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An Overview of Transparency at the Federal Trade Commission: Generalities and Innovations in Merger Analysis

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I. INTRODUCTION

The Federal Trade Commission's ("FTC") 2004 horizontal merger data release initiated a research program to increase the transparency associated with merger enforcement.[2] To tabulate the structural (e.g., Herfindahls, significant rivals, and entry conditions) and expected performance (e.g., customer concerns and hot documents) data required for the release, Bureau of Economics staff collected, organized, and reviewed files for every merger in which a second request was issued during the fiscal years 1996-2003. Supplemental work collected some data back to fiscal year 1993 and the later updates of the data filled out the file through fiscal year 2008. The collection of this unique research data set, along with the tabulation of new data (e.g., natural experiments, homogeneous goods structure, and customer sophistication) enabled a wide range of follow-on studies. The goal of the overall project is to explore the Federal Trade Commission's merger enforcement record in a search for empirical generalities and innovations. Insights into the analytical structures of merger analysis are likely to benefit a wide range of interested parties (attorneys, executives, bureaucrats, and academics).

This paper presents an overview of the various studies using the structure of the Merger Guidelines to organize the presentation.[3] Thus, the discussion starts with market definition and concentration, moves on to the competitive effects analysis, then entry, and finally, efficiencies. Conclusions are drawn for how the process appears to work and innovative ideas are highlighted.[4] When relevant, suggestions are made for future improvements in merger analysis.

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[1] Federal Trade Commission, mcoate@ftc.gov. I would like to thank everyone in FTC management who supported the project over the last five years, as well as the staffs of both the Bureau of Competition and the Bureau of Economics (past and present) whose hard work generated the data for the analysis. Special thanks go to the co-authors who worked on some of the papers and commented on others. Finally, I'd like to thank the research assistants whose hours of toil made the data collection possible. 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.

[2] The Commission released tabulations of market concentration statistics in February 2004. The report is reproduced in Appendix C of Coate and Ulrick (2005). For an update through fiscal year 2007, *see* Federal Trade Commission (2008).

[3] A total of 16 studies are directly or indirectly related to this review. Drafts of the surveyed papers are available at http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=340213. The working paper version of this paper contains enhanced abstracts for the studies (*see*, http://ssrn.com/abstract=1111687). Suggestions for further research are welcome.

[4] This presentation is not meant to suggest that merger analysis is a pure sequential process starting with market definition and ending with efficiencies. During an investigation, staff updates their analyses as necessary to reflect the current understanding of market realities (e.g., a better understanding of competitive effects could lead the staff to adjust the market definition). The process is best considered iterative, eventually converging to a final recommendation. Most final staff analyses will read as if the study was sequential, with only an occasional evaluation

Caution must be used in interpreting the results, because the research design is limited: first to the matters reviewed by the FTC; and second to subsets of FTC cases for which sufficient information was available for study. Thus, industries reviewed by the Department of Justice ("DOJ") are not represented.[5] Moreover, certain industries (e.g., oil and grocery) are under-represented in most of the analyses, because mergers in these industries often involve a large number of geographic market overlaps, thereby requiring a broad-brush discussion that often limits the scope of the market-specific analysis. Further caution is appropriate, because the project is based on the conclusions identified by the staff. While statistical analysis should minimize the impact of random error, the staff's analytical conclusions were not generally reviewed to correct for error naturally associated with any human analysis.[6] However, attempts were made to ensure that the results are robust, as variables were defined using different methodologies (e.g., use of Bureau of Competition data or aggregation of both Bureau of Competition and Economics data) and statistical analyses were run on different data sub-samples.[7]

II. MARKET DEFINITION AND CONCENTRATION

Market definition under the Merger Guidelines is based on the hypothetical monopolist "small, but significant and non-transitory increase in price" ("SSNIP") test. Although examples of relevant evidence are given, the bulk of the Guidelines' presentation focuses on the generic SSNIP methodology.[8] Product differentiation is implicit in the structure of the hypothetical monopolist test, but no real attempt is made to link the differentiation to real world implementation problems. Given a market definition, the Guidelines propose the Herfindahl index as a measure of market concentration and then posit the well-known structural presumption. While *per se* structuralism has been obsolete for a generation, the Guidelines retain some structural concepts to define safe harbors virtually immune from challenge.

By looking at how markets are defined, it is possible to build an understanding of the real world application of the Guidelines' SSNIP construct. In a merger investigation, the first question focuses on how competition actually works. A range of informal economic modeling structures (i.e., homogeneous good, customized good, vertical differentiation, spatial differentiation, and variety differentiation) is implicitly applied to organize this thought process.[9] The staff review generally identifies either a product or geographic market issue as

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presenting a simultaneous analysis. Conclusionary statements make it clear that the aggregate impact of the various Guidelines factors drove the policy result. While evidence that precludes competitive concern justifies the truncation of an investigation, the full Guidelines analysis is necessary to support an enforcement action.

[5] In Coate (2009a), 75 percent of the sample fell into the automotive, branded consumer, computer, chemical, aerospace, hospital, drug & device, oil & energy, and retail sectors, with most of the cases concentrated in the FTC's big 6: branded consumer goods, chemicals, hospitals, drugs & devices, oil & energy, and retail.

