

2018

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Silvia, Louis, "Economics and Antitrust Enforcement: The Last 25 Years" (2018). *Publications, Agencies and Staff of the U.S. Department of Commerce*. 593.

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Economics and Antitrust Enforcement: The Last 25 Years

LOUIS SILVIA

ABSTRACT Economics has reshaped antitrust enforcement over the last quarter century. Its impact has been most dramatic in merger analysis, with the shift toward unilateral effects theories and away from market concentration-related theories of collusion. Progress on both the theoretical and empirical fronts has also changed enforcement priors and competitive analyses concerning vertical restraints and monopolization. Economists also have made valuable assessments of the effectiveness of antitrust enforcement, though more work in this area is needed.

Key Words: Antitrust; Mergers; Horizontal Restraints; Vertical Restraints; Monopolization.

JEL Classifications: L1, L4.

Introduction

Advances in economic theory and techniques plus new empirical findings have reshaped antitrust over the last 25 years. Increases in quantitative data and more computing power have also made feasible analyses previously impossible or too costly. At the Federal Trade Commission, where I have worked since 1980, the antitrust economist's daily life has changed. Economists have shifted to increasingly complex and mostly quantitative analyses and away from review of company documents and the like, such tasks left increasingly to attorneys. While many remain generalists, specialization among antitrust economists has increased. Some have special skills in theoretical modeling, others in applied econometrics, and still others have expertise in certain enforcement areas such as intellectual property.

Here, I sketch out some major impacts of economics upon antitrust enforcement and highlight issues meriting further attention. The following section discusses the impact on merger analysis, the biggest area of federal

The views expressed here are those of the author and are not necessarily those of the Federal Trade Commission or any individual Commissioner. The author thanks Bureau colleagues Malcolm Coate, Jeffrey Fischer, Daniel Hosken, and Michael Vita for their helpful comments.

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antitrust enforcement. The next section looks at enforcement in the conduct area, and the third section notes economists' assessments of enforcement outcomes. Some concluding observations close the paper.

Merger Analysis

The rise of unilateral effects theories is the big story here. The issuing of the 1992 Department of Justice/FTC Merger Guidelines was a landmark event (US Department of Justice and Federal Trade Commission 1992). They articulated unilateral theories of harm based on "localized competition." Diversion rates and margins – not market shares and concentration – are the key elements in these theories. The 1982 and 1984 editions of the Guidelines, by contrast, almost exclusively focused on collusion, where changes in concentration were the foundational element (US Department of Justice 1982, 1984). The 1992 Guidelines were harbinger of things to come: the 2010 Guidelines treated unilateral theories more extensively and extended them to new settings, including auction markets, innovation, product variety, and homogeneous products. Though not discarded by the 2010 Guidelines, collusion had clearly lost prominence (US Department of Justice and Federal Trade Commission 2010).

The 1990s saw a shift toward analyzing cases with unilateral theories, either alone or together with collusion theories. Though collusion cases did not altogether disappear, unilateral effects is today's default setting. Unilateral theories, not collusion as in the early 1990s and before, now underpin competitive analyses of hospital mergers, long a staple of FTC merger work. Unilateral effects analyses have also made inroads in mergers in homogenous goods industries such as chemicals and refined petroleum products.

How did unilateral theories push collusion aside? One cause was the declining hold of the structure–conduct–performance paradigm on the antitrust mind. In part, this was due to the 1970s and 1980s critiques of cross-sectional studies that supported the paradigm. Evidence on profit–concentration relationships within a single industry from, say, natural experiments of local markets with differing concentration was rarely available as case guides. To be sure, Stigler's (1964) classic treatment of the oligopoly problem gave theoretical support for collusion due to merger-related increases in concentration. Yet, recent theoretical and empirical work suggests that effects of mergers on increasing the likelihood of coordination are complex and may be small, even sometimes negative (see, e.g., Kuhn 2008).

