Modeling the effects of mergers in procurement: Comment

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Abstract

Miller (2014, 2017) proposes an approach to the analysis of merger effects in markets involving procurement where one of the two product lines is discontinued. This note proves that, as presented in Miller (2014, 2017) and applied to a number of actual merger cases, eliminating one of the two product lines will not be more profitable than retaining both product lines from the merger, and therefore, applying this approach will likely overstate the anticompetitive effects of mergers.

1 Introduction

Models along the lines described in Miller (2014, 2017) are often used in the context of antitrust enforcement and in the analysis of mergers in particular. Miller (2014, 2017) describes the application in the litigation over the Power Reviews/Bazaarvoice merger, but similar models have been applied in the litigation over the Oracle/PeopleSoft and Mitchell/CCC mergers.[1]

Miller (2014, 2017) presents an analysis of mergers in bidding markets involving procurement that allows for both differences between products in terms of their value to the buyers and production costs. Miller (2014, 2017) considers two approaches to modeling the effects of a merger: (1) retention of all products and (2) discontinuation of a product.

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[*]The original motivation to look into this issue arose as part of consulting work on a pending merger. Nathan Miller provided helpful comments. This draft also benefited from the comments of Phil Haile, Leslie Marx, and George Rozanski.

[1]*US v. Oracle Corp.*, 331 F. Supp. 2d 1098 (N.D. Cal. 2004). *FTC v. CCC Holdings Inc.*, 605 F. Supp. 2d 26 - Dist. Court, Dist. of Columbia 2009.

In the retention of all products approach, a merger brings together two products and production processes and the merged company simply competes with the particular product that offers the higher-surplus to each particular buyer. An anticompetitive effect arises when the lower-surplus product of the merged company would have set the price for the higher-surplus product. This is the approach adopted by a number of other papers in the literature.[2]

In the discontinuation of a product approach, the model assumes that the merged company simply does not offer one of the two products being merged to any buyer even those that would have found the discontinued product of higher value. The production technology (i.e., value/cost distribution) of the product that is retained remains the same as it was pre-merger. Unlike the retention of all products modeling approach, the discontinuation of a product approach assumes that the merger results in lower expected total surplus as the contribution to total surplus due to one of the two merging firms' products is assumed to be simply removed from the market. In this approach, the same anticompetitive effect as in the retain all products approach arises when the retained product provides the highest surplus but an additional effect arises in the case where the discontinued product would have provided the highest surplus.

The approach of analyzing the effects of a merger under the assumption that the merged firm drops one of the pre-merger products has been adopted in the analysis of mergers by competition authorities. For example, citing to Miller (2014), the EC's GE/Alstom merger decision refers to the potential effects of the discontinuation of one of the pre-merger products and quantification of price effects under this assumption.[3]

Miller (2014) discusses these two case and when each might arise as follows:

> How mergers manifest depends on structure and magnitude of suppliers' fixed costs, which thus far have not been incorporated into the model. If fixed costs are sufficiently small then the merging firms likely find it profitable to retain both of their products and subsequently offer to maximize profit from their product portfolio. If instead suppliers incur separate fixed costs for each product (e.g., due to brand advertising) and these fixed costs are sufficiently large then the merging firms likely find it profitable to discontinue one of their products. I analyze these two cases in turn. (Miller (2014), p. 204.)

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[2]For example see, Waehrer (1999), Dalkir et al. (2000), Tschantz, Crooke, and Froeb (2000), Waehrer and Perry (2003),and Loertscher and Marx (2019).

[3]See, Annex I, paragraph 32 on pdf page 431 of the file available here: https://ec.europa.eu/competition/mergers/cases/decisions/m7278_6808_3.pdf.

However, as shown in this note no matter how high the fixed cost of maintaining a product line, as long as the fixed cost was covered pre-merger, the discontinuation of a product will generally not be more profitable for the merged firm than continuing to offer both products post-merger. Therefore, the situation where the merger does make it profitable to eliminate a product is unlikely to occur at least as modeled in Miller (2014, 2017). This is not to say that we would never observe a merged firm eliminating a pre-merger product, only that if such a move was planned, additional factors are likely at play. One example of such a factor is a merger efficiency in the production capability for the retrained products post-merger leading to smaller anticompetitive effects than arise from the model proposed in Miller (2014, 2017) even with the discontinuation of a product. However, the approach taken in Miller (2014, 2017) assumes an anticompetitive incentive to discontinue a product line that is generally alone not a profitable response to a merger.

