

# Paper Trail: Working Papers and Recent Scholarship

**Editor's Note:** Our editors tackle an array of papers in this edition of The Paper Trail. Bill Page notes four papers that offer related arguments about the proper scope of the U.S. offense of monopolization and the EC offense of abuse of dominance; and John Woodbury describes a paper that proposes a “simple and transparent” formula to replace the market share-based presumption of consumer harm in mergers of producers of differentiated products. Send suggestions for papers to review, and your comments, to: [page@law.ufl.edu](mailto:page@law.ufl.edu) or [jwoodbury@crai.com](mailto:jwoodbury@crai.com).

—WILLIAM H. PAGE AND JOHN R. WOODBURY

## Recent Papers

---

**David S. Evans & Keith N. Hylton, The Lawful Acquisition and Exercise of Monopoly Power and Its Implications for the Objectives of Antitrust**

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1275431](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1275431)

**Herbert J. Hovenkamp, Schumpeterian Competition and Antitrust**

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1275986](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1275986)

**Jonathan B. Baker, “Dynamic Competition” Does Not Excuse Monopolization**

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1285223](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1285223)

**Ariel Ezrachi & David Gilo, Are Excessive Prices Really Self-Correcting?**

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1237802](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1237802)

In this *Paper Trail* entry, I note four papers that offer related arguments about the proper scope of the U.S. offense of monopolization and the EC offense of abuse of dominance. The first, by David S. Evans and Keith Hylton, argues that antitrust analysis of dominant firm conduct should more explicitly take account of the special role of monopoly power as an incentive for innovation; the second and third papers, by Herbert Hovenkamp and Jonathan Baker, respectively, critique Evans and Hylton’s argument. The fourth paper, by Ariel Ezrachi and David Gilo, seeks to refute a different but related justification for the benign treatment of one form of dominant firm conduct—the claim that “excessive” prices are “self-correcting.”

Evans and Hylton argue that antitrust fosters innovation by actually favoring the acquisition of monopoly power in most circumstances. They observe that U.S. antitrust law has never condemned monopoly in itself, only certain anticompetitive “tactics” in the “game of competition.” U.S. antitrust law, for example, condemns practices, like cartels and mergers to monopoly, but allows individual firms to acquire monopoly power and to charge monopoly prices, even if doing

so reduces short-run consumer welfare. They read *Alcoa*<sup>1</sup> as holding that, in 1945, there was “nothing unlawful about obtaining monopolies by ‘superior skill, foresight and industry.’”<sup>2</sup> They also note the failure over the past century of various proposals for a no-fault monopolization standard or for a program of deconcentration. Evans and Hylton see in these and similar features of antitrust law a “revealed preference” for innovation and dynamic competition, and a recognition that monopoly power, or the prospect of acquiring it, is an important spur to investment in research and development.

Evans and Hylton argue that modern U.S. courts, in evaluating allegedly exclusionary conduct, weigh “the costs that consumers incur over time from the exercise of market power” against “the dynamic social benefits that the economy receives from allowing firms to receive monopoly profits as a reward for successful competition for markets.” This tradeoff, they suggest, is one reason for U.S. law’s tolerance of simple monopoly pricing. EC law nominally condemns excessive pricing, but this prohibition is so narrowly interpreted and rarely applied that, according to Evans and Hylton, “[a]s a practical matter . . . the European Community follows the United States in regulating the boundaries of the game of competition but giving firms wide latitude within those bounds.” The courts’ benign view of lawful monopoly power, according to Evans and Hylton, indicates that the apparent conflict between antitrust and intellectual property law is overdrawn, because both bodies of law allow firms to secure monopoly power “as a reward for expending effort on things that will ultimately benefit society.”

In the latter portions of the paper, Evans and Hylton argue that modern economic analysis is undermining the law’s conditional endorsement of monopoly power as an incentive for innovation. The authors suggest that the antitrust tradeoff between static and dynamic effects occurs in two stages: first, when a court (or Congress) identifies a category of practices as suspicious; and second, when a court determines whether a particular instance of the practice is monopolistic. They argue that courts sometimes err in the second stage by asking whether a practice harms the “competitive process,” a term they dismiss as meaningless. One source of confusion in the second-stage analysis, the authors suggest, is that modern industrial organization economics is unduly focused on static effects because of its “tractability bias” against complex dynamic models. To illustrate how dynamic models might affect antitrust analysis, Evans and Hylton adapt Oliver Williamson’s familiar welfare-tradeoff model to accommodate a case in which an alleged offender creates a new market by investment, but also engages in an exclusionary practice to protect its newfound monopoly power. If the exclusionary practice was necessary to induce the investment that led to the innovation, they argue, the optimal penalty should take account of the “residual consumer surplus” the alleged offender creates, that is, what is left of consumer surplus after the monopolistic output restriction in the newly created market.<sup>3</sup>

---

<sup>1</sup> *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

<sup>2</sup> This reading of the case is questionable. Judge Hand ultimately condemned “honestly industrial” business tactics, like “always anticipat[ing] increases in the demand for ingot and be[ing] prepared to supply them” or “doubling and redoubling its capacity before others entered the field.” *Id.* at 431. Evidently, for Judge Hand, superior skill, foresight, and industry did not encompass active competition. It was only in the 1970s that the courts began explicitly to recognize that monopolists need not pull their competitive punches. *See, e.g., Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 281 (2d Cir. 1979) (“Because . . . a monopolist is permitted, and indeed encouraged, by § 2 to compete aggressively on the merits, any success that it may achieve through ‘the process of invention and innovation’ is clearly tolerated by the antitrust laws.”) (citation omitted).

