl Shapiro, *Improving Critical Loss Analysis*, ANTITRUST SOURCE (Feb. 2008), available at <http://www.abanet.org/antitrust/at-source/08/02/Feb08-Farrell-Shapiro.pdf>. The Aggregate Diversion ratio defines the percentage of the lost sales to a price increase that are retained by other firms in the proposed market. It is computed by summing the firm-level diversion ratios (d_i).

²⁰ In a homogeneous goods market, aggregate diversion is not readily defined, because customers consider the products interchangeable. Meyer and Wang suggest an alternative (profit-based) diversion rule with the market defined if a particular firm's aggregate diversion index exceeds the inverse of the margin multiplied by the SSNIP. Christine Meyer & Yijia Wang, *A Comprehensive Look at Critical Loss Analysis in a Differentiated Products Market*, 8 J. COMPETITION L. & ECON. 863 (2012).

appropriateness of the linear demand assumption implicit in the analysis.²¹ We address each of these issues below.

In the process, we explain how this Lerner methodology rests upon various assumptions that are not applicable generally and may not be applicable except in a small minority of cases.²² The same may be true for assumptions associated with aggregate diversion and linear demand. Because an economic analysis that uses simplifying, but unrealistic, assumptions may be valid if it is also reliably predictive, we discuss some of the evidence relating to the ability of a Lerner-diversion model to predict outcomes in Part IV.²³ We find the evidence suggests that this general ability to predict competitive outcomes is lacking. Part V applies a range of assumptions to evaluate the implications of the Lerner-diversion model for market definition.

A. The Lerner Index

The Lerner Index is a standard measure of economic (as opposed to legal) market power, and it appears in most introductory undergraduate economics textbooks. The Lerner Index is derived from the profit maximization equation

²¹ Adriaan ten Kate and Gunnar Niels note that Farrell and Shapiro's characterization of diversion as a unit-less constant is not necessarily correct. Firms actually lose purchases from specific customers, and these customers may shift purchases to other rivals within the market. The one-for-one shift envisioned by Farrell and Shapiro represents a special case situation. To avoid additional confusion, we retain the Farrell and Shapiro convention on diversion but note that it is a simplification that does not always represent reality. See Adriaan ten Kate & Gunnar Niels, *The Diversion Story: Resolving the Ambiguities Surrounding the Concept of the Diversion Ratio*, 10 J. COMPETITION L. & ECON., 361 (2014).

²² This presents a serious problem for the use of the Lerner Index to estimate demand and define markets in litigation. (The assumptions associated with aggregate diversion and linear demand compound the problem.) The Supreme Court's decision in the *Daubert* case requires that any expert testimony presented in federal court meet two requirements (both now in Federal Rule of Civil Procedure 702). They are (1) the reasoning underlying the testimony must be scientifically valid, and (2) such reasoning is properly applied to the facts at issue. *Daubert v. Merrill Dow Pharms., Inc.*, 509 U.S. 579, 592–93 (1993). Some commentators believe the first prong is arguably met where the testimony is generally accepted in the profession. 2 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶ 309 (Aspen 3d ed. 2007). It is unclear to us whether the economics profession generally accepts the use of margin data to predict demand elasticities by way of the standard Lerner Index (and, even if it does, an alternative reading of *Daubert* does not defer the validity of the decision to the profession). The second prong requires that the theory fit the facts of the case. When the expert analysis rests on assumptions that do not apply to the case at hand, there is a good argument for exclusion of the testimony under *Daubert*. Such an argument could possibly be overcome by showing that the expert analysis relied upon simplifying assumptions that, although not reflective of the facts, have proven to result in predictions that are reliable. As we explain at the end of this part, the available evidence is to the contrary.

²³ On the other hand, even where the assumptions reflect the facts at hand, the expert analysis (if admissible under *Daubert*) could still be subject to cross examination on the basis that there is no evidence showing that such analysis has any track record of reliably predicting outcomes, or perhaps on the basis that there is evidence that such analysis does not reliably predict outcomes. In such a case, a trier of fact could find the testimony unpersuasive and refuse to credit it.

relevant to a monopolist. Many readers will recall that monopolists (at least the ones in economic textbooks) set their prices where marginal revenue equals marginal costs. With a little calculus, it is possible to derive the marginal cost equals marginal revenue condition that defines the optimal quantity that a monopolist should produce. Then it is easy to solve for the Lerner relationship that links margin ($m = (\text{Price} - \text{Marginal Cost})/\text{Price}$) with the inverse of the demand elasticity.²⁴ (To define terms, let $L = m = 1/e$, where L represents the Lerner Index, m is the price-cost margin, and e is the demand elasticity facing the firm in question at the optimal level of output.) The Lerner Index ranges between zero and one. At zero, the firm is pricing at marginal cost, and the elasticity is infinite. The higher the margin, the closer L gets to one, and the elasticity approaches one. Economic theory concludes the larger L is, the stronger the market power held by the monopolist. As an implication of the calculus-based equilibrium, the Lerner Index need apply only at the monopolist's optimal level of output.

Some economists have generalized the Lerner model of monopoly to apply to any firm selling a differentiated product. By definition, the differentiated product is unique and the firm holds a technical monopoly on that product. To the extent that prices are set to optimize short-run profits, the firm has the ability to set the price of its product, given assumptions for the prices of closely related goods and demand considerations. By assuming the firm maximizes its short-run profits, the mathematics becomes tractable. Moreover, the Lerner Index is considered to measure the degree of economic "market power" held by the firm. Market power as measured by the Lerner Index is neither an antitrust nor a legal concept. While the technical conclusions are obvious, the question remains whether the application of this model offers real insights into antitrust law or policy. The answer to that question is usually no.

There is widespread agreement that the Lerner Index cannot be used to identify a reliable measure of market power for antitrust purposes, because it suggests that market power exists whenever price is even modestly above some empirical measurement of marginal cost.²⁵ Prices above estimates of marginal

²⁴ Technically, the analyst takes the derivative of the profit function with respect to output and obtains functions for marginal revenue and marginal cost. If marginal cost is not linear over the relevant range, the Lerner index overstates the percentage elevation of monopoly price over the competitive level, because the competitive output is higher and thus an increasing cost function will generate a competitive price above the monopoly cost. William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 941 (1981).

²⁵ Kenneth G. Elzinga & David E. Mills, *The Lerner Index of Monopoly Power: Origins and Uses*, 101 AM. ECON. REV. 558, 561 (2011) ("Economists generally agree that . . . a relatively high Lerner Index may reveal nothing more than the necessity of covering fixed costs."); Robert H. Bork & J. Gregory Sidak, *The Misuse of Profit Margins to Infer Market Power*, 9 J. COMPETITION L. & ECON. 511 (2013) (a number of factors other than market power cause high margins, and firms with low margins can have market power); Robert S. Pindyck, *The Measurement of Monopoly Power in Dynamic Markets*, 28 J.L. & ECON. 193 (1985) (criticizing use of the Lerner Index to gauge market power in dynamic markets); see also ANTITRUST MODERNIZATION COMM'N,

cost are ubiquitous throughout the economy because of the existence of non-trivial fixed costs (for example, relatively high fixed costs exist for retailers, software producers, and any industry with material R&D programs). If the Lerner Index were used to measure market power in antitrust cases, courts would find market power everywhere a proxy for marginal cost differs from price. As a result, courts have generally held that the Lerner Index is not appropriate for measuring market power in antitrust cases.²⁶

Benjamin Klein and John Wiley, Jr. reject the Lerner index as a measure of market power because it focuses on the firm's own elasticity of demand and not the firm's ability to influence market prices.²⁷ In a differentiated product market, every firm sets its own price; to aggregate up to the market price, the analyst must provide a detailed economic analysis. This analysis requires market definition, a study of competition, and an evaluation of entry. For Lerner analysis to generate a set of market-level prices, some equilibrium structure, such as the Nash-Bertrand model, must be imposed; but that just begs the question: What is the evidence that a price-based Nash-Bertrand model is reliably predictive as a general matter? We are aware of none.

Although recognizing the limitations of the Lerner model for monopoly power, some economists believe the Lerner Index relationship linking higher margins to less elastic demand curves offers insights regarding market definition. By construction, a relatively high margin indicates (according to the Lerner Index) that there are few close substitutes for the product in question. This relationship between the margin and the demand elasticity is crucial to the proposal of some economists to modify the traditional Critical Loss

REPORT AND RECOMMENDATIONS 40 (Apr. 2007), available at http://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf ("Antitrust analysis also must recognize that a price above marginal cost, by itself, does not necessarily suggest that a firm has market power that should be relevant in an antitrust matter."). Some economists use the term "technical market power" to describe situations in which price exceeds marginal costs, without generating supranormal profits. The ability to maintain prices above the competitive level for material periods of time defines market power.

²⁶ See, e.g., *United States v. Eastman Kodak Co.*, 63 F.3d 95, 109 (2d Cir. 1995) ("Certain deviations between marginal cost and price, such as those resulting from high fixed costs, are not evidence of market power."); *Kaiser Found. v. Abbott Labs.*, No. cv-02-02443-JFW, 2009 WL 3877513, at *9 (C.D. Cal. Oct. 8, 2009) ("[T]he pricing difference between a brand name drug . . . and its generic equivalent does not reflect supra-competitive pricing, but the fact that . . . generics do not incur the substantial research and development expenses incurred by companies that develop and produce brand name drugs."); *Fresh Del Monte Pineapples Antitrust Litig.*, No. 04-md-01628-RMB-MHD, 2009 WL 3241401, at *7 n.9 (S.D.N.Y. Sept. 30, 2009) (evidence of a "huge operating profit to sales ratio" insufficient to establish monopoly power), *aff'd sub nom.* *Am. Banana Co. v. J. Bonafede Co.*, 407 F. App'x 520 (2d Cir. 2010); *Wireless Tel. Servs. Antitrust Litig.*, 385 F. Supp. 2d 403, 422 (S.D.N.Y. 2005) ("[T]he test for the existence of market power is the ability to control price or exclude competition, not simply pricing a product above marginal cost.").

²⁷ Benjamin Klein & John S. Wiley, Jr., *Competitive Price Discrimination as an Antitrust Justification for Intellectual Property Refusal to Deal*, 70 ANTITRUST L.J. 599, 628 (2003).

