

International Merger Law

Events and commentary

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Recent developments in economic theory regarding the competitive effects of horizontal mergers

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Although it may come as a surprise to antitrust attorneys, as recently as 1983 economic theorists in the field of industrial organization could not write down a model of competition in which horizontal mergers were profitable unless they involved merger to monopoly. That is, horizontal mergers in standard oligopoly models led to the paradoxical result that the profits of the merged firm were lower than the sum of the premerger profits of the two merging firms. The primary paper in the literature at the time characterized this result as "bizarre." Salant, Switzer, and Reynolds, *Losses From Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium*, 98 *Quarterly Journal of Economics* 185 (1983).

In response to the counter-intuitive nature of this result, Perry and Porter in an important paper made a conceptual breakthrough which led to the development of economic models with many profitable horizontal mergers. Perry and Porter, *Oligopoly and the Incentive for Horizontal Merger*, 75 *American Economic Review* 219 (1985). They noted that extant models assumed that firms' average costs remained unchanged as output increased, although the level of average cost could vary among firms. In a merger between firms with differing but constant average costs, the sole gain to the low-cost firm from the merger is the elimination of the high-cost firm as a rival. That is, the merger reduces the number of firms in the market by one, and in standard oligopoly models the market price rises as the number of firms falls. As a result, the post-merger price is higher than the pre-merger price. But notice that since the low-cost firm has no capacity constraints, it has no use for the productive capacity of the high-cost firm.

Thus, a horizontal merger in a model in which firms have differing but constant average costs results in the

higher-cost firm being shut down. In other words, since the lower-cost firm in such a merger has no use for the higher-cost firm's assets, a "merger" in such a model results in the lower-cost firm, in effect, assassinating the higher-cost firm. But how often do we observe mergers leading to the shut-down of one of the merging firms? The answer, of course, is almost never. Thus, models of horizontal mergers in which firms have differing but constant average costs are fatally flawed on both theoretical and empirical grounds. As Perry and Porter concluded: "The so-called merger increases price to the external benefit of all firms, but the new firm forgoes the production and profits of one of the two original firms.... Models with constant average cost invite this conceptual fallacy by obstructing any notion of assets or firm size." Perry and Porter argued that, intuitively, a merged firm should be "bigger" than either of the two premerger firms because it combines the assets of the two firms.

As Perry and Porter showed, a horizontal merger that decreases the number of firms in an industry has two conflicting effects on the profits of the merging firms. First, the merger raises the market price by eliminating one competitor, which benefits all firms in the industry. But second, the total output of the merged firm is less than the sum of the premerger outputs of the two merging firms. This occurs because firms with market power reduce their output in order to raise price. For example, a monopoly produces only a fraction of the total output produced by firms in a competitive industry. Thus, in determining whether a merger will be profitable, firms must weigh the gain from the increase in price against the loss from the decrease in output.

In order to show that many horizontal mergers are profitable, Perry and Porter posited a model in which

there is a fixed amount of capital in an industry. Thus, by construction there can be no new entry into the industry. A merger in the model combines the two merging firms' capital, and thus results in a "bigger" firm. Perry and Porter showed that, depending on the market shares of both merging and non-merging firms, the slopes of the supply and demand curves, and the behavior of firms in the market, i.e., if they compete or collude, a merger can be profitable or unprofitable. In their model many mergers can be profitable because the gain from the price increase often offsets the loss from the output decrease.

After Perry and Porter's path-breaking paper, Farrell and Shapiro, and McAfee and Williams considered the welfare effects of horizontal mergers in their model. Farrell and Shapiro, *Horizontal Mergers: An Equilibrium Analysis*, 80 *American Economic Review* 107 (1990); McAfee and Williams, *Horizontal Mergers and Antitrust Policy*, 40 *Journal of Industrial Economics* 181 (1992). In these papers, "welfare" is defined as the dollar value of the sum of producer and consumer surplus. "Producer surplus" is the dollar value of the area in a supply and demand diagram that lies above the supply curve and below the market price. "Consumer surplus" is the dollar value of the area in a supply and demand diagram that lies above the market price and below the demand curve.

