COMMENT ON DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION'S PROPOSED HORIZONTAL MERGER GUIDELINES

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Contents

I. INTRODUCTION

A. Qualifications

1. I am the Katherine Dusak Miller Professor of Economics at the Booth Graduate School of Business at the University of Chicago. I specialize in the economics of industrial organization, which is the study of individual markets and includes the study of antitrust and regulatory issues. I am also Senior Managing Director at Compass Lexecon, an economic consulting firm that specializes in the application of economic analysis to legal and regulatory issues.

2. I am co-author of the book Modern Industrial Organization, a leading textbook in the field of industrial organization, and I have published numerous articles in academic journals and books. I am also co-editor of the Journal of Law and Economics, a leading journal that publishes research applying economic analysis to industrial organization and legal matters. In addition, I serve on the editorial board of Competition Policy International and of the Journal of Competition Law and Economics, two academic journals that focus on antitrust issues.

3. I served as the Deputy Assistant Attorney General for Economic Analysis at the U.S. Department of Justice between 2006 and 2008. Between 2005 and 2007, I served as a member of the Antitrust Modernization Commission, a 12-member bipartisan commission with members appointed by the President and Congress to review the adequacy of the nation's antitrust laws. I was the only economist to serve as a member of the Commission, which included leading antitrust lawyers, many of whom had extensive experience at enforcement agencies. I also have served as an outside consultant during the DOJ and FTC's 1992 revision of the Horizontal

Merger Guidelines and have consulted for both the DOJ and FTC on a variety of antitrust issues. I submitted a prior comment regarding the Guidelines in November 2009.[1]

B. Assignment and Overview

4. I have been retained by counsel for AT&T, the Financial Services Roundtable, Microsoft Corporation, the National Association of Manufacturers, the U.S. Chamber of Commerce, and Verizon Communications, Inc. to share some of my views relating to the revisions to the Horizontal Merger Guidelines ("Guidelines") proposed by the Department of Justice and Federal Trade Commission ("antitrust agencies").[2] All the views expressed are my own.

5. After reviewing the proposed Guidelines, my central conclusion is that they provide an excellent, detailed statement of how the antitrust agencies actually analyze mergers. As part of this statement, the Guidelines include caveats about the appropriate use of the methods described. However, although the antitrust agencies may well understand these caveats, potential users of the Guidelines, including the business community and courts, may not have the same level of understanding.

6. In these Comments, I discuss particular aspects of the proposed Guidelines in order to make clear the limitations surrounding some of the methods described. Such clarity is important given the broad set of constituencies that the Guidelines necessarily serve. As described in the proposed Guidelines:[3]

> These Guidelines are intended to assist the business community and antitrust practitioners by increasing the transparency of the analytical process underlying the Agencies'

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1 Dennis Carlton (November 9, 2009), "Responses to 'Horizontal Merger Guidelines: Questions for Public Comment'" (hereinafter, *Previous Carlton Comments).*

2 Federal Trade Commission and U.S. Department of Justice, "Horizontal Merger Guidelines. For Public Comments: Released on April 20, 2010" (hereinafter, *Guidelines*).

3 *Id*, p. 1.

> enforcement decisions. They may also assist the courts in developing an appropriate framework for interpreting and applying the antitrust laws in the horizontal merger context.

If the business community and courts are to use the Guidelines, it is important that they understand not just what the antitrust agencies might do in evaluating mergers but rather why it makes economic sense for the antitrust agencies to do what they do, including the strengths, weaknesses, and limitations of the various methods. As one important example, to the extent that the antitrust agencies use methods that are not yet empirically tested, it is important for courts and business audiences to understand that limitation.

7. My comments are intended to clarify those issues in the proposed Guidelines that I view as particularly important for potential users to understand. In Section II, I address the Guidelines' proposed general economic framework for merger review. In Section III, I discuss the Guidelines' proposed use of the Upward Pricing Pressure methodology ("UPP") and urge caution in its application given the relatively untested nature of the methodology as a screen for anti-competitive mergers. In Section IV, I describe the need for additional empirical research to help guide the continued development of merger policy.

8. My specific conclusions about the Guidelines' proposed general economic framework for merger review are as follows:

- The new numerical cutoffs for Herfindahl-Hirschman Indices ("HHIs") may better reflect how government agencies evaluate mergers than did the cutoffs in the old guidelines, but like the old numerical cutoffs, they lack an empirical basis.
- Any suggestion that the courts should abandon the use of market definition when analyzing the competitive effects of mergers is unwise, as the failure to define markets would likely increase the number of erroneous decisions reached by courts.

- While the Guidelines mention the potential value of non-price competition, the emphasis is primarily on price competition. One result is that the proposed Guidelines do not convey clearly to the business community and courts the competitive importance of efficiencies in stimulating non-price competition, including competition to innovate. Such non-price competition may be particularly important in industries (such as telecommunications, computer software, and pharmaceuticals) with high levels of R&D, high fixed costs, and low marginal costs. In such industries, a high margin may not indicate a lack of dynamic competition, and fixed cost or product quality efficiencies may be particularly important in stimulating dynamic competition.

- The distinction between unilateral and coordinated behavior, which has been carried over from the previous Guidelines, is not a sharp one and is likely to lead to confusion, particularly to the extent it suggests that there are two distinct economic theories of oligopoly.

9. My conclusions with respect to the use of UPP in the unilateral effects section (VI) of the proposed Guidelines are as follows:

- UPP has not yet been widely discussed in the economic literature as a screen for potentially anticompetitive mergers, and the leading article on the topic (by Farrell and Shapiro) notes a number of caveats in the use of UPP.[4] These caveats are of importance to the business community and courts but are not addressed in the proposed Guidelines.

