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Unilateral Effects of Mergers in Differentiated Product Industries: The End of Market Definition?

Questioning the role of market definition in assessing unilateral effects of mergers in differentiated product industries

In differentiated product merger analysis, antitrust economists and attorneys have long struggled with the exercise of defining a relevant market and using the resulting market shares to assess the likely competitive effects of the merger. The reason is that the link between a merger-induced change in market concentration (as measured by the Herfindahl-Hirschman Index or HHI) and the likely price effects of a merger is questionable, especially for unilateral effects for mergers involving differentiated products. In a recent working paper titled "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition", Carl Shapiro and Joseph Farrell—highly respected economists who are currently serving as chief economists at the Antitrust Division of the Department of Justice and the Federal Trade Commission, respectively—have proposed an alternative to the exercise of market definition as a means of making an initial determination (a "presumption") regarding whether a merger between two differentiated products firms is likely to lead to higher prices.[1] The proposed test eschews market definition by appealing directly, and in a transparent way, to the theory of how a merger may alter the pricing incentives of the merging firms. In this note, we describe the proposed test and consider how to implement the test in practice.

The Farrell-Shapiro test for adverse unilateral effects without market definition

As Farrell and Shapiro acknowledge, the proposed test "draws heavily on ideas" that were previously developed by O'Brien and Salop and by Werden.[2] Unlike the notion of market concentration, which in the *Horizontal Merger Guidelines (Guidelines)* forms the basis of presumptions regarding both unilateral and coordinated effects of a merger, the proposed test is aimed only at arriving at a presumption about *unilateral post-merger price increases in differentiated product industries*. As with the market definition exercise described in the *Guidelines*, the Farrell-Shapiro test only considers the effect of demand-side substitutability between products, except to the extent that it gives the merging parties some presumptive credit for merger-induced efficiencies. Unlike the market definition exercise in the *Guidelines*, however, the proposed test is grounded in the economic theory of differentiated

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[1] "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," Joseph Farrell and Carl Shapiro, 25 November 2008. (**http://faculty.haas.berkeley.edu/shapiro/**) For a discussion, see John R. Woodbury's review in *The Antitrust Source* (December 2008), **http://www.abanet.org/antitrust/at-source/08/12/Dec08-pTrail12-22f.pdf**.

[2] The relevant articles are Daniel O'Brien and Steven Salop, "Competitive Effects of Partial Ownership: Financial Interest and Corporate Control," *Antitrust Law Journal* (2000), 67, 559 – 614, and Gregory Werden, "A Robust Test for Consumer Welfare Enhancing Mergers Among Sellers of Differentiated Products," *Journal of Industrial Economics*, (1996), 44, 409-413.

product mergers. Farrell and Shapiro state that if a presumption of a post-merger price increase is suggested by their proposed test, the merging parties may overcome that presumption by performing a more complete analysis of the merger's likely competitive effects. The more complete analysis would take into account the full equilibrium adjustment after the merger, including any pro-competitive effects of supply-side responses such as possible entry of new competitors and repositioning by existing competitors.

To understand the Farrell-Shapiro test, consider a merger between two firms, each of which produces a differentiated product. Prior to the merger, each firm sets the price of its product in order to maximize its own profit. After the merger, the merged firm will seek to maximize the total profit that it earns from selling the two products. As a result, one can expect that when the merged firm sets the price of each product, it will take into account the "cannibalization" effect of each product's price on the quantity of sales of the other product. That is, the merged firm will take into account that if it decreases the price of the product of one of the merging firms, some of the new sales of that product will come at the expense of, or will "cannibalize", the sales of the other merging firm's product.

To capture this change in incentives on the post-merger mechanics of price setting, the authors envision that each of the merging firms will continue to set its price in a decentralized fashion, but now each firm will have to pay a "cannibalization tax" equal to the loss of profit that its marginal output inflicts on its merger partner. The latter is the product of the appropriate *diversion ratio* between the firms' products (i.e., the number of units by which sales of the merger partner's product are reduced when sales of the product in question increase by one unit) and the *variable margin* earned on the merger partner's product. This is the Upward Pricing Pressure metric (UPP) proposed by Farrell and Shapiro. This manner of envisioning how a merger internalizes the competitive externality between the merging firms enables one to think of a merger as effectively increasing the marginal cost of the merging firms' products—by the amount of the cannibalization tax—thus creating upward pricing pressure as would any other increase in marginal cost. A higher UPP is the result of higher diversion ratios and/or higher margins.