[6] Herfindahls were corrected for obvious computational errors under the assumption that these errors would be noticed and the final decision based on the correct information. No other analyses outside the bounds of a conventional reading of the Merger Guidelines were corrected.

[7] And of course, "error" is often subjective, because different economists, looking at the same data, could reach different conclusions.

[8] For an overview on market definition, *see* Werden (2003) or Carlton (2007).

[9] Coate (2006) and Coate & Fischer (2008).

most in need of careful analysis. In roughly half the studies, the basic understanding of the facts leads inexorably to a specific market definition.[10] In half of the remaining matters (roughly a quarter of the sample), economic evidence is available to support a specific market definition.

While the bulk of the evidence is related to critical loss analysis; natural experiments and pattern analysis (e.g., Elzinga-Hogarty, price correlations) affect some market studies. It is rare to see supply-side analysis support a broad market, while the variable (customized) SSNIP construct is virtually never used.[11] Price discrimination is considered relevant in 11 matters, including the three markets in which supply-side flexibility would have otherwise broadened the market.[12] At the end of the market analysis, the staff has identified a market (usually, although not always, a narrow market),[13] along with a specific homogeneous or differentiated good structure within which to build the competitive effects analysis.

The staff reviews highlight a number of interesting innovations:

- First, the general market definition methodology does not appear to follow the literal reading of the Guidelines by testing a sequential set of potential market definitions. Instead, staff appears to organize the evidence to select a test market and an alternative broader market.[14] If the SSNIP is considered profitable, the narrow test market is accepted—while if the SSNIP is not profitable, the broader market is used by default.
- Second, the files show how critical loss analysis can be performed on differentiated goods when some index for market output is identifiable.[15] In some cases, the differentiation assumption is relaxed to generate a composite good (hypothetically, ounces of ready-to-eat breakfast cereal) and the loss of sales balanced against the additional profits from a market-wide SSNIP. Numerous different styles of analysis are used to define the actual loss required to complete the critical loss test.
- Third, the staff attempts to supplement Elzinga-Hogarty or price correlation studies with other evidence (i.e., problematic critical loss or weak natural experiment studies) implicitly addressing the well-known complications associated with these pattern

[10] This paragraph draws from the results of Coate & Fischer (2008).

[11] The variable (customized) SSNIP allows the analyst to vary the price increase imposed by each firm in the market to customize the market definition to a unilateral effects concern. Ordover & Willig (1993). For a critical discussion of the variable SSNIP, *see*, Coate & Simons (2009).

[12] Coate & Fischer (2008) at 1057.

[13] Coate & Simons show critical loss methodologies that make use of diversion ratios will likely define very narrow markets for almost any value of the margin. Coate & Simons (2009). For the standard approach to critical loss, *see* Harris & Simons (1989), and for the critiques, *see* Katz & Shapiro (2003) and Farrell & Shapiro (2008).

[14] *See*, Coate (2006) and Coate & Fischer (2008). If the staff followed the explicit Guidelines structure, one would expect to see more "close calls" in which multiple market possibilities are discussed and options presented. Instead, the analysis virtually always discusses two relevant choices. On occasion, more perspective is provided for measuring the market shares behind the Herfindahl statistic.

[15] The remainder of the paragraph is based on the Coate & Fischer (2008). This paper addresses the critical loss debate and notes diversions may not be stable in response to an across the board price increase. For a more detailed discussion of parameter stability, *see* Coate & Simons (2009).

analysis methodologies. Overall, fact-based market definition remains a challenge to regulators, but staff strives to validate their market definition.[16]

Staff memos follow the Guidelines in defining market share statistics, along with Herfindahls. Tabulations of these results are presented in the first data release (with updates to 2005 and then 2007); the reports highlight the fact that most investigations generate statistics well above the critical Guidelines' Herfindahl level of 1800.[17] In effect, the Guidelines' critical statistics generally serve as a safe harbor, although mergers in the oil industry are challenged at the classic 1400-1800 level (and mergers in the grocery retailing business are challenged at slightly higher levels).

The concept of the significant competitor is a key structural innovation.[18] Implicitly defined as "a firm whose independence could affect the ability of the merged firms to achieve an anticompetitive outcome,"[19] significant competitors are the logical outgrowth of the unilateral model of concern discussed below. The index could also have some value in coordinated interaction theories as long as it is supplemented with additional structural variables (i.e., an index for market leadership). While the memos do not necessarily use the term "significant competitor," the style of the staff analysis defines the concept in all but these words.[20]

A few coordinated interaction matters make use of "numbers-equivalent" analysis to compute Herfindahls, in which all firms are credited with equal shares, both in the pre- and post-merger worlds.[21] This concept is relevant when each rival has an ability to significantly increase output and thus would need to be included in a hypothetical cartel. For example, in dynamic markets it may be necessary to consider all significant competitors to be equal, if each firm has the same potential to innovate. Numbers-equivalent analyses are also observed in some unilateral effects investigations where the competitive concern applies various auction models.

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[16] The requirement to define markets for differentiated products is one of the most controversial issues in merger analysis. While ex-post evidence of anticompetitive effects could negate the need for a market, market definition is still helpful in evaluating the effects evidence. Simply assuming the effects evidence is correctly evaluated appears problematic.