- These caveats include limitations on UPP's power in predicting the price effects of mergers, including the fact that the UPP methodology does not account for the fact that

[4] Joseph Farrell and Carl Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *The B.E. Journal of Theoretical Economics*, Vol. 10, Issue 1, Article 9.

merger-related efficiencies in one product may lower the equilibrium prices of other products involved in the merger.

10. Finally, in Section IV, I note that there has been a dearth of research that tests which merger evaluation methods work and in what contexts they work. The research that has been done suggests that some existing methods may yield inaccurate predictions about post-merger prices in some cases.[5] Hence, additional testing of all methods contained in the Guidelines should be a high priority and, until such testing occurs, there will remain concerns about the reliability of the proposed methods.[6]

II. SOME BASIC COMMENTS ON THE GUIDELINES

11. In this section, I comment on the general economic framework presented in the proposed merger guidelines, including the proposed use of market concentration measures, the proposed de-emphasis of market definition, the role of non-price competition, and the Guidelines' attempts to distinguish unilateral and coordinated effects. In each case, the points I raise are almost certainly understood by those at the antitrust agencies who use the methods described in the Guidelines; however, my concern is that the points may not be equally well understood by others relying on the Guidelines, including the business community and courts.

A. The new HHI thresholds, just like those in the existing Guidelines, are not based on any well-established economic research.

12. Like the existing Guidelines, the proposed Guidelines include "HHI thresholds," both as a screen to determine which mergers are likely to "warrant scrutiny" and as a way to define

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5 See, for example, Craig Peters (2006), "Evaluating the Performance of Merger Simulation: Evidence from the U.S. Airline Industry," *Journal of Law and Economics*, XLIX, pp. 627-649.

6 For more on this point, see Dennis W. Carlton (2009), "Why We Need to Measure the Effect of Merger Policy and How to Do it," *Competition Policy International*, 5, pp. 77-90.

mergers that are presumed "to be likely to enhance market power."[7] Although the proposed Guidelines have raised the HHI thresholds between "unconcentrated," "moderately concentrated," and "highly concentrated" markets from the thresholds in the existing Guidelines, this does not mean that the proposed Guidelines have relaxed the stringency of merger review.[8] Rather, increasing the thresholds likely brings the proposed Guidelines more in line with actual agency practice than are the existing Guidelines. However, even with this change, it would be a mistake to conclude that the new thresholds reflect actual agency practice in all industries. In fact, the recent Federal Trade Commission review of merger investigations between 1996-2007 shows that, even for a given post-merger HHI and merger-induced change in HHI, the ratio of investigations cleared with no conditions to investigations in which relief was sought varies markedly across industries.[9]

13. Regardless of the precise cutoff levels used, it would be a mistake for courts to interpret the new Guidelines as calling for increased reliance on HHI thresholds since the value of any HHI thresholds for merger review is extremely limited. At best, HHI thresholds, if based on empirical evidence that relates the thresholds to the likely effects of mergers, could be used as a

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7 *Guidelines*, p. 19.

8 In particular, the proposed Guidelines raise from 1000 to 1500 the HHI cutoff for "moderately concentrated" markets and from 1800 to 2500 the HHI cutoff for "highly concentrated" markets. In moderately concentrated markets, the proposed Guidelines maintain the standard that mergers that induce HHI changes of 100 or more "potentially raise significant competitive concerns and often warrant scrutiny." However, for highly concentrated markets, the proposed Guidelines raise from 50 to 100 the change required for mergers to warrant scrutiny and from 100 to 200 the change required for a merger to create a presumption of enhanced market power. (*Id*, p. 19.)

9 See Tables 3.2 through 3.6 of Federal Trade Commission (2008), "Horizontal Merger Investigation Data, Fiscal Years 1996-2007." As one example, note that in the pharmaceutical industry (an industry with important non-price competition to introduce new and improved products), in markets with post-merger HHI between 3000 and 5000 and merger-induced change in HHI between 200 and 1200 (which would be presumed to enhance market power under the proposed Guidelines), there were nearly as many cases (10) in which the merger was approved with no conditions as cases (11) in which relief was sought. In contrast, for oil mergers, of the 23 markets with HHI levels and changes in this range, relief was sought in 22.

rough screen for identifying those mergers that might merit further investigation. However, I know of no body of economic research that provides either an econometric or a theoretical basis for the proposed (or existing) thresholds.[10] Moreover, there is no basis to apply uniform thresholds across different industries. Hence, to avoid potential misuse of HHI thresholds by courts or other users, it may be preferable for the Guidelines to note simply that HHI levels and changes will be considered as one part of merger review, but specific determinations about the implications of the HHI values in any particular merger will be based on empirical research that is specific to the industry in question or at least to industries with similar characteristics.

B. Any suggestion that the courts should abandon the use of market definition is unwise.

14. The proposed Guidelines deemphasize the use of market definition as a tool in merger analysis. Although, in some cases, the agencies may be able to dispense with the use of market definition and rely on other tools, it would be a mistake for courts, which generally have less antitrust experience than antitrust agencies, to do so. As I explained in my previous submission, even though market definition may be a crude tool to use, it does provide some structure to an antitrust analysis and its use likely prevents courts from making egregious errors.[11]

15. In discussing unilateral effects, the proposed Guidelines suggest that a competitive harm could result even if the non-merging firms in the industry keep their prices unchanged. In such a case, the logic of market definition in the Guidelines would indicate that the products of the two merging firms actually, by themselves, constitute a relevant market. While I sense that enforcement agencies may be reluctant to define explicitly such a narrow market—for fear a

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[10] To the extent that research on this topic occurs, it should also evaluate concentration measures other than HHI that are used by the agencies, such as the number of "significant competitors in the market" (*Id*, p. 18.)

