



CPI Antitrust Chronicle

June 2011 (2)

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I. INTRODUCTION

A recent edition of the *CPI Antitrust Chronicle*² provided a range of perspectives on the applicability of the Upward Pricing Pressure (“UPP”) model to merger analysis. A number of key insights (e.g., the relevance of market definition, the usefulness of an UPP screen, the similarity between UPP and merger simulation, and the need to validate the predictions of a theoretical model) were explored in some detail. However, the bulk of the discussion left something of a gap between theory and reality, because practical considerations affecting the applicability of the UPP methodology were not fully addressed.³ By drawing on insights from the Federal Trade Commission’s years of experience, I present some supplemental thoughts on these topics.

II. CONTINUED RELEVANCE OF MARKET DEFINITION

UPP analysis offers the ability to avoid the market definition process by focusing on a direct analysis of the merger’s competitive effect. Carlton seems supportive of this approach, but cautions that the direct estimation of competitive effects requires the labor input of highly trained economists.⁴ Thus, he suggests that the standard approach of market definition and structural analysis could be preferable whenever an antitrust agency lacks a highly trained staff.

To theorists, market definition may seem like a waste of time, because once the analyst has estimated a demand system for a market analysis, direct simulation of the price effect is feasible. While the Merger Guidelines hypothetical monopolist algorithm could define a market with the model’s parameters, as Carlton noted, this technique has not been operationalized.⁵ In practice, the hypothetical monopolist construct has become a methodology to test a proposed market definition, almost always prior to the estimation of any econometric model. As discussed in Coate & Fischer (2008), the merger analyst uses industry information to posit a relevant

¹ Federal Trade Commission, mcoate@ftc.gov. The analyses and conclusions set forth in this paper are those of the author and do not necessarily represent the views of the Commission, any individual Commissioner, or any Commission Bureau. I would like to thank Jeffrey Fischer for helpful comments on this paper.

² *What’s Up With Merger Analysis*, 3(1) CPI ANTITRUST CHRONICLE (March, 2011), available at <http://www.competitionpolicyinternational.com/mar-11>.

³ A couple of papers focus on practical issues. In section III of their paper, Baumann & Godek discuss application problems with the idea of linking margins to market power. Van der Veer details European policy, with his section III focused on natural experiments, (see, Michael G. Baumann & Paul E. Godek, *Margin of Error, The Flawed Paradigm in the New Merger Guidelines*, 3(1) CPI ANTITRUST CHRONICLE, (March 2011) available at: <https://www.competitionpolicyinternational.com/margin-of-error-the-flawed-paradigm-in-the-new-merger-guidelines> and Jan Peter van der Veer, *The Use of Empirical Techniques in European Commission Merger Cases*, 3(1) CPI ANTITRUST CHRONICLE, (March 2011) available at <https://www.competitionpolicyinternational.com/the-use-of-empirical-techniques-in-european-commission-merger-cases> .

⁴ Dennis W. Carlton, *Use and Misuse of Empirical Methods in the Economics of Antitrust*, 3(1) CPI ANTITRUST CHRONICLE, (March 2011), available at <https://www.competitionpolicyinternational.com/use-and-misuse-of-empirical-methods-in-the-economics-of-antitrust> .

⁵ *Id* at 3.

market and then applies the hypothetical monopolist test to determine if the market is viable.⁶ This approach is clearly sufficient for coordinated interaction cases, but remains controversial for unilateral effects analysis.

Regardless of the theoretical concerns, market definition plays a very practical role in allowing the merger analyst to define the “playing field” for the competitive effects analysis at the heart of a merger investigation. A qualitative market definition serves to identify the relevant competitors, because it differentiates the firms that matter a great deal to the competitive process from those that matter significantly less.

Most importantly to the economist, market definition may assist in addressing the “identification problem.” Simply estimating a statistical model does not necessarily “identify” the effect of structure on market performance, because the observed relationship could be caused by a range of other considerations. Exogenous evidence underpinning a market definition may very well provide a reason to reject the alternative explanations for the empirical relationship. For example, as Coate & Fischer note, the correlation between entry into the premium, natural, and organic food supermarkets (“PNOS”) and margins for other PNOS entities may represent either a direct competitive effect of a merger in a PNOS market or a short run disequilibrium effect of efficient entry into a general supermarket business.⁷ Exogenous evidence that proves the narrow PNOS market aids in identifying the impact of the statistical relationship.

Overall, market definition should remain an important part of a merger investigation in differentiated product markets, while UPP could serve as one of many analytical techniques for competitive effects analysis.

