



UPDATE...



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I. INTRODUCTION

Modern day antitrust is grounded in traditional neoclassical economic theory, which assumes consumers and firms are rational, profit maximizing entities. That view was solidified in the 1986 Supreme Court majority opinion in *Matsushita* (“...as presumably rational businesses...”).²

In contrast, behavioral economics, and the concept of bounded rationality, recognizes the real-world limitations on fully rational behavior. These limitations include constraints on time, constraints on the ability to sort through complexity, and constraints on the ability to process large amounts of information. In the bounded rationality framework, decision-makers do not make the best choice after maximizing a complex optimization problem. Rather, decision-makers make choices by taking short cuts, such as using rules-of-thumb, or through satisficing, by making a choice that exceeds some minimal acceptable level. These short cuts make complex problems more tractable.

Like consumers, firms make decisions using short cuts and rules of thumb. For example, rather than choosing a price based on a Lerner Index calculation that is derived from neoclassical economic theory or choosing a price based on the outcome of a complex linear programming model or robust A/B style testing (though some firms certainly do), many firms instead choose price by lowering or raising said price by a given percentage or dollar amount relative to a benchmark (e.g., the current price or last year’s price). Similarly, firms may exhibit behavioral biases by focusing on cost minimization rather than profit maximization.

Market realities of how firms actually behave create a gap in our knowledge: How well do real world market outcomes approximate the outcomes predicted by neoclassical economic models? Are empirical simulations of post-merger prices systematically biased? Is antitrust enforcement, relying on the traditional neoclassical framework, getting it right enough of the time?

II. THE USE OF NEOCLASSICAL ECONOMIC THEORY IN ANTITRUST

There are many empirical analyses in antitrust that rely on theoretical results that flow from traditional neoclassical models.³

For example, one of the basic relationships in antitrust economics is the Lerner Index. The Lerner Index is an equilibrium relationship stating that a profit maximizing firm chooses its optimal price such that the firm’s

² The dissenting opinion in *Matsushita*, written by Justice White, notes that firms may pursue objectives other than profit maximization. Specifically, the dissenting opinion states that the majority consistently assumed the firms at issue were pursuing near-term profit maximization rather than an alternative objective such as growth.

³ See, for example, Elizabeth M. Bailey, “Behavioral Economics and U.S. Antitrust Policy,” *Journal of Industrial Organization*: Volume 47, Issue 3 (2015), pp. 355-66.

percentage mark-up of price over marginal cost is related to the own-price elasticity of demand faced by the firm. It is predicated on the assumption of profit maximization and the first order conditions that are derived from that optimization problem.

Using the theoretical predictions that flow from this model, if an acquisition eliminates a competitor that lowers the firm's own-price elasticity of demand, holding all else equal, then the transaction will lead to higher prices because a reduction in the own-price elasticity of demand implies that the firm will increase its gross profit margin. The underlying assumption on which this equation is derived, however, is that the firm is maximizing profits. If the firm is not maximizing short-run profits, but instead growing revenue or market share, then analyses based on the relationship between the firm's gross profit margin and its own-price elasticity of demand may not be informative when making predictions about post-merger pricing.

Relatedly, merger analysis often uses Critical Loss as an economic tool to inform the definition of the relevant market. Critical Loss uses the relationship between a firm's gross profit margin and its own-price elasticity of demand derived from traditional economic models, coupled with an estimate of the acquiring firm's gross profit margin to draw inferences about the elasticity of demand. However, if the firm's short-run goal is something other than profit maximization, then an analysis based on a flawed inference about the firm's own-price elasticity of demand drawn from the firm's gross profit margin may not be useful for making predictions about post-merger market power and post-merger pricing. The problem arises not in estimating the own-price elasticity of demand econometrically but in deriving the "critical" own-price elasticity of demand from a theoretical relationship with the firm's gross profit margin.⁴

The weight given to marginal cost (or variable cost) savings over fixed cost savings is also predicated on comparative statics of results from neoclassical theoretical economic models. Traditional neoclassical economic models predict that variable cost savings, such as lower per unit input costs, are more likely to lead to lower prices post-merger than fixed cost savings, such as lower overhead costs. For this reason, more weight is given to efficiencies generated from variable cost savings than those generated from fixed cost savings. But if traditional neoclassical economic models do not adequately describe how firms set prices, then too little credit may be given to fixed cost savings. For example, if an acquiring firm sets prices taking account of fixed costs, such as full cost pricing methodologies, then a reduction in fixed costs may likewise lead to lower prices.

III. A GROWING BODY OF LITERATURE

Although the U.S. antitrust agencies rely on a profit maximization assumption for assessing competitive effects,⁵ economic models are simplifications of the real world.

