

Agenda

Advancing economics in business

Ex post merger review: what is it and why do we need it?

Is merger policy effective, and how can governments know whether they can rely on the established analytical tools to help them make the right enforcement decisions?

Daniel Hosken, an economist at the US Federal Trade Commission, considers how quantitative and qualitative ex post merger review can be used to test the current methods

Merger review has rapidly become an important component of antitrust enforcement throughout the world. Governments have realised that solving the competition problems caused by consummated mergers is very costly and time-consuming, and that the final remedies are often imperfect at best.¹

While the regulatory framework controlling government merger review varies throughout the world, most antitrust agencies face the same challenge. A general pattern is that firms notify the antitrust agency of an intent to merge. This notification begins the agency's merger investigation, which must be completed within a time period determined by statute. The goal of merger review is quite ambitious: within a few months, government attorneys and economists are required to forecast how a major change in market structure will affect competition in that market. The investigative team must quickly learn what products the merging firms produce; identify the substitutes to those products; identify the firms' current and potential customers; infer both supply and demand substitution in the markets affected by the proposed transaction; evaluate merger efficiencies; and forecast the likelihood and efficacy of potential entry. The evidence used in the investigation comes from an extensive review of company documents, conversations with company executives and industry participants and, in some cases, econometric analysis of market data. At the end of the merger review the antitrust agency must decide whether to allow the merger, allow it subject to modification (eg, divestiture of assets), or attempt to block it.

Given the necessity of quick decision-making with limited information, antitrust economists and attorneys have developed methodologies to forecast the price and output effects of mergers.² In the USA, for

example, courts have typically relied on analysis of patient flow data (measuring where a hospital's customers live, and how far they travel for hospital services) to determine the geographic markets to be used to decide whether to allow hospital mergers. Over the last decade, antitrust economists analysing mergers in consumer goods markets where scanner data is available often forecast the price effects of a merger by first estimating demand, and then simulating the price effects using an assumed model of competition.³ There are many attractive attributes of the demand estimation/simulation approach. The approach is very transparent: the assumptions made in forecasting the merger are explicitly stated. In addition, market data describing observed consumer purchasing behaviour is used in making the forecasts. What is not known, however, is whether the forecasts generated by merger simulation are informative of observed post-merger pricing.

Is merger policy effective? The rules used by an antitrust agency could be systematically too aggressive in merger enforcement, challenging mergers that would have resulted in lower consumer prices; or not aggressive enough, allowing mergers that increase consumer prices. Similarly, if the assumptions and methodologies used in merger enforcement do not provide useful information, enforcement agencies and courts could make incorrect enforcement decisions. How can governments learn whether they are making, on average, the right enforcement decisions, or whether the tools used in merger analysis are providing useful information? A useful source of information is a careful examination of how markets have changed following mergers. These studies provide information about whether, on average, a government has been too aggressive or too lenient in merger review. We can also learn whether the assumptions made and the

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methodologies employed in a prospective merger review provide reliable information to inform merger enforcement. In the remainder of this article I will describe what an ex post merger review is, and what kinds of information it can provide.

Ex post merger review

There are two major types of ex post merger study. The first is a descriptive (often qualitative) study, the goal of which is to describe what happened following a merger, rather than establish causality. These studies often seek to determine whether the conclusions or assumptions made as part of the merger investigation were, in fact, correct. For example, if the antitrust agency allowed a merger because of anticipated entry into a market, the study would determine whether the entry did indeed take place, and whether that entry was successful. The 1999 report from the US FTC Bureau of Competition is a good example of this first type of study.⁴ The goal of the FTC's study was not to estimate how the divested assets performed relative to the counterfactual of not allowing a merger,⁵ but rather to determine what happened to the assets divested by the merging parties—in particular, whether the divested assets were still in the market. The data used in the study was qualitative rather than quantitative, and consisted of interviews with industry participants. It found that nine of the 37 divestitures examined were 'not viable', meaning that the divested assets had effectively left the market that was the focus of the antitrust investigation.⁶ The investigative team also examined characteristics of the successful and unsuccessful divestiture packages in order to provide recommendations for better future relief, such as requiring merging parties to divest assets quickly and to ensure that key assets (possibly not directly related to the merger) be made available to ensure the viability of divested assets.