<sup>3</sup> Evans and Hylton also suggest that more complete dynamic analysis of the coordinated effects of an acquisition of a maverick firm would take account of the effect of such a merger on incentives for entry.

Evans and Hylton suggest that the bias in academic economics toward static models makes it problematic to turn over antitrust policy to economists. The solution, they propose, is to change “the reward systems in academic economics”:

The economic profession will need to provide a premium to researchers who work on dynamic competition and one that either compensates them for the especially hard mathematical work necessary for robust dynamic models or provides bonus points that skew incentives towards less mathematical dynamic analysis and away from highly technical, clever, and irrelevant static analysis.

In his comment, Herbert Hovenkamp agrees with Evans and Hylton that dynamic effects, especially those that occur through innovation, may have important competitive consequences. He argues, however, that this observation has only limited implications for the decision of antitrust cases, for three reasons. First, he disputes the assumption that modern intellectual property law promotes innovation optimally; consequently, antitrust law should not conform to IP policies. Second, he argues that, in most antitrust contexts, “innovation effects are difficult to assess or even foresee.” Monopoly profits might be invested to promote innovation, but that possibility has few general implications for antitrust policy. If, in a particular case, a restraint actually promotes innovation, the defendant should be able to offer evidence of that in the context of a rule of reason analysis.

Finally, Hovenkamp emphasizes that monopolistic practices may inhibit innovation as often as they promote it. Restraints on innovation inhibit the very dynamic competition that innovation produces. He illustrates this point by adapting Evans and Hylton’s hypothetical of a dominant firm that creates an entirely new product but also engages in an exclusionary practice to protect its monopoly power in the new market. Hovenkamp argues that it is more likely that a smaller rival would be the innovator and that the dominant firm would use the exclusionary practice against it. He cites, among other examples, the holding that Microsoft unlawfully pressured Intel to drop its project to develop a high-performance Java Virtual Machine that might have threatened Microsoft’s monopoly of PC operating systems.<sup>4</sup>

Hovenkamp recognizes that, in some cases, the same practice that allegedly hinders innovation by the plaintiff may actually enhance innovation by the defendant. He gives the example of joint ventures and standard setting, but he might also have cited *Microsoft* again. He concedes that, particularly in this kind of case, it is difficult to estimate *ex ante* the social gains and losses from the effects of such practices on innovation. He argues, nevertheless, that antitrust courts can, at a minimum, adjust their degree of scrutiny depending upon the extent to which the alleged practice facially appears to promote innovation or to suppress it.

Like Hovenkamp, Jonathan Baker criticizes Evans and Hylton paper for focusing too narrowly on the goal of fostering innovation by *limiting* antitrust enforcement. First, like Ariel Ezrachi and David Gilo, *infra*, Baker notes that the simple exploitation of monopoly power is lawful for a variety of reasons besides the incentives that monopoly profits might provide for innovation. For example, condemning simple monopoly would entail the loss of economies of scale and would force courts to regulate prices. Second, Baker argues that recognizing the role of monopoly in spurring innovation has little significance for antitrust policy, because monopolization enforcement does not necessarily inhibit innovation very much and may actually enhance it. He suggests, for

---

<sup>4</sup> *United States v. Microsoft Corp.*, 253 F.3d 34, 77–78 (D.C. Cir. 2001). Hovenkamp also discusses *Allied Tube & Conduit Corp. v. Indian Head, Inc.*, 486 U.S. 492, 496–97 (1988), which involved a boycott by steel conduit manufacturers aimed at excluding conduit made from PVC.

example, that “the available evidence” suggests that greater competition increases the incentive to innovate.

Moreover, like Hovenkamp, Baker emphasizes that monopolization enforcement may protect smaller firms’ incentives to innovate by preventing “cheap exclusion,” that is, “exclusionary practices by a dominant firm that are inexpensive for the dominant firm to implement and have no efficiency justification.” These practices may increase the dominant firm’s profit, but are unlikely to increase incentives for the dominant firm to innovate. Moreover, even if monopolization enforcement reduces a dominant firm’s monopoly profits, it may actually increase overall spending on research and development by increasing the incentives of rivals of the dominant firm to innovate. These effects are most likely to be welfare-enhancing in winner-take-all markets, where the dominant firms will have ample incentive to innovate simply to protect their dominant position.

Ezrachi and Gilo’s paper challenges one of the asserted justifications for antitrust law’s leniency toward monopoly pricing, the most basic form of monopolistic exploitation. They observe that U.S. and EC law generally decline to challenge “excessive” pricing on the grounds that doing so would be counterproductive, impractical, and unnecessary: it would be counterproductive because it would inhibit dominant firms’ incentives to innovate (as Evans and Hylton argue); it would be impractical because courts have no good way to establish a reasonable price; and it would be unnecessary, because high prices attract entry and thus are “self-correcting.” The authors seek to refute the last justification and thus refocus attention on the other two.