Regarding the welfare effects of horizontal mergers in the Perry and Porter model, McAfee and Williams showed that if the market demand curve slopes down by at least a moderate amount, any merger that creates a new largest firm reduces welfare. Thus, in order for a merger to increase welfare, there must be a non-merging firm whose market share exceeds the sum of the premerger market shares of the two merging firms. Thus, for example, any merger involving the largest firm reduces welfare. (A computer program is available from the authors that calculates the welfare effects of mergers in the model.) McAfee and Williams also showed that some profitable mergers that increase welfare violate the Herfindahl-Hirschmann Index ("HHI") criteria in the Merger Guidelines. U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, 62 BNA Antitrust and Trade Reg. Rep. No. 1559, S-1 (1992). Conversely, some profitable mergers that decrease welfare do not violate the HHI criteria in the Merger Guidelines. This, however, should not be surprising given the *ad hoc* nature of the HHI criteria in the Merger Guidelines. McAfee and Williams, *On What Economic Grounds Should Horizontal Mergers be Challenged?*, 7 *International Merger Law* 16 (1991).

The Perry and Porter model also yields a number of testable predictions regarding how a profitable horizontal merger should affect the market:

1. Industry output decreases.
2. The output and market share of all non-merging firms increase.

3. The merged firm produces less than the sum of the component firms' premerger outputs; thus its market share is less than the sum of the premerger market shares of the component firms.

4. The merged firm produces more than either of the component firms produced prior to the merger. Also, its market share is larger than either of the component firms' premerger market shares.

5. The HHI of the non-merging firms is unchanged by the merger.

One might ask how any merger in the Perry and Porter model can increase welfare given that the merger causes the market price to increase and total industry output to decrease. The answer is that a merger creates a tradeoff between two conflicting factors, one of which decreases welfare while the other increases welfare. The first factor has already been noted: a merger reduces total industry output, which decreases welfare. The second factor is that the merger reduces the total cost of producing any given total output, which increases welfare. Recall that, by assumption, there is a fixed quantity of productive capital in the industry. The more capital a firm has, the lower is its marginal cost. Thus, by combining the capital of two firms, a merger has the effect of lowering the combined firm's marginal cost. Therefore, in determining how a merger will affect welfare, we must weigh the gain from the reduction in marginal cost against the loss from the decrease in total industry output. As shown by McAfee and Williams, this tradeoff depends on the following three factors: (1) the elasticity of demand, i.e., the slope of the demand curve; (2) the market shares of the two merging firms; and (3) the HHI for the non-merging firms.

In a recent paper, Daughety reconsiders the original Salant, Switzer, and Reynolds model where all firms have the same constant average cost. Daughety, *Beneficial Concentration*, 80 *American Economic Review* 1231 (1990). Recall that, by construction, a merger in this model cannot create any "synergies," i.e., cost reductions, of the type that occurs in the Perry and Porter model. Even so, Daughety shows that a merger of two firms that were "followers" can increase welfare if the merged firm is a "leader." "Followers" are firms that choose outputs in response to the actions of other firms, while "leaders" are firms that choose outputs to affect the followers' output decisions. Leaders produce more than followers because the leaders want to force down the outputs of the followers. Daughety's result shows that, even with no cost savings resulting from a merger, the merger can still increase welfare by creating a firm that behaves as a leader.

What conclusions can be drawn from this recent research by industrial organization economists into the theoretical study of horizontal mergers? The research suggests that the days of basing public policy on ad hoc rules such as those embodied in the current Horizontal Merger Guidelines may be numbered. The trend in

economic research clearly indicates the development of formal models that specify the welfare effects of horizontal mergers in industries with different characteristics.

However, a serious challenge to current research is to identify which models fit which industries. One can

envision future Horizontal Merger Guidelines as consisting of specialized policy guidelines for different industries, where the guidelines follow from explicit, equilibrium models, each designed to predict the welfare effects of horizontal mergers in particular types of industries.

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