To the extent antitrust policy credits behavioral economics, it tends to focus on how firms modify their rational, profit-maximizing behavior to take advantage of the ways in which consumers deviate from the traditional neoclassical model. The strategic use of defaults, benchmarks, framing, and complexity may all be ways for firms to take advantage of behavioral, not perfectly rational, consumers.⁶ Firms' modifying their behavior to take advantage of consumer behavior has implications for the enforcement of consumer protection policies that are designed to protect them from unfair or deceptive practices.

Two arguments are typically made for continuing to treat firms as rational, profit-maximizing entities but making allowances for consumers to depart from neoclassical theory. First, firms have greater financial resources than consumers, which allows firms to access a wide array of consultants and advisors who can assist in information processing and making optimal pricing decisions. Second, firms that systematically and persistently fail to maximize profits are unlikely to survive in the long-run due to competition.

4 Issues with the Lerner Index and Critical Loss can arise from the consumer-side as well. For example, reference-based preferences, such as when consumers respond disproportionately to price increases compared to price decreases, can give rise to a demand curve with an outward kink at current prices. This kink means the demand curve is more elastic for price increases (above the kink) than for price decreases (below the kink). One implication of a demand curve with a meaningful kink at current prices is that the Lerner Index will not hold because the marginal revenue curve will be discontinuous at the prevailing price.

5 See the 2010 Department of Justice and Federal Trade Commission 2010 Horizontal Merger Guidelines, available at: <https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>. See also comments submitted during the DOJ and FTC revisions to the Horizontal Merger Guidelines in 2010 which credit "the working assumption of profit maximization as the best starting point for competition analysis," available at https://www.ftc.gov/sites/default/files/documents/public_comments/horizontal-merger-guidelines-review-project-proposed-new-horizontal-merger-guidelines-548050-00017/548050-00017.pdf at p. 1.

6 See, for example, a Summary Report from a 2007 FTC Conference on Behavioral Economics and Consumer Policy, available at: <https://www.ftc.gov/sites/default/files/documents/reports/summary-report-ftc-behavioral-economics-conference/070914mulhollandrpt.pdf>.

Other defenses given to justify the assumption that firms are fully rational and maximize profits include: profit maximization is a pretty good approximation most of the time; firms learn the optimal outcome overtime; firms make one-off mistakes but these mistakes average out across a large population of firms; rules of thumb lead to outcomes that approximate the outcome that would result from a complex optimization problem; profit maximization is analytically easy from a theoretical perspective; and if profit maximization (which often gives one unique solution) is not assumed, then there are too many other possible outcomes. These may be good and correct arguments, but they are based on reasoning, not empirical evidence.

There is an active and growing body of empirical evidence from the economics literature, largely in the field of finance, of firm behavior that departs from strict profit maximization.⁷

For example, Graham & Harvey (2001) show that, while neoclassical economic theory predicts Net Present Value is the optimal investment decision rule for firms making capital budgeting decisions, many Chief Financial Officers report that in practice they make capital budgeting decisions based on short cuts and rules of thumb, such as the Internal Rate of Return rule, various versions of the “Payback” rule, and the “Profitability Index” rule.⁸ Malmendier & Tate (2005) show empirically that firms with overconfident CEOs systematically make corporate-level investment decisions that diverge from the optimal.⁹ Bubb & Kaufman (2013) identify empirical evidence of systematically different pricing for credit cards offered by investor-owned banks as compared to the credit cards offered by credit unions, depository institutions that are mutual institutions owned by their customers.¹⁰ Similarly, Eliason et. al. (2018) provide empirical evidence of systematically different profit-making behavior at dialysis facilities owned by independents compared to dialysis facilities owned by large chains by comparing the location-specific treatment strategies made pre-acquisition versus post-acquisition.¹¹ As well, a recent working paper by DellaVigna & Gentzkow (2017) finds empirical evidence, based on Nielsen scanner data, that supermarket, drug store, and mass merchandise retailers often charge uniform prices, thereby deviating from the benchmarks of traditional profit maximization.¹²

IV. IS IT TIME FOR AN UPDATE?

How closely a model’s assumptions track actual firm behavior determines, in part, how useful traditional neoclassical economic models are for predicting potential anti-competitive effects. For these reasons, the economic models employed must be ones that fit the facts on the ground.

There are a limited, but slowly growing, number of antitrust precedents for the reliance on behavioral assumptions. For example, in the 1991 Ivy League Financial Aid Price Fixing Agreement Litigation, the Department of Justice argued that, by collectively agreeing on financial aid packages, universities were competing less aggressively in their financial aid offers to students. The universities argued that the use of the neoclassical economic model was inappropriate in this circumstance because the schools were non-profit entities not profit-maximizing entities. The Third Circuit Court of Appeals agreed with the Massachusetts Institute of Technology that a strict reliance on the neoclassical model was inappropriate given the non-profit objective function of the universities. In remanding the case back to the district court, the appeals court instructed the district court to consider the potential for the collective financial aid agreement to increase welfare.

