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Critical Loss: Implementing the Hypothetical Monopolist Test

Malcolm B. Coate and Jeffrey H. Fischer

U.S. Federal Trade Commission

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Implementing the Hypothetical Monopolist Test

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T he 1982 Department of Justice (DOJ) Merger Guidelines formalized the hypothetical monopolist test (HMT) for market definition, defining a market as a group of products for which a hypothetical monopolist could profitably impose a price increase. In effect, the DOJ proposed a method of abstracting from the complexities of the traditional market definition methodology based on demand and supply elasticities.[1] The HMT evolved slightly with the 1984 and then the1992 Guideline revisions. By 2003, DOJ economist Gregory J. Werden could conclude that the Guidelines test was generally accepted as compatible with the case law.[2]

Critical Loss (CL) analysis was formalized by Barry C. Harris and Joseph J. Simons in the late 1980s.[3] The standard analysis simply computes the level of lost sales (i.e., the critical loss) sufficient to leave the hypothetical monopolist indifferent between

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[*] The authors are economists at the U.S. Federal Trade Commission (FTC). The analyses and conclusions set forth in this paper are those of the authors and do not necessarily represent those of the FTC, any individual Commissioner or any Commission Bureau.

[1] It is important to recognize that the HMT merely organizes the merger analysis around the concept of the market; it is not a substitute for doing the rest of the review. As such, the exact contours of the market are less important than providing some reasonable boundaries for the analysis of competitive effects, ease of entry, and efficiencies.

[2] Gregory J. Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, 71 ANTITRUST L.J. 253 (2003).

[3] Barry C. Harris & Joseph J. Simons, *Focusing Market Definition: How much Substitution is Necessary*, 12 RESEARCH L. & ECON. 207 (1989).

imposing a price increase and holding current prices. As such, CL is merely a way of implementing the HMT. It is applicable when the simplifications implicit in the calculation are reasonable, and inapplicable when the simplifications are unreasonable. While it makes sense to discuss the failures of any specific application of the model, it is inappropriate to suggest that the entire methodology is incorrect. The concept is useful— and used—because it provides a framework in which to define markets that is easy to implement and simple to present in court.[4] It captures the essence of the market definition issue: whether a price increase is profitable because a firm would not lose too many customers outside the candidate market. On occasion, more sophisticated analyses may better capture nuances in competitive behavior, but the straightforward test is often appropriate.

This comment responds to two recent CL papers in this magazine. The first, by Gregory J. Werden, cautions against the standard application of CL analysis. The second, by Kevin Murphy and Robert Topel, conclude the CL concept is "so fundamentally flawed that it cannot be used as a tool of market definition." In this paper, we show that Werden overstates his case, while Murphy & Topel are simply wrong.

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[4] In our study of market definition analysis at the FTC, we found that roughly half the market definitions were clear to all and generated without an appeal to critical loss analysis. Thus, standard critical loss is unable to systematically broaden the market beyond fact-based common sense boundaries. Moreover, in 15 matters, we found staff applied a range of critical loss analyses, customized to the case under review. *See* Malcolm B. Coate & Jeffrey H. Fischer, *A Practical Guide to the Hypothetical Monopolist Test for Market Definition*, J.L. COMPETITION & ECON. (forthcoming 2008), *available at* http://ssrn.com/abstract=940667.

Reply to Werden[5]

Werden starts with a brief overview of CL. He then launches into a series of conceptual criticisms. We view his commentary as a collection of special cases in which the standard CL model is not a good methodology for the HMT test.[6] As the plaintiff bears the burden of proof on market definition, the plaintiff would be expected to present the evidence necessary to rebut a broad market resulting from the standard analysis.[7]

Werden first objects to the use of a specific hypothetical price increase (say, five percent), rather than the use an optimal monopoly price increase. He provides an example of how a five percent price increase would be unprofitable even though a larger increase would be profitable. In this example, a substantial fraction of customers have highly inelastic demands, and the rest have highly elastic demands. A small price increase drives the latter group to an alternative product, rendering the price increase unprofitable; however, the former group would continue to purchase from the monopolist for an even larger price increase, rendering the larger price increase profitable. If evidence can show that demand was bifurcated in this way, then nothing precludes the plaintiff from offering this alternative CL test.