[17] *See*, Coate & Ulrick (2005) at Appendix C. Recall that the data set includes only matters in which the FTC issued a second request. Merger investigations with Herfindahls below 1800 may be closed in the initial 30 day waiting period.

[18] *See*, Coate & Ulrick (2006), Coate (2005b), and Coate (2009c).

[19] Coate & Ulrick (2005) at Appendix C, page 51.

[20] Merger reviews generally highlight the identities of the firms important to the competitive process.

[21] *See*, Coate (2008b). The numbers-equivalent convention defines the mapping between the number of significant rivals and the Herfindahl defined by the equal share assumption. A reduction in the number of rivals increases the Herfindahl from one number on this scale to the next. Unlike standard Herfindahl analysis, doubling the product of the market shares of the merging parties does not generate the change in the number-equivalent Herfindahl. For example, a four-to-three numbers-equivalent merger implies a Herfindahl moving from 2500 to 3333.

III. COMPETITIVE EFFECTS ANALYSIS

The Merger Guidelines advance two theories of competitive concern. Unilateral effects analysis applies when the merged firm can raise price independently of its rivals and coordinated interaction is relevant when some form of cooperation is needed before the merged firm can adversely affect the market.[22] The Guidelines accept the responsibility to move beyond the numbers and tell an actual anticompetitive story linked to the theory of competitive concern. Product differentiation is clearly important, but the Guidelines do not mandate one style of competitive analysis for differentiated products.

The underlying modeling style of the market (i.e., homogeneous goods or differentiated products) influences, but does not control, the specific style of merger review. While staff analyses often discuss both coordinated interaction and unilateral effects analyses, it is best to consider this an "in the alternative analysis."[23] Given an understanding of the effect of a merger on competition, one or the other analysis will almost always dominate.[24] With only two significant pre-merger competitors (a fact situation that virtually guarantees a very large Herfindahl statistic), mergers in both homogeneous and differentiated markets require the dominant firm variant of unilateral effects analysis, while three or more competitors complicates the discussion.[25] With three or more pre-merger rivals, the bulk of the homogeneous goods markets are evaluated with coordinated interaction, while the results are mixed for differentiated goods.[26] In a few situations, Commission staff differs on the appropriate theory of concern.[27]

A. Coordinated Interaction

For collusion cases, a review of the files identifies a clear interest in high post-merger concentration; mergers increasing Herfindahls by at least 500 points to a level above 3000 are much more likely than not to be challenged. On the other hand, mergers leaving the Herfindahl

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[22] For unilateral analysis, commentaries include Landes & Posner (1981), Werden & Froeb (1996), Werden (1998), and Hausman & Leonard (1997), while for coordinated interaction *see*, Baker (2002) and Dick (2003).

[23] *See* Coate (2005b).

[24] It is conceivable that both analyses will be relevant, although relevant for different time periods of analysis. Possibly short run collusion could raise one set of concerns, while long run unilateral effects lead to a different analytical problem. *See*, Federal Trade Commission and U.S. Department of Justice (2006) at 17, (hereinafter Merger Commentary (2006)).

[25] Excluding the two-to-one dominant firm mergers leaves the analyst with more collusion cases than unilateral effects cases. In Bergman et al (2009), 70 coordinated interaction matters could be compared to 43 unilateral effects cases. Likewise in the Coate (2005b), 56 collusion cases would be compared to 29 unilateral investigations. For Coate (2009c), a total of 91 unilateral investigations were reviewed, in comparison to 129 coordinated interaction matters.

[26] In Coate (2009b), once the two-to-one mergers are excluded, the review identified coordinated interaction theories for 52 of the 68 matters studied with a homogeneous goods structure and 77 of the 152 matters studied with a differentiated goods structure. While investigations in differentiated product markets are much more likely to end in enforcement if a unilateral theory can be applied, collusion concerns are also regularly reviewed. For example, in the Commentary on the Guidelines, R.J. Reynolds/British American, a tobacco industry merger, is recognized as a coordinated interaction investigation even though the market is clearly differentiated. *See*, Merger Commentary (2006) at 19.

[27] In the Coate (2008a), six cases were identified in which the attorneys and economists differed on the theory of concern.

below 2400 (or imposing a change of less than 200 points) are rarely considered problematic.[28] Three models of competitive concern ("regime shift," "maverick," and "structuralist") could be linked to the Guidelines' stated concern with price increases that are "more likely," or coordination that is "more complete."[29] While the bulk of the investigations appear to apply a regime shift model, enforcement is relatively more likely when the matter can be characterized as structuralist or maverick, probably because these analyses are more likely to be supported by empirical evidence.[30]

Statistical analysis identifies a significant effect for the post-merger Herfindahl on the enforcement probability and finds the effect could be decomposed into one variable for the number of significant competitors and another variable for the ratio of the share of the leading firm to its largest rival.[31] This result suggests that some type of leadership model contributes to the collusion concerns. Customer sophistication, interacted with product homogeneity, makes enforcement less likely, while stand-alone product homogeneity adds to competitive concerns. Vertical issues and efficiencies generally make collusion findings statistically less likely; this result is not surprising, as more complex cost structures make coordinated pricing more difficult to accomplish.