Ezrachi and Gilo’s argument that excessive prices do not attract entry turns out to be very involved and purely theoretical. The gist of the argument is that pre-entry prices do not attract entry; only expected post-entry prices do. If an incumbent is more efficient than the prospective entrant, it can always reduce prices to marginal cost and deprive the entrant of any reward from entry. Consequently, according to Ezrachi and Gilo, the potential entrant will only enter if it believes the incumbent is less efficient. The authors thus reason that a more efficient incumbent’s strategy in response to entry will be to reduce prices to marginal cost and drive out the entrants. Only when entry is “insignificant,” they suggest, will the incumbent make room for the entrants and to set the short-run profit-maximizing price for a dominant firm:

Once the incumbent detects the first steps of entry, it is expected to react immediately, and the resulting price war is expected to bring prices down to competitive levels very quickly. The entrant, for its part, expects such competitive pricing to prevail almost immediately upon entry, and it contemplates whether to expend the costs of entry into the market given these competitive and modest post-entry profits. Another possibility is that the entrant wishes to remain a fringe competitor, with a very small market share. Such fringe entry would usually not stimulate a price war and would therefore be attracted by excessive prices. But the entr[y] of insignificant fringe firms, which cannot restrain the incumbent’s excessive price in the long run, is not the sort of entry that would alleviate concerns from excessive prices.

The record in some antitrust cases is consistent with the prediction that a dominant incumbent would respond aggressively to significant entry.<sup>5</sup> In other cases, however, incumbents have found it unprofitable to do so and have chosen to maintain the short-run profit-maximizing umbrella

---

<sup>5</sup> See, e.g., *United States v. AMR Corp.*, 335 F.3d 1109, 1112 (10th Cir. 2003) (reporting that American Airlines responded to entry on profitable routes at its Dallas hub by reducing prices, adding capacity, and offering more seats at lower prices; after driving out the entrants, American raised prices to prior levels).

price.<sup>6</sup> So it is unclear how generally Ezrachi and Gilo's account of the relevant incentives reflects reality.

In any event, if a potential entrant should rationally expect an efficient incumbent to respond aggressively to entry, it follows that excessive pre-entry prices will not necessarily attract entry. Excessive prices, Ezrachi and Gilo argue, are not very good signals of whether the incumbent is more or less efficient than the prospective entrant. So only in narrow circumstances would potential entrants glean enough information about the relative efficiency of the incumbent simply from the fact that it is charging high prices. Even if there is some signaling value of excessive prices, that value is not necessarily greater than the signaling value of regulated non-excessive prices. An inefficient incumbent that is required to charge a lower price may find it difficult to set prices that mislead prospective entrants into believing that it is efficient.

Ezrachi and Gilo observe that, if they are correct that excessive prices do not attract entry, the question of whether to prohibit excessive prices hinges on the remaining two justifications for forbearance: the impracticality of determining a reasonable price and the fear of deterring innovation. The authors do not consider these justifications in any detail, but suggest tentatively that they may not hold in all circumstances. For example, the authors suggest that limiting excessive prices may not deter innovation "when the level of investment required in the particular industry in question is relatively low, when the dominant firm has presumably recouped its investments in the past . . . or when the competition authority has found a way to take account of the investment consideration when assessing what an excessive price is."

—WHP

**Joseph Farrell and Carl Shapiro, Antitrust Evaluation of Horizontal Mergers:  
An Economic Alternative to Market Definition (Nov. 28, 2008)**

<http://faculty.haas.berkeley.edu/shapiro/>

For some time, economists (and lawyers) have struggled with the seeming inconsistency of defining markets and focusing on market share when evaluating mergers in differentiated product industries. In this paper, two highly respected economists, Joseph Farrell and Carl Shapiro (both former chief economists for the Antitrust Division), put this issue front and center on the antitrust stage.<sup>7</sup> Their paper proposes a "simple and transparent" formula to replace the market share-based presumption of consumer harm in mergers of producers of differentiated products.

---

<sup>6</sup> See, e.g., *United States v. American Can Co.*, 230 F. 859, 879–80 (D. Md. 1916), which reports that, after the formation of the American Can trust through a series of acquisitions:

prices were put up to a point which made it apparently profitable for outsiders to start making cans with any antiquated or crude machinery they could find in old lumber rooms or which they could have made for them in a hurry, or even to resume can making by hand. . . . At first, the defendant seems to have thought it would try to buy them out, and it bought a few of them . . . ; but . . . such policy was impossible. In the first place, its money was gone. . . . There were too many new shops to buy them all, and, as it has turned out, it was easy enough to start some more. The real remedy would have been to reduce the price of cans. If defendant had not been under the necessity of realizing large and quick profits, doubtless it would have done so. Its mere cost of operation, excluding any allowance for capital investment, must have been below that of many of its poorly equipped competitors, who then rushed into the field. But, if prices had been reduced, the idea that there was a speedy fortune to be made by defendant's stockholders would have been too speedily dispelled. Other devices were resorted to. The attempt to keep up the price of cans was persisted in. In an effort to do so, the defendant itself sent brokers into the market and bought some millions of cans from its rivals. Some of these were very badly made, as was to be expected from new shops, equipped with wretched machinery and hastily rushed into business. These cans were stored for a while, and ultimately such of them as were salable at all were sold for what they would bring. Possibly these purchases did keep up the price longer than would otherwise have been the case.