The many in-depth investigations since the 1980s Guidelines also suggested that the profit–concentration relationship was weaker than previously supposed, at least at concentration levels typically seen. The factors of the then frequently used collusion checklist (e.g., price transparency, lumpiness of sales) also often pointed in different directions. The factors were difficult to weigh. Case narratives that a merger would increase the likelihood of collusion (e.g., by the sudden emergence of customer allocation schemes) often had a fairy-tale flavor.

Product differentiation also rested uneasily in the collusion-centered Guidelines. Differentiation is theoretically ambiguous for likelihood of collusion. Many antitrust analysts long considered it a negative factor. Empirical studies of cartels conducted since the 1990s have supported this view. Yet, the 1980s Guidelines observed that differentiation between merging

firms could matter to the enforcement decisions in limited circumstances. When structural presumptions had great weight, discussion not infrequently occurred about the possible biases in HHI metrics due to differentiation. Those who did not work in antitrust during the 1980s cannot appreciate the thinking back then that went in to coming up with precise, “just right for Goldilocks” concentration measures.

Shapiro (2010) has suggested that the old Guidelines mentality reflected a bygone age when basic industrial commodities dominated the economy. No doubt, differentiation has increased in many US markets, but Shapiro’s conjecture may not be completely correct. Economists at the time – and the original Guidelines themselves – recognized the fact of differentiation. The 1980s mentality was to think broadly about price outcomes. Differentiation was a detail. Consistent with this mentality was a tendency back then of defining relevant markets broadly. Mocking of Brown Shoe¹ “submarkets” was not uncommon, though some of those so indulging had reservations that there might be some truth in the concept. The notions of “head to head competition” and “localized effects” associated with the rise unilateral theories, on the other hand, encouraged defining narrower markets (Pautler 2015). Those hoping to draw inferences from historical patterns of agency enforcement as related to concentration levels should take note: concentration measures depend on the methodology and assumptions in defining relevant markets. Both have varied across time and markets.

Leading antitrust analysts in the early 1990s also believed that the early Guidelines did not sufficiently emphasize anticompetitive merger effects other than collusion (Willig, Salop, and Scherer 1991). These concerns and the other issues with the early Guidelines created an environment receptive to the game theoretic developments of the 1980s. These developments extended standard oligopoly models to merger analysis and to settings beyond single price markets. These unilateral effects models made explicit the underlying mechanism of price determination. They dealt much more satisfactorily with differentiation. They had the bonus of directly integrating marginal cost efficiencies into the analysis. Their key variables were generally measurable. Advances in estimating techniques, the growing availability of data, and increasing computer power made possible ever more useful measures. Though there has been work to reinvigorate collusion analyses (see, e.g., Jayaratne and Ordober 2014), its impact on antitrust practice has been limited compared to developments on the unilateral effects side.

Many new analytical tools are associated with the rise of unilateral effects analyses: various upward price pressure tests, a plethora of price increase formulae, and merger simulations of widely varying complexity and data requirements (see, e.g., Budzinski and Ruhmer 2009). Unilateral models have also proved adaptable to industries with special institutional features (e.g., hospital pricing in the context of health insurer networks), to those with unusual market conditions (e.g., binding capacity constraints), and to vertical mergers. Recent work has extended models of price determination to account for rivals’ reactions, multi-product firms, and departures from Nash conduct assumptions (see, e.g., Jaffe and Weyl 2013).

Increased precision in predicting merger effects is the chief allure of these new tools. They have become important additions to the antitrust toolbox and increasingly prominent not only in agency decision making but also as

relied-upon evidence in litigation. Yet, they sometimes face an uphill fight in persuading enforcement decision makers when their inferences differ from those of traditional methods, including those based on qualitative evidence such as company documents or customer opinions. For some analysts and decision makers, inferences from traditional analyses serve as a critical, if not determinative, robustness check on the results coming from these new tools.