[11] *Previous Carlton Comments*, ¶ 21.

court will think the definition is artificial—my view is that one should use and defend a narrow market if it is indeed appropriate. Hence, I am concerned that the unilateral effects framework in the proposed Guidelines may enable government litigators to argue in court either that they have no need for a market definition or that the market is broad but the transaction should be blocked anyway because the parties are close competitors with differentiated products. This approach gives more latitude to government litigators to bring a merger case without having to define and defend an appropriate market. Instead, the Guidelines should help clarify that narrow market definitions can be economically appropriate and reasonable, especially in evaluating the unilateral effects of mergers in industries with differentiated products.

C. The Guidelines should be clear about the potential importance of non-price competition and the efficiencies that can stimulate such competition.

16. The proposed Guidelines mention the potential value of non-price competition, such as innovation to produce new or improved products. For example, in discussing efficiencies, the proposed Guidelines correctly indicate that efficiencies can come from "…improved quality, enhanced service, or new products" in addition to "lower prices."[12] The proposed Guidelines also correctly indicate that efficiencies "relating to costs that are fixed in the short term…can benefit customers in the longer run, *e.g.*, if they make new product introduction less expensive."[13]

17. However, relative to the attention paid to price competition, the Guidelines place little emphasis on non-price competition. For example, the discussion of fixed cost savings is relegated to a footnote, which also notes that although the benefits from fixed costs occur in the

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12 *Guidelines*, p. 29.

13 *Id*, p. 30. For more on the importance of fixed cost savings, see Antitrust Modernization Commission, *Report and Recommendations*, April 2007, which discusses the ability for fixed cost savings to benefit consumers by creating increased incentives to innovate.

longer run, "[t]he Agencies normally give the most weight to the results of this analysis over the short term."[14] And while the Guidelines note the possibility of efficiencies from improved product quality, they also indicate that "the Agencies consider whether cognizable efficiencies likely would be sufficient to reverse the merger's potential to harm customers in the relevant market, *e.g.*, by preventing price increases in that market."[15] This language does not appear to give as much credit to non-price effects such as new and improved products that might benefit consumers even if they do not "prevent price increases." Failure to credit such efficiencies would be unfortunate, as economic literature recognizes that much of the gain in consumer welfare over time can directly be attributed to technological innovations and new products, including, among others, new drugs and medical treatments, mobile phones, and the Internet.

18. I remain concerned that courts or other users of the Guidelines may perceive that merger analysis should place relatively little weight on factors such as: (i) consumer benefits that derive from non-price competition, including competition to innovate and produce new or improved products, and (ii) fixed cost and other efficiencies that stimulate such competition. I am particularly concerned that the Guidelines, as written, could lead either the antitrust agencies themselves or courts to stop beneficial mergers in industries characterized by high levels of R&D and intense competition to innovate (*e.g.* computers, telecommunications, and pharmaceuticals, among others). Such industries are often characterized by high gross margins (that is, prices that are well above marginal costs), which may lead mergers to be scrutinized closely due to the Guidelines' stated view that "high pre-merger margins normally indicate that each firm's product

[14] *Id*, p. 30.

[15] *Id*, p. 30.

individually faces demand that is not highly sensitive to price."[16] Compounding the problem, the benefits from such mergers often flow from merger-enabled reductions in fixed costs and the associated increase in incentives to invest in R&D and introduce new products. Failure to account adequately for the effect of mergers on such incentives could cause agencies to challenge mergers that would foster such innovation and enhance consumer welfare.

19. To avoid improper merger enforcement decisions, two important points should be incorporated into the proposed Guidelines and merger review. First, in industries characterized by high levels of R&D and associated high fixed costs, as well as relatively low marginal costs, high short-run gross margins (price minus marginal cost) should not be presumed to demonstrate a lack of competition. Rather, there may be intense, dynamic competition to innovate and introduce new and improved products. Second, in such industries, substantial weight should be placed on merger-related reductions in fixed costs that enhance firms' incentives to invest in R&D and thus potentially generate new (or higher quality) products and services.

D. The distinction between "unilateral effects" and "coordinated effects" in the Guidelines is artificial and should be deemphasized.

20. The proposed Guidelines carry over the distinction between unilateral and coordinated effects from the present Guidelines.[17] The proposed Guidelines correctly note that "[i]n any given case, either or both types of effects may be present, and the distinction between them may be blurred."[18] Nevertheless, the delineation of two separate types of "effects" suggests

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16 *Id*, p. 12.

17 In particular, in the context of unilateral effects, the Guidelines state that "the elimination of competition between two firms that results from their merger may alone constitute a substantial lessening of competition." (*Id*, p. 20.) In the context of coordinated effects, the Guidelines state that "a merger may diminish competition by enabling or encouraging post-merger coordinated interaction among firms." (*Id*, p. 24.)

18 *Id*, p. 2.

incorrectly that there is one economic theory of oligopoly that underlies potential unilateral effects of a merger on competition and a separate theory that underlies potential coordinated effects.