<sup>7</sup> Both authors have relationships with my employer, CRA International.

If the products in a particular industry segment are differentiated, then they are not perfect or even equally close substitutes for each other. If the products of the merging firms are much closer substitutes than others, then standard unilateral competitive effects analysis—for example, some version of the simulations based on Bertrand models of competition—could suggest a substantial risk of a post-merger price increase. Absent offsetting efficiencies, repositioning, entry, dynamic considerations, etc., economists would be inclined to view this as the end of the analysis.

If that merger is to be challenged in court, then the antitrust agency's economists and lawyers (or maybe just the agency's lawyers) are likely (or likely feel compelled) to cast this in more familiar litigation terms—that the merger will lead to a large combined share or high HHI plus a large delta in a defined antitrust market. That is, the agency will rely on what Farrell and Shapiro call the “structural presumption” that higher market shares lead to higher prices.<sup>8</sup> This recasting of the competitive effects story is not surprising. As Farrell and Shapiro note (p. 5), questions of market definition “are typically central in court while economists wonder how the outcome of a merger can turn on an inevitably somewhat artificial and arbitrary line drawing exercise.”

Suppose that the agency staff concluded that the differentiated products of the merging parties were in fact the closest substitutes for each other and so would predict a unilateral price increase if the merger were cleared. In order to fit the square peg of product differentiation into the round hole of market definition, one could define the market as consisting of primarily the products of the merging parties on the grounds that they are the closest substitutes (or virtually so) for each other. And that market definition may well be consistent with the Guidelines' “hypothetical monopolist” paradigm. In that market, the combined firm would have a 100 percent share (or virtually so), leading to the conclusion that the merger would likely lead to higher prices.

As Farrell and Shapiro observe, even if that conclusion were correct, it may well be that the agency would lose a court challenge to the merger. Suppose that there were numerous other products that were more or less close substitutes for those of the merging parties (even if not nearly as close as the products of the merging parties were to each other). The merger's defenders could argue the agency has ignored the pricing constraints imposed by these alternatives. Once one considers the array of “reasonably interchangeable” alternatives, the merging parties would argue that the market would have to be broadened to include those alternatives. And in that more broadly defined market, the combined share of the merged firm may be relatively small, thus rebutting any “structural presumption.”

As a matter of economics, both approaches to evaluating a differentiated products merger are wanting. The merger's defenders are correct that the narrow market approach does in fact ignore the price competition provided by excluded products. But the broad market approach effectively and incorrectly treats all products in the defined market as equally substitutable.

Notwithstanding those flaws, Farrell and Shapiro observe that the rebuttable structural presumption is one that continues to dominate antitrust litigation. Aside from legal precedent, the attractiveness of the structural presumption lies in its simplicity and transparency. It requires “only” a market definition, a simple share calculation, and the assumption of a simple and intuitive causal relationship between market share and price.

---

<sup>8</sup> Of course, you would expect the agency to also argue that there are no offsetting factors that would rebut that presumption since market share is no longer the overriding consideration in antitrust it once was.

Against that background, Farrell and Shapiro set out to develop an alternative rebuttable presumption that is also simple and transparent but more accurately reflects the underlying economics in differentiated-products mergers.<sup>9</sup> That presumption can be used by the agencies when they challenge a merger and can also guide them in their HSR review of whether such mergers raise unilateral effects concerns.<sup>10</sup> The Farrell-Shapiro alternative to the structural presumption would not rely on market definition but rather on the underlying profit-maximizing principles that can drive post-merger prices upward (or not) in a differentiated product industry.

Farrell and Shapiro develop a measure of the post-merger upward pricing pressure (UPP) that is similar to one developed by O'Brien and Salop.<sup>11</sup> Farrell and Shapiro then compare the UPP to an assumed level of merger-specific cost savings that one might generally expect to be associated with mergers, what they (and others) call a "standard deduction" for efficiencies.

That comparison depends only on the first principles of profit maximization and not in any way on the particular shape of the demand curve and so bears an acknowledged similarity to a paper by Werden.<sup>12</sup> In the context of a differentiated products industry, Werden demonstrates how to determine the level of merger-specific efficiencies that will just offset any post-merger price increase—the "critical" level of cost-savings. Werden's analysis depends only on the first principles of profit maximization and is independent of any particular shape of the demand curve.

As will be apparent from the discussion below, one can use the Farrell-Shapiro metric to calculate that level of efficiencies that just offsets the upward pricing pressure, an approach very similar to Werden's. But perhaps the Werden approach would not provide the courts with a simple and transparent rebuttable presumption that the merger would harm consumers. It only provides a critical efficiency level that the expected efficiencies associated with the particular merger must equal or exceed. That level of expected efficiencies may be difficult to quantify and may be anything but transparent.<sup>13</sup> (But obviously, a rebuttal to the rebuttable Farrell-Shapiro presumption is that the expected efficiencies are greater than the standard deduction.)

The underlying principles of the paper's proposal are easy to illustrate. Farrell and Shapiro posit two firms, A and B, with A producing good 1 and B producing good 2. When A is considering the

---

<sup>9</sup> Just to be clear, what follows applies only to unilateral effects in differentiated product industries where (as noted below) the Bertrand model applies. Thus, it does not apply to coordinated effects or to unilateral effects driven by models other than Bertrand (e.g., Cournot). In short, this paper does not write the HHI out of the Guidelines or legal precedent, nor does it purport to do so.

