Comments on the Draft Merger Guidelines of the
U.S. Department of Justice and Federal Trade Commission

Vertical Mergers:
The Guidelines Should Discuss an Additional Theory of Harm and the Use of
Quantitative Tests on Ability to Foreclose versus Incentive to Foreclose

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I. Introduction and summary

The U.S. Department of Justice and Federal Trade Commission (“the Agencies”) discuss several
types of mergers in the July 2023 Draft Merger Guidelines (“the Draft”). The Draft contains 13
guidelines, of which Guidelines 5 and 6 are particularly relevant to vertical mergers. Our comments
focus on vertical mergers and thus pertain mainly to those two guidelines.

Our comments have three principal purposes. First, we suggest that the Agencies acknowledge a
further theory of harm regarding vertical mergers (one that is established in the economic literature
but not mentioned explicitly in the Draft). Second, we lay out a recently-developed, practical, and
transparent quantitative test (the “margin test”) that the Agencies can use to gauge whether the
merged entity will have the ability to foreclose downstream rivals. Third, we discuss vGUPPI tests
that the Agencies can use to gauge the incentive to foreclose downstream rivals, and explain how
they fit with the recently-developed margin test on ability.1

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views and not necessarily the views of the organizations with which we are affiliated. We were not
commissioned by anyone to write these comments.

1 Our comments reflect our research, e.g., A. Kadner-Graziano, 2023, “Vertical Mergers: No Foreclosure,
II. Main comments

1. The stakeholder effect in vertical mergers is a recognized theory of harm. A vertical merger can lessen competition and reduce consumer welfare due to the stakeholder effect alone (i.e., even without any of the effects discussed in the Draft). We suggest the Agencies include the stakeholder effect as a potential theory of harm in the Merger Guidelines.

In the Draft, the Agencies state that vertical mergers can lessen competition in a number of ways, including, for example, by providing the merged firm with access to competitively sensitive information about its rivals and/or by facilitating coordination. The Draft also repeatedly mentions foreclosure as a main concern in vertical mergers.

However, the academic literature has established that vertical mergers can lessen competition through an additional effect. The Draft appears to have omitted that effect. To illustrate the omitted effect, suppose firm A competes with firm B, and firm A acquires firm S which is an input supplier to firm B. Post-merger, the merged entity (firm AS) profits from both the sales of its downstream division A and the sales of its upstream division S. When firm B sells more output in the downstream market, it purchases more inputs from the merged entity. Because the merged entity profits from sales of firm B (its downstream competitor), it has a lesser incentive to compete against firm B. This lessens competition in the downstream market.²

There is no settled name for this effect which was first identified by Chen (2001).³ It has been called the “collusive effect” by Chen (2001), “input supply effect” by Moresi and Schwartz (2017), “Chen effect” by Moresi and Schwartz (2021) and Moreisi and Salop (2021), and “stakeholder effect” by Kadner-Graziano (2023).⁴ Hereafter, we use “stakeholder effect” because, intuitively, the merged firm AS competes more softly due to its stake in firm B’s sales.

² Like other theories of harm in vertical merger cases, the ultimate concern is horizontal. 15 U.S.C. § 18 (“… the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly.”). See also S. Moresi and S. C. Salop, 2021, “When Vertical is Horizontal: How Vertical Mergers Lead to Increases in Effective Concentration”, Review of Industrial Organization 59, 177-204.
Crucially, the stakeholder effect can materialize even absent any of the effects discussed in the Draft. For example, suppose firm S faces competitors in the input market so that the merged entity AS cannot foreclose firm B. Suppose further that there are no concerns of coordination or of access to competitively sensitive information. Then, the merger still can lessen competition and reduce consumer welfare due to the stakeholder effect alone.

The Draft acknowledges that mergers can create efficiencies and that the Agencies will credit benefits from cognizable efficiencies. Absent any of the effects harmful to competition discussed in the Draft, a vertical merger can have two countervailing effects on downstream competition. It can increase competition via, for example, the elimination of double marginalization (“EDM”) but lessen competition via the stakeholder effect. The net effect on downstream competition and consumer welfare is generally ambiguous: a vertical merger can either increase or reduce both.