III. APPLICABILITY OF AN UPP SCREEN

Farrell & Shapiro introduced their methodology as “a simple diagnostic test to flag horizontal mergers that are most likely to lead to unilateral anti-competitive price effects in markets for differentiated products.”⁸ In effect, UPP was seen as replacing the market share analysis undertaken to establish a presumption of a competitive concern. However, as Simons & Coate pointed out, UPP analysis could not be applied without an exogenously defined benchmark.⁹ Noel discusses this search for an UPP threshold, focusing on my work linking UPP-related models to the FTC staff’s choice of the best methodology with which to evaluate competition in a differentiated products market.¹⁰ In one model, the optimal benchmark varied with margin, a clear problem when the margin variable is difficult to measure. In the other

⁶ Malcolm B. Coate & Jeffrey H. Fischer, *A Practical Guide to the Hypothetical Monopoly Test for Market Definition*, (4) COMPETITION L.& ECON., 1031-1063 (December 2008).

⁷ Malcolm B. Coate & Jeffrey H. Fischer, *Why Can't We All Just Get Along: Structural Modeling and Natural Experiments in Merger Analysis*, 2011, available at SSRN: <http://ssrn.com/abstract=1853675>.

⁸ Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10(1) B. E. J. OF THEORETICAL ECON., 34 (2010) available at <http://www.bepress.com/bejte/vol10/iss1/art9>.

⁹ Joseph J. Simons & Malcolm B. Coate, *Upward Pressure on Price Analysis: Issues and Implications for Merger Policy*, 6(2) EUR. COMPETITION REV., 145-164 (August 2010).

¹⁰ Michael D. Noel, *Upward Price Pressure, Merger Simulation and Merger Simulation Light*, 3(1) CPI ANTITRUST CHRONICLE, (March 2011), available at <https://www.competitionpolicyinternational.com/upward-price-pressure-merger-simulation-and-merger-simulation-light> Noel is correct that the staff believes both unilateral and coordinated theories can be used in merger analyses for certain markets and thus the UPP benchmark is used to focus on the cases in which unilateral analysis is considered the best approach to competitive effects analysis for the merger under review.

model, the benchmark statistic did not vary much with margin, implying that this UPP-related model could be of assistance in screening mergers.¹¹ Olley describes a second paper that applies the UPP model to predict the likely competitive effect of the merger.¹² He reports that this UPP model is less successful at predicting merger challenges than a model linked directly to the number of significant competitors. Olley concludes by calling for additional research.

To organize a search for additional insights into the screening process, it is necessary to start with an institutional overview of the problem; here, screening mergers. With a few exceptions, large transactions must be filed with the government and are subject to an initial merger review by either the Federal Trade Commission or Department of Justice. If this review triggers a possible concern, the relevant staff puts in for “clearance,” and once the clearance is granted by the other Agency, undertakes an initial investigation during what is left of the (normally) 30-day waiting period.

Staff has to make the decision to fully investigate the merger (that is, issue a second request) based on the limited information collected within the 30-day time period. This information might include initial measures of markets shares, counts on the number of potential competitors, a basic understanding of ease of entry, and most importantly, the customers’ initial expectations on the effect of the merger. Only rough approximations of complex economic concepts such as margins or diversions would be available, along with potentially unsubstantiated claims of efficiencies. While data could be gathered to enable an application of the UPP model at this stage, the analyst would be unlikely to have much confidence in the results, due to the potential for inaccurate measurement of the models’ parameters. Instead, it would appear the standard structural analysis must remain the key screening mechanism. Moreover, the existence of “killer facts” linked to key Guidelines issues such as relatively low diversion ratios, ease of entry, repositioning, fringe expansion also play a role.¹³

During the “second request” investigation, the staff has the time to refine the competitive analysis and obtain a more detailed understanding of the competitive process. Here, the UPP concept, focused more on share-based diversions than margins, holds some promise to identify the matters likely to be challenged, especially when combined with variables for entry and effects’ evidence. In a simulation with historical FTC data on mergers in differentiated product markets, an UPP index, adjusted for entry and effect’s evidence, was shown to have a reasonable ability to separate matters destined for merger challenge from those matters likely to be closed.¹⁴ The diversion benchmark approximated 30 percent, a figure that also arose out of a case study analysis. A more complex model UPP model, generalized to allow for pro-forma margins linked

¹¹ Malcolm B. Coate, *The Enhanced UPP Screen, Merging Markets into the UPP Methodology*, (2011), available at SSRN: <http://ssrn.com/abstract=1559399>. Note the specific mergers screened for unilateral review would differ with the choice of margin, but the screen itself would serve to separate the portfolio of mergers into two classes, one more likely to raise stronger unilateral concerns and another more likely to raise stronger collusion concerns.

