Comments on Proposed Vertical Merger Guidelines

by
Professor David Sibley
University of Texas at Austin
and
Dr. Gleb Domnenko
Integra FEC, LLC

In this submission we comment on certain elements of the Proposed Vertical Merger Guidelines promulgated by the Department of Justice and the Federal Trade Commission. In these comments, we make three points. First, we argue that the vGUPPI approach to unilateral effects analysis, although creative, has severe shortcomings. Second, we show that a vertical merger can lead to both higher and lower upstream input prices for the unintegrated firms remaining after a vertical merger. Third, we show that to equate vertical foreclosure with an increase in the post-merger upstream price leaves out important effects that can threaten the viability of an unintegrated downstream competitor. We propose that the best metric to describe foreclosure is that of a vertical price squeeze.

1. Unilateral Effects

The term "unilateral effects" has come to be used for formulas that calculate the directional effects of a merger on prices and have also been used as components of a full merger simulation model. In horizontal merger analysis, the widely used GUPPI methodology[1] examine the incentives of the merged firm to either raise or lower its prices, assuming that other firms hold their prices at their pre-merger levels. Strictly speaking, this approach only looks at the effect of a small increase in the prices of a merged firm starting with the pre-merger levels of those prices.[2]

The other approach is full merger simulation. In the context of horizontal mergers, there are well-developed merger simulation models that are used in most modern merger analyses.

In the case of vertical merger analysis, methodologies are not so well developed. Moresi and Salop[3] ("MS") have developed the equivalent of the GUPPI analysis for

[1] Due to Farrell and Shapiro (2010).
[2] Jaffe and Weyl (2013) have shown that multiplying the vector of GUPPI calculation by the appropriate pass-through matrix yields good approximations to the results of full merger simulations.
[3] Moresi and Salop (2013).

the post-merger upstream price of a firm about to engage in a vertical merger and for the post-merger downstream price of the merged firm. MS refer to the equivalent of the GUPPI applied to the upstream price in a vertical merger as the vGUPPIu. The corresponding calculation for the downstream price is called the vGPUUId.

Each of these formulas holds all prices but one fixed, and examines the effects of changing that one price a small amount. For example, the vGUPPd holds constant all prices but the downstream price of the merged firm. The vGUPPIu holds constant all prices except the upstream price of the merged firm. Yet, both of these prices will change once the merger takes place.[4] Further, they can change in ways that affect the signs of the various vGUPPI indices. This calls the accuracy of these expressions into question, even for directional effects of the merger.

In a recent paper, we have analyzed these issues in the context of a very simple model with an upstream monopoly supplying an industry with two downstream firms with a critical input.[5] Denoting the two downstream firms by D1 and D2, they both produce differentiated products and compete on price.

Even though the model is simple, it does not lend itself to closed form solutions. Therefore, we use the approach of Monte Carlo simulation. Our simulations are based on both linear and logit demands.

Without loss of generality, assume that the upstream monopolist and D1 merge and retain the corporate name D1 after the merger. When we use the term "pre-merger Firm 1", we mean only the unintegrated downstream firm as it was before the merger. When we use the term "post-merger Firm 1", we refer to the entire merged firm.

The first point to note about the vGUPPIu approach is that it always predicts an increase in the upstream price.[6] There is intuition behind this of course. The post-merger Firm 1 does have an incentive to raise the costs of its rival. This induces the post-merger Firm 2 to increase its price, shifting some downstream demand to Firm 1.