The second type of study is quantitative, and does seek to establish causality. Most often these studies seek to estimate the price (and/or output) effects of a merger; that is, they estimate how a merger *causes* prices to change.

This distinction between descriptive and causal studies may appear subtle, but it is quite important. To measure how a merger affects prices, the economist must model how prices would have changed 'but for' the merger. Finding a credible forecast of the counterfactual change in price following a merger is typically the most important (and most difficult) part of the ex post merger evaluation. Mergers do not occur randomly: they are choices made by firms. The endogeneity of the decision to merge may confound a researcher's ability to measure accurately the effect of the merger on price. For example, firms in a shrinking industry may merge in order to rationalise capacity. In markets with falling demand, we might expect prices to

fall but for the merger. If we observe that post-merger prices have fallen, it will be difficult to determine whether the price decreased because the merger was efficient (resulting in lower prices), or because it was anti-competitive (prices fell, but by less than they would have done had the firms remained competitors).

The most common approach taken to estimating the price effects of a merger is to use some form of a difference-in-differences estimator. In a difference-in-differences model, the price effect of the merger is isolated by comparing how a price changes in the market affected by the merger relative to the price in a comparison market; that is, the price effect of the merger is the 'difference-in-the-difference' in pricing pre- and post-merger between the merger market and comparison market. The strength of the difference-in-differences approach is that the researcher does not have to specify explicitly the cost and demand factors that affect pricing (independent of market structure). Instead, the researcher assumes that changes in those factors affect the merger market and the comparison market identically. For example, we could measure the price effects of a petroleum merger affecting a Midwestern US city (such as Louisville, Kentucky) by measuring how the price of gasoline in Louisville changed relative to another city facing similar supply and demand conditions, but unaffected by the merger (such as Chicago, Illinois). The price effects of the merger would then be estimated as the change in price in Louisville pre- and post-merger relative to the change in price in Chicago pre- and post-merger.⁷ The key difficulty in these studies is in finding a good comparison market for the merger market. Most research papers provide substantial justification for the comparisons selected and, where feasible, examine the robustness of results relative to different comparison markets.

What can we learn?

There are significant limitations on what we can learn from ex post merger review. Mergers are highly idiosyncratic. They occur in many very different industries and the level of competition required in one industry might be different from that required in another industry. Similarly, markets change over time. A merger that might have been anti-competitive in 1990 might not be problematic today (possibly as a result of globalisation). Ex post merger reviews are case studies: the researcher estimates how a market changes following a specific change in market structure. The findings of any single merger review might be informative only about that transaction. It is only by gathering evidence from many mergers that we can begin to draw broader inferences about merger policy.

There is also an important sample selection that takes place that affects the set of consummated mergers we

observe.⁸ Because of the existence of antitrust laws and enforcement agencies, the most problematic mergers are never proposed, so the mergers that we observe are those that survive antitrust scrutiny. Furthermore, the overwhelming majority of mergers pose no competition concern because either the merging parties do not produce competing products, or the markets in which they operate are not concentrated. Each year in the USA thousands of mergers are filed with federal antitrust authorities, but only a small fraction of those—roughly 3%—are subject to a full merger investigation.⁹ Because of this selection, the average price effect of *all* consummated mergers should be negative.¹⁰ To determine whether antitrust authorities are being effective, however, researchers should focus on estimating the price effects of mergers on the enforcement margin, rather than the price effect of the average merger—that is, those mergers where the antitrust authority was roughly indifferent between challenging and allowing the merger. If we observe that, on average, the marginal merger resulted in a price increase, we would infer that antitrust regulation was not strict enough. In contrast, if the marginal merger were associated with a price decrease, we would conclude that enforcement was too severe. Because of these selection issues, most studies that measure how mergers affect pricing actually study mergers where the change in market structure could plausibly increase the market power of the merging parties.