**Example 1.** Firm S supplies inputs to firm A and firm B. Firm A and firm B are competitors in the downstream market and the diversion ratio between them equals 50%. Firm S earns a unit margin of $20 on input sales to firm A, and a unit margin of X dollars on input sales to firm B. Those margins cannot increase because input prices are constrained. Firm A acquires firm S. Then, if X is sufficiently high (low), the stakeholder effect dominates (is dominated by) the EDM effect, and hence downstream competition and consumer welfare decrease (increase).

Note that, in the special case of a diagonal merger (i.e., if firm A acquires firm S without sourcing anything from firm S), there is no EDM effect. Absent any other efficiencies, the stakeholder effect lessens downstream competition, reduces consumer welfare, and benefits all downstream firms.

We suggest that the Agencies include the stakeholder effect as part of the theories of harm for vertical mergers in the Merger Guidelines.

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5 Efficiencies are cognizable if they are merger specific, verifiable, passed through, and procompetitive. Draft, pp. 33-34.

6 The input prices charged by firm S to the two downstream firms may be constrained if, for example, the downstream firms could produce the input in-house or procure it from an alternative supplier. Input prices and margins may differ across the two downstream firms if, for example, the latter are unequally efficient at producing the input in-house or have access to different alternative suppliers.

7 For a graphical representation of input margins such that a vertical merger will reduce versus increase consumer welfare, see Figure 1 in Kadner-Graziano, supra n. 1.

8 The stakeholder effect benefits all downstream firms and harms the upstream rivals of the merged firm, in a similar way as when a vertical merger facilitates coordination in the downstream market. In contrast, foreclosure benefits the downstream firms that are not foreclosed and harms the firms that are foreclosed.
2. In vertical mergers, a recently-developed quantitative test (the “margin test”) can be used to identify whether the merged entity will have the ability to foreclose downstream rivals partially (i.e., by still selling the input to them but at a higher price than pre-merger). We suggest the Agencies consider using the margin test.

The Draft mentions foreclosure as a main theory of harm in vertical mergers. It distinguishes between ability and incentive to foreclose, and states that foreclosure concerns are warranted if the merged firm has both the ability and incentive to foreclose rivals. Regarding the ability to foreclose, the Draft lays out several channels through which foreclosure can materialize. Regarding the incentive to foreclose, the Draft explains that it depends on the extent to which the merged firm competes with rivals that use the related product or service.

Antitrust authorities can rely on a number of tests to estimate the incentive of a merged entity to foreclose rivals (e.g., by raising rivals’ costs as part of a strategy of complete or partial foreclosure). Such tests include “vertical arithmetic”, upward pricing indices, and merger simulations. However, to our knowledge, there has been no test thus far to identify whether the merged entity will have the ability to foreclose rivals in the first place.

A recently-developed test for vertical mergers allows antitrust authorities to assess whether a proposed merged entity would have the ability to raise the price at which it sells a related product to downstream rivals. The new test is consistent with standard models of vertical relationships. We next lay out an illustrative model to convey the intuition for the test.

Consider again the previous example where firm S supplies inputs to firms A and B. The supplier has a constant unit cost of production, and the downstream firms use one unit of input per unit of output. Suppose that first the supplier sets the unit input prices to firms A and B, and then the latter

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10 Draft, Guideline 5, pp. 3, 14-16.
11 Draft, p. 16 (“If the merged firm has the ability and incentive to make it harder for its rivals to compete in the relevant market, there are many ways it could act on those incentives.”).
12 Draft, p. 15 (“… the merged firm might raise price, reduce quality, provide less reliable access, or delay access to product improvements or information relevant to making efficient use of the product.”).
13 Draft, p. 15.
14 In the Draft, the “related product” is the product, service, or customer that rivals use to compete in the relevant market. Draft, p. 14. The Draft thus implicitly discusses both input foreclosure and customer foreclosure. The new test is for input foreclosure.
set the output prices of their products. Kadner-Graziano (2023) shows that, if the supplier is an unconstrained monopolist for input sales to firm B, then the following relationship holds between the supplier’s dollar margin on input sales to firm B (denoted by $m_{SB}^u$) and firm B’s dollar margin on sales of its output (denoted by $m_B^*$):  

$$m_{SB}^u \times \rho_B \geq m_B^*$$

where $\rho_B$ denotes the pass-through rate of firm B.  