B. Unilateral Concerns

Focusing on unilateral effects analysis, it is possible to draw a clear parallel to the EU concept of market dominance. In one study, 38 of 52 unilateral enforcement actions are characterized by the staff as dominant firm two-to-one mergers.[32] Some form of closest competitor spatial analysis is used in most of the remaining cases, with a few matters studied with a more complex game-theoretic model. Closed matters generally apply the spatial style of analysis (only one two-to-one investigation was closed). Using a broader data set and a European (share-based) definition of dominance, another paper finds 88 of the 96 unilateral merger investigations would qualify as dominance cases.[33] A more extensive study of unilateral effects notes 86 of 177 matters are two-to-one mergers and another 50 are three-to-two transactions.[34] Considering the market shares associated with a data set of 177 unilateral effects transactions identifies EU dominance-related issues in between 153 and 163 of the 164 leading firm matters.[35] Thus, while some commentators claim that unilateral analyses have largely

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[28] Coate (2006).

[29] *See*, Coate (2005b), Coate (2008b), and Coate & Ulrick (2008). A "regime shift" model posits the merger is likely to change the performance of the market from competitive to less than competitive. The "maverick" model is an example of a regime shift in which the loss of the maverick firm to merger is likely to lead to the less than competitive performance. A "structuralist" model postulates some on-going link between market concentration and performance, such that the merger is likely to lessen competition.

[30] Coate (2006).

[31] The paragraph is based on results from the Coate (2008b).

[32] The first part of the paragraph is based on the Coate (2006).

[33] Bergman et al (2009). The combined share of the merging parties could also be considered a key concentration variable, with the 35 percent cut-off considered the lower bound for concern (this data suggests unilateral concerns are not challenged by the staff when post-merger share does not exceed 35 percent).

[34] Coate (2009c).

[35] Coate (2009b).

replaced collusion concerns, the facts suggest that the bulk of these unilateral matters focus on leading firms and raise classic dominant firm/dominance issues.[36]

The number of significant rivals has a strong effect on the likelihood of unilateral concerns.[37] Mergers to near monopoly almost always result in enforcement action and one study shows staff analyses of three-to-two mergers suggest a likelihood of enforcement of 67 percent. For mergers with more than three pre-merger rivals, the average enforcement probability is only 29 percent.[38] A larger sample generated similar results for two-to-one and three-to-two mergers, but noted enforcement was still also likely for four-to-three mergers.[39] Strong findings for entry impediments predict higher enforcement probabilities, while some evidence suggests that efficiencies reduce concerns. Customer sophistication or buyer power generally did not systematically reduce the probability of an enforcement action.[40]

Shifting to a pure market share index shows enforcement actions are rarely taken under a unilateral effects theory when the post-merger share fails to exceed 35 percent.[41] Possibly, when the post-merger share of the merged firm is not large (that is, not greater than 35 percent), the staff is uncomfortable with its ability to infer a concern from structure and the files generally lack natural experiment evidence to support a competitive concern for low share unilateral mergers.

C. Innovations in Competitive Effects Analysis

FTC merger analyses make use of evidence variables (natural experiments, validated customer complaints, and hot documents) to support an inference of competitive concern generated by the change in market structure.[42] The review of files highlights the staff's desire to move beyond structuralism to "prove" their claim through a reference to exogenous facts in the investigational record. What we see is "hypothesis testing," as staff formulates a hypothesis on the competitive effect of the merger (based on the information in the record (i.e., internal documents, customer interviews, and economic analyses)) and then "tests" the hypothesis with exogenous evidence related to the likely outcome of the merger.[43] In effect, merger analysis

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[36] Baker (2003).

[37] Coate (2005b), Bergman et al. (2009), Coate (2009c), Coate & Ulrick (2008) and Coate (2009a). The number of significant rivals is able to: (1) proxy the number of firms whose pricing choices need to be considered and (2) define the number of firms possibly able to reposition in response to a price increase. Thus, the variable appears theoretically superior to a market share alternative. In some specifications, the Rivals variable significantly predicts enforcement, while the share and change in Herfindahl variables do not.

[38] The enforcement ratios in the two sentences are based on results from the Coate (2006).

[39] Coate (2009c).

[40] Customer sophistication did not reduce the probability of enforcement in a couple of recent studies. (Coate (2009c) and Coate & Ulrick (2009)). However, the variable did have a negative effect on enforcement in Bergman et al. (2009), with a somewhat older sample of both collusion and unilateral mergers.

[41] This discussion is based on the Coate (2009b). Theorists can easily define models to generate price effects at shares well below the 35 percent standard. The problem is the models must survive an attempt at falsification to be considered economic science (Coate & Fischer (2009)).

[42] *See*, Coate (2005b), Coate (2006), Coate & Ulrick (2008), Coate (2008b), and Coate (2009c).

[43] For an explanation of why standard merger testimony should include evidence on the likely competitive effect of a merger, *see* Coate & Fischer (2009).

applies an experience-based "Folk Theorem" in which structural concerns are validated with performance evidence.[44] Three types of evidence play a role in the competitive analysis.