2   Model

I adopt the notation of Miller (2014), but for convenience eliminate the use of the parameter θ. As shown in Proposition 1 of Waehrer (2020) there is also no need to write the key expression for the expected profit of suppliers as a conditional expectation in the form suggested in Miller (2017). The only additional notation added here is for the representation of the fixed costs. Briefly, for any set of suppliers A, the maximum variable surplus available is represented by the random variable z_A. The set of all pre-merger suppliers is denoted by N, and the set of suppliers N excluding j is denoted $\{k \neq j\}$. Suppose that the two merging firms are suppliers 1 and 2, and their fixed costs are F_1 and F_2.[4]

For a competitive structure like an open auction or second-price auction where the winner is the supplier that provides the highest surplus and the price is determined by the level of surplus offered by the supplier with the next best surplus to offer, Equation 7 of Miller (2014) provides a very simple expression for the expected variable profit of supplier j conditional on supplier j being selected as the winner. As shown in the present context by Proposition 1 in Waehrer (2020) and is easily derived from results relating to efficient mechanisms (see for example, Krishna (2010)), the

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[4]Note that in Eq. 22 and 23 in Miller (2014) the letter F is used to denote a distribution function. Here there is no need to refer to that distribution, so there should be no confusion with these two different uses of the same notation.

unconditional variable profit of supplier j has an equally simple form, which is

$$E[z_N] - E[z_{\{k \neq j\}}]$$

In words, the expected profit of supplier j the expected highest surplus given all the products offered minus the expect highest surplus given the offered products not including supplier j's offering. This is in fact the marginal contribution of product j to total surplus.

3 Main result

Using the fact that a supplier's variable profit is equal to its margin expected contribution to total surplus, the profit of supplier 1 including fixed costs is

$$E[z_N] - E[z_{\{k \neq 1\}}] - F_1 > 0. \tag{1}$$

The inequality follows from the assumed fact that pre-merger or but-for the merger supplier 1 would find it profitable to continue to offer its product line. (One could assume that this is weakly positive without affecting the analysis.)

If the merged supplier keeps all of its products as described in Miller (2014), the merged firm's profit is

$$E[z_N] - E[z_{\{k \neq 1,2\}}] - F_1 - F_2. \tag{2}$$

If the merger supplier discontinues the product of supplier 1, its profit is

$$E[z_{\{k \neq 1\}}] - E[z_{\{k \neq 1,2\}}] - F_2. \tag{3}$$

Note that if product 1 is discontinued, $E[Z_{\{k \neq 1\}}]$ is the expected highest surplus given the products offered (now not including product 1) and $E[Z_{\{k \neq 1,2\}}]$ is the expected highest surplus of all of the offered products not including the offering of the merged supplier.

Miller (2014) suggests that if F_1 is large enough that the merged firm would likely discontinue product 1. However, if supplier 1 is profitable pre-merger, it will always be more profitable post-merger to continue to offer both products rather than eliminate one. To see this, observe that

Expression 2 minus Expression 3 is equal to firm 1's pre-merger profit given in Expression 1, which by assumption is positive.

4   Conclusion

An interesting question is what do we make of a situation where the intention of the merged company is to do away with one of the product lines following the merger, but we think that the mode of price discovery is an open auction? Three possibilities come to mind, though this list is unlikely to be exhaustive. (1) One of the product lines is really not profitable and would have been discontinued even without the merger. (2) Merger efficiencies result in a higher surplus in one of the product lines decreasing the value of continuing to operate the other. (3) When it discontinues one of the products, the merger firm plans on shifting some or all of the production capacity from the discontinued product to the retained product and thus increasing the contribution to total surplus from the retained product. Each of these possibilities is associated with lower anticompetitive effects than the approach to a discontinued product taken in Miller (2014, 2017).

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