There are questions of course about whether the assumptions in these new tools affect their predicative abilities. There has been much research on these questions. Economists have examined possible biases due to demand system assumptions (see, e.g., Crooke et al. 1999), or those resulting from computational approaches (see, e.g., Knittel and Metaxoglou 2011). Other researchers have used natural experiments to test demand systems assumptions (Raval, Rosenbaum, and Wilson 2016). Others have studied how firms respond to cost changes to identify appropriate demand structures (Miller, Remer, and Sheu 2013). Still others have compared the predictions of simulations to various *ex post* measures of merger outcomes (see, e.g., Garmon forthcoming; Weinberg and Hosken 2013).

The price determination assumptions have long been controversial. Critics say the models are deficient, being static and leaving out dynamic elements that matter. Competitive regimes might change post merger, for example (Carlton 2010). Proponents argue that outcomes in these static models roughly approximate those in whatever more complex dynamic games are really played. In some actual cases, margins do appear to approximate simulation predictions and simulations do a reasonable job in accurately back casting the effects from historical events. However, these comforting observations may not always occur. Peters (2006), for example, concluded that deviations from firm conduct assumptions played an important role in the mismatch he found between simulation predictions and actual post-merger prices in airline mergers.

The relation of non-price competition in current unilateral effects models is similar to that of differentiation to the collusion theories of old Guidelines – accounting for non-price competition seems important, but integrating it into the analysis is not straightforward. Recent work suggests that including non-price dimensions of competition significantly affects predictions (see, e.g., Tenn, Froeb, and Tschantz 2010). Needed work in this area would include more study of post-merger “repositioning” by the *merging* firms (see, e.g., Ghandi et al. 2008), actual rival re-positioning, and the stability of diversion rates generally.

Sampling and measurement error also matter to predictions. Measurement errors will vary from case to case depending on data quality. One possibly systematic error is in the measuring of margins. This topic has not received as much attention as it deserves. Antitrust enforcers do have access to much private data seldom available to academic researchers. This abundance does not mean that any margin from firms’ accounting records is appropriate for analysis. While accounting data may provide reasonable measures of short-run incremental production costs under some circumstances, other elements important to the relevant economic margins are less readily identified. These include rent payments to past investments or to specialized factors (Baumann and Godek 2011).

Predicted price increases should be robust to plausible alternative margin interpretations. The main issues here are the appropriate length of run and the treatment of the costs of non-price competition. Certainly, there should be

consistency between diversion rates and margin assumptions. Costs other than those associated short-run marginal costs are almost certainly important to observed diversion rates. To illustrate, suppose gasoline Retailer A acquired nearby Retailer B, and pre-merger diversion was 30%. In the US gasoline retailing markets, gross margins, defined by the difference between retail and wholesale gasoline prices, are about 10% of retail price. These numbers suggest some modest upward price pressure. Yet, if A did not continue to incur costs at B beyond paying for wholesale supply but abandoned all selling efforts, the paying of taxes and utilities, and the costs of whatever amenities and facility upgrades might attract customers to B, then the observed diversion would certainly fall – and with it, the implied upward price pressure at A’s station would fall. Retailer B presumably incurred such costs because this maximized the present value of the firm over some time horizon. The combined firm’s maximizing calculus could be different, but it is doubtful that it would involve only short-run marginal costs.

1We leave this section by noting the broader impact of unilateral effects theories upon antitrust analysis. Similar to plumbing upgrades in an old house, changes in one area of antitrust analysis can have largely unforeseen effects elsewhere. The rise of unilateral effects analyses led to revised thinking in defining antitrust relevant markets (see, e.g., Katz and Shapiro 2003). It subsequently resulted in a diminished role for traditional market definition in merger work. Some antitrust scholars go further and advocate getting rid of market definition altogether in economic analysis and focus directly on competitive effects (see, e.g., Kaplow 2011). This direct-to-competitive effects view may well affect antitrust analysis outside of mergers, and there may be signs of this already.

Conduct Analysis

Economics’ effect on conduct enforcement over the last quarter century has been multi-faceted and has come from progress on both the theoretical and empirical fronts. For example, the economics of transactions costs and externalities have increasingly guided conduct analyses. Models of multi-sided platforms have emerged. These models have been used to analyze both vertical and horizontal antitrust issues in many industries. Opportunistic hold-up has become the foundation for anticompetitive concerns in a variety of settings such as standard essential patents.