21. In fact, the Guidelines' distinction between unilateral and coordinated effects is artificial and provides a misleading view to practitioners, courts and others of the economic theory that provides the foundation for merger enforcement. Both unilateral and coordinated effects analyses should properly be understood as variations of oligopoly theory (which is based on non-cooperative game theory), which provide the general theoretical basis for any concerns about the potential adverse effects of mergers on consumers. Unilateral effects models are often based on models of Bertrand competition, which are static in the sense that firms are assumed to make simultaneous decisions about price, recognizing the interdependence of their decisions on current demand, but ignoring the dynamic effects of such decisions. Analyses of coordinated effects, although typically less formal than analyses of unilateral effects, generally focus on dynamic factors affecting firms' interactions over time.

22. Thus, a principle distinction between what the Guidelines call "unilateral" and "coordinated" effects is the extent to which they focus on static or dynamic factors. This seems like a peculiar use of terminology over substance—both types of analyses are properly considered as applications of standard oligopoly theory. There is no reason that a static differentiated product model based on Bertrand competition cannot be extended to account for dynamic competition, in which case it would look like what the Guidelines call a coordinated effects model. Of course, static considerations might be more important than dynamic ones for the evaluation of some mergers but that does not mean that potential harms are properly

considered “unilateral” in some mergers and “coordinated” in others. My concern is that suggesting such classifications may lead to substantial confusion, particularly in courts.

23. There is an alternative interpretation of the distinction between unilateral and coordinated effects, which is worth highlighting. It is possible to distinguish between a situation in which a merger harms competition only by reducing the number of firms competing and a situation in which a merger harms competition not only because there are fewer firms post-merger but also because the way the firms compete has changed. For example, the way firms compete may change post-merger for reasons such as increased transparency of information allowing for better monitoring of rivals’ prices. Making such a distinction between a simple change in the number of firms and a more fundamental change in the nature of competition—and describing how the antitrust agencies will evaluate each possibility—would be useful, but the Guidelines contain no such distinction as presently written.

24. While I suggest that the proposed Guidelines should deemphasize the distinction between unilateral and coordinated effects, this should not be misunderstood to allow the agencies to investigate or challenge mergers on vague or unstated grounds. The agencies should clearly delineate the mechanism of competitive harm that is being posited and identify which static and dynamic factors are raising competitive concerns.

III. UPWARD PRICING PRESSURE

25. While the proposed Guidelines do not refer explicitly to the “Upward Pricing Pressure” method (“UPP”) for evaluating mergers involving differentiated products, Section 6.1 of the proposed Guidelines (on unilateral effects) uses the phrase “upward pricing pressure” and refers

to many of the concepts developed in Farrell and Shapiro's excellent paper on the method.[19] As such, it seems highly likely that the business community and courts will see the discussion of unilateral effects as implicitly referencing and perhaps endorsing UPP as a method for the review of differentiated products mergers.

26. My concerns with the references to UPP are twofold. First, while Farrell and Shapiro's paper does an excellent job of discussing the appropriate use of UPP, including the caveats associated with its implementation, these caveats do not appear in the Guidelines and thus may not be understood fully by users of the Guidelines. I discuss some of these caveats in the remainder of this section. In particular, measuring the "UPP index" raises important conceptual and practical issues, which may be difficult to overcome.[20] Moreover, even if one can properly measure the UPP index for each product involved in a merger, evaluating what those indexes imply for price changes raises caveats that are discussed in Farrell and Shaprio's article but could easily be missed by users of the Guidelines. For example, due to its single-product focus, UPP does not incorporate the possibility that efficiencies on one product may generate lower equilibrium prices for other products involved in the merger.

27. Second, the use of UPP as a merger screen is untested; to my knowledge, there is no empirical analysis that has been performed to validate its predictive value in assessing the competitive effects of mergers. I return to the need for more empirical work to evaluate UPP (and other merger review methods) in Section IV, below.

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19 Farrell and Shapiro (2010), Supra Note 4.

20 Throughout this Section, I use the term "UPP" to refer to the general methodology described in Farrell and Shapiro's paper and the term "UPP index" to refer to the specific mathematical formula computed as part of the methodology.

A. Measuring the UPP index raises important conceptual and practical measurement issues.

28. To use UPP requires that one compute one (seemingly simple) index to capture the upward pressure that a merger places on the prices of the products sold by the merging firms. In particular, consider the case in which two single product firms (Firm 1 and Firm 2) merge. The UPP index for the product sold by Firm 1 is defined as follows:[21]

$$UPP_1 = D_{12}*[P_2 - C_2] - E_1*C_1$$

where P_2 is the price of Firm 2's product ("Product 2"), C_j is the marginal cost of Product j, E_1 is the percentage change in Product 1's marginal cost due to the merger, and D_{12} is a diversion ratio equal to the fraction of the sales lost by Product 1 (due to an increase in P_1) that are captured by Product 2. UPP_2 is defined symmetrically.

29. Despite its simple form, proper measurement of the UPP index raises both theoretical and practical issues, which I describe in turn, below.

1. Theoretical issues with measuring the UPP index

30. As explained in Farrell and Shapiro's paper, the form of the UPP index derives from "the assumption of classic, static Bertrand price setting behavior between the two merging firms."[22] In the static Bertrand setting, under fairly general conditions, if the UPP indexes are positive for all products sold by Firm 1 and Firm 2 (which, in practice, may be substantially more than two products), then the merger will raise the prices of all products sold by each firm.

31. However, the fact that the specific form of the UPP index depends on the assumption of static, Bertrand price setting—in which firms simultaneously set prices taking one another's

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[21] The notation here borrows from Schmalansee (2009), "Should New Merger Guidelines Give UPP Market definition?" GCP: The Antitrust Chronicle.