Now suppose that firm B can produce the input in-house at a constant unit cost (denoted by $c_B$) that is higher than firm S’s unit cost and, furthermore, there exist one or more alternative suppliers that can supply the same input as firm S at a constant unit cost (denoted by $\bar{c}$) that also is higher than firm S’s unit cost.  

It is thus efficient for firm B to procure the input from firm S (as opposed to producing the input in-house or procuring it from an alternative supplier). The central distinction developed in Kadner-Graziano (2023) is that, if $c_B$ and $\bar{c}$ are both relatively high then firm S is unconstrained by competition and hence earns a relatively large monopoly margin. Conversely, if either $c_B$ or $\bar{c}$ are relatively low then firm S is constrained by competition and hence earns a relatively small margin (firm S would want to set a higher input price to firm B, but competition from other sources of supply prevents it from doing so).

Intuitively, the supplier’s pre-merger margin on input sales to firm B reveals something about its market power over firm B. A sufficiently low margin is evidence of competitive constraints. The new test pinpoints how low “sufficiently low” is.

The test compares firm S’s pre-merger dollar margin on input sales to firm B, $m_{SB}^*$, and firm B’s pre-merger dollar margin, $m_B^*$. If $m_{SB}^* \times \rho_B < m_B^*$, the supplier is constrained pre-merger and cannot obtain a higher price post-merger (as it faces the same competitive constraints as pre-merger).

**Margin Test.** *If $m_{SB}^* \times \rho_B < m_B^*$, the proposed merged entity AS cannot obtain a higher input price from firm B than pre-merger.*

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15 This result holds for the setting described in the text. It does not hold, for example, with bargaining or two-part tariffs. For details on the model and limitations, see Kadner-Graziano, *supra* n.1.

16 For example, a pass-through rate of 0.5 (or 50%) means that if the input price to firm B increases by 1 dollar, the output price of firm B increases by 50 cents.

17 The test also applies when competing suppliers offer differentiated (rather than homogeneous) inputs.
A clear benefit of this margin test is that it requires only three data points. Furthermore, it does not require to define any relevant market. On the contrary, applying the margin test can reveal whether the supplier faces relevant competitors. Also, the margin test is robust to changes in several of the underlying model assumptions. For example, it also applies with differentiated inputs and multiproduct firms. For settings where the margin test does not apply (e.g., with bargaining or two-part tariffs), see Kadner-Graziano (2023).

**Example 2.** The supplier earns a dollar margin of $10 on each unit sold to firm B. Firm B earns a dollar margin of $60 on each unit sold. The pass-through rate is 50%. According to the margin test, because $10 \times 50\% < $60, the supplier is constrained pre-merger and cannot obtain a higher price post-merger.

In some cases, the Agencies may have a rough estimate but no precise data on the pass-through rate. The condition in the margin test can be rewritten to back out the “critical” pass-through rate:

**Margin Test (reformulated).** If $\rho_B < m_B^* / m_{SB}^*$, the proposed merged entity AS cannot obtain a higher input price from firm B than pre-merger.

**Example 3.** Firm S has a unit margin of $5 on sales to firm B and firm B has a margin of $20. The actual pass-through rate is unknown to the Agencies, but they know it lies below 200%. According to the margin test, the merged entity cannot obtain a higher input price from firm B for any pass-through rate below $m_B^* / m_{SB}^* = 20/5 = 4$ or 400%. The merged entity cannot obtain a higher input price from firm B than pre-merger since the actual pass-through rate is lower than 200% and hence also lower than the critical pass-through rate of 400%.