<sup>10</sup> I am somewhat confused about how this alternative "presumption" would be used. Sometimes the paper can be read as suggesting that the agencies can use the Farrell-Shapiro approach as a first screen (like the 1000 HHI safe harbor in the Guidelines) in the internal review of mergers. For example, the paper notes (at pp. 11–12) that its proposed metric would "yield a tractable screen, much as the concentration-based approach sets aside for later consideration many possible reasons why concentration may not accurately gauge competitive effects." In that case, the approach wouldn't be used in and of itself to challenge mergers any more than any HHI above 1000 is used by the agencies as a presumption of competitive harm. But regardless of how the authors intend the staff to use the Farrell-Shapiro metric, the bulk of the paper clearly sees this approach as something much more than a screen—that it would replace the structural presumption in agency-challenged mergers.

<sup>11</sup> Daniel O'Brien & Steven Salop, *Competitive Effects of Partial Ownership: Financial Interest and Control*, 67 ANTITRUST L.J. 559 (2000).

<sup>12</sup> Gregory Werden, *A Robust Test for Consumer Welfare Enhancing Mergers Among Sellers of Differentiated Products*, 44 J. INDUS. ECON. 409 (1996).

<sup>13</sup> However, as the paper itself notes (at n.32), one could compare Werden's critical cost savings associated with any particular merger to Farrell and Shapiro's "standard deduction" for efficiencies. If the critical cost savings were greater than the standard deduction, the presumption would be that prices would increase post-merger. That presumption could be rebutted by the merging parties by showing that the actual expected efficiencies were larger than the critical cost savings or that other factors (e.g., entry, repositioning) would result in a lower critical cost savings. Farrell and Shapiro don't indicate why this would or would not be a reasonable alternative to their approach.

profit-maximizing degree of price aggressiveness for good 1, it will not account for the losses experienced by B when B loses sales to A. After all, A and B are independent firms.

If  $P_2$  is the price of good 2 and  $C_2$  is its marginal cost,  $P_2 - C_2$  is the absolute gross margin earned by B on every sale of good 2. Suppose that for every additional unit of good 1 sold by A when A lowers the price of good 1, B loses “d” units of good 2 sales. Farrell and Shapiro call “d” the diversion ratio from good 1 to good 2.<sup>14</sup> Then for each additional unit of good 1 sold at the lower prices, B’s lost profit is d times the absolute margin earned on the sale of good 2, or  $d*(P_2 - C_2)$ .

Of course, if A and B are independent firms, A doesn’t consider this loss in its pricing of product 1. Suppose that A and B merge. Now when A prices good 1 aggressively, some of A’s additional sales come from the “cannibalization” of B’s sales of good 2 by the increased sales of good 1. The new owner of both A and B will want the manager of A to account for this cannibalization effect in its profit calculus.

The sale of an additional unit of good 1 now generates an opportunity cost to the owner of the merged firm equal to the reduction in B’s profits, i.e.,  $d*(P_2 - C_2)$ . For A’s managers to internalize the cannibalization effect (i.e., to create incentives for A’s managers to account for this opportunity cost when setting the profit-maximizing price of good 1), the owner of the merged firm can levy on A’s managers a per-unit “tax,”  $t_1$ , on the production of good 1 equal to  $d*(P_2 - C_2)$ . This tax increases the marginal cost of producing good 1 by the amount of the lost profits on good 2 from the sale of an additional unit of good 1. As a result of the higher marginal cost, the corresponding profit-maximizing price charged by A’s manager will also be higher.<sup>15</sup> An analogous tax,  $t_2$ , would be levied on the production of good 2 to enable the managers of Firm B to internalize the cannibalization of good 1 sales when another unit of good 2 is sold.

Thus, in the case of good 1, the measure of upward pricing pressure is

$$UPP_1 = t_1 = d*(P_2 - C_2).$$

Using pre-merger data, one can interpret UPP as an indicator of whether price will rise post-merger. The paper (p.9) refers to these indicators as a quantitative expression of how “the loss of competition between Firms A and B will cause upward pricing pressure.”

UPP does not measure by how much post-merger prices might rise and so differs from the post-merger price predictions that are generated by simulation models. As with any other marginal cost increase, the predicted price increase would depend on the extent to which marginal cost increases (i.e., the cannibalization costs) are passed through to consumers via higher prices. And that, in turn, depends on assumptions about the shape of firm demand curves, among other things. Like Werden’s measure of the critical efficiency gain, the UPP is not dependent on the shape of the demand curve.

As long as goods 1 and 2 are substitutes and have positive margins, any merger between two firms producing differentiated products will result in positive measures of UPP because the diver-

<sup>14</sup> This counter-intuitive description of d—which in this example would appear to be diversion from good 2 to good 1—is partly a result of the way we normally think about diversion. That is, if A raises the price of good 1 by some small amount, we usually think of diversion as the fraction of good 1’s losses from its price increase that will be “captured” by good 2. If A now lowers its price to its previous level, then the fraction of the gains to A coming from B will be the same as the fraction of its losses to B when A increased price.