While the Merger Guidelines are relatively silent on evidence, the case files are not. The initial review highlights both customer complaints and hot documents. The FTC Transparency release defines both variables. Customer concerns must express a "credible concern that a significant anticompetitive effect would result" from the merger.[45] The weight of the evidence from the interviews affects this conclusion. Likewise, hot documents must "predict the merger will have an adverse price or non-price effect on competition."[46] As a bottom line, customer complaints or hot documents are validated as part of the merger review process.

More in-depth review of the files isolates a range of economic analyses associated with natural experiments.[47] These analyses differ by theory of concern.[48] Four event classifications are identified for coordinated interaction concerns. The most obvious event involves evaluating actual market performance to show less-than-competitive behavior exists and then links it to some causative structural variable. Showing case-specific structuralism tends to suggest that a merger will be anticompetitive, because the transaction makes the structural conditions even less competitive.[49] Two other styles of analysis focus on special case considerations. In some markets, it is possible to demonstrate a relationship between a historical merger and poor market performance. If that change in structure affected performance, then another merger is likely to adversely affect performance. In other markets, it is possible to show that the market has remained relatively competitive due to the behavior of a maverick. This evidence is useful in confirming a maverick theory of violation. A final classification of events focuses on events in comparable markets. Here, the analysis must show both the event and the close similarity between the affected market and the market of concern.

For unilateral concerns, four different styles of event analyses show up in the files. One possible analysis links an earlier merger in the same market to an anticompetitive effect and therefore supports the competitive concern for a follow-on merger. An alternative analysis explores the effect of re-positioning on the market. If a merger partner has repositioned itself and materially affected competition, the loss of that independence might matter. A third analysis focuses on historical entry (exit) and links that change in structure to unilateral effects. Evidence showing a firm entered the market and improved the overall competitive environment suggests that the loss of the independence of that rival could adversely affect the

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[44] The phrase "Folk Theorem" is simply an economic term of art used to describe a general understanding that just evolved over time. The Folk Theorem conclusion should not be read to suggest that every internal merger analysis presents the best theory, supported by the strongest evidence. Instead, the files, when read together, show the design of the enforcement system that is compatible with this goal. In any particular case, different analysts may have different views on particular facts and insights. If forced into court, the Commission staff needs a theory of violation and some supportive evidence. Respondents would have their own theory on the merger's effect, along with their own take on the evidence. The court would decide.

[45] Coate & Ulrick (2005) at Appendix C, page 53.

[46] Coate & Ulrick (2005) at Appendix C, footnote 16.

[47] Useful analyses include Davis (2005), Coleman & Langenfeld (2008), and Johnson (2008).

[48] For a discussion of evidence in collusion and unilateral effects cases, *see*, Coate (2008b) and Coate (2009c). The detail of the analyses differs substantially from file-to-file.

[49] For some suggestions on how to evaluate competition, *see* Scheffman & Coleman (2003).

market. A fourth line of analysis addresses events in comparable markets. Again, these studies must show the event and a clear similarity between the analogous market and the market of concern. In all of these studies, care must be taken to account for alternative explanations for the observed behavior. [50]

While not as prevalent in the files, evidence also serves to immunize a merger from concern.[51] In some merger investigations, the customers support the transaction. By applying the same validation process as used for complaints, it is possible to isolate the matters in which the customers believe the market will benefit (i.e., efficiencies will lead to lower prices) from those in which only a specific customer will benefit. "Cold" documents are also reasonably straightforward, although only one cold document finding has been noted in the files. A merging party may have looked at a merger comparable to the one under review and documented the conclusion that the deal would not affect the market. Hence, it could be reasonable to consider this analysis as evidence that the merger in question is not anticompetitive.[52] Natural experiments may also show a change in structure, comparable to the merger at issue, had no effect on the market. Or evidence may show that a maverick firm remains in the market to ensure competition. This evidence could serve to falsify an anticompetitive theory and thus reduce the probability of a competitive concern.[53]

Customer sophistication (buyer power) analyses are also developed in the staff evaluations. The most striking results occur in homogenous goods industries reviewed with a collusion theory, where findings of customer sophistication materially reduce the probability of an enforcement action. In effect, it would appear that buyer power is thought to make it more difficult for some form of tacit collusion to allow suppliers to elevate or maintain prices above the competitive level. All the customers in the market would clearly benefit from this pro-competitive effect. In contrast, the evidence for sophistication is much weaker for unilateral effects cases. Here, it is harder to see how the customer forces price back to the competitive level. Possibly some direct evidence would be required in these matters.[54]

Finally, the original transparency analysis is compatible with a "reduced-form" model of competition analysis for mergers involving a large number of competitive concerns in different product or geographic markets.[55] When faced with a double-digit list of competitive concerns

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[50] Coate & Fischer (2009) describe systematic event analyses in which the analyst can collect data from a number of markets and perform a sophisticated econometric analysis to evaluate the impact of the merger on performance. These analyses can support either coordinated interaction or unilateral theories of concern. Alternative analyses evaluate opportunistic information discovered in the investigation.

[51] Coate (2005b), Coate (2006), Coate & Ulrick (2008), and Coate (2009c).

