

Know The Capacity Closure Analysis In Horizontal Mergers

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The U.S. antitrust agencies have long evaluated mergers in homogeneous product markets to determine “whether the merged firm will find it profitable unilaterally to suppress output and elevate the market price.”[1] But the U.S. Department of Justice had not publicly disclosed a formal economic method to analyze output suppression concerns until 2007, when it required two large newsprint manufacturers to divest a newsprint mill because of concerns that the combined firm would try to raise price by “strategically closing, idling, or converting some of its capacity.”[2] This “capacity closure” model has since been applied to other paper product markets[3], and similar considerations have motivated the DOJ to require divestitures in other industries[4], including most recently in connection with the establishment of the Ardent Mills wheat-milling joint venture among ConAgra, Cargill and CHS.[5]



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Ardent Mills vividly illustrates that counsel and economists advising on mergers involving undifferentiated manufactured products must be familiar with capacity closure analysis, which is becoming an increasingly important economic tool. How does the capacity closure model work? What are its benefits and limitations? And how does one identify cases in which capacity closure could become an issue and prepare for capacity closure analysis during the merger review?

The Capacity Closure Model

The capacity closure model analyzes whether the merged firm will have the incentive and ability to close production facilities to raise prices. Initially it may seem counterintuitive for any merging party to spend money on new assets only to shut down some of them, but Ardent Mills illustrates the rationale behind the model. There, the DOJ asked whether the joint venture would find it profitable to close relatively high-cost wheat mills and reap the benefits of higher prices on sales from its remaining (more profitable) mills.[6] The answer was yes if the price effect of closing capacity was large enough that “any lost profit due to lower sales would be more than offset by a corresponding increase in profit on sales made at a higher price due to the capacity closure.”[7] Mergers may increase the profitability of a capacity closure strategy because they provide a larger volume of post-closure sales on which the higher post-closure margins can be earned.

The capacity closure model is based on an assumption that, for a given price, all production facilities that can operate profitably will produce at full capacity, while those that cannot will be idled, closed, or converted to other uses. That assumption is most plausible in homogeneous manufactured product markets with a single market-clearing price and high fixed costs of production. In such industries, the shape of the supply curve is driven by the efficiency and capacity of each production facility. Closing capacity removes supply that would be profitable at current prices, forcing customers either to buy less, to buy other products, or to seek alternative supply sources. Because all profitable facilities are assumed to be operating at full capacity, any alternative supply is inevitably higher priced since it must come from idled facilities with operating costs above current prices.

The capacity closure model requires an estimate of the size of the price increase that would arise from capacity closure, which is determined by likely customer and competitor responses. If customers can readily substitute to other products (e.g., from wheat flour to other types of flour) or otherwise reduce their purchases in response to a price increase, closure is unlikely to raise prices. Similarly, if rival suppliers can take advantage of the higher price by increasing output (e.g., by ramping up production at currently operating wheat mills or restarting idled mills), then an output suppression strategy is likely to fail.

Merits and Limitations of the Capacity Closure Model

From a theoretical perspective, the capacity closure method is a significant improvement in the analysis of competitive effects of mergers in industries that previously were analyzed primarily using traditional measures of concentration, such as market shares or Herfindahl-Hirschmann-Indices. These measures may predict competitive effects of a merger less accurately than a properly calibrated capacity closure model. But while the basic premise of the model is relatively straightforward, its implementation is not. Three principal limitations pose the greatest practical challenges: the extensive data requirements of the model, the strong assumptions it makes about the types of supply responses a price increase will generate, and the failure to incorporate merger-related efficiencies.

- **Data Requirements.** The model imposes a heavy burden on the parties because it requires detailed data for implementation. First, the model requires extensive data on the parties' and competitors' capacities and variable costs to calibrate the profitability of closure and estimate the magnitude of the likely price increase. Such data are required of all capacity that is currently open and of any capacity that might open in response to a capacity closure. Second, the capacity closure approach requires estimates of the elasticity of customer demand and the elasticity of industrywide supply. These data often are not readily available or are of poor quality, and sometimes cannot be generated at all.
- **Supply Responses.** The capacity closure approach is also limited by its assumptions concerning how other suppliers would respond to a price increase. Because the model was developed for a declining industry (newsprint) in which investment in expanding capacity was unlikely, it contemplates only the reopening of costly, idle capacity as a potential supply response. As a result, it is inherently unsuitable for application to dynamic industries in which suppliers are continually investing in better, lower-cost capacity. If the merging parties were to close a facility (such as a high-cost wheat mill) but that facility were replaced by new supply at costs below pre-merger prices, the effort to raise price would fail completely. The capacity closure model does

not contemplate this type of supply response, and therefore typically will overstate the effects of mergers in dynamic industries.

- **Efficiencies.** Finally, the capacity closure approach is not designed to take account of efficiencies. In particular, it treats each supplier as a collection of independent facilities and ignores that variable costs of facilities may be interrelated. This greatly simplifies the modeling of a closure, but provides no mechanism to account for merger efficiencies, such as reducing freight costs by shipping from facilities located closer to the merged entity's customers, consolidating output at lower-cost facilities, or optimizing product mix across a larger network of facilities. Where such efficiencies exist, the model will not capture all costs of a closure, and will therefore overstate the impact of a merger.

Practical Implications

The increased use of the capacity closure model in merger analysis, at least at the DOJ, has several practical implications for merging parties.