As for *per se* illegal horizontal agreements (e.g., price fixing, customer allocation), economists’ studies of cartels over the last quarter century have underscored the critical importance of enforcement directed toward price fixing. These studies indicate durable, significant anticompetitive effects from explicit price fixing, these effects being generally much greater than those found in merger retrospectives (Langenfeld 2017). DOJ’s 1993 implementation of its leniency program – guided by game theory – is a notable event that has been generally regarded as significantly increasing the detection of price fixing.

Changes in economic analyses of non-*per se* illegal horizontal agreements (e.g., trade or professional group restrictions on non-price competition) have for the most part been marginal, though reflecting general trends in antitrust of increased quantification and analytic rigor. Evolving legal standards associated with rise of truncated rule of reason analyses, however, has de-emphasized the need for upfront assessment of market definition and market

power in many horizontal agreements cases and encouraged direct consideration and quantification of competitive effects.

Advances in economics have had a healthy leavening effect on antitrust attitudes about vertical restraints. This has been a gradual process beginning with the seminal work of Spengler (1950), Bork (1978), and Telser (1960). Largely coming on the heels of theoretical work, empirical research also indicated that vertical restraints are generally efficient or competitively benign (Cooper, Froeb, and O'Brien 2005; Lafontaine and Slade 2008). This evidence has softened enforcement priors about vertical restraints. This is not the only example of empirics catching up to theory. For example, recent empirical research has contributed to the understanding of the actual likelihood of welfare losses associated with patent hold-up (see, e.g., Galetovic, Haber, and Levine 2015).

Economists' work on vertical restraints has been especially important due to its impact on the courts. This impact is evident beginning with Supreme Court's 1977 decision in *Sylvania*,² which held that non-price vertical restraints should be evaluated under a rule of reason, and in following decisions in *Monsanto*³ and *Sharp*,⁴ both of which involved dealer termination claims. The Court's decisions in *State Oil*⁵ and *Leegin*⁶ are recent cases reflecting the impact of economics on the legal treatment of vertical arrangements: they respectively moved maximum and minimum RPM restrictions from the *per se* illegal category to the more expansive rule of reason box. The courts are clearly a conservative element in antitrust. The impact upon the courts of new economic theory, techniques, methodologies, or empirics is often slow. Economists wanting to affect antitrust policy fundamentally must be willing to play the long game.

Recent monopolization cases generally involve vertical issues. Exclusionary conduct, either outright exclusion or softer forms of exclusion with conditional pricing contracts (e.g., market share or loyalty discounts), and tying are typically the practices of concern in monopolization cases. Remedial goals are typically limited to prohibiting these practices. Since the early 1980s, initiatives to break up leading firms, though sometimes internally debated, were seldom undertaken. Reluctance to subject very successful firms with structural re-engineering suggests some recognition of the reality of dynamic competition in which firms superior in satisfying buyer needs, or in reducing costs, grow relative to rivals.

New game theoretic models have emerged since the 1990s that, among other things, feature mechanisms to overcome traditional objections to anticompetitive outcomes: the triangle loss problem in the case of exclusion and the one monopoly rent critique in tying. New analyses of tying have shifted the focus of competitive concerns to the tying good and away from the tied good (see, e.g., Carlton and Waldman 2002). Overall, this body of work has provided insights on the importance to competitive outcomes of strategic incentives, contracting externalities, observability, commitment, and the structure of the bargaining game. It has also furnished a more a comprehensive theoretical basis for the possible efficiencies of vertical restraints.

These models typically do not require detailed, upfront assessments of market power. They invite direct examination of competitive effects, leaving in-depth consideration of market definition and market power to later, and

only if needed. But their predictions are often fragile. Welfare consequences are often ambiguous. Outcomes are sensitive to assumptions about contracting, first mover advantages, observability, beliefs, and the intensity of downstream competition. Any assumption may or may not hold in real world cases (O'Brien 2008). Validation of model predictions by reference to observables is often limited. For example, quantifying efficiencies or the adverse scale effects on targeted rivals is sometimes difficult, the latter especially so in rapidly evolving markets.