[52] Internal analysis showing continued competition in the market if the proposed merger is consummated would be much more difficult to validate as a cold document.

[53] The data collection process is clearly biased against finding evidence associated with competition, because the process only reviews memos written at the end of the second request investigation. If evidence turns up showing no competitive concern, the matter could be closed as a "quick look" and thus not be included in the data set. Moreover, evidence of continued competition is most likely to be found when some other exogenous condition (ease of entry, sophisticated customers) exists to preclude a competitive concern. Thus, even if the quick look memos were as detailed as the final memos, the evidence might not be recorded.

[54] Coate & Ulrick (2009) note court findings of buyer sophistication appear to reduce the probability of enforcement in merger litigation.

[55] *See*, Coate & Ulrick (2006).

and tight Hart-Scott-Rodino deadlines, it is very difficult, if not impossible, to undertake a detailed Guidelines' based analysis in each problematic market. Staff does the best it can; conducting aggregate cross-market analyses of various issues (i.e., entry, theory of concern, efficiencies) and, when possible, customizes the analysis to reflect facts in specific markets. However, it is just impossible to provide the same level of detailed study when a merger involves 10 drug markets or 15 wholesale gasoline markets.[56] Thus, the staff may apply a general structural analysis and generate enforcement recommendations.[57] While one can be concerned with regulatory short cuts, the data review finds the aggressive enforcement was industry, not case, related. Oil and grocery markets are simply subject to a tighter review.[58] Further review of this style of analysis would be useful.

IV. ENTRY UNDER THE MERGER GUIDELINES

The Merger Guidelines' recommended analysis studies the timeliness, likelihood, and sufficiency of entry to determine if entry is likely to deter or defeat an anticompetitive effect of concern.[59] Basic definitions are given for the three concepts, with timeliness linked to physical realities associated with actual entry, likelihood to the potential profitability of entry, and sufficiency to the ability of the timely, likely entry to offset the relevant competitive concern. The Guidelines' entry algorithm leaves the implementation details a little vague, although it notes that all the available evidence should be used.[60]

The empirical studies of FTC enforcement confirm the near outcome-determinative effect of easy entry.[61] If entry is not impeded, enforcement action is very unlikely under either a coordinated interaction or unilateral effects theory. Moreover, enforcement probabilities increase as the evidence associated with entry becomes stronger and stronger. This result holds for a number of different implementations of the barrier concept.

Entry analyses regularly address more than one style of entry (e.g., *de-novo* entry, fringe entry, product extension entry).[62] As the facts related to each style of entry may differ, multiple analyses of the timeliness and likelihood questions are required. Then the styles of entry that

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[56] While rules of thumb could be applied to identify both coordinated interaction and unilateral effects cases, detailed analysis to check the choice would be time consuming. If a broad statistical relationship between structure and outcome is postulated, a reduced form effect could be estimated. Interestingly, the number of rivals does not appear to be statistically significant in enforcement analyses limited to oil or grocery mergers, suggesting that these transactions are evaluated with a standard collusion theory. Coate & Ulrick (2005) at 18.

[57] If one market requires special attention, that deal can be studied as if it was a single overlap.

[58] Some evidence would generalize easier than other types of evidence. Customer complaints would almost certainly have to be market-specific, while natural experiments in a single market might be relevant to an entire class of markets.

[59] The Guidelines also mandate consideration of uncommitted entry. Although probably relevant in the initial decision to issue a second request, this supply-side analysis rarely justifies the broadening of markets in full investigations and when relevant, may be offset by price discrimination arguments (Coate (2008a)). Thus, the impact of uncommitted entrants must be considered in the standard entry analysis.

[60] Background information on entry is available in Coate & Langenfeld (1993) and Carlton (2004).

[61] Coate & Ulrick (2006), Coate (2005b), Bergman et al (2009), Coate & Ulrick (2009), and Coate (2009).

[62] The remainder of the section is based on the results of the Coate (2008a).

are both timely and likely must be passed through the sufficiency analysis to determine if the effect of timely, likely entry is sufficient to offset or deter the competitive effect of concern.

Timeliness analyses are often tightly linked to readily verifiable facts such as the time delays caused by regulation or construction schedules. Reputation issues may also delay entry. Likelihood analyses are often more problematic. While some situations (i.e., Stiglerian barriers, switching costs, Certificate of Need regulation) may render entry unlikely, many other cases exist in which the analyst must evaluate the viability of efficient-scale entry. In some cases, detailed data on both scale and sales opportunities exist; in other cases, the staff has evidence on branding, low profits, or declining market, but no clear evidence with which to balance scale and sales opportunities. These analyses are simply less dispositive than the timeliness considerations.

Sufficiency concerns are based on a range of special case considerations that affect the ability of timely, likely entry to ensure that the market remains competitive. Staff advances analyses related to specific inputs in short supply, the need for full product lines, and the importance of reputation, network economics, and the marginal impact of the fringe. Overall, barriers are identified in 109 of the 138 investigations studied, with more barrier findings for unilateral than coordinated interaction theories of concern.