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[5] Gregory J. Werden, *Beyond Critical Loss: Properly Applying the Hypothetical Monopolist Test*, GCP MAGAZINE 2 (Feb. 2008), *at* http://www.globalcompetitionpolicy.org/index.php?&id=862&action=907 (last visited Mar. 31, 2008).

[6] We sharply disagree with Werden's suggestion that standard CL analysis should be excluded as unreliable under Rule 702 of the Federal Rules of Evidence (a rule based on Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993)). The basic CL arithmetic captures the essence of the HMT, and the analysis is readily applied whenever the expert can parameterize the model. If the expert failed to correctly apply the critical loss test, that issue should be resolved in the trial on the merits. Special case problems with an economic methodology do not warrant exclusion under *Daubert*.

[7] Of course, the plaintiff would be expected to present a standard CL analysis to substantiate a broad market when the merging parties do not compete in a narrow Guidelines market.

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Werden's second point is that complex cost functions may require a modification of the standard CL calculation. He offers an example of a multi-plant monopolist. Depending on the cost differences across plants, it could be the case that an expected actual loss is profitable when the costs associated with the high-cost plant are used, but unprofitable when the costs are based on the monopolist's average costs across all of the plants.[8] Again, this seems like a special case in which the plaintiff could easily offer this alternative CL test, if the facts so dictate. More importantly, however, this approach strikes us as misleading if the market structure of the merger under study involves several firms: although a hypothetical monopolist would hypothetically control all of the plants in the market, the realistic alternative is that the post-merger oligopolists would have to coordinate an output reduction across *all* of their plants. Narrowing the market based on a CL test that fails to consider the realities of the market would elevate formalism over fact.

Finally, Werden observes that the standard CL test hypothesizes a fixed price increase, while a multi-product monopolist of differentiated goods would set product-specific price increases. This is really a criticism of the HMT structure rather than the CL test that merely attempts to implement the HMT. As in the example just discussed, market realities generally involve coordination among multiple firms, where the oligopolists are unlikely to achieve anything like the product-by-product optimal price

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[8] This criticism is not new. Coate & Williams (2007) show that the calculated critical loss is higher if the industry cost curve is not flat. Of course, the constant cost assumption is often reasonable as market prices may be set by long-run considerations and thus the constant short-run marginal cost may be appropriate. *See* Malcolm B. Coate & Mark D. Williams, *Generalized Critical Loss for Market Definition*, 22 RESEARCH L. & ECON. 41 (2007).

increases of the hypothetical monopolist.[9] Again, the point of the HMT is to organize the

analysis of the merger around the concept of the market, and the standard CL test does so

without resorting to gimmicks. In special cases, an economist can present a more

complex analysis, postulating product-specific price changes to define the market,

leaving it to the court to resolve the academic dispute.[10]

Reply to Murphy & Topel[11]

In contrast with Werden, who appears to accept the general CL concept but would

like to modify the analysis as necessary to generate narrow markets,[12] Murphy & Topel

totally reject the standard application of CL analysis in market definition. Their

presentation is based on the observation that a short-run theory of profit maximization in

markets with differentiated goods creates certain theoretical predictions regarding the

expected actual loss in sales resulting from an anticompetitive price increase. Because the

hypothetical monopolist, by definition, faces a demand that is no more elastic than that of

the relevant market, in common high margin cases some price increase is almost always

profitable, and thus markets must be narrow. An analyst can still calculate critical loss,

but high margins ensure that the "fix is in" for the estimate of actual loss. In Murphy &

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[9] If the merger is one to monopoly, then Werden's modification of the CL test does not fall victim to the application problems, but the plaintiff retains the burden of proof for the more complex technique. Furthermore, any price discrimination arguments would have to be addressed within the relevant market.