There are also examples of personal objectives, not profit maximizing objectives, weighing in on antitrust considerations. First, in 2001, the Federal Trade Commission (“FTC”) closed its investigation into Genzyme Corporation’s acquisition of Novazyme Pharmaceutical, two firms

7 In addition to the empirical economic papers discussed below, other empirical economic papers documenting non-profit maximizing behavior by firms include: Steven Levitt (2006), “An Economist Sells Bagels: A Case Study in Profit Maximization,” NBER Working Paper Number 12152 dated April 2006 (empirical evidence that the prices set by a bagel firm sustain long-run systematic deviations from profit maximization); David Romer (2006), “Do Firms Maximize? Evidence from Professional Football,” *Journal of Political Economy*, 114(2): 340-365 (empirical evidence that decisions made by NFL teams depart from optimal decision-making, with choices selected that are more conservative than maximization predicts are optimal); and Armstrong, M., & Huck, S. (2010), “Behavioral Economics as Applied to Firms: A Primer,” *Competition Policy International*, 6(1), 2–45 (survey of empirical evidence that firms depart from the profit maximizing paradigm through the use of satisficing behavior and rules-of-thumb).

8 John Graham & Campbell Harvey (2001), “The Theory and Practice of Corporate Finance: Evidence from the Field,” *Journal of Financial Economics*, Vol. 60. See also John Graham & Campbell Harvey (2002), “How Do CFOs Make Capital Budgeting and Capital Structure Decisions?,” *Journal of Applied Corporate Finance*, Vol. 15, No. 1, Spring.

9 Ulrike Malmendier & Tate, G. (2005), “CEO Overconfidence and Corporate Investment,” *Journal of Finance*, 60(6), 2661–2700.

10 Bubb, R., & Kaufman, A. (2013), “Consumer Biases and Mutual Ownership,” *Journal of Public Economics*, 105, 39–57.

11 Paul J. Eliason, Benjamin Heebsh, Ryan C. McDevitt & James W. Roberts, “How Acquisitions Affect Firm Behavior and Performance: Evidence from the Dialysis Industry,” Working paper dated June 18, 2018, available at https://www.ftc.gov/system/files/documents/public_events/1349883/eliasonheebshmcdevittroberts.pdf.

12 DellaVigna, S. & Gentzkow, M. (2017), “Uniform Pricing in US Retail Chains,” Working Paper dated November 7, 2017.

that conducted early studies into treatment for a rare genetic disorder that affects infants and children. While not explicitly using the term behavioral economics, the FTC appears to have recognized circumstances that may dictate a departure from the strictly rational, profit-maximizing economic model in favor of fact-specific behavioral considerations. In closing the investigation, the then-Chairman of the FTC noted that the structure of the Genzyme/Novazyme transaction “strongly suggest[ed]” that the transaction would not dampen incentives to develop a treatment because the manager that would be in charge of the research program post-transaction had two children afflicted with the disease. Similarly, in the mid-1990s, the FTC went to court to block a proposed merger between Butterworth Health Corporation and Blodgett Memorial Medical Center, two non-profit acute-care hospitals located in Grand Rapids, Michigan. A U.S. district court denied the FTC’s request for a preliminary injunction finding that the non-profit status of the merging hospitals would result in the combined entity having a different objective post-merger than if the merging hospitals were for-profit. As well, the district court gave credit to the composition of the board of directors post-merger, noting that the individuals on the board were members of the local community and therefore were unlikely to make decisions that were consistent with strict profit-maximization post-merger.

V. CONCLUSION

Predicting competitive effects is not easy and no economic model predicts the future with certainty. When facts matter, as they do in antitrust investigations, one-size-fits-all approaches are inadequate. A more expansive toolkit is neither aligned with an aggressive pro-enforcement agenda nor with a more lenient antitrust enforcement agenda. Rather, a more expansive toolkit provides additional tools to get it right.

Understanding how consumers and firms make decisions is fundamental to antitrust because the assumptions made are central to predicting competitive dynamics post-transaction. How close the assumptions made in an economic model come to approximating actual behavior determines, in part, how useful the model is in predicting potential anticompetitive effects. To the extent there are situations in which the fact pattern shows that firm behavior does not match well with traditional assumptions, such as growing revenue or increasing market share, predictions based on neoclassical models may be off directionally. If a firm is pursuing an objective other than profit maximization, even in the short or medium run, it makes sense to consider whether it is appropriate to apply a theoretical economic model that assumes strict profit-maximization.

Because the empirical literature in finance and economics has provided a growing collection of real-world examples of the ways in which firms depart from profit maximization, it makes sense to fill this gap in our knowledge. How well do the market outcomes from behavioral firms approximate the market outcomes predicted by neoclassical economic models? Does the evidence provide a basis to conclude that neoclassical economic assumptions allow antitrust policy to get it right enough of the time?



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