Innovations in Entry Analysis

The entry analysis study also uncovers a few innovations. First, the staff closely reviews the files for evidence of actual (found in 55 files) and planned future (found in 46 files) entry. Either actual or planned entry evidence (found in 77 files) appears to make the staff more willing to conclude entry was easy (27 of the 29 easy entry findings fell into this sub-sample). Thus, real world entry evidence may play an important role as a check on the more theoretical entry analyses.

Second, the review of the files flags a few matters in which the timeliness analysis is adjusted to consider entry in progress. This generalization of the basic method is particularly important, because it occurred in industries with government-based entry impediments (e.g., pharmaceuticals). If the products in the development pipeline did not count, entry would rarely be timely in these markets.

Finally, the paper identifies a solution to the analytical difficulties associated with the likelihood of entry. In a few innovative reviews, staff presents net present value models of the entry decision, based either on available entry studies or pro-forma profitability models. Net present value analysis, if carefully implemented, should be able to determine if a firm could profitably (would) enter in response to a specific anticompetitive effect. All the required information should be available in the record of a complete investigation; the staff just needs to build the entry model.

V. EFFICIENCIES UNDER THE MERGER GUIDELINES

The Merger Guidelines require efficiencies to be valid, verified, and merger-specific before they are relevant to the overall competitive effects analysis. To justify an otherwise anticompetitive merger, the efficiencies must reverse the aggregate harm to consumers. In

effect, this appears to mean that efficiencies must prevent a loss in overall consumer welfare; social welfare considerations are not controlling.[63] Exactly how this analysis is undertaken is not clearly specified in the Guidelines.[64]

To evaluate efficiencies, it is necessary to disaggregate the general staff discussions into individual claims and then apply the standard validation, verification, and merger specificness screens.[65] While efficiency claims are not made in every case; an average of three claims are advanced when efficiencies seem to merit discussion. Both the Bureaus of Competition and Economics report variable cost, fixed cost, and dynamic efficiencies, along with a few generic claims. Staff reviews generally discuss the efficiency claim in light of the Guideline review standards, but most claims are neither clearly rejected nor accepted. In addition to the expected comments on validity, verification, and merger specificness, the staff analysis may discuss issues associated with the efficiency being outside the market of concern, limited to fixed costs, or not passed through to the consumer. Reviews by both the Bureaus of Competition and Economics provide the Commission with perspective, as the specific staff evaluations regularly differ. Interestingly, the reviews appear basically as favorable for variable cost savings as fixed cost savings.

Some form of an efficiency argument exists when at least one claim is favorably reviewed or, in some cases, accepted by the staff. Using this definition of efficiency, the data show the economists have always had a strong interest in efficiencies, while the Bureau of Competition developed more of an interest around 1995.[66] These staff-based codings have been used to create a combined attorney/economist variable equal to one when at least one Bureau finds efficiencies and zero otherwise.[67] While historical studies have shown a positive value for the efficiency index reduces enforcement,[68] the variable has had mixed success in the Transparency project. Initial results suggested that the variable had no effect when a broad set of control variables is used, but more recent results show the expected negative effect on the probability of an enforcement action.[69]

The review of the files also highlights the fact that the staff rarely assesses whether efficiency considerations reverse the competitive concerns. This result is probably driven by a combination of the relatively qualitative competitive effects analysis and the difficulties

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[63] Williamson (1967) is the classic reference, while Roberts & Salop (1996) offers an interesting synthesis of social welfare and price analysis.

[64] For a discussion of balancing and a comment on the role of customer support, *see* Coate (2005a). And for evidence suggesting the Commission's Bureau of Competition started addressing efficiencies in more cases in 1995, *see* Coate (2009a).

[65] Coate and Heimert (2009). The discussion in the rest of the paragraph draws on this research.

[66] Coate (2009a) at Table 6.

[67] Coate (2005b). On occasion the study is limited to the BC data.

[68] *See*, for example, Coate (2002).

[69] Compare Coate (2005b) with no significant efficiency findings, with Coate & Ulrick (2009) and Coate (2009a) with significant efficiency results. Limiting the data to collusion cases generates mixed results (Coate (2008b)), while a focus on pure unilateral concerns does not detect a standard efficiency effect when controlling for a range of factors (Coate (2009c)). In effect, an extensive specification of the enforcement model may capture efficiency issues in more than one explanatory variable.

associated with measuring the magnitude of the efficiencies.[70] While parties often allege specific efficiency claims, the standard analysis implies some reductions must be taken to compute the validated, verified, merger-specific efficiency. Many staff investigations are only able to conclude that some positive level of efficiencies should be expected. Without a detailed estimate of the magnitude of the price effect and a valuation for efficiencies, explicit balancing is not possible.[71]

Innovations in Efficiency Analysis

One important innovation is the willingness to broadly consider efficiency claims. For example, fixed cost savings are considered, possibly because they clearly generate pressure for lower prices in the long run. Likewise, dynamic efficiencies associated with the reduction of transaction costs are also relevant, because these savings enable the introduction of innovative products or technologies. And efficiencies outside the market of concern are relevant, unless some remedy resolves the competitive problem without eliminating the efficiencies. On the other hand, studies often disregard merger-specific efficiency claims when the merged firm is able to retain the savings after divesting the "offending" assets in an innovative merger settlement. Counting efficiencies the merged firm retains after the remedy as a reason not to impose a settlement would be a policy error. Balancing remains in the experimental stage; while mathematical models offer the potential to quantify the effects of the transaction, evidence is needed to validate the applicability of the proposed model.