Analysis. When combined with additional assumptions about diversion (discussed in the next part), theory would allow direct calculation of Actual Loss to a SSNIP as a way to make the Critical Loss technique operational.²⁸ This argument is uncomfortably close to circular. Given widespread agreement that the Lerner index does not define meaningful market power, the use of the analysis to define markets followed by the use of the markets to generate presumptions on meaningful market power appears highly suspect. To avoid the circularity, exogenous evidence would be needed to define a market prior to competitive analysis.

Several fundamental and potentially disqualifying problems associated with the application of the Lerner Index to the market definition process illustrate the relevant issues. The Lerner Index represents a *theoretical* relationship between the economic concepts of the margin and the demand elasticity. Demand elasticity estimates derived from the Lerner equation do not constitute empirical evidence. Such estimates are of marginal value unless a methodology exists both to measure the relevant margin and to implement all the required adjustments to the standard equations necessary to address the dynamic considerations that often drive the competitive process. To avoid these operational barriers, economic studies must show that market-based Lerner analysis is applicable to the situation under review. And there is very good reason to believe that the Lerner relationship²⁹ cannot be reliably applied in many, if not most, cases.

By its own terms, the standard Lerner Index need only apply where three conditions are met: competition is straightforward to model and thus effectively static;³⁰ short-run marginal costs control the price decision; and both the demand and cost curves are smooth around the equilibrium point. Finally, for Lerner analysis to be applicable, marginal cost must be accurately measured at or very close to the equilibrium point. We address each of these requirements in turn.

²⁸ The Lerner-diversion methodology may be artificial, because Lerner analysis is at its core a monopoly model and implicitly assumes that firms can undertake actions without regard to the threat of entry. If entrants can introduce new differentiated products to compete with incumbents, the diversion concept becomes an illusion. If the incumbent raises price, it has no reason to believe that a close rival, rather than an entrant, will recapture the lost sales.

²⁹ This is certainly true for the standard Lerner Index, because the marginal cost concept is theoretical. Adjustments could be made to the Index to account for real-world conditions in theory, but those adjustments have not been used in practice and certainly not in *H&R Block*. Moreover, we do not know yet whether any such adjustment would be of practical use.

³⁰ The standard Lerner model abstracts from the potential for innovation, the magnitude of transactions costs, and supplier-customer interactions. In effect, this structure represents a very static view of the competitive process. Some dynamic competitive effects can be considered by generalizing the Lerner model. See Pindyck, *supra* note 25, at 193; Jay Ezrielev & Janusz Ordovery, *The 2010 Horizontal Merger Guidelines: A Static Compass in a Dynamic World?*, ANTITRUST SOURCE (Oct. 2010), available at <http://www.abanet.org/antitrust/at-source/10/10/Oct10-Ezrielev10-21.pdf>.

A static style of competition involves situations in which firms, selling specific differentiated products, unilaterally set prices to maximize their short-run profitability assuming that decisions in one period do not affect profits in later periods.³¹ In contrast, competition is dynamic when price and output are inter-temporally determined. In other words, each firm's actions today impact their output, prices, and profits tomorrow. As Robert Pindyck states, “[c]learly almost all real-world markets are dynamic.”³² While complicated mathematical tools can address dynamics issues, the analysis tends to require heroic assumptions that may not apply to the relevant market environment. Thus, the Lerner Index may rarely apply outside of the textbook.³³

Moreover, Lerner analysis assumes firms sort their costs into two categories, short-run marginal costs and fixed costs. Although this assumption would be defensible if all output decisions were short run in nature, many business decisions have long-run implications. For example, customers may prefer to obtain long-run commitments (supply arrangements, research partnerships, or promotional support) from their suppliers. In making these commitments, firms need to take a long-run view of cost, and thus more costs must be considered marginal. Firms may also prefer to use a longer run standard for business planning. For example, it may be possible to obtain a higher quality labor force or more reliable input supplies if a firm made commitments into the future. Again, in these decisions more costs would be marginal. If most firms use long-run marginal costs, the bulk of the variation in the Lerner model disappears as no low marginal cost markets are observed. To the extent that prices are set based on long-run considerations, the standard Lerner technique of basing marginal cost on average variable cost is problematic. It should not be a surprise that many businesses try to maximize the net present value of their future stream of earnings rather than this quarter's profits.

Next, the Lerner relationship between the margin and the elasticity of demand is derived via calculus and requires that both demand curve and cost functions be differentiable (basically, smooth). Otherwise, the math does not provide a means to relate the margin to the elasticity, and the equation is not valid. There are many reasons to think that demand or cost curves will not always be smooth.³⁴ Demand is not differentiable where it is significantly more

³¹ Coate and Simons suggest an initial analysis be undertaken prior to the application of any market model. This study should determine if the relevant products are best described as homogeneous, differentiated in a static sense, or differentiated in a dynamic sense. For homogeneous goods, the standard Critical Loss Analysis applies, although the new approach might be considered if the differentiation is static in nature. If dynamic considerations drive market competition, the simple Lerner model is inapplicable. See Malcolm B. Coate & Joseph J. Simons, *In Defense of Market Definition*, 57 ANTITRUST BULL. 667 (2012).

³² Pindyck, *supra* note 25, at 194.

³³ *Id.*

³⁴ See David T. Scheffman & Joseph J. Simons, *Unilateral Effects for Differential Products: Theory, Assumptions, and Research*, ANTITRUST SOURCE (Apr. 2010), available at <http://www.abanet.org/antitrust/at-source/10/04/Apr10-Scheffman4-14f.pdf>; David T. Scheffman & Joseph J. Simons,

elastic for price increases than for decreases; this causes a kink in the demand curve at the equilibrium point. Kinks may be due to either consumer or competitor reaction to price changes. With respect to consumers, there is significant empirical evidence indicating that they often react more strongly to price increases than decreases.³⁵ This literature includes work by Daniel Kahneman for which he won a Nobel Prize.³⁶

With respect to competitor reactions, the economics literature has long recognized that competitors may respond differently to price increases than to decreases implemented by their rivals. First, think of competitors that are geographically distant from the merging parties. At current prices, they may not be able to profitably sell into geographic areas near the merging firms because the transportation cost is too high. Thus, these distant competitors will not respond to price decreases by the merging parties. However, when the merging parties raise prices, such shipments may become profitable, and the distant competitors may have a significant response. Second, competitors may respond differently to the price increases of their rivals than to their price decreases. Firms often are very concerned with loss of market share for a host of reasons, separate from a pure focus on short-run profitability. For example, firms may determine that the more profitable response to a rival's price increase is to take share rather than short-run profit, because inframarginal rents may be higher over the long run with higher share.

Finally, in any market, the value of the Lerner Index depends crucially on the measurement of marginal cost. If some costs are quasi-fixed, the model will generate different results if these costs are classified as marginal instead of fixed.³⁷ Moreover, the Lerner result only applies at the point of equilibrium and, under its own terms, can only predict the demand elasticity at that point or very, very close to it. The hypothetical monopolist test, however, generally involves much more substantial movements away from that equilibrium point. The SSNIP is by definition a "significant" price increase and in practice is usually 5 percent to 10 percent. Thus, a SSNIP contemplates a non-trivial reduction in output, which could range from a few percent to 20 percent or more. As a result, CLA often involves a substantial movement away from the

Unilateral Effects with Differentiated Consumer Products: A Response to Werden, ANTITRUST SOURCE (Aug. 2010), available at http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/Aug10_Scheffman8_2f.authcheckdam.pdf (containing the bases of these discussions).

³⁵ Both the marketing and economics literature include studies involving kinked demand curves based on these consumer reactions. The marketing literature includes a concept known as reference pricing, which involves the consumer establishing a perceived reference price based on historical pricing. A number of articles conclude that consumers react differently to price increases and decreases relative to their reference price but more strongly to price increases. See *supra* note 34.

³⁶ See *supra* note 34.

³⁷ Quasi-fixed costs are costs that are partially fixed and partially variable.

equilibrium point, and a Lerner based margin cannot be used to estimate demand unless demand behaves in a linear manner over the entire range of the SSNIP. Variation in the relationship between output and marginal cost can cause further complications. Lerner analysis focuses on the marginal cost of the last unit of output produced by the firm. In contrast, the standard Critical Loss Analysis uses incremental cost associated with the relevant output change. Although these cost numbers could be the same, they do not need to be.

B. Aggregate Diversion

The diversion ratio (D) is discussed in the HMGs in connection with unilateral effects analysis.³⁸ It is used to measure the share of the loss in volume from a price increase by a firm that is diverted to a specific rival, generally a rival within the relevant market. Some economists suggest using a related concept to implement Critical Loss Analysis. Diversion to each rival in the candidate market is measured, and the sum of diversion to all rivals within the candidate market is defined as the aggregate diversion ratio (A). The aggregate diversion ratio thus measures the percentage of volume that switches from the firm raising price in the candidate market to the other rivals in the candidate market. This loss is “recaptured” by the hypothetical monopolist, as the margins lost to one firm are recovered by other firms within the hypothetical cartel. Assuming the applicability of the Lerner Index, it is easy to show that the hypothetical monopolist will find it profitable to raise price *on a single product within the candidate market* whenever this overall diversion (A) exceeds the Critical Loss (A is greater than GL).³⁹

Such an approach, however, can only be used directly when we change the basic market definition algorithm of the Guidelines from the original 1982 version. That version hypothesized a uniform SSNIP over all products and firms in the candidate market as opposed to a price increase by only one firm or product. The 1992 Guidelines permitted SSNIPs to vary over products and firms. However, until recently, the test was virtually always performed with a uniform SSNIP, and for good reason.⁴⁰ Even the H&R Block case appeared to have envisioned a uniform SSNIP.

As the illustration below shows, the use of the single firm and product SSNIP can lead to narrow markets where anticompetitive effects appear unlikely. Let us assume ten equally situated firms (that is, firms 1 to 10),

³⁸ 2010 Guidelines, *supra* note 1, § 6.1.

³⁹ Farrell and Shapiro abstract from this analysis, preferring to jump directly to an analysis for the uniform SSNIP, as well as one based on residual demand curves in which different expectations for pricing strategies are considered. *See* Farrell & Shapiro, *supra* note 20.