[22] Farrell and Shapiro (2010), Supra Note 4, p.15.

prices as fixed—raises important theoretical issues for the measurement of the UPP index. In particular, recent research has demonstrated that although the concept of UPP is quite general, the details of how the diversion ratio should be computed depend on the specific oligopoly model that actually applies to the industry.[23] Because it is difficult to know precisely what oligopoly model best applies to an industry, it is difficult to know the correct diversion ratio to use in a more general form of the formula. To the extent that practical implementations rely on the standard diversion ratio (implied by the static Bertrand model), it is important for users to understand that if the industry does not actually conform to the static Bertrand model, the result that positive UPP indexes for all products necessarily imply price increases for all products does not hold.[24]

32. An example in which firms do not behave according to the static Bertrand model (where price competition is the only form of competition) may help to clarify this point. Suppose that the following conditions (similar to those discussed in Section II.C) hold: Firm 1 and Firm 2 compete to introduce new products; there are several firms competing in the industry; and a merger of Firm 1 and 2 will lower the costs of innovating. In such a case, the merger may be pro-competitive even though the UPP index may be high.

2. Practical issues with measuring the UPP index

33. In addition to these theoretical concerns, computing the UPP index may raise a number of practical measurement issues. Application of UPP requires reliable product-specific information

[23] See Glen Weyl (2010), "The First-Order Approach to Merger Analysis," Harvard University, available from the author on request.

[24] This critique applies not just to UPP but also more generally to merger simulation models that rely on a specific model of oligopoly such as static, Bertrand competition. This critique also highlights the need for empirical work on the accuracy of predictions based on UPP. The extent to which, in practice, deviations from Bertrand competition may bias results based on UPP (or merger simulation) cannot be known without substantial testing.

on diversion ratios between products, gross margins (price less marginal cost), and merger-related cost savings. Measurement of each of these elements may be complex and raise a variety of issues that may generate disagreement among experts. Each of these measurement issues can be more complicated than the issues that typically arise in market definition and market concentration analysis. In the remainder of this section, I describe each of these difficulties in turn.

a) Difficulties with measurement of diversion ratios

34. Although a diversion ratio is easy to describe, it would be misleading to think that the ease of description carries over to an ease of measurement. In fact, to calculate a diversion ratio one must implicitly estimate both the own-price and cross-price elasticity of demand. Although such calculations are fairly common, estimation of demand curves is neither easy nor likely to be something that will generate no controversy.

b) Difficulties with measurement of margins

35. Similarly, although it is easy to describe a margin as the difference between price and marginal cost, it would be misleading to think that the ease of description translates into an ease of measurement. In particular, the relevant margin involves marginal cost, not average variable cost. It is often difficult to calculate marginal cost because standard accounting data do not do so. If one uses average variable cost as an approximation to marginal cost, then one runs the risk of overestimating margins (and market power), with the consequence that the UPP index will overestimate the incentive to raise price post-merger, because average variable cost is often

below marginal cost.[25] Moreover, as discussed above (in Section II.C), high margins can be consistent with dynamic competition involving innovation and this type of competition is ignored by the UPP methodology.

c) Difficulties with measurement of cost savings

36. Finally, while cost savings associated with a merger may be easy to describe in general terms, they may be hard to quantify. Despite these difficulties, one cannot ignore efficiencies when computing the UPP index because, absent efficiencies, UPP implies that all mergers between firms selling differentiated products will lead to price increases. The Farrell and Shapiro article recognizes this point and, to deal with it, suggests using a "standard deduction" to account for "default efficiencies" so that using UPP would not lead to the investigation of all mergers, but rather would be limited to identifying mergers that create significant price increases.[26] However, the proposed Guidelines are silent on any sort of "standard deduction" or "default efficiency" gains, so it is unclear how the antitrust agencies will incorporate efficiencies in assessing which mergers to investigate, particularly in the common case in which efficiencies are difficult to quantify with precision.

B. Even if the UPP index can be measured properly, it may be of limited value in predicting a merger's likely price effects.

37. Even if static, Bertrand competition is a reasonable description of oligopoly behavior in a given industry and the practical issues with measuring the UPP index can be overcome, UPP may be of limited value in predicting a merger's likely effect on prices. Most basically, there are

[25] For example, in a long-run equilibrium in a perfectly competitive market with identical firms, price equals marginal cost, which equals average total cost, and thus exceeds average variable cost. See Dennis W. Carlton and Jeffrey M. Perloff (2005), *Modern Industrial Organization*, Fourth Edition, p. 63.

[26] Farrell and Shapiro (2010), Supra Note 4, p. 10.

many cases in which UPP does not even yield a clear prediction about the *sign* of a merger's likely effect on prices (i.e., positive or negative). And even in those cases where UPP does yield clear predictions about the direction of a merger's price effects, it is of limited value in predicting the relative *magnitudes* of the price effects.

1. In many cases, UPP yields no clear prediction about the sign of a merger's effect on prices.

38. Farrell and Shapiro show that (assuming static, Bertrand competition) if the UPP indexes for all relevant products are positive, then the merger will increase the price of all products. Note that this result does not provide guidance on the case in which the UPP indexes for some of the products involved in a merger are positive, while the UPP indexes for other products are negative. If the UPP indexes for various products have different signs then UPP yields an indeterminate result. In order to draw inferences about the effect of a proposed merger on price in such cases, one would have to take the additional step of using a merger simulation model to estimate the predicted price changes post-merger, a task that requires, among other things, specific assumptions about the demand curve for each product.