¹² G. Steven Olley, *New Tools for Competitive Effects: Do We Really Know What Works Best?* 3(1) CPI ANTITRUST CHRONICLE, 7 (March 2011), available at <https://www.competitionpolicyinternational.com/new-tools-for-competitive-effects-do-we-really-know-what-works-best>.

¹³ Empirical evidence on this screening decision is limited, because staff is not required to prepare comprehensive written reports to justify not going forward with an investigation. Without systematic documentation, it is difficult to fully evaluate the decision making process.

¹⁴ Malcolm B. Coate, *Unilateral Effects Analysis and the Upward Pricing Pressure Model: Evidence from the Federal Trade Commission*, 2011, available at SSRN: <http://ssrn.com/abstract=1837645>. As noted by Olley, the significant rivals variable outperformed the UPP index, but the difference was not statistically significant.

to the relevant industries under review, was noticeably less successful in predicting the outcome of unilateral investigations. By formalizing the study of unilateral competition with the concept of diversion, UPP analysis is likely to improve the review process. On the other hand, more study is needed before margins can be expected to play a comparable role in merger review.

IV. UPP SIMULATION

UPP style modeling can also be seen as substitute for merger simulation. Schmalensee recognized that an UPP-based procedure enables “one to obtain plausible estimates of post-merger price changes,” but cautioned that the methodology remains only a screen.¹⁵ Simons & Coate directly addressed merger simulation and observed that an UPP-based simulation would represent a useful “test-drive” for a full simulation analysis.¹⁶ To move beyond a simple screening function, they recommended that effects’ evidence be required to confirm the reliability of the UPP simulation prior to its use to support a merger challenge. In his comment in the recent ANTITRUST CHRONICLE, Carlton sees UPP as a potential short-cut for simulation, because less demand information is required to parameterize the model.¹⁷ However, he notes that UPP simulation faces all the limitations associated with standard merger simulation procedure, along with a few other issues unique to the UPP model’s structure. Noel also offers limited support for UPP simulation, by observing that Schmalensee’s insight represents a “merger simulation light” and therefore represents an improvement on the basic UPP methodology. However, he also recognizes that defining diversions, marginal costs, and efficiencies may be a challenge.¹⁸

By changing the focus of the analysis from a rough index of pricing pressure to a merger simulation, analysts move beyond a screening goal and implicitly suggest that UPP analysis could play a role in the overall competitive effects analysis. As a practical matter, UPP would be only one of the many models (e.g., collusion, dominant firm, or qualitative head-to-head competition) that could be applied when relevant to conclude that the merger is likely to substantially lessen competition. The implications of any of these models are more persuasive when confirmed with exogenous effects’ evidence.¹⁹

As a merger simulation, UPP would appear most applicable to consumer goods markets where it can be argued that customers face exogenous prices. Even in these markets, a post-simulation analysis would need corroborating evidence on issues such as entry, repositioning, and fringe expansion.²⁰ While UPP analysis is simple enough to be calibrated for differentiated producer goods, the fact that prices are often negotiated on a customer-by-customer basis casts doubt on its general applicability.

¹⁵ Richard Schmalensee, *Should New Merger Guidelines Give UPP Market Definition*, 12(1) CPI ANTITRUST CHRONICLE, 5 (December 2009), available at <https://www.competitionpolicyinternational.com/assets/Free/SchmalenseeDEC-091.pdf>.

¹⁶ Simons & Coate, *supra* note 9 at 291-392.

¹⁷ Carlton, *supra* note 4 at 11.

¹⁸ Noel, *supra* note 10 at 6.

¹⁹ Malcolm B. Coate, *The Use of Natural Experiments in Merger Analysis*, 2011, available at SSRN: <http://ssrn.com/abstract=1853705>.

²⁰ In a comment on the 2010 Merger Guidelines, Coate & Simons caution against over-reliance on margin-based approaches to merger analysis. See, Malcolm B. Coate & Joseph J. Simons, *Continuity and Change in the 2010 Merger Guidelines*, 19(2) CPI ANTITRUST CHRONICLE, (October 2010), available at <https://www.competitionpolicyinternational.com/continuity-and-change-in-the-2010-merger-guidelines>.

V. VALIDATION OF THE UPP ANALYSIS

The CPI ANTITRUST CHRONICLE'S symposium on the UPP model also raised important questions on the empirical validation of the UPP model (along with the closely related merger simulation analysis). While game theoretic models clearly generate testable hypothesis, economists have been remiss in testing the implications of their models. Because the UPP model serves to further simplify Post-Chicago theory to a level more comprehensible to the broad antitrust community, empirical testing is now even more important. Carlton details some of the limited evidence on the effectiveness of merger simulation, implicitly suggesting that this evidence also serves to test UPP.²¹ Olley addresses basically the same studies.²² Both authors seem to suggest that the data offer only mixed support for simulation methodologies and clearly call for further research.