⁴⁰ *See* Malcolm B. Coate & Joseph J. Simons, *Critical Loss vs. Diversion Analysis: Clearing up the Confusion*, ANTITRUST CHRONICLE app. (Dec. 16, 2009), available at <https://www.competitionpolicyinternational.com/assets/Free/SimonsCoatesDEC-091.pdf> (discussing this scenario at greater length).

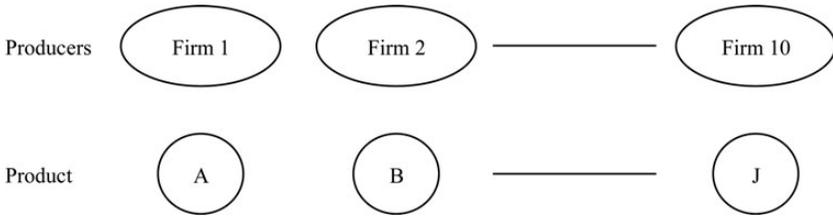


Figure 2. Market definition hypothetical

respectively producing differentiated products *A* to *J*. For example, these could be nine cereal companies producing nine different kinds of kid’s ready-to-eat cereals, along with one composite rival for all other goods. It could also be 10 different types of a metal alloy produced by 10 different firms, or it could be three firms selling tax software and seven firms providing tax preparation services. Let us also assume a merger of firms 1 and 2 (controlling products *A* and *B*) and evaluate the market definition for such a merger. Further, assume that the firms have a margin of 25 percent, which means the Critical Loss for a ten percent price increase is 28.57 percent. Additionally, assume that when the combined firm raises the price of product *A* by ten percent, a total of 40 percent of the volume is lost, with 4.44 percent diverting to each of the nine alternatives (below products *B* to *J*).⁴¹

As we explain below, the merged firm cannot raise price profitably by itself, but a hypothetical monopolist controlling firms 1 to 4 would find it profitable to increase price. When the combined firm raises the price of product *A* by 10 percent, it loses 4.44 percent of its volume to each of products *C* to *J* for a total loss of volume of 35.5 percent. Since the Critical Loss is 28.57 percent, the predicted actual loss exceeds the Critical Loss, and neither the merged firm nor products *A* and *B* can be their own market. However, a hypothetical monopolist that controls products *A* to *D* (firms 1 to 4) could profitably raise the price of product *A*. Such a hypothetical monopolist would only lose sales to products *E* to *J* since it controls, by definition, products *A* to *D*. As a result, it only loses 26.4 percent of its volume (4.44 percent × 6 representing the other six firms/products that it does not control). In this case, the Actual Loss (26.4 percent) does not exceed the Critical Loss (28.57 percent), and the single firm SSNIP appears profitable.

Assume that (1) Firms 1 and 2 merge, (2) the merged firm raises the price of product *A* by ten percent, (3) volume diverts from product *A* equally to products *B* to *J*, and (4) the price increase for product *A* is collectively profitable for firms 1 to 4. Under these assumptions, using a single firm and product SSNIP would result in a conclusion that products *A* to *D* are a market. But the

⁴¹ This is the exact loss that would be forecast by the Lerner-based model discussed above. The model discussed in this part was introduced by Coate and Simons, *id.*, although here our example uses a 10 percent SSNIP applied in *H&R Block*.

purpose of going through this exercise is not apparent because there is no unilateral effect possible since increasing the price of product *A* is not profitable to the merged firm itself, because sales are lost to all rivals and coordinated interaction is not possible unless there are side payments from firms 3 and 4 to the merged firm.⁴² So, why would we ever define a market like this? It makes no sense, and there are no reported instances of a court consciously applying such an approach⁴³ or relying on anything other than a uniform SSNIP.

Perhaps for the reasons described above, some economists have suggested a way to generalize the diversion-related CLA approach to a uniform SSNIP. This approach was the one used by the DOJ's economic expert in the H&R Block case. In this context, the aggregate diversion ratio (*A*) is alleged to measure the extent of switching that occurs between products within the candidate market when the prices of all products in the candidate market rise by a SSNIP. Again, the traditional inquiry of whether *PL* is greater than *CL* would be replaced with *A* is greater than *CL*. However, in order for this *A* is greater than *CL* test to be valid with a uniform SSNIP, a very strong, counterintuitive assumption is required.

To transform this firm-specific diversion analysis into a market-wide analysis, it is necessary to *assume* that the diversion that occurs to firms within the candidate market when one firm raises prices equals the diversion to firms in the candidate market when they all raise price. Or as Joseph Farrell and Carl Shapiro note, aggregate diversion must be constant for changes in output over the relevant range associated with the uniform SSNIP.⁴⁴ The only obvious way for that to be true is if the firm level diversion ratios are constant when a uniform SSNIP is imposed. Such a structure is easy to assume but more complicated to justify.

To illustrate the peculiar nature of this assumption, let us consider an example using a potential merger of Mercedes and BMW. Assume that when Mercedes raises prices 10 percent, it loses 30 percent of its lost volume to

⁴² A third alternative, the variable SSNIP, is explored in Coate and Simons, *supra* note 40, at 13–15. For collusion concerns, the variable SSNIP analysis remains flawed, with side payments needed to make the cartel viable. For a unilateral analysis, the merged firm appears to profit from its actions, while the rivals within the market adjust their prices in light of the leading firm's decision. Such a naïve focus on price abstracts from repositioning and entry analyses that generally require close analysis of actions taken by firms artificially excluded from the market. To the extent that empirical evidence suggests that this type of variable SSNIP analysis identifies a likely competitive concern, dispensing with market definition appears more appropriate than tweaking the procedure. Proving merger effects with direct evidence is reasonable for consummated mergers with actual anticompetitive effects but highly suspect for proposed mergers in which the likely effect must be inferred from the totality of the evidence.

⁴³ There appears to be some confusion in the court's decision in the H&R Block case. The court at one point describes the single firm SSNIP, *United States v. H&R Block, Inc.*, 833 F. Supp. 2d 36, 60 (D.D.C. 2011), but seems to apply the uniform one proposed by the DOJ's expert economist. *Id.* at 63 (“Warren-Boulton calculated that for a 10 percent price increase in DDIY, the price increase would be profitable if the resulting lost sales did not surpass 16.7 percent.”).

⁴⁴ Farrell & Shapiro, *supra* note 19, app.

BMW, 30 percent to Audi, 20 percent to Lexus, and 20 percent to Infiniti. The diversion ratio between Mercedes and BMW is 30 percent for this example of a single firm SSNIP. If BMW were then to raise its price, the constant diversion assumption means that the 30 percent of customers that switched to BMW from Mercedes when Mercedes raised price cannot go to any manufacturer. That is, even though both BMW and Mercedes have now raised their prices, these firms retain 100 percent of the customers that originally switched from Mercedes to BMW when only Mercedes raised price or switched from BMW to Mercedes when only BMW raised price. We refer to the percentage of customers kept by the hypothetical monopolist as the retention ratio, which the constant diversion assumption sets at 100 percent.⁴⁵

To test whether Mercedes and BMW are a market under a uniform SSNIP, the aggregate diversion ratio must measure how much switching occurs between Mercedes and BMW when they both raise price by 10 percent. In our example, we would have to see that the 30 percent of the customers lost by Mercedes and BMW in the face of individual price increases would remain with one of those two firms following the uniform price increase in order for the constant diversion assumption to be valid.⁴⁶

Why would we expect that a substantial number of customers who switch from Mercedes to BMW when the price of BMW goes up would remain with these two firms when both the prices of Mercedes and BMW increase by a SSNIP or vice versa? We think that generally this would not be the case, but in any event, it is an empirical question.

As we show in Part V below, changing the constant diversion assumption and allowing lower retention ratios can dramatically impact the market definition. There is no basis to believe that, as a general rule, there would be significant switching among firms that raise their prices the same amount at roughly the same time.⁴⁷ Thus, an assumption to that effect is unjustified, especially because it is likely to be outcome determinative to the market definition exercise.

Again, the economist's diversion analysis, like the Lerner analysis discussed above, may be relevant in special case situations. As such, the methodology may be useful when it is validated with exogenous empirical evidence. Imposing the Lerner Index and constant diversion assumptions as a general rule for Critical Loss Analysis, however, would be highly suspect and without support.

⁴⁵ Coate & Simons, *supra* note 40. The concept is illustrated graphically in Malcolm B. Coate & Joseph J. Simons, *Critical Loss v. Diversion Analysis: Another Attempt at Consensus*, ANTITRUST CHRONICLE (Apr. 16, 2010), available at <https://www.competitionpolicyinternational.com/critical-loss-v-diversion-analysis-another-attempt-at-consensus>.

⁴⁶ In general, the output diverted from one firm in the market to another firm in response to a single firm SSNIP could also return to the original supplier in response to the uniform SSNIP to justify the constant diversion assumption. Because anything can happen, it is better to rely on empirical evidence on the effect of a uniform SSNIP on the sales of the products in the proposed market than infer the answer from theory.

⁴⁷ Coate & Simons, *supra* note 45.

C. Linear Assumption for Demand Curve

As described above, the Lerner Index only applies at the point of equilibrium and, under its own terms, can only predict the demand elasticity if demand is close to linear over the relevant range. Thus, if the Lerner Index is to be applied, it is important to have some empirical evidence to support the linear hypothesis or at least rule out a concave demand function.⁴⁸

Although some economists that advocate the use of the Lerner Index suggest linear demand is a good assumption, they have no basis to do so and offer none. With linear demand, the rate at which a product's quantity demanded falls in response to a price increase is constant. Thus, if in response to a one percent price increase demand falls by X percent, then a five percent price increase will cause demand to fall by five times X percent. There is no reason to believe that demand curves must behave this way. In fact, there is good reason to believe that for some products, this is not the case.

Linear demand seems to imply that consumers are distributed uniformly in the relevant product space.⁴⁹ In thinking about the retail sector from a purely geographic perspective, for example, linear demand implies a uniform distribution of customers throughout the geographic area that a store might serve. However, due to urban development patterns, this is usually not the case. There are often clumps of consumers, and retailers generally locate where the clumps are, even though they often try to serve consumers beyond their immediate clump. Thus, we often see retailers clustered where population is more dense, and the preference for a given retail establishment tends to increase the nearer a consumer is located to such a retailer. As a retailer begins to raise price, the most marginal customers for that retailer are likely to be those further away from the store, and they are driven away with small price increases. However, as the retailer raises price further, it starts to drive away customers that are closer to the store and more densely distributed. Thus, with higher percentage price increases, the retailer drives away an even higher percentage of customers. As a result, quantity demanded falls at an increasing pace as price rises, which describes a concave demand structure rather than a linear one.