<sup>15</sup> The paper notes that this need not always be the case, but it also notes that in “a very broad class of oligopoly models, including all reasonable Bertrand models, an increase in some firms’ marginal costs, with no shift in those of other firms, raises equilibrium prices.” (p.9) (note omitted).

sion ratios will always be positive. That's not very helpful as a presumption of merger harm because all differentiated-product mergers with positive margins and some degree of substitutability will lead to a positive UPP. Any merger policy premised on a positive UPP would result in a virtual per se ban on such mergers.

That is why Farrell and Shapiro introduce the "standard deduction" for efficiencies, which I mentioned earlier. The "standard deduction" represents a presumed minimum efficiency gain from any merger. Suppose that the merger-specific standard-deduction efficiencies are expected to reduce the costs of producing good 1 by  $E$  percent. Then the enforcement question is whether the net UPP (i.e., the UPP net of efficiencies) is positive.

More specifically, the test is whether (for good 1)

$$(1) d^*(P_2 - C_2) > E * C_1$$

where  $C_1$  is the marginal/variable cost of producing good 1.<sup>16</sup> If this inequality holds for both goods 1 and 2, price will tend to increase at least in the standard Bertrand price-setting models typically used for differentiated product analysis. The merger-induced opportunity cost increase (which will tend to raise prices) on the left-hand side of (1) will be larger than the cost-reducing effect generated by the efficiency standard deduction on the right-hand side of (1).<sup>17</sup> If the inequality is satisfied for both goods, the rebuttable presumption would be that prices would rise substantially.<sup>18</sup> Farrell and Shapiro note that "our test has power because it captures the much more general idea that the loss of competition between the merging firms is significant enough to outweigh the efficiencies presumed to result from the merger." (p.12.)

Farrell and Shapiro note that the opportunity cost or cannibalization tax,  $d^*(P_2 - C_2)$ , itself depends on the post-merger prices that are set, not on the pre-merger prices—that is, higher post-merger prices for good 2 will mean that the tax on good 1 should be higher than that suggested by a tax based on the pre-merger good 2 price. The merger raises the margin on good 2 and so raises the opportunity cost of selling another unit of good 1.

To account for these feedback effects, the paper follows Werden to show that the price of good 1 will rise if the following somewhat more complicated expression holds:

$$(2) d_{12}(P_2 - C_2) + d_{12}d_{21}(P_1 - C_1) > E C_1(1 - d_{12}d_{21})$$

where  $d_{12}$  is the diversion from good 1 to good 2 and  $d_{21}$  is the diversion from good 2 to good 1. There is an analogous condition for the price of good 2 to rise. The paper seems to recommend the use of (2) within the agencies during the merger review process, but the use of (1) in court because it is more transparent. And inequality (1) remains the focus of the paper.

As noted above, the net UPP does not measure price increases, only post-merger cost changes. Translating the net UPP into a predicted price increase (or decrease) requires information on the extent to which cost increases are passed-through to consumers via higher prices. But

<sup>16</sup> For reasons that are completely unclear to me, the paper transforms expressions such as that in (1) into a ratio form that lacks the straightforward intuitive appeal of inequality (1).

<sup>17</sup> It may be worth noting that the expression could be modified to account for the standard deduction for the post-merger efficiencies in the production of good 2. If so, the expression would be  $d^*(P_2 - (1 - E)C_2) > E * C_1$ , assuming the same standard efficiency deduction is ascribed to both good 1 and good 2. (My thanks to my colleague Serge Moresi for pointing this out.)

<sup>18</sup> It is possible that the net UPP for good 1 might be positive (i.e., that the cannibalization tax is not offset by the cost savings for good 1) while that for good 2 might be negative. While the paper indicates that the mixed test results should be "enough to establish the rebuttable presumption," it also considers other alternatives. (pp. 23–24.)

that in turn requires an assumption of a specific functional form for (or curvature of) demand (e.g., linear, logit, AIDS, constant elasticity) and an assumption about how firms interact when costs and prices change. “Because the magnitude of the price effects varies so much with these somewhat arcane assumptions, for reasons that are opaque to non-economists, the [price-prediction] methodology is hard to make robust and transparent.” (p. 19.)

As a result, the authors prefer their simpler and more straightforward approach. “[It] is generally much easier and more robust to predict the *sign* of the price effects of a merger, as our test aims to do, than to predict their *magnitude*.” (p. 17.) That is, determining whether, after accounting for the standard efficiency deduction, the post-merger price will rise by a substantial amount or a trivial amount requires more structure (assumptions) about the shape of the demand curve in particular than is required by the Farrell-Shapiro approach. If the cannibalization tax is not offset by the standard deduction for efficiencies, the Farrell-Shapiro approach will indicate that post-merger prices will likely increase. And in the view of the authors, that should be sufficient to establish the necessary presumption that the merger will harm consumers.