Standard models of differentiated product competition predict that any merger involving two differentiated products will imply upward pricing pressure. To avoid creating a presumption of competitive harm for every such merger, the authors suggest crediting each product of the merging firms with a certain merger-induced reduction in its marginal cost (a "standard deduction," of say 10 percent), which can potentially counteract the upward pricing pressure from the cannibalization tax. The net pricing pressure on each product of the merging firms is the net effect of these two changes in its effective marginal cost. If the net effect is an increase in the effective marginal cost of a product (i.e., the cannibalization tax is larger than the standard deduction), then the test leads to a presumption that the merger will likely lead to an increase in the price of that product. The net UPP can be viewed as replacing the HHI safe harbor—if the net UPP is negative (so that post-merger prices are expected to fall), the merger is within the safe harbor (barring other evidence of direct unilateral harm from the merger). By framing the inquiry as *whether* a merger is likely to lead to a price increase instead of *how large* the predicted price increase might be, the Farrell-Shapiro test side-steps a difficulty associated with standard Bertrand models of differentiated product competition, viz., the magnitude of a predicted price increase depends on the "shape" of the demand curve. But as a result of this framing, the presumption of harm if the merger fails the test is the same whether the merger fails the test by an inch or by a mile.

While the above describes the authors' preferred version (the "pure" version) of the test that is "free" of any assumptions regarding the shape of the demand function, knowing the magnitude of the price increase may be helpful in understanding, for example, how "convincing" evidence of entry and repositioning must be to counter the UPP. The authors modify the test to generate a magnitude of the predicted price increase by assuming that 50 percent of the merger-induced "cannibalization tax" less the standard deduction for efficiencies would be passed through to consumers. This pass-through rate is consistent with monopoly pricing and linear demand. Thus, in this version of the test, quantifying the

likely price effect of a merger does require an assumption about the shape of demand not required for the "pure" version of the UPP test.

Farrell and Shapiro appear to be of the view that the antitrust agencies bear the burden of undertaking the UPP test (more generally, the agencies bear the burden of establishing a presumption).[3] Once the agency has established a presumption of competitive harm, the onus would then shift to the merging parties to rebut that presumption, by challenging the appropriateness of the data used by the agency to establish the UPP and/or by undertaking a more complete analysis of the merger's competitive effects.[4] Farrell and Shapiro also note that in cases that are ultimately litigated in court, the agency would be expected to study potential arguments that serve to rebut a presumption of competitive harm "before suing to block a proposed merger."[5] Although Farrell and Shapiro do not state this explicitly, it would appear that proactive merging parties may want to undertake their own version of the UPP test in order to pre-empt an unfavorable presumption in the first place.

Issues that are likely to arise during implementation of the Farrell-Shapiro test

Farrell and Shapiro emphasize that the UPP test is designed to provide a simple and transparent diagnostic of a merger's price effect, leaving a more complete investigation of its competitive effects to subsequent "back-end" analysis. Nevertheless, their discussion of how the UPP test is to be implemented leaves some open issues for antitrust practitioners.

Diversion ratios

Take, for example, diversion ratios between the products of the merging parties—how should these be calculated? Farrell and Shapiro suggest that one way to obtain diversion ratios is to consider some group of products (that includes the merging firms' products) and assume "market share based diversions" between them.[6] While Farrell and Shapiro are quick to point out that this group of products need not constitute a relevant market, how does one decide which products are "in" and which are not? Conceptually, this effort has the potential to result in the same kind of "artificial and arbitrary line drawing exercise" that Farrell and Shapiro characterize as a key practical flaw in the standard market definition exercise.

Diversion ratios might also be measured using econometric demand estimates of own- and cross-price elasticities. Alternatively, Farrell and Shapiro also suggest using consumer surveys or customer switching studies for diversion ratio measures. What kinds of consumer surveys or switching studies would be appropriate for this use? For example, firms often ask consumers what brand they would choose if their favorite were unavailable or ask them to rank brands in order of preference. Would those surveys be useful even if the responses are not related to small price changes?

Magnitude of likely price effect

If the agencies focused on how much prices are likely to increase instead of whether prices would increase at all as in the "pure" version of the UPP test, what should the assumed pass-through rate be to translate the UPP into a price increase? Farrell and Shapiro suggest a pass-through rate of 50 percent—consistent with monopoly pricing and linear demand. If the UPP test suggested a price

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[3] This seems evident, for example, when Farrell and Shapiro state, "… [T]he government could obtain its presumption ... by asking whether the merger will create upward pricing pressure." (page 26, emphasis added).