39. In their paper, Farrell and Shapiro propose one solution to this indeterminate case, suggesting that "a positive test result for any (significant) product should be enough to trigger further scrutiny."[27] It is not clear to me why that is the appropriate standard when UPP does not provide any clear predictions in this case.

40. As one example, Table 1 considers a hypothetical merger between two single-product firms (Firm 1 and Firm 2) in an industry consisting of four symmetric, single-product firms. The example is defined such that if Firm 1 and Firm 2 merge, then, in the absence of any marginal

[27] *Id*, p. 27.

cost efficiencies, the UPP index for each firm is equal to $6.25.[28] Table 1 presents three variations on this example, in which the marginal cost efficiency for product 1 due to the merger is $5, while the marginal cost efficiency for product 2 is $8 (Case A), $10 (Case B), or $15 (Case C). Hence, in each of these cases, the UPP index is positive for product 1 and negative for product 2, meaning that in each case the merger's price effects are indeterminate under the UPP methodology.

41. Table 1 shows the actual price effects of a merger under these conditions. As seen in the table, the results are quite different across the cases, with price increases for both Product 1 (1.76%) and Product 2 (0.26%) in Case A, but price declines for Product 2 in Cases B (-0.79%) and C (-3.42%). Given that the products have equal pre-merger quantities, a reasonable merger standard might be to approve mergers if and only if the average price change is negative, in which case the merger should be approved for Case C, but not Cases A and B. Regardless of how the price changes are weighed against one another, Table 1 demonstrates that UPP makes no clear prediction about the sign of a merger's effect on price when the UPP indexes are positive for some products and negative for others. A full merger simulation (or some other source of evidence) is required.

[28] The details of the example are as follows. The demand curve for Firm 1 takes the linear form: Q1=50-P1+0.25*P2+0.25*P3+0.25*P4, where Q1 is the quantity produced by Firm 1, and P1 through P4 are prices for Firms 1 through 4 respectively. The demand curves for other firms are symmetric to that of Firm 1. The marginal cost for each firm is $75. Competition is assumed to be static Bertrand. Hence, at the pre-merger equilibrium the following conditions hold: each product has a price of $100, each firm sells a quantity of 25 units, the own-price elasticity for each product is equal to -4, and the cross-price elasticity between all products is equal to 1.

Table 1: UPP Indexes and Overall Price Changes

Case	UPP Index (No Efficiencies)	Efficiencies		UPP Index (With Efficiencies)		Price Change	
	Firm 1&2	Firm 1	Firm 2	Firm 1	Firm 2	Firm 1	Firm 2
A	$6.25	$5	$8	$1.25	($1.75)	1.76%	0.26%
B	$6.25	$5	$10	$1.25	($3.75)	1.71%	-0.79%
C	$6.25	$5	$15	$1.25	($8.75)	1.57%	-3.42%

2. The UPP methodology is of limited value in predicting the magnitude of a merger's effect on prices.

42. Farrell and Shapiro recognize that UPP is of limited value in predicting the *magnitude* of a merger's effect on prices. However, this important limitation of UPP analysis may not be clear to courts or other users of the Guidelines, who may assume that higher UPP indexes necessarily mean larger expected price increases. This section illustrates two limitations of UPP in predicting the size of a merger's effects on prices: (i) due to differences in "pass-through rates" (the rate at which cost changes are passed through to prices), two different mergers may have the same UPP index yet produce significantly different effects on prices; and (ii) due to its single-product focus, UPP fails to consider the "feedback effects" that result from a merger's simultaneous effect on the prices of multiple products, including the effect of cost efficiencies for one product on prices of other products.

a) Effect of different pass-through rates

43. Because of differences in pass-through rates, two different mergers may have the same UPP indexes yet produce significantly different effects on prices. To understand why different pass-through rates matter for a merger's effect on prices, consider the index UPP_1, as defined above. One interpretation of this index is that, if one treats the price of Product 2 as fixed, then the effect of the merger on the price of Product 1 is identical to the effect of a cost increase of

size UPP_1 on Product 1.[29] While a useful insight, this interpretation also demonstrates that the merger's effect on the price of Product 1 depends on the rate at which such cost changes are passed through to price, which can vary widely across industries due to, for example, differences in the shape of demand curves in different industries.[30]

44. Table 2 presents merger simulation results to demonstrate the potential importance of differential pass-through rates in different industries (because of differences in the shape of the demand curve) on actual merger price effects. In particular, the table presents results from two cases, where Case A uses the same setup as used for Table 1 (including linear demand curves), while Case B replaces the linear demand curve with a "PCAIDS" demand curve,[31] which is calibrated to yield the same pre-merger equilibrium as in Case A.[32] For simplicity, there are assumed to be no marginal cost efficiencies from the merger, which, given the parameters used in the example, means that the UPP index for each merging firm is equal to $6.25 in both Case A and Case B.

45. Table 2 presents the results of this simulation, which demonstrate that, given different

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29 See Luke Froeb, Steven Tschantz, and Gregory J. Werden (2005), "Pass-through rates and the price effects of mergers," *International Journal of Industrial Organization*, 23, pp. 703-715, as well as Farrell and Shapiro, Supra Note 4..

30 The fact that different demand curves can lead to substantially different price predictions is well understood, having been previously documented in the context of merger simulations. See, for example, Philip Crooke, Luke Froeb, Steven Tschantz, and Gregory Werden (1999), "Effects of Assumed Demand Form on Simulated Postmerger Equilibria," *Review of Industrial Organization*, 15, pp. 205-217.