In short, while advances in economics have promised increased precision in merger analysis, there is less sense of this effect in the monopolization or the vertical areas. Indeed, perplexity has arguably increased. Many of those steeped in the relevant literature recognize these challenges (see, e.g., Ramseyer and Rasmusen 2014). This appreciation is not universal among antitrust practitioners, some of whom rely on subjective priors and do not sufficiently distinguish possibility from likelihood.

Assessment of the Performance of Antitrust

Economists also have assessed the performance of antitrust enforcement. A great deal of attention has been devoted to merger retrospectives. Retrospectives are valuable because they speak to whether enforcement has been on target. They also help evaluate merger simulations and other new analytical tools. Retrospectives can also motivate enforcement initiatives. For example, retrospectives were instrumental in reviving the FTC enforcement program in the hospital industry, a program that had stalled after litigation defeats in the 1990s.

Current findings raise warning flags for antitrust enforcers. Ashenfelter, Hosken, and Weinberg (2014) reviewed 49 merger retrospectives and concluded that the evidence is overwhelming that mergers can cause significant price increases. They also note some differences in the incidence of positive merger price effects across industries (e.g., all airline merger studies show price increases, but it is unclear whether consumer prices increased due to petroleum industry mergers). John Kwoka's recent book (2015) examined published retrospectives of US mergers occurring between 1976 and 2006, a sample somewhat overlapping that of Ashenfelter *et al.* Based on his meta-analysis, Kwoka concluded antitrust enforcement generally did not prevent price increases. Kwoka inferred that enforcement has been too lax and has increasingly strayed off target. One likely culprit, in his view, is the relaxed attitude toward traditional structural presumptions, specifically too little attention to mergers with lower market shares and concentration measures.

The European Commission (EC) also recently released a review of merger decisions in the EU (European Commission 2015). Based on retrospective studies that estimated post-merger effects in 25 mergers occurring between 1995 and 2012, the EC study also found that, on average, price rose post merger, especially in unchallenged transactions. The EC study found magnitudes of post-merger price increases to be roughly comparable to Kwoka's for US mergers. The EC study found that market concentration was a strong driver of the estimated merger price effects in its sample, which is consistent with a view that market concentration has been receiving too little weight in enforcement decisions.

Yet, it is premature for an across-the-board enforcement course correction or a return to old ways. The sample of examined mergers is small, is concentrated in a few industries, and focuses on short run effects, possibly too short a time for any efficiencies to be fully implemented. Additional retrospectives and research may be informative about whether the nature of market competition (e.g., price vs. quantity as strategic variable, the significance of product differentiation and non-price competition, and buyer characteristics) has something to do with observed effects. More retrospectives on recent mergers would also shed light on whether the developments in prospective merger analysis described above are really delivering increased enforcement precision.

There are also alternative views about appropriate meta-analysis methodology and what the current evidence is saying (Vita and Osinski [forthcoming](#)). For example, the modal and median price increases in Kwoka's sample of retrospectives are very small. The retrospectives that we do have also tell us mostly about Type II agency enforcement errors (not challenging anticompetitive mergers), but little about Type I agency errors (challenging benign or procompetitive mergers). This is because the overwhelming number of examined mergers proceeded unchallenged, while the few that were challenged eventually proceeded upon judicial review. There is a trade-off between the two errors. Type II error could be much reduced if enforcement returned to the days of Von's Grocery,⁷ but few informed observers appear to want that. If market concentration has something to do with retrospective outcomes, what we would want to know is the trade-off between Type I and Type II errors conditional on concentration.

More recent and future retrospectives may also be more reliable than earlier ones. For example, the clustering of standard errors in retrospectives using panel data is now more common (see, e.g., Bertrand, Duflo, and Mullainathan 2004). The ongoing debate on the relative merits of reduced form and structural approaches continue to inform merger retrospective analyses (see, e.g., Angrist and Pischke 2010; Nevo and Whinston 2010). Some economists have also proposed new approaches to important and challenging issues, such as the endogeneity of mergers (Dafny 2009).