We emphasize, however, that vertical mergers can reduce consumer welfare even in the absence of foreclosure, as we discussed in section II.1 above.

Moreover, if the merged entity cannot obtain a higher input price, it might nevertheless be able to raise its rival’s cost by stopping to supply altogether, as discussed in Kadner-Graziano (2023) among others.\(^{18}\) In other words, the merged entity might engage in complete foreclosure if it cannot engage in partial foreclosure. According to a widespread intuition on complete foreclosure, if the merged entity earns a small margin on input sales to firm B, it does not lose much if it forecloses

firm B completely from access to its input, and hence is more likely to have the incentive to do so. However, the margin might be small precisely because the merged entity is constrained. Therefore, the margin test can be used also to inform the Agencies on whether there are alternative options to the input supplied by the merged firm that downstream firm B could use following complete foreclosure by the merged firm.

We suggest that, in vertical merger reviews, the Agencies consider using the above margin test on ability to foreclose downstream rivals.

3. In vertical mergers that potentially raise input foreclosure concerns, we suggest that the Agencies consider using an initial screen based on Guidelines 5 and 6 and quantitative tests of the stakeholder effect and the ability and incentive to foreclose.

The quantitative tests discussed in this comment are consistent with theoretical models where there is price competition both upstream and downstream. Therefore, our suggestions apply to vertical mergers in industries where firms compete mainly by setting prices.19

Initial screens in vertical merger reviews typically begin with an analysis of the merged firm’s ability to raise downstream rivals’ costs by stopping to supply inputs (or services) to them.20 If the merged firm has such ability, one then evaluates its incentive to stop supplying the input by carrying out a profitability analysis (“vertical arithmetic”).

We suggest continuing the initial screen with the margin test to gauge whether the merged firm will have the ability to foreclose downstream rivals partially by increasing the price at which it sells to them. One then can calculate the vGUPPIu score to gauge the merged firm’s incentive to increase the input price to a given rival, and the vGUPPIr score to gauge the implied effect on the rival’s incentive to increase the output price to its own customers. One also can gauge the magnitude of the stakeholder effect (net of the EDM effect if EDM is cognizable) using the vGUPPId score.21 If vGUPPId and vGUPPIr are both positive, then the merged firm and the rival

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19 It does not apply to all settings where firms set prices. For details and limitations, see Kadner-Graziano and Moresi and Salop, supra n.1.

20 The margin test can inform this analysis. For example, if the upstream merging firm is constrained by a downstream firm’s option to produce the input in-house, then it cannot raise that firm’s costs post-merger (see Kadner-Graziano, supra n.1, for more details).

21 There are two vGUPPId formulas: vGUPPId1 measures the stakeholder effect and, if EDM is cognizable, vGUPPId2 measures the net effect of the stakeholder and EDM effects. See Moresi and Salop, supra n.1.
will want to raise their output prices post-merger, which will tend to reduce competition and consumer welfare.

- If the margin test indicates that the merged entity is unable to raise rivals’ costs by selling the input at a higher price, the merger nevertheless may reduce competition through the stakeholder effect (as discussed in section II.1).\(^{22}\)

- If instead the margin test does not show that input prices are constrained, then one evaluates the magnitude of the merged firm’s incentive to raise input prices to rivals (using vGUPPlu) and of the implied incentives of rivals to raise output prices (using vGUPPIr). Again, one also evaluates the stakeholder effect (net of the EDM effect if EDM is cognizable) using vGUPPId. Here, however, there are potentially strong feedback effects between the merged firm’s pricing incentives upstream (i.e., the input prices charged to rivals) and its pricing incentives downstream (i.e., the output price charged to customers). These feedback effects may change the sign of the vGUPPI scores and thus it is important to account for them.\(^{23}\)

We next illustrate this last point through two examples, using standard vGUPPI scores and also simultaneous vGUPPI scores that account for feedback effects.\(^{24}\)