31 The PCAIDS demand system, a variant of the Almost Ideal Demand System (AIDS), was proposed for use in merger simulations by Roy J. Epstein and Daniel L. Rubinfeld (2001), "Merger Simulation: A Simplified Approach with New Applications," *Antitrust Law Journal*, 6, pp. 883-919.

32 For Case A, the linear demand curves for each firm are the same as specified for Table 1 (footnote 27). For Case B, the PCAIDS demand curve for Firm 1 is given by: S1=0.25-0.75*ln(P1)+0.25*ln(P2) +0.25*ln(P3)+0.25*ln(P4), with the demand curves for all other firms symmetric to that of Firm 1. For both Case A and Case B, the marginal cost for each firm is $75. Competition is again assumed to be static Bertrand. Hence, in the pre-merger equilibria for both Case A and Case B, the following conditions hold: each product has a price of $100, each firm sells a quantity of 25 units, the own-price elasticity for each product is equal to -4, and the cross-price elasticity between all products is equal to 1.

demand curves and thus different pass-through rates, two mergers with the same UPP indexes can generate substantially different price effects.[33] In particular, despite the fact that the UPP index is the same for both demand curves ($6.25), the price increase from the merger is substantially larger when the demand curve has the PCAIDS functional form (8.43%) than when it has the linear form (4.61%).[34]

Table 2: UPP and Predicted Price Change from Merger Simulation

Model	UPP Index for Firm 1	Price Increase for Firm 1 from Merger Simulation
Case A: Demand is Linear	$6.25	4.61%
Case B: Demand is PC AIDS	$6.25	8.43%

b) Feedback effects

46. In their paper, Farrell and Shapiro recognize that, while UPP looks at price effects for each product in isolation (holding the price of all other products at their pre-merger levels), actual price effects depend on the feedback between the price changes of various products. In particular, they discuss the effect of a marginal cost efficiency for one product on the prices of other products involved in the merger, noting that UPP "does not account for the fact that any cost reduction in Product 2 will raise Product 2's margin and thus raise the value of sales

[33] As discussed above, the UPP index for Product 1 is precisely the same as a cost change only when the prices of other products are held fixed, so that there are no feedback effects. However, to conform with standard merger simulation methods, the results in Table 2 allow the prices of all products to change. My conclusions are unaffected if I instead model a case in which only the price of Product 1 is allowed to change, with the prices of all other products fixed at their pre-merger levels, thus eliminating feedback effects.

[34] Note that this result implies that it is entirely possible for there to be situations in which the UPP index is higher for potential merger A than potential merger B even though the predicted price change (using merger simulation) is larger for potential merger B. This result does not require that the mergers under consideration occur in different industries with different demand curves. For example, even if one restricts attention to a specific type of demand curve (e.g., PCAIDS), different combinations of own- and cross-price elasticities can generate the same value for the UPP index but yield different predictions of price changes following a merger.

diverted to Product 2 when the price of Product 1 rises."[35] The implication they draw is that the feedback effects make the use of UPP conservative.[36] As I now show, this need not be the case.

47. There is an important effect of marginal cost efficiencies for Product 2 on the price of Product 2 that then has a feedback effect on the price of Product 1. In particular, to the extent that efficiencies from the merger lower the marginal cost of Product 2, this will tend to *reduce* the price of Product 2, which will in turn put *downward pressure* on the price of Product 1. This effect is completely ignored by UPP.

48. Table 3 presents simulation results demonstrating these feedback effects. Using the same basic setup as Case B from Table 2 (including PCAIDS demand curves), the table reports equilibrium price changes for Product 1 given different-sized cost efficiencies for Product 2.[37] It also reports "Modified UPP indexes," which are the same as the standard UPP indexes except that the lower, post-merger marginal cost is used for Product 2 rather than Product 2's pre-merger marginal cost.[38]

49. Two points are clear from the results in Table 3. First, higher efficiencies on Product 2 offset (at least partially) any positive effects from the merger on the price of Product 1. A 20 percent reduction in Product 2's marginal cost is sufficient to eliminate the Product 1 price increase, while a 25 percent reduction in Product 2's marginal cost leads to a decline of 0.51% in the price of Product 1. Second, the UPP index does not capture this effect. The standard UPP index (in which no efficiencies are applied to Product 2's cost) is $6.25 in all cases. The

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35 Farrell and Shapiro (2010), Supra Note 4, p. 12.

36 *Id*, pp. 13-14.

37 The only change from Case B of Table 2 is that I assume that, due to efficiencies from the merger, the marginal cost of Product 1 falls by 10 percent

38 Some researchers have suggested using this modification to UPP as a way to include the effect of cross-product efficiencies. See Schmalansee (2009), Supra Note 20, p. 2.

modified UPP index, which incorporates the lower marginal cost for Product 2 but not the effect of this lower marginal cost on the price of Product 2, actually yields the counterintuitive and misleading result that the UPP index grows larger as the cost of Product 2 falls, reaching $10.94 with a 25 percent efficiency on Product 2.

Table 3: UPP Index and Efficiency in Product 2

Firm 2 Marginal Cost Efficiency	Firm 1 "Modified UPP Index"	Firm 1 Price Change
0%	$6.25	1.54%
5%	$7.19	1.22%
10%	$8.13	0.86%
15%	$9.06	0.46%
20%	$10.00	0.00%
25%	$10.94	-0.51%

50. The results in Table 3 demonstrate that, in the presence of substantial efficiencies, UPP may substantially overpredict a merger's likely effect on prices. Heightening the importance of this point is the fact that such feedback effects are strongest when the products are close substitutes, which is precisely the situation in which careful merger review is most critical. This means that, while the use of UPP may provide one piece of useful information about a merger's likely price effects, the results need to be interpreted with substantial caution, particularly when important marginal cost efficiencies are present for many products.