Economists have also given attention to non-merger enforcement. This work has largely taken the form of case studies, ranging from those on the great old cases, such as Standard Oil⁸, to more recent big cases such as Microsoft.⁹ Modern economic assessment of these venerated icons is valuable because past cases often serve as models and precedents. The impermanence of seemingly entrenched market power and the challenges in designing meaningful remedies are among the general lessons from these case studies. There are opportunities for more assessments of conduct-related antitrust outcomes. For example, the FTC's many horizontal restraints cases involving professional associations deserve attention.

A limited amount of work has focused on the benefits and costs of antitrust. Writing in 2003, Baker summarized the then available evidence and concluded that "almost surely" the consumer benefits of antitrust exceed public and private expenditures related to enforcement (Baker 2003). This is the prevailing view in the antitrust community, though not every economist has been so sanguine (see, e.g., Crandall and Winston 2003). There is more disagreement over whether enforcement margins are optimal.

Researchers have ample reasons to undertake new cost-benefit centered analyses of antitrust enforcement. There have been arguments that the competitiveness of the US economy has changed one way or the other, suggesting changing benefits from antitrust. The private and public costs of antitrust investigations have clearly increased. Document submissions in antitrust investigations, for example, have reached prodigious levels, a phenomenon associated with rise of firms' use of e-mail and electronic file keeping. The courts' standards on burden and proof have also changed (Kolasky 2012): these changes have implications for costs and for likelihood of enforcement errors. Firms' strategic use of the antitrust and the role of private enforcement deserve additional attention beyond that they have already received (see, e.g., McAfee, Mialon, and Mialon 2008; Sokol 2012).

Economists also debated the welfare standard for antitrust enforcement, this mostly for the mergers with the Williamson trade-off in view. One rough estimate suggests that the choice between consumer and total welfare standards significantly matters to the cost-benefit calculus (Huschelrath 2012). Economists' bottom lines on the appropriate standard are mixed. The issues are well understood: how and if distributional effects should count, which kind of cost savings should matter, the significance of costly rent-seeking, and the ease of monitoring antitrust policy under alternative standards. The consumer welfare standard presently faces little serious challenge in the US. Distributional issues, which resonate very strongly with non-economists, continue to trump efficiency arguments.

A few countries do not have a pure consumer welfare standard. Canada's standard, for example, is a hybrid of the consumer and total welfare standards. Distributional effects may be viewed as netting out in intermediate product mergers upstream from final consumers. Study of enforcement intensity, outcomes, and the nature of proposed transactions in these jurisdictions may be informative to the debate about the antitrust welfare standard.

Conclusion

Developments in economic theory and empirics, along with more data and enhanced computational capabilities, have made antitrust analysis increasingly complex and quantitative over the last quarter century. Competitive paradigms have shifted. Some developments have promised increased clarity and precision in enforcement, but others have added perplexities. Empirical findings have also changed enforcement priors and examined the effectiveness of antitrust performance. Theory and empirics have both been important in reshaping antitrust. Of the two, the latter is the greater because true progress in antitrust enforcement – as is the case in most areas of human endeavor – depends critically on the ability and willingness to measure, and to measure repeatedly.

Notes

1. *Brown Shoe Co., Inc. v. United States*, 370 US 294 (1962).
2. *Continental T.V., Inc. v. GTE Sylvania, Inc.*, 433 US 36 (1977).

3. *Monsanto Co. v. Spray-Rite Svc. Corp.*, 465 US 752 (1984).
4. *Bus. Electr. Corp. v. Sharp Electr. Corp.*, 485 US 717 (1988).
5. *State Oil Co. v. Khan*, 522 US 3 (1997).
6. *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 US 877 (2007).
7. *United States v. Von's Grocery Co.*, 384 US 270 (1966).
8. *Standard Oil Co. of New Jersey v. United States*, 221 US 1 (1911).
9. *United States v. Microsoft Corp.*, 373 F.3d 1199 (DC Cir 2004).

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