- **Prepare for a Capacity Closure Theory in Capital-Intensive, Commodity Industries.** Merging parties are most likely to encounter the capacity closure model in industries with homogeneous manufactured products and large fixed costs. Those characteristics discourage investment in new capacity that might otherwise be expected to counteract any price increases.
- **Don't Count on Market Share Safe Harbors.** The 1992 Horizontal Merger Guidelines suggested that the agencies would only evaluate capacity closure "[w]here the merging firms have a combined market share of at least thirty-five percent."^[8] However, the 2010 Guidelines no longer reference market share, and the DOJ has used capacity closure considerations where the parties held less than 35 percent of available capacity, notably in Exelon/Constellation.^[9]
- **Model Capacity Closure Early.** Where capacity closure may become an issue, parties should begin data collection quickly so their economists can predict the outcome of the model. In most cases, data collection will be a time consuming process and it is important to manage the parties' expectations accordingly. In addition, it is critical to develop a deep understanding of elements not considered in the model's standard framework. For example, if competitors are already building new capacity, or if rivals' capacity can be quickly and economically expanded through technological or process improvements, that is strong evidence that additional investment will follow any attempted price increase. Moreover, in some industries, facilities can be run more efficiently as part of a network, so that closing one facility will raise costs at other facilities. These factors are crucial to understanding capacity closure incentives and advocating effectively during the merger review. However, they require detailed proof that often takes time to develop.

- **Engage with the Agency Economists.** Cases that turn on capacity closure analysis are driven by complex economic modeling. Even more so than in other merger reviews, it is critical to establish a line of communication about data and assumptions between the parties' economists and the economists at the agencies.
- **Consider the Impact on Remedies.** Capacity closure cases can raise unusual remedy issues. Typically, the agencies require divestiture of a set of efficient assets to ensure that the purchaser can compete effectively with the merged entity. In the capacity closure context, however, the incentive to close capacity is greatest for low-margin, high-cost facilities. Thus, the divestiture package that most effectively addresses a capacity closure concern includes the parties' least efficient facilities. This can raise two problems. First, the agencies may seek divestiture of more efficient assets, even though a divestiture of less efficient assets may actually better remedy anti-competitive effects predicted by the model. In *Abitibi-Bowater*, for example, the DOJ required divestiture of one of the largest, most efficient newsprint mills in the country to ensure that the new competitor would be profitable even in weak demand conditions. Second, even if the DOJ accepts divestiture of high-cost facilities, it may be difficult to find a purchaser. These issues reflect tensions within the capacity closure model itself, and merging parties should consider them early on.

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The authors were involved in advising International Paper in connection with the review of the acquisition of Temple-Inland by the DOJ, where DOJ staff applied the capacity closure model.

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[1] U.S. Dep't of Justice & Fed. Trade Comm'n, HORIZONTAL MERGER GUIDELINES §6.3 (2010); see also U.S. Dep't of Justice & Fed. Trade Comm'n, HORIZONTAL MERGER GUIDELINES §2.22 (1992) (hereinafter 1992 GUIDELINES) ("where products are relatively undifferentiated and capacity primarily distinguishes firms and shapes the nature of their competition, the merged firm may find it profitable unilaterally to raise price and suppress output.").

[2] See Competitive Impact Statement, *United States v. Abitibi-Consolidated and Bowater Inc.*, 1:07-cv-01912 (DDC Oct. 23, 2007), available at <http://www.justice.gov/atr/cases/f227100/227108.pdf>, p. 6. The model was developed by the DOJ's lead economists on the case, see Nicholas Hill, *Analyzing Mergers Using Capacity Closures*, EAG Discussion Paper (Aug. 2008), available at <http://www.justice.gov/atr/public/eag/236664.pdf>; Declaration of Nicholas Hill, *United States v. Abitibi-*

Consolidated and Bowater Inc., 1:07-cv-01912 (DDC Aug. 8, 2008), available at <http://www.justice.gov/atr/cases/f236400/236438.pdf>

[3] Competitive Impact Statement, United States v. Altiivity Packaging and Graphic Packaging Int'l, 1:08-cv-00400 (DDC March 5, 2008), available at <http://www.justice.gov/atr/cases/f230800/230814.pdf>, p. 6 (coated recycled boxboard); Competitive Impact Statement, United States v. International Paper Co. and Temple-Inland Inc., 1:12-cv-00227 (DDC Feb. 10, 2012), available at <http://www.justice.gov/atr/cases/f280100/280135.pdf>, p. 6-7 (containerboard).

[4] For DOJ enforcement actions, see Competitive Impact Statement, United States v. Baker Hughes Inc. and BJ Services Co., 1:10-cv-00659 (DDC Apr. 27, 2010), available at <http://www.justice.gov/atr/cases/f258200/258203.htm>, p. 9 (vessel stimulation services in the Gulf of Mexico); Competitive Impact Statement, United States v. Exelon Corp. and Constellation Energy Group, Inc., 1:11-cv-02276 (DDC Dec. 21, 2011), available at <http://www.justice.gov/atr/cases/f278400/278485.pdf>, p. 10 (wholesale electricity).

[5] Competitive Impact Statement, United States v. ConAgra Foods Inc., Horizon Milling, LLC, Cargill Inc., and CHS Inc., 1:14-cv-00823 (DDC May 20, 2014), available at <http://www.justice.gov/atr/cases/f306000/306056.pdf>, p. 15.

[6] Id.

[7] Id.

[8] 1992 GUIDELINES §2.22.

[9] United States v. Exelon Corp. and Constellation Energy Group, Inc., n.4 supra (22-28% share).

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