[4] Farrell and Shapiro go on to state (also on page 26), "And, of course, the merging parties could rebut the government's case by showing, for example, that firms … could rapidly reposition their products, deterring or offsetting any localized post-merger price increases" (emphasis added).

[5] Farrell and Shapiro, page 23, footnote 67.

[6] Farrell and Shapiro, page 16.

increase, it would presumably then be the burden of the parties to demonstrate that the pass through rate is lower (or that there are other offsetting factors, such as entry and competitor repositioning). Does any price increase justify a presumption of harm or must the agencies define a "tolerable" level of a predicted price increase to account for inevitable measurement or statistical error? This is a possibility that Farrell and Shapiro consider.

Standard efficiency deduction

Another open issue is the size of the standard efficiency deduction. While the authors use 10 percent for illustrative purposes, one might also imagine reasons as to why the extent of any "standard" merger-induced efficiencies should differ across industries. But any deduction significantly less than 10 percent (say, 3 percent) will result in a test that most mergers likely would fail—this would suggest that use of the test with lower standard efficiency deductions is not particularly powerful in its ability to distinguish pro-competitive from anti-competitive mergers.[7]

And if there is a standard efficiency deduction of 10 percent, this may mean that the merging parties would be well advised not to attempt to estimate efficiencies unless they are expected to be larger than 10 percent. However, one might argue that the 10 percent reflects efficiencies that are difficult to measure, such as the adoption of best practices by the merged firm or the merger's contribution to maintaining a "lively corporate control market." If so, then any efficiencies estimated by the parties should be in addition to the standard deduction not instead of the standard deduction. Thus, unlike taxes, one could both itemize and take the standard deduction.

The role of UPP in cases that are ultimately litigated in court

Perhaps the most significant open issue is how to implement the test in court. The authors suggest that the UPP 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."[8] This leads to a natural question: how will the UPP test enable the agencies to establish a presumption of competitive harm when such a presumption cannot be otherwise established by market definition and concentration? Recognizing that the usefulness to the agencies of the UPP test may ultimately depend upon the answer to this question, the authors state, "In cases where there is UPP but the market shares of the merging firms in the broad market are too low to establish any structural presumption, the government would need to explain how the merger would lead to the loss of important, localized competition between the two merging firms. …The government might also need to clarify that the price increases resulting from the merger would not apply uniformly to the entire relevant market."[9] So this would effectively require that the agency explain to the court why the relevant market definition exercise is irrelevant, which is why Farrell and Shapiro proposed the UPP in the first place.

How CRA can help merging parties navigate the Farrell-Shapiro test

Farrell and Shapiro have provided a simple, transparent, and conceptually sound way of supplanting the structural presumption of adverse unilateral effects in differentiated product mergers. But the devil is in the details. If the antitrust agencies pursue this approach, it could result in a substantial change in the way we analyze the unilateral effects of differentiated products mergers; however, it could also

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[7] For example, suppose that the diversion from merging firm B's good to merging firm A's good is 10 percent, the pre-merger price of good A is 4, and its pre-merger marginal cost is 3. The associated "cannibalization tax" for the production of good B is, thus, 0.1. If the standard deduction is 10 percent, then the net UPP is negative (equal to -0.2), implying that the merger falls within the safe harbor. If, on the other hand, the standard deduction is 3 percent, the net UPP is positive (equal to 0.01), implying a presumption of competitive harm.

[8] Farrell and Shapiro, page 25.

[9] Farrell and Shapiro, page 26.

lead us back to using the market definition exercise as a way of identifying candidate products that serve as “close-enough substitutes” for the unilateral effects analysis.

Using our insights into the economic theory upon which the Farrell-Shapiro test is based, as well as the experience we have gained during our long history of assisting clients with the merger review process, CRA can assist merging parties in the following ways, among others:

- Evaluating alternative ways of identifying the collection of relevant products “competing” with those of the merged firm and measuring diversion ratios
- Considering arguments that the costs should be measured over a longer-run horizon
- Assessing whether the merger-related efficiencies can be added to the presumed “standard” cost savings associated with a merger and identifying other non-cost based efficiencies (e.g., quality improvements)
- Addressing the effect of non-price competition on the use and relevance of the measure of UPP
- Determining whether a full simulation that incorporates industry-specific features can be used to counter concerns of post-merger price increases from the UPP test
- Developing arguments for committed and uncommitted entry, competitor repositioning, and other factors that can be used to rebut any presumption of UPP following the merger.

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