Nonetheless, Farrell and Shapiro then go on to modify the test to account for the possibility that the agencies and courts might prefer a price increase threshold above which mergers are presumed to be harmful to consumers. If  $G$  is the pre-specified price-increase threshold and  $R$  is the rate of the pass-through of cost increases of good 1 to prices, the test in expression (1) can be modified to answer the question of whether the opportunity cost-driven cost increase net of efficiencies for good 1, when translated into higher prices, is greater than some pre-determined price increase for good 1.

$$(3) R [d^*(P_2 - C_2) - E^*C_1] > G^*P_1$$

where  $R$  is the fraction of any cost increase for good 1 (net of efficiencies) that is passed on to consumers via higher prices and  $G$  is the “tolerance” level for price increase (e.g., 5 percent). If this is the test that were to be implemented, Farrell and Shapiro suggest setting  $R = 0.5$ , the pass-through rate assuming linear demand. (The paper does not seem to suggest a level for  $G$ , although it offers an example using 5 percent.)

For any given  $E$ , inequality (3) is less demanding than (1). If the bracketed expression on the left-hand side of (3), i.e.,  $[d^*(P_2 - C_2) - E^*C_1]$ , is positive, Farrell and Shapiro would conclude that that alone means the agencies have satisfied the rebuttable presumption burden—the UPP is greater than the standard-deduction efficiencies (i.e., inequality (1) holds). But the deal could still fail to satisfy the rebuttable presumption in (3) if the resulting price increase is less than  $G$ . Thus, (3) would be more permissive towards mergers.<sup>19</sup>

Expressions (1) through (3) are the core of the paper’s proposed new rebuttable presumption: if the inequalities in those expressions hold, there is a rebuttable presumption that the merger will harm consumers. But the paper clearly prefers the demand-free expressions in (1) and (2).

Farrell and Shapiro then address measurement issues and caveats. The paper notes the general availability of prices and the more limited availability of marginal cost measures. But the paper

---

<sup>19</sup> Farrell and Shapiro offer this modification to account for a view that the incidence of false positives might be more significant or costly than false negatives. Alternatively, mergers may have benefits beyond the merger itself (such as a “lively” corporate control market). (pp. 20–21.) But another reason for being more permissive is that the presumption doesn’t account for either easy entry or rapid repositioning that could offset relatively modest price increases. Easy entry or rapid repositioning in response to a post-merger price increase would reduce diversion between goods 1 and 2 and so reduce the size of the cannibalization tax. Even within expressions (1) and (2) which avoid price predictions, these possibilities could be accounted for by reducing “ $d$ ” by some “standard deduction”-like percentage.

notes that margins in differentiated product good industries tend to be high and so the test may not be “especially sensitive to the measurement of marginal costs.”<sup>20</sup>

Diversion ratios can be estimated using “econometric methods,” inferred from customer switching studies or from consumer surveys. The paper doesn’t specify how the surveys should be designed or what “econometric methods” might be used. With respect to the latter, diversion ratios are frequently inferred from own-price and cross-price elasticities generated by an econometrically-estimated demand model. And that demand estimation relies on specifying the shape of the demand curve, making expressions (1) and (2) indirectly dependent on that shape.

Another approach suggested by the paper is to infer diversion ratios by calculating the shares of the collection of products that “are about equally close substitutes” for the products of the merging parties and then using proportional diversion for the estimate of  $d$  in the net UPP test. The paper is quick to note that identifying this collection of close substitutes does not have to satisfy any market definition test. However, the paper offers no guidance in how to identify the collection of “about equally close substitutes.”

But even if the paper had an algorithm to identify the set of “about equally close substitutes,” the risk is that once again, the analysis is pushed into the same kind of line-drawing exercise as is true with current market definition. Indeed, if there are  $n$  products considered to be “about equally close substitutes,” then it’s not hard to infer from the discussion in the paper that one way of choosing those  $n$  products is to choose those whose shares are about equal in some product segment under consideration. Then the share of each in the limited collection of “about equally close substitutes” would be very close to  $1/n$ . So inevitably and in a seemingly arbitrary way, some goods (or services) that are almost “about equally close substitutes” will be left out of this direct analysis. This approach seems unnecessarily restrictive, could itself lead to false positives, and so is subject to the same line-drawing criticism that the authors (and many if not most economists) have leveled at the use of market definition when products are differentiated.

There is also the critical choice of what the standard deduction for efficiencies ( $E$ ) should be. The paper uses an illustrative 10 percent, although it suggests as a start  $E$  could be set “based on evidence of the efficiencies that commonly result from horizontal mergers.” (p.10). Michael Salinger, former Director of the FTC’s Bureau of Economics, has suggested that the standard deduction should be 1–3 percent based on post-merger productivity studies.<sup>21</sup> That level of the standard-deduction efficiencies can result in (1) or (2) being satisfied for almost any deal involving two merely somewhat substitutable goods.<sup>22</sup>

In addition, the paper regards this approach as embodied in inequalities (1) and (2) as superior to the use of simulations to predict post-merger price increases because it does not require any assumptions about demand shapes. As discussed, the shape of the firm’s assumed demand

---

<sup>20</sup> The authors also believe that “firms keep track of their cost functions . . . to know how far they can profitably cut prices.” (p. 16.) That would be incredibly helpful if true, but it’s certainly news to me.

<sup>21</sup> Michael Salinger, Four Questions About Horizontal Merger Enforcement, Presentation to ABA Section of Antitrust Law Economics Committee 3 (Sept. 14, 2005), available at <http://www.ftc.gov/speeches/salinger/050914ababrownbag.pdf>.