Coate & Fischer have taken a critical view of the link between simulation analyses and the comparable ex-post price effects.²³ Their discussion amounts to a meta-analysis of the issue, with pro-form qualitative merger simulations created as needed to track the results of merger retrospective studies. In one example, a retrospective study of a merger in the alcoholic spirit's industry identified a price effect even after a Federal Trade Commission remedy was imposed. While one could assume that the FTC's brand divestitures had an insufficient effect on pricing incentives, it seems more reasonable to posit that other factors caused the post-merger increase in prices. Moving on to a second example, Nevo's cereal market simulations failed to match Ashenfelter & Hosken's computed post-merger price results. And in a third example, prices were found to rise in the feminine protection market, even though the core products of the merging firms used entirely different technologies and therefore almost certainly exhibited low diversions. While more research is clearly useful, merger simulation (and by inference UPP analysis) appears to have had great difficulty in matching measured post-merger price effects.

As a practical matter, the burden shifting structure in *Baker Hughes* makes this focus on evidence absolutely crucial in merger litigation.²⁴ While theory is sufficient to establish a presumption of a competitive concern, the defendant can rebut this concern with theoretical (entry is easy) and empirical (a study that shows prices unlikely to rise) evidence. If the defendant offers any material evidence, the plaintiff is left with the overall burden of proof. While *Heinz* and *CCC Holdings* can be read to suggest that this burden is minimal in three-to-two mergers, once four or more pre-merger rivals are shown to exist, courts seem likely to insist on some type of validation for a structural model.²⁵

Economists also have a growing recognition that structuralist models (e.g., UPP and simulation) must compete with Experimentalist models (e.g., standard critical loss and competitor-performance studies) in an intellectual market for merger tools. Angrist & Pischke laid out the basic issues and Coate & Fischer present a more comprehensive overview that draws

²¹ Carlton, *supra* note 4 at 12. Papers by Nevo, Peters, and Weinberg & Hosken are discussed.

²² Olley, *supra* note 12 at 5. A study by Ashenfelter & Hosken was also noted.

²³ Malcolm B. Coate & Jeffrey H. Fischer, *Daubert, Science and Modern Game Theory: Implications for Merger Analysis*, 2008, available at SSRN: <http://ssrn.com/abstract=1268386>, (forthcoming in the SUPREME COURT ECONOMIC REVIEW).

²⁴ U. S. v. Baker Hughes Inc., 731 F. Supp. 3, *aff'd* 908 F.2d 981 (D.C.Cir. 1990).

²⁵ FTC v. Heinz 1116 F. Supp. 2nd 190, *rev'd* 246 F. 3rd 708 (D.C. Cir 2001) and FTC v. CCC Holdings 605 F. Supp. 2nd 26 (D.D.C., 2009).

on insights from litigated cases.²⁶ This overview suggests that structuralist models might be preferred when the merger model faces complications such as a sophisticated effects-efficiencies tradeoff, while natural experiments suffice when the relevant competitive process is simpler.

Finally, as discussed in Coate, natural experiments, broadly defined, have played an important role in Federal Trade Commission merger reviews for at least twenty years.²⁷ Application of the Guidelines methodology gives rise to a hypothesis for the competitive effect of a merger; then evidence on natural experiments, validated customer concerns, or hot documents serve as a test of that Guidelines-based hypothesis. While this analytical approach does not explain every decision, when combined with the general empirical models of monopoly and duopoly, it covers the bulk of the matters involved in the FTC study.

VI. CONCLUSION

UPP analysis represents an innovative tool that can serve to define a competitive concern stemming from a merger. However, the theoretical methodology must be customized for practical considerations. First, market definition matters, because market analysis aids in the interpretation of the empirical modeling underlying the UPP parameters. Second, an UPP-related screen is useful in predicting both the analytical choices of the enforcement agency, as well as the outcome of the investigation. However, other variables such as entry and effects' evidence matter, while variation in the margin statistic does not appear to have a significant effect on policy. Third, UPP simulation appears to be a viable tool with which to define a hypothesis for the competitive effect of the merger, however it would only be one of many choices. Finally, UPP related models should be validated with evidence prior to their use to actually demonstrate a competitive concern.

²⁶ Joshua D. Angrist & Jorn-Steffan Pischke, *The Credibility Revolution in Empirical Research: How Better Research Design is Taking the Con out of Econometrics*, 24(2) J. ECON. PERSPECTIVES 24(2), 3-30 (Spring 2010) and Coate & Fischer, *supra* note 7.

²⁷ Coate, *supra* note 19.