This same type of dynamic might apply for industrial markets such as cement plants, chemical plants, as well as branded products where firms attempt to locate their products in the product space where consumer tastes are clumped. In any specific situation, the facts associated with the direct measurement of Predicted Actual Loss will control the analysis. Theory, by itself, cannot be dispositive.

⁴⁸ In contrast, if the demand function is convex, the linear structure will over-predict loss. For a convex demand curve, narrow markets are almost guaranteed. See O'Brien & Wickelgren, *supra* note 17.

⁴⁹ See Jay Ezrielev & Joseph J. Simons, *The 2010 Merger Guidelines, Critical Loss, and Linear Demand*, 7 J. COMPETITION L. & ECON. 497 (2011) (basis of this discussion).

IV. ECONOMIC EVIDENCE AND LERNER-DIVERSION ANALYSIS

The Lerner-based analysis, along with its Critical Loss application, depends on the assumed applicability of the standard Lerner equation coupled with the accuracy of the diversion estimates and the linear demand structure. Yet, as described above, many real world markets will not correspond to the assumptions that underlie Lerner-Diversion analysis.⁵⁰ Of course, the Lerner-diversion analysis may still be appropriate if there is empirical evidence to demonstrate that the analysis generates reliable predictions in a range of real-world situations.⁵¹

In the rest of the section, we discuss evidence that serves to test the reliability of a Lerner-based model.⁵² Applications of Lerner analysis should generate reasonable estimates for margins and costs, so our first analysis explores Lerner-based models to determine if their predictions for costs are reasonable. In the situations discussed below, some of the cost findings appear anomalous. More importantly, the success generated by Lerner models in predicting market realities is limited. In a wide class of models (direct structural analysis, reduced form analysis, and implicit theoretical reviews linked to cost and demand conditions) predictions based on Lerner analysis do not appear to offer much explanatory power. Thus, it is reasonable to conclude that Lerner analysis does not offer a broadly applicable model of competition policy. It may still be applicable on a case-by-case basis when the specific assumptions can be shown to be applicable to the industry under review.⁵³

A. Direct Application of Lerner Analysis to Price

Lerner analysis is, at its core,⁵⁴ a structural model of price competition. Thus, it can be applied to empirical data to generate representations of the competitive process that can then give rise to a set of predictions on future behavior. To evaluate the basic Lerner relationship, it is important to know if applications of

⁵⁰ Assumptions include well-defined products, perfect information, and price-setting behavior.

⁵¹ Milton Friedman advanced the basic idea, noting that models could be useful if they predict “as if” their assumptions were true. See Milton Friedman, *The Methodology of Positive Economics*, in *ESSAYS IN POSITIVE ECONOMICS* 3 (Univ. of Chicago Press 1953). This idea imposes a testing standard similar to that of noted philosopher Karl Popper. (Popper recognized that testing can never prove a theory [model] to be correct, but falsification of the theory serves to reject it.) Failure to pass Friedman’s test (failure to predict) means the modeling structure fails Popper’s test. Popper’s rule was cited as relevant to evaluating scientific testimony. *Daubert v. Merrill Dow Pharms., Inc.*, 509 U.S. 579, 593 (1993); KARL POPPER, *CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE* (Routledge & Kegan Paul 5th ed. 1972).

⁵² Economists often laud the Lerner structure as a fundamental axiom of profit maximization and view any challenge to the use of the Lerner model as a rejection of economic theory and its use of profit maximization as a unifying principle. Farrell & Shapiro, *supra* note 20, at 14. They seem to take this view in spite of the indisputable fact that the standard Lerner formula requires assumptions that are usually not met in the real world.

⁵³ Lerner analysis may also be applicable at an aggregate level in explaining relationships that would occur in a very stylized model of competition. Moreover, this discussion does not suggest that Lerner analysis should be rejected as a model of monopoly.

the model (1) generate reasonable parameterizations for key variables (here, margins or costs derived from margins) and (2) predict the outcomes of key structural changes affecting the competitive process. If the Lerner model generates accurate values for key parameters and predicts important outcomes correctly, an argument can be made that the model offers general insights into economic theory. If not, then the model should be reserved for special case situations in which its assumptions match reality.

The breakfast cereal market offers information on one application of a Lerner-style index. After a detailed study of the industry, the court in *Kraft* identified product innovation as the key focus of competition.⁵⁴ This observation matched that of Richard Schmalensee, the expert in the FTC's earlier breakfast cereal monopolization case.⁵⁵ Schmalensee's model focused on the fixed costs of introducing brands and considered the marginal costs of the brands to be equal.⁵⁶ An application of Lerner analysis can be tested by observing if credible margin values are generated from empirically estimated elasticities.

Credible margins were not generated by a well-known study of ready-to-eat cereals. Nevo applies a mixed logit analysis to the cereal industry and found average margins ranging from relatively low values of 0.24 (Wheaties) and 0.26 (Total) to relatively high values of 0.70 (Quaker Life) and 0.86 (Rice Krispies).⁵⁷ Nevo admits that the Rice Krispies margin is problematic but suggests that the other margin differences are generally related to demand and cost considerations for the products at issue. However, none of these brands represents recent innovations, and thus the dispersion of margins is surprising. Digging deeper into the results, one finds that Cheerios has a margin of 0.64, while the more innovative Honey Nut brand's margin is just 0.01 higher. Again, this result is incompatible with the innovation evidence. Nevo's cost per serving data also appears problematic, with a range of 1.8 cents to 23.4 cents. If costs of production actually varied that much, it is hard to see how Schmalensee would not have been forced to model the cost functions in his work. The cost difference of 20 percent between the two versions of Raisin Bran is particularly surprising. Given the importance of innovation, it appears reasonable to conclude that costs are relatively similar across classes of cereal, and the Lerner analysis fails to adequately model the relevant competitive process.

Other studies also generate Lerner-related results inconsistent with empirical evidence.⁵⁸ Product differentiation is evident in the pancake syrup market where

⁵⁴ *New York v. Kraft Gen. Foods*, 1995-1 Trade Cases (CCH) ¶ 70,911 (S.D.N.Y. 1995).

⁵⁵ *Kellogg Co.*, 99 F.T.C. 8 (1982) (dismissal order).

⁵⁶ Richard Schmalensee, *Entry Deterrence in the Ready-to-Eat Breakfast Cereal Market*, 9 BELL J. ECON. 305 (1978).

⁵⁷ Aviv Nevo, *Mergers with Differentiated Products: The Case of the Ready-to-Eat Breakfast Cereal Industry*, 31 RAND J. ECON. 395, 410 tbl.4 (2000). Statistical reliability tests were not presented in the summary discussion due to the nature of the analysis.

⁵⁸ We do not wish to suggest that every demand study fails to generate a compatible elasticity-margin relationship. However, when theoretical complications suggest the Lerner

brands (Aunt Jemima, Log Cabin, Mrs. Butterworth, and Hungry Jack) compete with generic products and a range of specialty syrups. Branding seems to play a key role in the competitive process, as brands maintain prices well above private label substitutes.⁵⁹ Weinberg and Hosken report demand elasticities for the pancake syrup brands ranging from -1.86 to -2.62 .⁶⁰ All are precisely estimated, so the confidence interval associated with the relatively elastic brands (Mrs. Butterworth and Hungry Jack) differs from the relatively inelastic values for Aunt Jemima and Log Cabin. Thus, the margins on Aunt Jemima and Log Cabin implied by the Lerner index (53.8 percent and 51.8 percent, respectively) significantly exceed those for the other brands (42.6 percent for Mrs. Butterworth and 38.2 percent for Hungry Jack). Average price and quantity are almost identical for Aunt Jemima and Mrs. Butterworth, and thus costs must differ by the same percentage as margin.⁶¹ However, pancake syrup is made from the same ingredients, which suggests that it would be very unlikely for actual costs to differ by 20 percent.⁶² Thus, the application of the Lerner relationship seems to fail to capture the market realities. Given that the pre-merger evidence suggests that pricing policy is an integral part of the product branding strategy based on long-run reputation for quality and possibly relationships with retailers, the failure of simple Lerner analysis is not surprising.

Likewise, Jerry Hausman and Gregory Leonard discuss an analysis of competition in heavy trucks sold in the European Union. Truck pricing appears customer specific, with 20 to 25 percent of the price linked to options and competitors discounting well below list prices to make sales.⁶³ Here, innovation on new features and improved performance, along with marketing (including post-sale service) may be as important as the actual price. Hausman and Leonard report that the application of a Lerner-style model to the European truck market used elasticities to identify a margin of 87 percent on Volvo's production in Norway but only 43 percent for Scania.⁶⁴ This result is simply incredible, and thus one can only conclude that the Lerner relationship failed to represent this competitive process. Although the model's failure could be ascribed to poor data, the substantial discounting undermines a key price

model may not be applicable to a particular industry, the failure of the model to predict reasonable results is relevant.

⁵⁹ Brand prices are over 50 percent higher than generic product. See MATTHEW WEINBERG & DANIEL HOSKEN, USING MERGERS TO TEST A MODEL OF OLIGOPOLY tbl.1 (2009), available at <http://www.wemarket4u.net/be/workshops/microeconomics/2008/docs/mweinberg.pdf>.

⁶⁰ *Id.* tbl.7.

⁶¹ *Id.* tbl.1.

⁶² The interested reader could discover that Log Cabin switched from high-fructose corn syrup to sugar in 2009, but at the time of the study, the brands used basically the same inputs.

⁶³ Jerry A. Hausman & Gregory K. Leonard, *Using Merger Simulation Models: Testing the Underlying Assumptions*, 23 INT'L J. INDUS. ORG. 693, 694 (2005).

⁶⁴ *Id.* at 697.

assumption (prices are fixed for each firm) needed for Lerner analysis. These results are likely to be only the tip of an iceberg of failure for producers' goods, because Lerner-based models can only be estimated when firm-specific price data is available. However, for many producer goods, prices are negotiated on a sale-by-sale basis. Some form of competition occurs but with every large transaction representing a separate market-based interaction. Even if price competition is relevant, other factors may also affect the applicability of Lerner analysis.