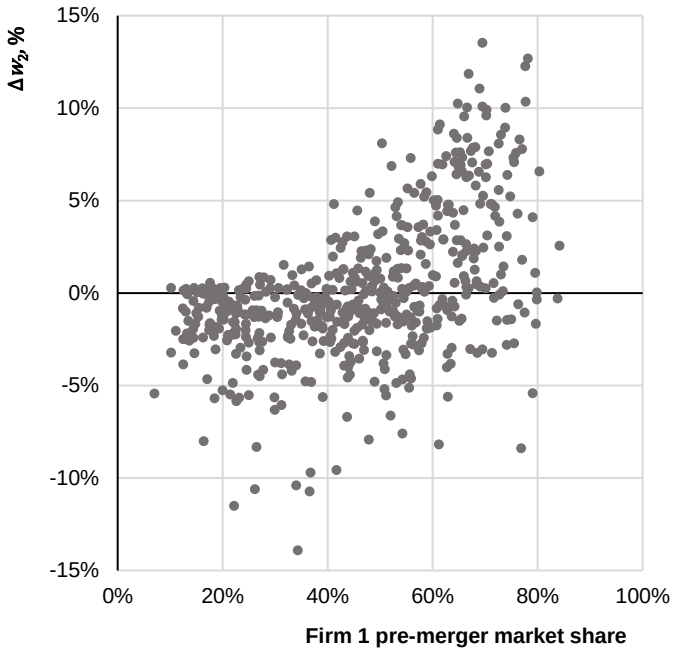
However, there is another, countervailing, incentive, noted first by Chen[7]. The unintegrated Firm 2 may be a very large customer of Firm 1 post-merger. If Firm 2

[4] MS were well aware of this and counselled caution in the use of these indices.
[5] See Domnenko and Sibley (2020) ("DS"), hereafter.
[6] See Moresi and Salop (2013).
[7] Chen (2001).

loses business to Firm 1 after the merger, the upstream demand curve faced by Firm 1 post-merger shifts in. This can cause the upstream price to be lower after the merger than before the merger.[8]

For the technical detail in each of these simulations, we refer to DS (2019) and DS (2020).[9] DS do Monte Carlo simulations assuming both linear demand curves and logit demand curves.

Figure 1. Linear Demand. Upstream Input Price Change



Consider Figure 1. With linear demands, this figure relates the pre-merger size of Firm 1 downstream to the percentage change in the upstream price charged to Firm 2 as a result of the merger. The horizontal axis shows the pre-merger downstream market share of Firm 1, the downstream firm involved in the merger. The vertical axis shows the percentage change in the input price paid by Firm 2, compared to its pre-merger level[10]. It shows that if Firm 1 had a low pre-merger share in the

[8] This point has also been noted by Das Varma and DeStefano (2018).
[9] SSRN: https://dx.doi.org/10.2139/ssrn.3447687
[10] Given the logic of Monte Carlo simulation, the pre-merger downstream share of Firm 1 is the result of the input parameters chosen randomly for that particular simulation. These input parameters are: the intercepts of both downstream demand curves, their slopes, their cross-price terms and their marginal costs. There parameters are chosen from uniform distributions. The model is solved both pre-merger and post-merger for each such set of parameters. The figures shown in this comment are from the outputs of the model.

downstream market, it tends to pay a lower price for the input after the merger. If Firm 1 was large before the merger, then Firm 2 tends to pay more after the merger.