<sup>22</sup> For example, using (1), suppose that the diversion from A’s good 1 to B’s good 2 is a modest 10%, the good 1 price is 4, and the marginal cost is 3. The last two imply a relatively low pre-merger margin of 25%. If  $E = 10\%$ , then inequality in (1) does not hold and so there is no presumption that this deal would adversely affect consumers (the left-hand cannibalization-tax side of the inequality is 0.1 and the right-hand efficiency side is 0.3.) If  $E = 3\%$ , then inequality (1) is satisfied and under this approach, there is a presumption that the deal will harm consumers (the right-hand side of the inequality now falls to 0.09).

curve is a key to determining the pass-through rate and so the predicted price effects of the merger. And across the usual functional forms for demand, predicted price changes can vary widely.<sup>23</sup>

It's not clear whether the authors are arguing that given the limitations of simulations, that all simulations should be off the table or whether they should be explored only if the agencies have established that inequalities (1) and/or (2) hold. While focusing on the sign rather than the magnitude of (1) and (2) means the analysis is robust to the shape of demand, it certainly isn't true that nothing is lost in translation. Predicted price changes can provide agency staff and the courts with at least some preliminary notion of how solid the evidence of efficiencies, entry, repositioning, and so on, must be if the merger is to be cleared. A large predicted price increase might suggest that such evidence must be quite strong and persuasive.<sup>24</sup>

In addition, simulation models can be flexible enough to better tailor the model to the facts of the industry, such as accounting for capacity constraints or non-price methods of competition. Moreover, in terms of a remedy, simulation models can provide insight into the full competitive effect of (for example) divesting a plant by the merging parties to another firm in the industry. Because the approach in (1) and (2) focuses just on the merging parties, that approach cannot evaluate the competitive effect of the divestiture to an industry incumbent.

In any event, as suggested by the title of the paper and the discussion in the paper, the authors argue that for assessing unilateral effects in product-differentiated industries, the rebuttable presumption of harm embodied in inequalities (1) and (2) is a superior "alternative to the entrenched method based on market definition and concentration." (p.3). But the authors are clearly struggling with the ongoing reliance by the courts on market definition and market share. So the authors suggest that the Farrell-Shapiro approach "could be implemented without requiring that the courts abandon the use of market definition and without requiring that the courts embrace the narrower relevant markets implied by the Guidelines." (p. 25). In challenging a merger, the government can define the market broadly and then within that market, satisfy the rebuttable presumptions in inequalities (1) or (2).

If the post-merger market shares are high in the defined market, then the original structural presumption would likely be satisfied. Given the history of the courts' reliance on the structural presumption, why would the courts even bother to say in addition, inequalities (1) and (2) hold?

And as Farrell and Shapiro recognize, if the market shares of the merging firms are relatively small in this broadly defined market, then agencies will have to explain to the court why the low shares are irrelevant by invoking inequalities (1) and (2) and the accompanying intuition. Which is where all this started.

For evaluating a merger's potential for unilateral effects, it would seem far more natural (and even more honest) to begin with inequalities (1) and (2) along with the underlying intuition.

---

<sup>23</sup> But the paper also suggests that simulations require a calibration of the model to current market conditions and then suggests using that calibration to predict post-merger price changes and so "risks mis-specification by omitting the less immediate and concrete aspects of the firms' objectives and conduct." (p. 25.) I don't think this says anything more than that one wants the simulation to be consistent with data on prices (and maybe costs) and shares in the pre-merger world, *assuming* a specific functional form for demand. And this seems more generally to focus back on the advantage of (1) and (2) as being independent of the shape of demand. But the notion that simulations fail to account for "the less immediate and concrete aspects of the firms' objectives and conduct" seems odd—the motivation for the simulation has always been the intuition behind inequality (1), that post-merger, the acquiring firm accounts for effects of its actions on the profits of the acquired firm (and vice-versa) in a way that did not happen pre-merger.

<sup>24</sup> Of course, a modified version of the left-hand side of expression (3) could be used as a preliminary indicator of the size of the price increase. That is, one could use  $R [d^*(P_2 - C_2)]$  as a measure of the possible post-merger price increase, which translates the post-merger cannibalization tax into a price increase using the pass-through rate  $R$ .

Consistent with that view, the penultimate sentence in this paper notes that “the market definition exercise is a distracting appendage to the ‘real’ analysis of mergers with unilateral effects.” (p. 29.)

This is a paper worth reading because these two eminently qualified economists have resurrected the question of the need for and relevance of relevant market definition in differentiated product industries. I am concerned about the shorter shrift given to implementation issues (estimating diversion, determining which products to directly include in the analysis). But given the broad sweep of this paper, it probably is unfair to expect every implementation detail to be discussed in much depth. It goes without saying that those details will be critical. And the paper is at its best when it doesn’t fall back into something like a market definition trap.

Farrell and Shapiro have proposed an interesting and potentially powerful way of supplanting the structural presumption in differentiated product industries. Hopefully, the debate regarding the use of market definition in such industries may now take (or re-take) one of the center stages of antitrust enforcement. If so, this in and of itself will be an important contribution of the paper. The structural presumption is clearly not one that is a good fit in differentiated product industries. This same debate will no doubt also generate discussion on the optimal use of simulations in antitrust.

Moreover, the importance of the market definition debate may be heightened, as we are now on the verge of changing antitrust enforcement regimes. As a consequence, this is a debate that the courts may well take note of. ●

—JRW