Given its ability to structurally model competition, it is not surprising that Lerner analysis has been used to model the effects of mergers. Nevo's cereal model gave rise to Lerner-based predictions of a 12.2 percent increase in the price of Chex but price reductions for Cheerios as a result of General Mills' purchase of the Chex brands from Nabisco. A merger retrospective by Orley Ashenfelter and Daniel Hosken shows price increases for the General Mills brands of Cheerios and Wheaties, but no effect on Chex.⁶⁵ In effect, the actual results were basically the opposite of the theoretical results, hardly an impressive performance for Lerner analysis (although given the difficulties with consistent parameterization detailed above, not surprising).⁶⁶

B. Indirect Application of Lerner Analysis to Price

In addition to studying direct applications of structural Lerner-style models to the competitive process, it is useful to review reduced-form market analyses to see if the results are compatible with basic Lerner ideas. Here, the pharmaceutical industry is chosen, because drug pricing has been subjected to close empirical review. As noted below, the results of these studies are often incompatible with naïve strategies for direct profit maximization. In effect, it appears that Lerner analysis should not be applied even in some obvious situations of market power.

Some brand name prescription drugs hold strong patent-protected market positions when introduced by their manufacturer. To the extent that the drug replaces a more expensive physician-based treatment, the value of the drug could be quite high. In light of the third party payment system used to finance health care, demand for treatment might be totally inelastic at any price below the substitute therapy.⁶⁷ Opportunity-cost-based drug pricing suggests that

⁶⁵ Orley C. Ashenfelter & Daniel Hosken, *The Effect of Mergers on Consumer Prices: Evidence from Five Mergers in the Enforcement Margin*, 53 J.L. & ECON. 417 (2010).

⁶⁶ See Malcolm B. Coate & Jeffrey H. Fischer, *Daubert, Science, and Modern Game Theory: Implications for Merger Analysis*, 20 SUPREME CT. ECON. REV. 125, 160–63 (2012) (additional examples of problematic Lerner-based simulations).

⁶⁷ Third-party payment separates the decision to consume the drug (generally made by the physician charged with treating the patient) from the obligation to pay for the drug (generally attached to the insurance company). Although insurers may create incentives for the use of the cheapest treatment, exclusions of care generally need to be written into the coverage agreement.

the drug price will be elevated significantly above cost to trigger a Lerner-based equilibrium. However, industry evidence does not clearly show prescription pharmaceuticals are regularly priced to obtain all the available profit, as a Lerner analysis would predict. Ovation's pricing policy for Indocin IV represents an extreme example of this situation.⁶⁸ Merck, a major pharmaceutical producer, marketed Indocin IV at a relatively low price to treat a heart condition in newborns. Drug treatment is strongly preferred to surgery, and thus the value to the customer is large. In effect, Merck refrained from Lerner pricing, likely because of reputation effects. Once Merck sold the drug to Ovation (itself later acquired by Lundbeck) the price was quickly raised by 40 percent.⁶⁹ As soon as Ovation obtained the ability to brand the product independently of Merck, price increased by a further 1,278 percent. Prices for the other acquired products also increased by triple digit amounts and, in one case, even more than the 1,278 percent rise noted above.⁷⁰ Overall, this pricing evidence illustrates a situation in which Lerner analysis was not used for pharmaceutical pricing.

Pricing of generic drugs offers further evidence of pharmaceutical pricing. When patent protection expires and a generic competitor enters the niche, prices tend to be depressed by roughly 20 percent.⁷¹ Output rarely expands materially, suggesting again that the patent-holder could have raised price without a material loss in sales. To the extent that the evidence shows pharmaceuticals are consistently underpriced based on a Lerner analysis, the analyst seems required to reject the application of the Lerner model as inapplicable to the pharmaceutical industry. Alternatively, one could argue that the generic entrant offers a lower quality product and therefore its lower price is not relevant to the preexisting branded market. Such an assumption would then shift the analysis to the behavior of the second generic entrant.

Monopolies in generic "markets" tend to be short-lived, because rivals can enter as soon as the Hatch-Waxman exclusivity expires for a generic that successfully challenged a patent or upon approval of another generic by the Food

For example, insurers may not cover treatments considered experimental in nature or those not documented by the government.

⁶⁸ Fed. Trade Comm'n v. Lundbeck, Inc., 2010–2 Trade Cases (CCH) ¶ 77,160 (D. Minn. 2010). The discussion in the text draws from the facts in this opinion.

⁶⁹ Ovation also raised the prices of four other drugs acquired from Merck, two by the same 40 percent, one 25 percent, and the last by 15 percent.

⁷⁰ Gregory Werden, *The Economics of FTC v. Lundbeck: Why Drug Mergers May Not Raise Prices*, 9 J. COMPETITION L. & ECON. 89 (2013). Werden's model, while interesting, fails to allow customers to play in the theoretical model to obtain more competitive prices. Once the game is complicated, his high price equilibrium may disappear.

⁷¹ Figure 6.2 shows the entry of the first generic depresses price to roughly 20 percent below the brand level. See FED. TRADE COMM'N, AUTHORIZED GENERIC DRUGS: SHORT TERM EFFECTS AND LONG TERM IMPACT 99 fig.6.2 (2011), available at <http://www.ftc.gov/os/2011/08/2011genericdrugreport.pdf>.

and Drug Administration. Thus, competition for generic products is usually characterized by entry of new competitors. Empirical studies show that the entry of the second and third generic rival further depresses price to 20 to 30 percent below the price associated with the first generic.⁷² Marginal costs are usually low, say 10 to 20 percent of price, generating a Lerner-based demand elasticity of 1.11 to 1.25 for generic products. Given that elasticity, the reduction in generic price from further competition would be associated with a 22 to 37 percent increase in volume.⁷³ This does not occur, as research shows the introduction of generics tends not to increase overall sales materially. The interim FTC report on authorized generics found the introduction of an authorized generic increased unit sales by only 6 percent above the level associated with a single generic entering with Hatch-Waxman exclusivity.⁷⁴ Although generic rivals will take additional sales away from the branded entity as time passes, these sales gains cannot be considered price related because managed care switches patients to generic drugs with limited consideration to the magnitude of the discount.⁷⁵ These results imply that the first generic does not price as aggressively as a Lerner analysis would suggest, again possibly the

⁷² *Id.* Judging from Figure 6.2, *id.*, the entry of the second generic lowers price by another 20 percent (of the 80 percent generic price point), and the third generic lowers price a further 10 percent. With authorized generics, the impact of additional generic entrants can be estimated from Figure 6.1, *id.* A more sophisticated analysis would identify even larger generic effects for markets with four or more long term rivals. See Luke Olsen & Brett Wendling, *The Effect of Generic Drug Competition on Price During the Hatch-Waxman 180 day exclusivity Period* (Fed. Trade Comm'n, Working Paper No. 317, 2013), available at <http://www.ftc.gov/be/workpapers/wp317.pdf>.

⁷³ This volume increase is independent of the increase in sales from patients switching from the brand to the generic drug, an effect that tends to be linked to time on the market. The volume increase tends to occur as additional patients switch away from the brand due to incentives offered by their Pharmacy Benefit Managers. To the extent that the bulk of this competitive switching occurs when the first generic enters and undercuts the brand price, no large output expansion will be observed. To the extent the switching would occur anyway but just in a lagged fashion, new entry and lower prices would not have an effect and the quantity expansion predicted by Lerner model would not occur.

⁷⁴ An interim FTC study is also of interest. Compare the results from Table 1-H with those of Table 1-G to compute the effect. The Hatch-Waxman act establishes a six-month period of exclusivity for the first generic rival to challenge successfully the patents that exclude rivals from competing with the branded product. However, the brand is able to authorize a second generic rival to compete during the "exclusivity" period. Thus, the FTC study evaluated the impact of this second generic entrant on the competitive process. At the end of the exclusivity period, any number of generic rivals can be approved to compete in the market. See FED. TRADE COMM'N, AUTHORIZED GENERICS: AN INTERIM REPORT 15–16 tbls.1-G & 1-H (June 2009), available at <http://www.ftc.gov/os/2009/06/P062105authorizedgenericsreport.pdf>.

⁷⁵ If the brand drug faces close therapeutic competition from other rivals (as occurs in some, but far from all FTC merger cases), a case-by-case analysis is needed, as medical conditions may or may not allow active substitution after the patient has become accustomed to a specific brand. See Farasat A.S. Bokhari & Gary Fournier, *Entry into the ADHD Drug Market: Welfare Impact of Generics and Me-too's*, 61 J. INDUS. ECON. 339 (2013) (further illustration).

result of a dynamic reputation concern with its customers.⁷⁶ Pharmacy Benefit Managers may insist on a 20 percent discount from a generic manufacturer and punish any generic producer trying to maintain a price closer to the branded price by refusing to purchase goods in more competitive generic markets.

Although these examples focus on one industry, they identify an empirical pricing issue that appears to limit further the applicability of Lerner analysis. In contrast to a simple model of a firm, firms in the economy often sell multiple products. This allows buyers to behave strategically and punish firms in other markets for aggressive exploitation of market power. In these cases, a simple Lerner-based model does not maximize overall profits and thus is not employed. Again, none of the evidence suggests that Lerner analysis is never applicable in differentiated products, just that the model is not a general theory of economics that can justify the application of theory-based rules to define relevant markets.

C. Implicit Application of Lerner Analysis

A number of other situations exist in which Lerner analysis generates obvious implications for competition that are simply not observed in the marketplace. Here, the problem focuses on specific cost conditions that seem to mandate firm-specific pricing strategies. However, stark differences in firm-level pricing do not appear to be observed and are certainly not advocated in business textbooks.

One important test of the ability of Lerner analysis to predict outcomes relates to estimating the impact on prices when marginal costs change. If marginal cost changes materially and prices do not, the results are incompatible with the Lerner Index. Such changes occur when companies confront “make or buy” decisions.⁷⁷ These decisions involve choices by firms regarding whether to make a significant input internally or to purchase the input from a third party. If the firm makes the input, fixed costs are higher, and marginal costs are lower. In contrast, when the firm buys the input from a supplier, fixed costs are lower, and marginal costs are higher. This evidence leads to clear implications for margins, which, if correct, should generate predicted changes in price if the input represents a large portion of overall cost. If the firm decides to make the input, a simple proxy for marginal costs remains low (and margins high), with the firm maximizing profit at a relatively inelastic point on the demand curve (that is, a lower price point). Once the firm chooses to buy instead of make the input, the measure of marginal costs increases, margins

⁷⁶ The branded product tends to hold or increase price, following a harvest strategy, probably because matching the price of the generic entrant would not be profitable in the long run.