Figure 2. Logit Demand. Upstream Input Price Change

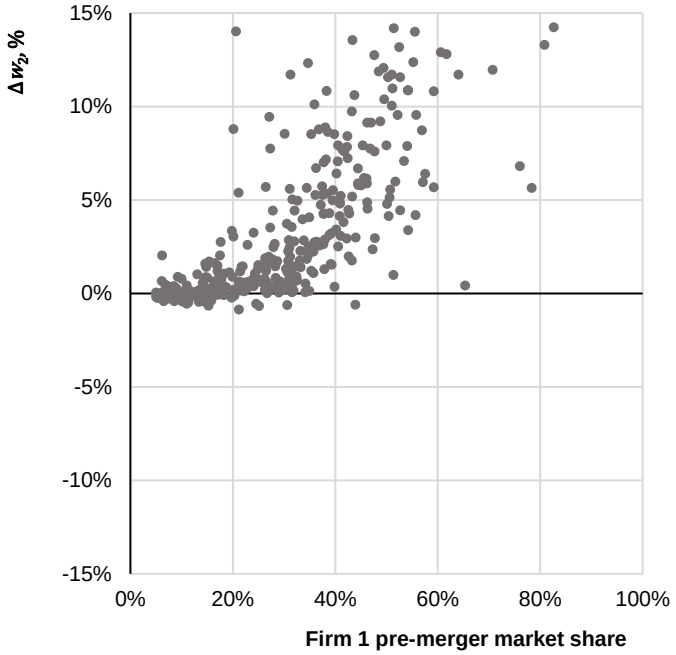


Figure 2 shows the same information, but assumes logit demands downstream. The pattern of results is somewhat different from Figure 1. If Firm 1 was small pre-merger, the upstream input price can be lower than before the merger, but the upstream price reductions tend to be much smaller than in the linear case. Once we get to simulations in which Firm 1 was bigger than about 20%-30%, the merger causes pronounced upstream price increases to Firm 2.

However, in neither case do we see upstream price increases for all simulations. The number of cases in which it falls is appreciable for both demand assumptions.

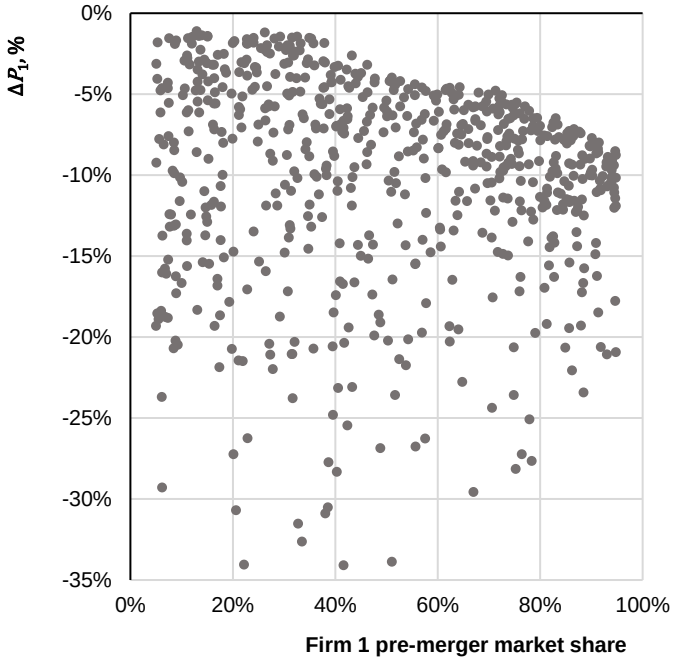
This fact undercuts the indiscriminate use of the vGUPPu as a qualitative indicator of the upstream price effects of a vertical merger. It implies that even as a "quick look" at a vertical merger, the vGUPPIu index is not reliable.

2. Elimination of the Double Marginalization Problem

The DS results also allow us to examine how well the standard "successive monopolies" merger result extends to the case in which there are two downstream

firms. Figure 3 shows our simulation results for Firm 1's price post-merger compared to pre-merger in the logit case.

Figure 3. Logit Demand. Downstream Price Change of Firm 1



The results for Firm 1 are consistent with what is predicted in the standard case in which the downstream firm is a monopoly: Firm 1's prices are all lower after the merger than before. Firm 2 cuts its price, too, as long as Firm 1 was not too big before the merger[11]. However, if Firm 2 is too small, then it pays higher input prices and increases its downstream price relative to the pre-merger case. Thus, it is not certain that all downstream customers are benefitted by the vertical merger. Customers of Firm 2 can easily be injured.

DS (2020) show that in the logit case, Firm 2 often raises its downstream price in response to the generally higher upstream prices. This contrasts to generally lower downstream prices for Firm 2 in the linear case.