VI. CONCLUSION

The review of staff memos generates a number of important insights into applied merger analysis and highlights a number of innovations, many of which deserve further work. First, although roughly half of the markets are relatively easy to define given the physical and economic realities of the marketplace, the other half of the market definitions require complex analysis. Critical loss structures offer promise and a key question is whether some type of homogeneous or composite good can be defined to facilitate the market-level calculation. Market definition is an empirical, not theoretical, question as markets are only analytical constructs designed to aid the overall analysis. When limitations on available data preclude critical loss analysis, natural experiments or pattern analysis might be useful. Further work is certainly needed to develop new ideas to structure market definition analysis in complex cases.

Given a market, it may be possible to build on the innovations associated with significant competitors, leadership, and numbers equivalent concepts to create sophisticated structural indexes. Moreover, thought should be given to revising the structural presumptions to reflect enforcement realities.

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[70] Coate & Heimert (2009).

[71] Any merger simulation model can evaluate the effect of the efficiencies by lowering the cost structure for the merged firms and solving for the post-merger equilibrium. Because dynamics are often important, the analysis should also model how the efficiencies are diffused through the market and balance the short run and long run effects of the merger.

Guideline-based competitive effects analyses should be seen as hypotheses for the competitive effect of a merger. Both unilateral effects and coordinated interaction theories are relevant, although virtually always for different mergers. The hypotheses need to be tested with evidence prior to concluding the merger is likely to substantially lessen competition.[72] The test may be based on a natural experiment isolated during the investigation, validated customer concerns, or hot documents. These last two considerations may very well be linked to historical natural experiments observed by the relevant parties and thus may be just as market-based as pure economic data. Of course, care must be taken to ensure that the evidence, aligned with the theoretical competitive concern, is actually compatible with the competitive environment faced by the firm. This is particularly important for a plaintiff in light of the willingness of courts to ignore questionable customer concern and hot document evidence.[73] General studies linking customer concerns and hot documents to specific natural experiments may enhance the value of this evidence. Evidence may also be useful to falsify the theory of concern, as different natural experiments, customer support or cold documents may imply competition is not likely to be affected by a change in structure. Further work could test these economic models, possibly by focusing on industries with repeated interactions at the enforcement agencies or markets in which the remedy failed to affect structure (due to some unforeseen shock to the market) and the alleged anticompetitive effect had a chance to occur.

Entry analysis on timeliness and sufficiency are generally based on relatively hard facts available in the record of the investigation. Time-lines are readily identifiable, and a reasonably clear answer is possible for the ability of an entrant to compete in the business segment affected by the merger. Likelihood of entry remains, on occasion, subject to speculation. However, the likelihood issue is most amenable to economic analysis. We know that firms model entry decisions in the normal course of business. The merger analyst should be able to do the same thing, and answer the question of whether entry is profitable at the required scale to negate the theory of competitive concern. Modeling has been undertaken in a few FTC investigations and it should be undertaken in many more cases to improve the standard ad-hoc likelihood analysis. Further analysis could also exploit the evidence on actual or expected entry. Actual entry represents a natural experiment that may be useful for competitive effects analysis, while expected entry almost always generates some implications for the Guidelines' analysis. While these links are recognized, their significance could be further developed.

Finally, efficiency claims appear to matter (at least a little). Efficiency analysis is badly in need of a method to integrate cost savings into the overall competitive effects analysis. Modern Industrial Organization offers a range of models to simulate the outcome of mergers given both changes in structure and cost considerations. Once the competitive effects analysis validates the predictions of the model for the competitive concern, it could make sense to run the simulations with various assumptions for the cost savings to determine the net effect of the merger. Of course, economics has a wide range of other models that can also offer insights when a

[72] For coordinated interaction and unilateral effects models, this testing is necessary for the analysis to be validated science. Simply presenting mathematical analysis or qualitative arguments is not sufficient to predict the effect of a merger, because the theory has no empirical support until it is tested. Parameterizing a model is not enough. Coate & Fischer (2009). *See* also, Fisher (1989) and Peltzman (1991).

[73] *See*, for example, FTC vs. Arch Coal, Inc, et al. 329 F. Supp. 2nd 109 (D. D. C., 2004).

complete quantification of the competitive process in not viable. Close study of efficient transactions allowed to proceed would seem like a good idea to identify the approaches best able to find real world efficiencies. And empirical studies relating changes in fixed cost to changes in the market price would be useful to identify any direct and immediate effect of fixed cost efficiencies.[74]

The review of the record suggests a large and growing role for economics in antitrust investigations. However, the staff analyses are clear; merger enforcement regularly highlights evidence on likely competitive concerns. Standing alone, simulation models or other theoretical economic analyses are poor substitutes for real evidence suggestive of less than competitive behavior. Of course, for maximum impact, effects evidence should be presented in light of an economic theory of violation. Thus, merger reviews need to combine the economic ideas inherent in the Guidelines with the facts needed to substantiate the economic analysis.

VII. APPENDIX (BIBLIOGRAPHY)

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