⁷⁷ See *supra* note 34 (forming the basis of this discussion). The test can be interpreted as evidence on the failure of the firm to obtain an estimate of marginal cost or a critical problem with the relevance of the Lerner model.

fall, and the firm maximizes profit by moving to a more elastic point on the demand curve (that is, a higher price point). Decisions to move from purchasing to manufacturing a significant input should have the opposite effect. We are not aware of any study that identifies such price changes following shifts in make or buy strategies, nor is the issue considered important in the standard financial analysis underlying the make or buy decision.⁷⁸ Instead, actual pricing decisions seem focused on allowing the firm to maximize its long-run profits, and thus business behavior suggests a clear recognition that both short-run marginal and fixed costs must be recovered. Once it becomes necessary to price to recover fixed costs, marginal costs must impute a theoretical premium linked to the fixed cost investment. Fixed costs may be related to capital investments, technology, or historical reputation. Because quantification of these investments is difficult, the exact adjustment in marginal cost will not be easily identified by the analyst. In effect, margin may need to be measured as the monopoly surcharge, an observation that renders the Lerner model tautological.⁷⁹

A similar anomaly would be observed if firms in the same industry make different make or buy choices and thus have significantly different marginal cost structures. Consider two competitors that produce similar but differentiated products who may even be each other's closest competitor. If one of the firms relies primarily on internal production for its inputs and the other relies primarily on third parties, the two firms will have dramatically different marginal costs. If they sell at roughly the same price, the Lerner Index predicts that the one relying primarily on internal production will face a much more inelastic demand curve than the other. This makes no sense at all. Again, by considering both fixed and marginal cost, firm behavior can be rationalized.

Russell Pittman generalizes this basic criticism to address all forms of Lerner analysis.⁸⁰ By focusing on the need of the firm to cover all its costs to remain in the market, Pittman observes that marginal cost measures that exclude the cost of capital are deficient.⁸¹ In effect, Pittman would mandate

⁷⁸ See Ann P. Bartel, Saul Lach & Nachum Sicherman, *Technological Change and the Make-or-Buy Decision*, 30 J.L. ECON. & ORG. 165 (2014) (example of the relevance of sunk, usually fixed, costs); see, e.g., MAURICE GREAVER, STRATEGIC OUTSOURCING: A STRUCTURED APPROACH TO OUTSOURCING DECISIONS AND INITIATIVES (AMACOM 1999). Greaver discusses the obvious issue of outsourcing—switching fixed costs to variable costs—but the link to pricing is not a focus of the book.

⁷⁹ If the analyst knows price and the monopoly premium, then the Lerner index allows the calculation of both the margin and the demand elasticity. However, the goal of Lerner analysis is to measure the monopoly premium, and therefore it cannot be simply assumed.

⁸⁰ Russell Pittman, *Who Are You Calling Irrational? Marginal Costs, Variable Costs and the Pricing Practices of Firms*, U.S. DEP'T OF JUSTICE, ANTITRUST DIV. (July 2009), available at <http://www.justice.gov/atr/public/eag/248394.pdf>.

⁸¹ Note that firms can still ignore sunk costs in their optimization problem, because exiting an unprofitable market in the long run is efficient behavior.

consideration of the firm's long-run cost structure. Examples of firms basing their pricing decisions on full or long-run costs are ubiquitous.⁸²

D. Explicit Anomalies Incompatible with Lerner Analysis

Lerner analysis predicts pricing will be driven by profit optimization, so changes in price will be relatively symmetric around the equilibrium. Some shocks to the market will cause price to rise predictably, while others will cause it to fall with the same predictability. In effect, the firm's elasticity of demand will allow the analyst to evaluate any situation. This insight may not be generally applicable. In a comprehensive study, Sam Peltzman found prices tend to rise faster than they fall in response to changes in input costs.⁸³ Demand side explanations for this empirical result, linked to consumer search costs,⁸⁴ imply a kink in the demand curve, leaving the marginal revenue curve undefined at the equilibrium level. Without a credible value for marginal revenue, the Lerner relationship cannot be derived. Peltzman reported that price asymmetry did not exist when the firm was vertically integrated for the relevant inputs, and thus demand side conditions may not be the full cause.⁸⁵ To the extent that the pricing behavior is generated by the complexities in the vertical contracts used to market the products, abstracting from these realities to impose a naïve price model upon the competitive process is problematic. One can only conclude that the empirical evidence on price transmission asymmetries is not compatible with basic Lerner analysis.

V. SIMULATIONS FOR THE REVISED CRITICAL LOSS STRUCTURE

This part provides simulations to demonstrate the impact of the Lerner-diversion approach to Critical Loss Analysis on market definition. The simulations illustrate how the revised analysis will narrow the relevant market for

⁸² Al-Najjar, Baliga, and Besanko consider full cost pricing to be the most common pricing tactic employed, although they note the actual prices may behave as if the firm focuses on marginal costs. Nabil Al-Najjar, Sandeep Baliga & David Besanko, *Market Forces Meet Behavioral Biases: Cost Misallocation and Irrational Bidding*, 39 RAND J. ECON. 214, 215, 217 (2008). It is important to note that Pittman's general concern is related to the inability of short-run proxies to represent marginal costs, independent of fixed costs. Hence, marginal cost pricing may represent reality on average, but firms with either high or low marginal costs may behave differently than expected by the model. Thus, for the purposes of this discussion, the "marginalist controversy" is not relevant. See M.R. Lucas, *Pricing Decisions and the Neoclassical Theory of the Firm*, 14 MGMT. ACCT. RES. 201 (2003) (providing a historical discussion of the topic).

⁸³ Sam Peltzman, *Prices Rise Faster Than They Fall*, 108 J. POLIT. ECON. 466 (2000).

⁸⁴ Mariano Tappata, *Rockets and Feathers: Understanding Asymmetric Pricing*, 40 RAND J. ECON. 673 (2009).

⁸⁵ Peltzman, *supra* note 83, at 494; see Jochen Meyer & Stephan von Cramon-Taubadel, *Asymmetric Price Transmission: A Survey*, 55 J. AG. ECON. 581 (2004) (surveying related articles).

almost any value of the margin. This means that instead of just addressing the alleged anomaly of artificially broad markets in high margin markets, the Lerner methodology also generates narrow markets for almost any differentiated product. In effect, the theorist's methodology is too successful to be considered credible in the face of evidence that many markets are broad.⁸⁶ Further analysis shows how those market definitions change when the assumptions on constant diversions, the magnitude of the SSNIP, and the linearity of demand are modified.

Our simulations assume nine equally situated firms and one composite firm (representing choices outside the candidate market) such that 11.1 percent of the lost volume will divert to the other nine entities (the eight firms and the composite firm) when prices are raised.⁸⁷ Each firm is assumed to have a constant marginal cost, which when expressed as a percentage of price allows the calculation of the margin. The Lerner index is used to transform the margin into an estimate of the firm's elasticity that then generates the maximum loss associated with an exogenous SSNIP (initially ten percent). The simulation allows the hypothetical monopolist to recapture the portion of this loss diverted to the rivals within the market. Thus, a negative relationship exists between Predicted Actual Loss and the size of the market, with the firm facing 88.9 percent of the maximum loss for a market with two firms and 11.1 percent of the maximum loss for a market with all nine firms. To define the extent of the market, firms are added (and Predicted Actual Loss is reduced) until the Predicted Loss falls below the Critical Loss. At that point, a uniform SSNIP imposed by the rivals within the market will be profitable. For comparison purposes, the standard approach to Critical Loss would estimate this loss with empirical evidence rather than theory and assumption.

Table 2 shows a comparison between (1) the resulting market definitions under the revised approach to CLA analysis using the constant diversion assumption and (2) the market definitions relaxing that assumption. Recall that Farrell and Shapiro's constant diversion assumption sets the Retention Ratio to 100 percent. We provide comparisons setting the Retention Ratio to 50 percent, 25 percent, and 10 percent.⁸⁸ The first column of Table 2 lists the range of margins from 90 percent through 10 percent. The second column displays the number of firms in the market for each level of margin assuming

⁸⁶ Internal FTC staff analyses identify broad markets in a numerous situations. Malcolm B. Coate, *Economic Models and the Merger Guidelines: A Case Study*, 2 REV. L. & ECON. 53 (2006).

⁸⁷ The basic model tracks the assumptions in Coate & Simons, *supra* note 40. Because the parameters used in the simulation model differ from our earlier work, the results change. Given the issues in *H&R Block*, the assumptions in this article are relevant for a study of that case.

⁸⁸ A Retention Rate of zero is expected in the Harris and Simons Critical Loss Analysis, and the market definition would need to be expanded. See Harris & Simons, *supra* note 4. Here, 50 percent, 75 percent, or 90 percent (respectively) of the 11.1 percent of volume that is lost to each firm in the market is transferred to firms outside the market when a single firm SSNIP is transformed into a uniform SSNIP. See *id.*

Table 2. Market definition analysis with 10 percent SSNIP

Price-cost margin for firm	Retention set to 100 percent	Retention set to 50 percent	Retention set to 25 percent	Retention set to 10 percent
0.9000	2 firms	3 firms	5 firms	9 + firms
0.8000	2 firms	3 firms	5 firms	9 + firms
0.7000	3 firms	4 firms	6 firms	9 + firms
0.6000	3 firms	4 firms	7 firms	9 + firms
0.5000	3 firms	4 firms	7 firms	9 + firms
0.4000	3 firms	5 firms	9 firms	9 + firms
0.3000	4 firms	6 firms	9 + firms	9 + firms
0.2000	4 firms	7 firms	9 + firms	9 + firms
0.1000	6 firms	9 + firms	9 + firms	9 + firms

Source: Authors' calculations.

diversion is constant (that is, Retention Ratio equals 100 percent). The third column shows the number of firms in the market assuming the Retention Ratio is set to 50 percent, and the fourth column shows the results for a Retention Ratio of 25 percent. The last column provides the results for a retention rate of 10 percent.