**Example 4.** Firm S supplies inputs to firms A and B. The supplier has a constant unit cost of production, and firms A and B use one unit of input per unit of output. The supplier sets unit input prices to firms A and B, and then the latter set the output prices of their products. The pre-merger unit prices are $50 for the input and $100 for the output, and the pre-merger margins are 60% for both firm S and firm A. The diversion ratio from firm B to firm A is 40%. The total diversion ratio from firm A to firm B and all the other rivals that use the input of firm S is 80%. The pass-through rate of firm S is 50%. Finally, firms A and S merge, and EDM is cognizable. Then, vGUPPlu and vGUPPIr are positive while vGUPPId is negative: vGUPPlu = 48%, vGUPPIr = 12%, and

\(^{22}\) I.e., vGUPPId > 0. If EDM is cognizable, the EDM effect may outweigh the stakeholder effect, i.e., vGUPPId < 0 is possible, in which case the merger increases competition (absent other concerns).


\(^{24}\) Moresi and Salop, *supra* n. 2.
vGUPPId = -6%. Accounting for feedback effects, the simultaneous vGUPPIs are all positive: SvGUPPIu = 63.5%, SvGUPPIr = 15.9%, and SvGUPPId = 19.4%. That suggests that the merger will lessen competition and cause all prices to increase.

Intuitively, in Example 4 the raising rival’s cost effect is relatively large and magnifies the stakeholder effect, so that the EDM effect actually does not outweigh the stakeholder effect.

**Example 5.** The setting is the same as in Example 4, except that the pre-merger margins are 20% for firm A and 80% for firm S (instead of 60% for each) and the total diversion ratio from firm A to firm B and all the other rivals that use the input of firm S is 40% (instead of 80%). Again, vGUPPIu and vGUPPIr are positive while vGUPPId is negative: vGUPPIu = 16%, vGUPPIr = 4%, and vGUPPId = -24%. Accounting for feedback effects, the simultaneous vGUPPIs are all negative: SvGUPPIu = -3.8%, SvGUPPIr = -1.0%, and SvGUPPId = -24.8%. That suggests that the merger will increase competition and cause all prices to decrease.

Intuitively, in Example 5, the EDM effect is relatively large and changes the raising rival’s cost effect into a “reducing rival’s cost effect”.26

**III. Conclusion**

Our comments on the Draft highlight three points regarding vertical merger reviews.

1. Vertical mergers can lessen competition and reduce consumer welfare via the stakeholder effect. The Draft does not mention the stakeholder effect. We suggest the Agencies include the stakeholder effect in the Merger Guidelines as an additional potential theory of harm.

2. The Agencies can use a recently-developed, practical, and transparent margin test to assess whether a merged entity will have the ability to foreclose its downstream rivals by still selling the related product (or service) to them, but at a higher price than pre-merger. While

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25 The standard vGUPPId score measures the stakeholder effect holding input prices constant. The simultaneous vGUPPId score takes into account that a higher input price to firm B increases the merged firm’s stake in firm B and hence increases the stakeholder effect.

26 The standard vGUPPIu score measures the raising rival’s cost effect holding the output price of the merged firm constant. The simultaneous vGUPPIu score takes into account that a reduction in the output price of the merged firm (due to EDM) reduces the margin earned on sales diverted from firm B and hence reduces the raising rival’s cost effect. When the EDM effect is large and the stakeholder effect is small, as in Example 5, the total margin earned by the merged firm may be smaller than firm S’s pre-merger margin on input sales to firm A, and thus the merged firm may want to reduce (not raise) the input price to firm B.
a relatively small margin earned on the related product might be evidence that the *incentive* to foreclose is relative strong, it also might be evidence that the *ability* to raise rivals’ costs is likely very limited.

3. The margin test for the ability to foreclose and the vGUPPI scores for the incentive to foreclose are complementary quantitative tools that the Agencies can use in vertical mergers that raise input foreclosure concerns. We suggest an initial screen that is based on those quantitative tools and consistent with Guidelines 5 and 6.