IV. NEED FOR RETROSPECTIVE STUDY OF PRICE EFFECTS FROM MERGERS

51. While the Guidelines discuss several methods that may be used to predict the price effects of proposed mergers, they do not indicate which methods are (or are not) supported by empirical studies. For many of the methods discussed in the Guidelines, I am not aware of much (if any) empirical evidence validating the method's predictive power. As a result, empirical validation of these methods remains an important area of research and the Guidelines should

state clearly that research on the methods is ongoing and that new results may lead to modifications or clarifications to the Guidelines.

52. The few academic studies that have examined the merger-review methods employed by the agencies (and economists in general) have found them to provide inaccurate predictions of post-merger prices in at least some cases. For instance, Peters (2006) uses data on five airline mergers during the 1986-1987 period to generate predicted post-merger price changes using conventional merger simulation techniques and then to compare these predictions with the observed price changes.[39] He finds that, in some cases, the standard merger simulation methods do not provide an accurate forecast for post-merger price changes. Instead he finds that what he terms "supply-side effects"—which include the possibility that the model's main assumptions, such as static, Bertrand competition, are incorrect—can, in some cases, cause actual post-merger price realizations to differ substantially from predictions based on pre-merger simulations.[40]

53. In considering Peters' findings, note that UPP is effectively a simplified version of merger simulation. As such, Peters' findings tell a cautionary tale—more such studies should be conducted before one treats UPP, or any other potential merger review method, as a consistently reliable methodology to identify anticompetitive mergers. Because it is likely that courts will pay special attention to methods specifically mentioned in the Guidelines, I would prefer that the Guidelines not refer to particular methods (and exclude others), particularly when the reliability

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39 Peters (2006), Supra Note 5.

40 As part of his analysis, Peters also studies the simpler method of predicting the post-merger price based on historical relationships between prices and market concentration. Interestingly, he finds that, in many cases, this simpler method yields results that are fairly similar to more sophisticated merger simulation methods. (Peters (2006), Supra Note 5, p. 646.)

of the referenced methods, relative to other methods that might be employed, has not been tested.[41]

54. While quite useful, even Peters' study is only one example of the type of research required to assess the efficacy of the tools described in the proposed Guidelines for merger evaluation. In particular, Peters evaluates a few specific merger simulation techniques; in practice, the agencies may employ any of the numerous tools described in the Guidelines. What is needed—and what the antitrust agencies are uniquely well positioned to provide—is a systematic study of the accuracy of predictions made by various methods. For each merger the agencies review closely (*e.g.*, each merger for which there is a "second request"), they should record which analytical tools were employed and what predictions were reached with each tool. Then, for those mergers that are consummated, the antitrust agencies should undertake retrospective reviews of actual marketplace outcomes in comparison to those predictions. Only in that way—by combining a record of what tools were used and what conclusions were drawn from each tool with a study of observed outcomes from mergers—can systematic evidence be collected on the efficacy of various methods used in merger review.[42]

V. CONCLUSION

55. The proposed Horizontal Merger Guidelines do an excellent job of describing how the antitrust agencies analyze mergers. In my experience, when the agencies analyze mergers they are generally careful to recognize the limitations inherent in each of their methods of analysis.

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41 In my previous comments, I expressed a similar concern that courts or other antitrust practitioners might place undue emphasis on those methods that are referenced explicitly in the Guidelines (*Previous Carlton Comments*, ¶20).

42 For a more complete discussion of this line of research, see Carlton (2009), Supra Note 6. As described there, such retrospective studies would need to control for post-merger changes in industry conditions and for the "selection bias" induced by the fact that only consummated mergers can be studied, but there are standard econometric techniques for implementing such controls.

My primary concern with the proposed Guidelines is that the limitations in the methods may not come through clearly enough to avoid confusion among audiences that rely on the Guidelines, including the business community and the courts.

56. In these Comments, I discussed six specific limitations to the appropriate usage of the Guidelines. First, while the proposed Guidelines update the HHI cutoffs to reflect actual agency practice, to my knowledge there remains no empirical evidence establishing a relationship between these cutoffs and a merger's likely effects on prices. Second, any suggestion that the courts should abandon the use of market definition in analyzing merger cases is unwise. Third, while the Guidelines do mention the possibility of non-price competition, I am concerned that such competition (and the efficiencies that can help to stimulate it) remains underemphasized. Fourth, the distinction between unilateral and coordinated effects in the Guidelines remains artificial, as there are not actually different economic theories of oligopoly underlying these effects. A more natural distinction would be to stress the relative importance of static and dynamic elements of competition, recognizing that both may be important in any particular industry. Fifth, if the Guidelines' discussion of unilateral effects is to mention UPP, they should also note the limitations of the methodology, including the fact that it is not designed to predict the magnitude of a merger's effect on prices and can lead to particularly poor predictions when multiple, closely substitutable products experience efficiencies as part of a merger. Finally, there remains a dearth of empirical research to support the accuracy of some of the methods described in the Guidelines when used to predict the likely price effects of a merger. Bolstering the empirical support for the methods and potentially modifying the methods based on what is learned should be a high, ongoing priority of the antitrust agencies.