The first thing to notice about Table 2 is that the constant diversion assumption imposed by Farrell and Shapiro produces very narrow markets. With a 10 percent margin, the market will be defined to include six firms. However, once the margin hits 20 to 30 percent, the number of firms in the market drops to four so that a merger with those margins will be viewed as reducing the number of competitors from four to three. Once the margin gets to 40 percent and above, only three firms are included in the market, with an automatic monopoly structure generated for margins at 0.8 or above. Thus, for almost all values of the margin, the revised approach to CLA results in market definitions showing merger to monopoly or near monopoly. The results would be even more noticeable if the SSNIP is lowered to 5 percent, as the number of firms in the market would be 4 or fewer for the full range of margins.⁸⁹ Although the economists who introduced the diversion technique to market definition did so to preclude the application of broad markets where margin is high, our simulations show the revised Critical Loss methodology generally precludes broad markets for virtually all margin levels. In effect, the Lerner-diversion analysis, as applied in the economic literature, would appear to be outcome determinative for a large universe of cases.

What happens when we relax the constant diversion assumption? Changing the Retention Ratio from 100 percent to 25 percent roughly doubles the number of firms in the market for moderate or high levels of margin. For low margins, the market must be expanded beyond the nine firms. Reducing the retention ratio further to 10 percent produces a market larger than the nine

⁸⁹ See Coate & Simons, *supra* note 40, at 11 tbl.3.

Table 3. Effect of concave demand with 25 percent retention

Margin	Retention 25% with linear demand 5% SSNIP	Retention 25% with linear demand 10% SSNIP	Retention 25% with concave demand 5% SSNIP	Retention 25% with concave demand 10% SSNIP
0.9000	3 firms	5 firms	5 firms	9 firms
0.8000	4 firms	5 firms	6 firms	9 firms
0.7000	4 firms	6 firms	6 firms	9 or more firms
0.6000	4 firms	7 firms	7 firms	9 or more firms
0.5000	5 firms	7 firms	7 firms	9 or more firms
0.4000	5 firms	9 firms	8 firms	9 or more firms
0.3000	6 firms	9 or more firms	9 or more firms	9 or more firms
0.2000	7 firms	9 or more firms	9 or more firms	N/A
0.1000	9 or more firms	9 or more firms	N/A	N/A

Source: Authors’ calculations.

firms for all margin levels.⁹⁰ Thus, changing only the constant diversion assumption has very dramatic effects on the results of the market definition exercise. This clearly shows that the Lerner-diversion methodology depends crucially on its underlying assumptions.

Relaxing the linear demand assumption generates additional insights, which are illustrated in Table 3. The presence of a concave demand can increase the number of firms in the market by 50 percent or more.⁹¹ Table 3 shows the range of margins in column 1. Columns 2 and 3 show the number of implied firms in the market assuming linear demand, a 25 percent retention ratio, and a 5 percent and 10 percent SSNIP, respectively. Columns 4 and 5 show the number of implied firms in the market assuming demand is changed from linear to concave for a 5 percent and 10 percent SSNIP, respectively. By switching from a linear to a concave demand, it is possible to justify significantly broader markets for any value of the margin. Here, again the assumptions behind the Lerner-Diversion analysis affect the implications of the model.

⁹⁰ By construction, consumers purchase from firms 1 to 9 or the composite firm 10. Markets with 9 or more firms contain the composite good, and thus no further competitive analysis is needed because prices cannot increase.

⁹¹ Table 3 requires the specification of a concave demand function. For any such function, the elasticity at the equilibrium point is determined by the firm’s margin, but this elasticity cannot be used to predict actual loss because the demand curve is no longer linear. Instead, it is necessary to use the specification of the concave demand curve to generate the output level associated with a SSNIP. In our simulation, a quarter circle defines a manageable concave demand curve. The demand function (relevant for positive values of price and quantity) is easy enough to parameterize and it has a measurable elasticity at each point. The Lerner index identifies the elasticity associated with each margin value. From that equilibrium point, it is possible to impose either a 5-percent or 10-percent SSNIP on the market and compute the lower quantity. This actual loss is then used to solve for the number of firms in the market.

As a bottom line, the simulations show that the new approach to Critical Loss is heavily influenced by assumptions. If the standard theorist's assumptions are used, markets are narrowed significantly for all values of the margin and narrowed dramatically for high values of the margin. On the other hand, with alternative assumptions discussed in this article (for example a retention rate around 25 percent), the implications of the new analysis tend to disappear. Because the theory, once generalized to allow for a broader application, is inconclusive, empirical estimates of actual loss remain important in applying the Critical Loss test for any version of the margin. With this background, we move to discuss the H&R Block case in more detail.

VI. *UNITED STATES V. H&R BLOCK*: AN ILLUSTRATION

In the spring of 2011, the Department of Justice filed suit seeking to enjoin H&R Block's acquisition of 2SS Holdings, which sells digital do-it-yourself tax preparation software (DDIY) under the TaxACT brand. Intuit (the maker of TurboTax), H&R Block, and TaxACT were the three most popular software providers; jointly these firms accounted for approximately 90 percent of federal tax returns prepared using DDIY at the time of the suit. Intuit held 62 percent of such sales, with H&R Block and TaxACT controlling 15.6 percent and 12.8 percent, respectively. Clearly, limiting the market definition to DDIY products would have a near dispositive impact on the outcome of the case, with the analysis evaluating the impact of a merger that reduced the number of significant competitors from three to two.⁹²

Tax returns are also prepared by professional tax preparers, some accountants, and other employees of tax preparation services. Many other individuals prepare their own tax forms using pen and paper. The court referred to these potential substitutes as "assisted preparation" and "pen and paper," respectively. The defendants argued that both substitutes should be included in the relevant market, while the DOJ argued that the market was limited to DDIY.

The court sided with the DOJ, effectively moving the burden of proof to the defendant. The court then rejected the defendant's evidence and issued an injunction blocking the transaction. Barriers to entry and fringe expansion seemed to be the most important to consider, although the potential to create a more aggressive rival for Intuit (TurboTax) could have been relevant. The court rejected the evidence on fringe expansion, primarily because the fringe lacked the full complement of forms and had not established a strong brand. Neither of the court's arguments appears convincing, because access to the broadly available forms would service most taxpayers and brand is probably not important to taxpayers with simple returns. Customers most in need of a comprehensive

⁹² In the H&R Block case, the court noted that the defendants failed to rebut the presumption of a coordinated interaction concern and added that mergers to duopoly have never been permitted in the presence of barriers to entry. *United States v. H&R Block, Inc.*, 833 F. Supp. 2d 36, 81 (D.D.C. 2011).

branded DDIY supplier are probably those most likely to switch to assisted preparation. With this strict analysis of fringe expansion, ease of entry was also doomed as a relevant consideration. In retrospect, it appears that by facilitating the imposition of a burden on the defendants, the success of the DOJ's new market definition methodology played a crucial role in their victory. Had the DOJ kept the burden of proof on demonstrating anticompetitive effects, the outcome of this merger challenge may have been different.

A. Issues in Market Definition

In evaluating the relevant product market, the court suggested that it was applying the hypothetical monopolist test and specifically acknowledged that the appropriate question was “would enough DDIY users switch to assisted or pen-and-paper methods of tax preparation in response to a five-to-ten percent increase in DDIY prices to make such a price increase unprofitable?”⁹³ However, the court never really answered this question.

Instead, the court seemed to rely primarily on documents and testimony to perform the market definition exercise, but it did so without first determining how much volume the hypothetical monopolist would lose if it imposed a SSNIP on the market. Rather, the court first reviewed the documentary and testimonial evidence concerning substitution generally and reached a market definition conclusion on that basis. It did not discuss how interchangeable alternatives needed to be or how much substitution was necessary in order to require the expansion of the market beyond DDIY.⁹⁴

The court stated that the documents showed the merging parties were primary competitors; for example, the investment banker memoranda identified TurboTax and H&R Block as TaxACT's “primary” competitors.⁹⁵ The court recognized that the defendants' documents discussed assisted preparation and

⁹³ *Id.* at 52.

⁹⁴ The Interchangeability question is complex, because all three types of products combine with different amounts of the customer's time to produce a tax return. For the assisted return, the taxpayer just needs to gather the relevant information (W-2s, 1099s, receipts) and turn the data over to the tax preparer. This product economizes on both time and tax knowledge, and thus it is not surprising that it is the most expensive. For DDIY, the taxpayer needs to gather the information and then sit through endless input screens or input the data into electronic copies of the relevant forms. The program saves the consumer time by handling the calculations and (for taxpayers who bother to read the instructions) reduces the level of understanding required. Branded services are sold to consumers, while fringe products are often free (these firms might charge for online filing of the return). Pen-and-paper tax returns generally require the most consumer time but might be the easiest when the consumer can just replace last year's numbers with this year's numbers. Calculations are easy to make in Microsoft Excel. Naïve price analyses, comparable to those that occurred in this case, are unlikely to be insightful.

⁹⁵ Given that investment banker memoranda usually have disclaimers stating that potential buyers should not rely on them, crediting such documents in any significant way seems suspect. These types of documents are essentially sales brochures, involve puffing, and are usually not relied upon by anyone in the sales process.

pen-and-paper as substitutes as well, but the court emphasized that other DDIY providers were the “primary” competitors.⁹⁶ This conclusion is compatible with the observation that the other branded DDIY products would exhibit high diversion ratios when any one rival raised price. As noted in the text, this conclusion is not sufficient to infer a narrow market, because these diversion ratios may change when a uniform SSNIP is imposed by all DDIY providers.

The court made a significant point of the fact that only some of the products offered by DDIY providers had similar prices to those of assisted preparation, and that the parties “cannot demonstrate that this [price similarity] is *generally* the case.”⁹⁷ The court’s focus on the extent to which the majority of products overlapped in price or whether the DDIY providers were “primary” competitors is consistent with an implicit assumption about what it takes to include different products in the same market. Specifically, it suggests that the products must be substitutes for each other with respect to most of their customers as opposed to being substitutes on the margin. This analysis fails to understand that Critical Loss (and the hypothetical monopolist test of the Merger Guidelines more generally) focuses on the behavior of the marginal customers, because it is substantial switching by these customers that requires the rejection of the market.