3. Vertical Foreclosure

Most discussions of foreclosure tend to equate foreclosure with an increase in the upstream price due to the merger. Our results show that there is more to the issue than this. Even if the upstream price to Firm 2 goes down as the result of the merger,

[11] See Domnenko and Sibley (2020), Figures 2a and 4a.

its profit falls sharply after the merger. This is because of a perverse side effect of solving the double marginalization problem. When Firm 1 cuts its price after the merger, as predicted by the usual theory, it becomes a tougher competitor downstream. Therefore, Firm 2 is caught between a lower price by Firm 1 and an upstream price that may be (1) higher than before the merger or (2) lower, but not enough to deal with the sharp downstream price cut by Firm 1. In short, Firm 2 is caught in a vertical price squeeze.

To illustrate, consider Figure 4.

Figure 4. Logit Demand. Downstream Profit Change of Firm 2

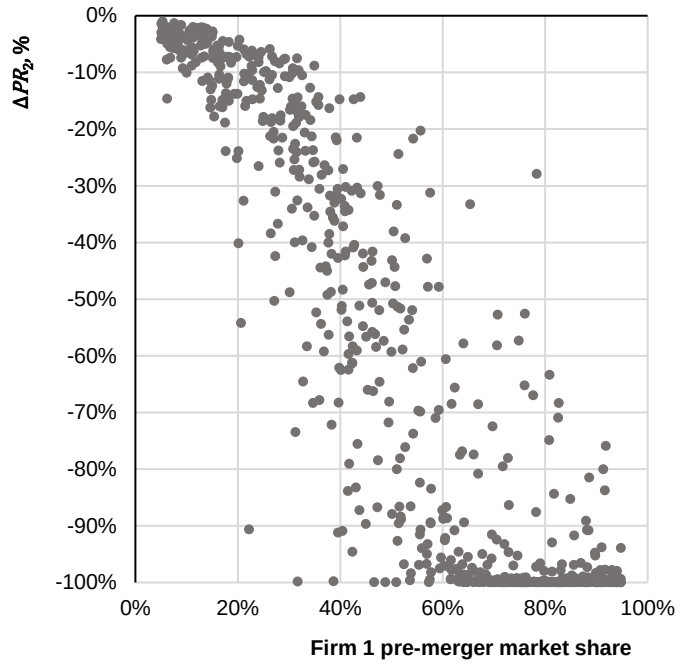


Figure 4 shows the effects of the merger on the profit of Firm 2 in the logit case. The changes are uniformly negative and get larger the bigger is Firm 1. In itself, this is not a competitive issue. However, if Firm 2 should exit the market, then the effect of the merger would be to harm competition.

Figure 4 demonstrates that foreclosure is more complicated than simply whether or not the upstream price to Firm 2 goes up. Firm 2 can lose money and, possibly, exit even if the upstream price paid by Firm 2 does not increase. This is because, by solving the double margin problem for the merged firm, the merger confronts Firm 2 with a price set by Firm 1 that is below what it would have been otherwise. The

reduction in the downstream price of Firm 1 can overwhelm Firm 2 even when Firm 2 pays a lower upstream price.

References

Chen, Y. (2001). On vertical mergers and their competitive effects. *RAND Journal of Economics*

32(4), 667–685.

Das Varma, G. and M. De Stefano (2018, 12). Equilibrium analysis of vertical mergers.

Domnenko, G. and D. Sibley. Simulating Vertical Mergers and the Vertical GUPPI Approach (January 1, 2019). Available at SSRN: https://ssrn.com/abstract=3447687 or http://dx.doi.org/10.2139/ssrn.3447687

Domnenko, G. and D. Sibley. 2020. Simulating Vertical Mergers and the vGUPPI Approach. 2020.

Israel, M., M. Katz, and B. Keating (2019, 9). Declaration of Compass Lexecon. Joint Opposition
of T-Mobile US, Inc. and Sprint Corporation.

Moresi, S. and S. C. Salop (2013). vGUPPI: Scoring unilateral pricing incentives in vertical mergers.

Antitrust Law Journal 79(1), 185–214.

Farrell, J. and C. Shapiro. 2010. Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition. B.E. Journal of Theoretical Economics: Policies and Perspectives, 10(1).

Jaffe, s. and E. G. Weyl. 2013. The First-Order Approach to Merger Analysis. American Economic Journal: Microeconomics, 5(4).