[10] As a practical matter, it is often difficult to generate useful information on the likely effect of a uniform price increase. Imagine the confusion in customer interviews of hypothesizing the profit-maximizing vector of price increases!

[11] Kevin Murphy & Robert Topel, *Critical Loss Analysis in the* Whole Foods *Case*, GCP MAGAZINE 1 (Mar. 2008), *at* http://www.globalcompetitionpolicy.org/index.php?&id=949&action=907 (last visited Mar. 31, 2008).

[12] Werden seems to anticipate some of our reactions to Murphy & Topel. In his concluding remarks, Werden states: "the calculations suggested by RCLAD [his term for a revised CL calculation that uses the Lerner Index to predict actual losses] are predicated on simplistic assumptions, much as CLAD [his term for critical loss], and consequently are subject to similar criticisms."

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Topel's view, virtually any CL analysis that provides evidence that the likely actual loss exceeds the computed critical loss is wrong.[13] We think this misses the point of studying actual markets.

While the basic math of the Murphy & Topel model is correct, its application to the market definition problem is highly problematic. First, static economic equilibria are defined at specific mathematical points. Comparative statics (the study of mathematical partial derivatives) can identify the effects of small movements away from an equilibrium point. As the values of the relevant functions move further away from that point, anything can happen.[14] For example, customers may consider the merged firms their first and second choices for very small price increases. However, if the price increase rises to the level required in a CL analysis, more distant substitutes may appear much more attractive. Even in the short run, substitution patterns may be complex. Although imposing structure on the demand system may succeed in disguising the substitution, it will not change reality.

A more serious criticism involves whether the assumption that firms maximize short-run profits is reasonable. If market share is related to long-run profitability, firms may be reluctant to naïvely optimize their profits in the current period.[15] Murphy & Topel assume, without evidence, that firms behave according to the short-run model and,

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[13] While standard CL test computes the critical loss from margins and then estimates actual loss from exogenous data, theorists, like Murphy & Topel, rely on the hypothesized relationship between the short-run margin and demand elasticity to predict actual loss. In effect, they use the same margin data for both critical and actual loss. If margins are substantial and the number of firms small, this methodology almost always defines narrow markets.

[14] Mathematically, this distinction involves the difference between derivatives and differentials.

[15] Firms may set their price, product, promotion, and placement strategies simultaneously as part of their long-run competitive strategy. Economists need to understand the competitive conditions in the market before they choose the appropriate economic model of competition.

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therefore, dismiss evidence suggestive of a pricing strategy inconsistent with this theoretical model. A more realistic analysis would consider long-run profit maximization. Short-run costs and prices may still be relevant for antitrust analysis as market power involves exploitation of short-run structural anomalies for opportunistic gain. Standard CL explores this trade-off, but the short-run Lerner index no longer constrains the parameterization of the model. Short-run demand elasticity is not necessarily linked to margin. Facts, as evaluated through CL, answer the HMT.

Third, Murphy & Topel assume that products are differentiated in a meaningful way. It is always important to remember that product differentiation is a modeling assumption.[16] Sometimes it is useful; in other cases, differentiation just complicates the analysis and should be ignored. Economic modeling is all about simplification. If the facts indicate that products are essentially undifferentiated, homogeneous goods models are relevant. For a homogeneous goods model, the standard CL approach may be appropriate, and, as noted earlier in this paper with respect to Werden's special cases, modification of the standard CL approach is often straightforward. Overall, Murphy & Topel would have us elevate theory over fact when, actually, science requires facts to trump theory.

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[16] For a more detailed discussion on modeling choices for critical loss, *see* Malcolm B. Coate & Mark D. Williams, *A Critical Commentary on the Critical Comments on Critical Loss*, ANTITRUST BULL. (forthcoming 2008).

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