Later in its opinion, the court appears to accept the proposition that the Critical Loss was only 16.7 percent. So for this case, the number of marginal customers—the ones who would switch away from DDIY to assisted preparation or pen-and-paper in the face of a 10 percent SSNIP—could be small (something just over 16.7 percent) and still be sufficient to require a market definition broader than DDIY. Yet there seems to be a complete disconnect between the qualitative facts relied upon by the court in reaching its market definition determination and what was necessary to require an expansion of the relevant market. The court seemed to believe that a much higher degree of substitution (much more than 16.7 percent) was required. What might explain such an implicit assumption? Perhaps the answer lies with the testimony of the economic experts.

The court concluded that the credible economic expert testimony was compatible with DDIY as a relevant product market.⁹⁸ Specifically, the court found that the analysis presented by the DOJ’s expert tended to confirm the court’s conclusion on market definition, although the available data in the case limited the predictive power of his models. The court could not draw any conclusions from the testimony of the defendant’s economist because of “severe shortcomings” in the underlying consumer survey data upon which she relied.

⁹⁶ *H&R Block*, 833 F. Supp. 2d at 53. Uncritical acceptance of such documents would almost guarantee every market definition is narrow, because every firm has close competitors that merit the bulk of its attention. Standard market-definition analysis attempts to determine if the firms are also constrained by more distant rivals.

⁹⁷ *Id.* at 56 (emphasis added).

⁹⁸ *Id.* at 60.

B. The DOJ's Expert

The DOJ's expert Dr. Warren-Boulton applied the new version of Critical Loss Analysis that focuses on diversion ratios. After calculating the Critical Loss at 16.7 percent, Warren-Boulton proceeded to compare that threshold with the estimated aggregate diversion ratio because he opined that:

[E]conomists have shown that if the aggregate diversion ratio to products inside the proposed relevant market exceeds the critical loss threshold, then the critical loss analysis indicates that a SSNIP at that level would be profitable for a hypothetical monopolist.⁹⁹

To estimate the aggregate diversion ratio, Warren-Boulton relied on IRS data showing the extent to which taxpayers switched among the various methods of tax preparation. Although such data is not an actual measure of diversion, because it is not limited to switching caused by price changes, Warren-Boulton thought it was indicative and used it in his calculations. The court agreed.

The IRS data showed that, of the taxpayers that left H&R Block's DDIY product, 57 percent went to other DDIY providers and 43 percent went to either assisted preparation or pen-and-paper. The numbers were similar for TaxACT and for TurboTax, as 53 percent went to another DDIY provider for TaxACT and 39 percent went to another DDIY for TurboTax. It appears from the court's opinion that Warren-Boulton used this data as evidence of the aggregate diversion ratio. Given that the IRS data showed 39 to 57 percent of consumers switching to other DDIY providers, Warren-Boulton concluded that aggregate diversion was likely to be far in excess of the Critical Loss of 16.7 percent.¹⁰⁰ However, this diversion statistic is relevant only for a single firm SSNIP. Had all the DDIY providers raised price, the extent of switching among them surely would have been less.

Thus, a major focus of Warren-Boulton's testimony was whether his theoretical proxy for the aggregate diversion ratio exceeded 16.7 percent.¹⁰¹ Based on the court's opinion, he does not seem to have tried to evaluate whether the hypothetical monopolist would have actually lost more than 16.7 percent of its sales in the face of a uniform SSNIP. Accordingly, the focus of his market

⁹⁹ *Id.* at 63 (citing Michael Katz & Carl Shapiro, *supra* note 17, at 49–56).

¹⁰⁰ *Id.* at 63.

¹⁰¹ Warren-Boulton attacked the broad market by positing that the demand for tax services would be totally inelastic and would negate the entire purpose of defining a market in an antitrust case. This conclusion fails to understand the competitive implications of the broad market. By bringing direct provision of the service (pen and paper) into the market, the analysis can preclude an anticompetitive effect, because self-provision of services is, by assumption, competitive. The defendants did not appear to highlight this point for the court. Had they, the court may have looked more favorably on their evidence. (As an aside, another issue with this case is the potential for the fringe firms to interact with "pen and paper" and defeat a price increase. Consumers have no need to compute their taxes by hand, as any software program will do that. All they need to do is enter their numbers into a program and copy down the answers on a tax form. Given that access to these fringe services is often free, the taxpayer has a ready substitute for the products of the three leading firms.)

definition testimony was the extent of substitution among DDIY providers and not among the various providers of tax preparation services. One can only conclude that the economic evidence was incomplete.

Determining whether the Predicted Loss exceeds the Critical Loss, on the other hand, requires a focus on the customers that are marginal to DDIY providers as a group. Whether the customers *on average* view DDIY and assisted preparation as substitutes is not relevant to that question. Accordingly, the testimony of the DOJ's expert economist may have influenced the court to look for the wrong thing in its qualitative analysis of the documentary and testimonial evidence.

Of course, if the diversion-related version of CLA were the correct one, then the court's analysis would have been more appropriate. However, no empirical justification was offered for the new model. Additionally, it is important to note that the Lerner-Diversion model would return a narrow market as long as 16.7 percent of each firm's lost sales were recaptured by the other DDIY producers. DDIY firms could lose 83 percent of their lost sales to distant rivals (assisted preparation and pen-and-paper), and the Farrell-Shapiro model applied by Warren-Boulton would still return a narrow market. In effect, market definition becomes a theoretical exercise of isolating narrow classes of closely-related substitutes. As long as these substitutes are close rivals, Lerner-diversion analysis finds a narrow market. Theory now controls market definition.

The DOJ's expert seems to have relied on the several assumptions described above, which were likely not justified, certainly not demonstrated to be justified, and perhaps cannot be justified in most cases. Specifically, the assumptions underlying Warren-Boulton's analysis were that (1) the Lerner Index is applicable and can be used reliably to predict demand elasticity, (2) the diversion ratio is identical for both the single firm and uniform SSNIP, and (3) demand is basically linear over the relevant range. Although the defendants made an "oblique" reference to the controversy over "the proper way to perform Critical Loss Analysis" in their cross-examination of Warren-Boulton, the court notes they failed to "pursue the [controversy] further."¹⁰² Based on the court's opinion, it does not appear that the defendant's economic expert addressed the problems with the diversion-based approach to CLA either. Rather, her market definition seemed to concentrate on alternative measures of diversion, specifically survey evidence that the court rejected. She seems to have accepted the diversion-based approach to CLA. Thus, the court was apparently never presented with anything approaching a full explanation of the controversy surrounding the market definition approach advocated by DOJ and its expert.¹⁰³ This oversight may have contributed to the DOJ's success in this matter.

¹⁰² *H&R Block*, 833 F. Supp. 2d at 64 n.19.

¹⁰³ Warren-Boulton also escaped unharmed in his application of merger simulation to evaluate the likely unilateral effect of the merger. Here, the court accepted his claim that simulation is "fully consistent with the correct economic theory." *Id.* at 87. The defendants appear to have

Had the court been presented with such testimony, perhaps the result would have been different. For example, the switching data showed that 11.2 percent of TaxACT's customers switched to assisted preparation in one year, while 2.7 percent switched to H&R Block's DDIY product and 9.1 percent switched to TurboTax.¹⁰⁴ Data on percentage volume loss (as opposed to percentage of switching) is only provided for TaxACT in the opinion. This switching data appears not to have been in response to a price increase by TaxACT. Assuming the numbers are similar for the other DDIY providers, a price increase by all DDIY providers may have resulted in substantially more loss of volume, and one can speculate that it might easily have exceeded the 16.7 percent Critical Loss. The numbers are such that it could easily have been a much closer question than whether a naïve measure of aggregate diversion exceeded the Critical Loss.

Focusing on diversion rather than the Predicted Loss thus made the court's decision on market definition a much easier one than might have otherwise been the case. As illustrated by the simulations in Part V above, the standard Lerner-diversion analysis generates narrow markets for a wide range of assumed margins, and therefore a theoretical focus on predicted loss will tend to generate narrow markets in numerous situations. Likewise, it is easier to show the aggregate diversion ratio is greater than the Critical Loss (A greater than CL), than it is to use actual evidence to prove that the Predicted Loss is less than the Critical Loss (PL less than CL). The adoption of the diversion-based approach to CLA would thus make the government's burden of proof on market definition a much easier one to carry. Once a narrow market is defined, the government can then exploit the structural presumption to conclude that the merger is likely to lessen competition substantially.¹⁰⁵ Combining the Lerner-diversion theory with the historical case law creates the potential to tighten merger policy significantly. The H&R Block case provides a real life illustration of how the new approach to Critical Loss changes the burden of proof in a merger case.

VII. CONCLUSION

Critical Loss Analysis is a fact-based methodology designed to identify the boundaries of relevant markets and assist in the analysis of mergers and other

failed to confront Warren-Boulton with the empirical evidence showing merger simulations consistently err in predicting effects of consummated mergers. Again, while the profit-maximizing structure of the theory is completely consistent with economic theory, the rest of the assumptions that underpin the merger simulation need not be. Given that the historical facts suggest simulation is rarely able to accurately predict outcomes, the "probative value" of the analysis is small. See Coate & Fischer, *supra* note 66, at 160–63.

¹⁰⁴ See *H&R Block*, 833 F. Supp. 2d at 65.

¹⁰⁵ *United States v. Phila. Nat'l Bank*, 374 U.S. 321 (1963); *United States v. Baker Hughes Inc.*, 731 F. Supp. 3 (D.D.C. 1990), *aff'd*, 908 F.2d 981 (D.C. Cir. 1990); *Fed. Trade Comm'n v. Heinz, H.J. Co.*, 1116 F. Supp. 2d. 190, *rev'd*, 246 F.3d 708 (D.C. Cir 2001).

antitrust concerns. Some economists propose replacing the fact-based inquiry of the standard model with a shortcut to infer evidence from a theoretical model linked to firm level pricing, not market competition. However, the model does not appear to be broadly applicable, and even when it is applicable, the parameterization of the model may be difficult. Our simulations show the proposed technique will generate narrow markets for virtually all values of the margin parameter, but this result critically depends on the assumption of the retention rate and the specification of the demand function. The H&R Block case stands as an example of how a naïve application of this theoretical methodology can almost guarantee success to the plaintiffs because it tends to shift the burden of proof in a merger case to the defendant. Such a shift in the standard of proof could dramatically affect merger regulation in the United States, with the potential for significant adverse effects on the ability of the economy to restructure in a dynamic world.