Over the last 30 years, more than 20 studies have been published that estimate the price effects of consummated mergers.¹¹ The majority of these studies examine mergers in just four industries (airlines, banking, hospitals, and petroleum), because these are the industries where price and output data is most available. Even though most of these studies find that the studied mergers resulted in price increases,¹² one cannot conclude that antitrust enforcement has been too lenient. These studies examine only a fraction of mergers and, more importantly, a small fraction of the industries experiencing mergers. The results of this literature do, however, show that mergers in concentrated industries can result in significant increases in consumer prices.

Ex post merger evaluation can sometimes inform us about the efficacy of tools used in prospective merger analysis. Recent research examining the price effects of hospital mergers offers important information on the efficacy of a key tool used in US hospital merger review: Elzinga–Hogarty analysis.¹³ This is a methodology used to measure flows of patients into (and out of) a region in which a hospital is located, and is a tool used in geographic market definition. The analysis frequently shows that most consumers use local hospitals, but a significant fraction of patients travel large distances (typically to major cities) to

receive hospital care. Courts have often interpreted evidence of this type as suggesting that hospital markets are very large. The courts reached that conclusion by inferring that, because some patients travel great distances to a preferred hospital at pre-merger prices, if prices were to increase then many more consumers would switch to distant hospitals. Recent research, however, shows that very few (if any) of those consumers using local hospitals switched to distant hospitals in response to merger-related price increases. This evidence strongly suggests that Elzinga–Hogarty analysis was not a useful tool for defining geographic markets in hospital merger analysis.¹⁴

Demand estimation and merger simulation have become popular tools in merger analysis. The appeal of these techniques is quite clear. If economists can estimate demand, and if firms engage (approximately) in differentiated Bertrand price competition, then merger simulation can provide important information on the likely price effects of a merger. To my knowledge, three papers have examined how well commonly used merger simulation tools predict the price effects of these mergers.¹⁵ The evidence from these papers, although quite limited, is mixed. Each one estimates demand, simulates the price effects of mergers using these demand estimates, and then compares simulated price effects to price effects estimated using pre- and post-merger pricing data and a difference-in-differences technique. The merger simulations in Peters (2006) correctly predict that the five airline mergers he examines result in price increases. The simulated price effects, however, are often quite different from the difference-in-differences estimates. Weinberg and Hosken (2008) examine two consumer product mergers and find that, in one case (a passenger car motor oil merger), the estimated price effects are very close to the simulated price effects. In the second merger (breakfast syrup), the simulated price effects are large while the estimated price effects are essentially zero. Finally, Weinberg (forthcoming) finds very small simulated price effects for a merger of manufacturers of feminine hygiene products, while his estimated price effects are both statistically and economically significant.

Conclusion

Ex post merger is resource-intensive. Quantitative and qualitative studies require a significant investment in person-hours, and often the acquisition of market data. The cost of these studies is likely to be justified by the expected benefits. Only by analysing the efficacy of past enforcement decisions can antitrust agencies improve their decision-making. Furthermore, through careful selection of which mergers to study, researchers can evaluate the efficacy of tools used in merger analysis.

Daniel Hosken

¹ Baer, W. (1997), 'Reflections on Twenty Years of Merger Enforcement under the Hart-Scott-Rodino Act', *Antitrust Law Journal*, **65**, pp. 825–63.

² The 2010 US Department of Justice/Federal Trade Commission's 'Horizontal Merger Guidelines', for example, provide an extensive description of the kinds of analyses that US enforcement agencies consider in merger review. See US Department of Justice/Federal Trade Commission (2010), 'Horizontal Merger Guidelines'.

³ See, for example, Hausman, J., Leonard, G. and Zona, D. (1994), 'Competitive Analysis with Differentiated Products', *Annales d'Economie et de Statistique*, **34**, pp. 159–80; and Nevo, A. (2000), 'Mergers with Differentiated Products: the Case of the Ready-To-Eat Cereal Industry', *RAND Journal of Economics*, **31**, pp. 395–421.

⁴ US Federal Trade Commission (1999), 'A Study of the Commission's Divestiture Process', prepared by the Staff of the Bureau of Competition of the Federal Trade Commission. The study is available at: <http://www.ftc.gov/os/1999/08/divestiture.pdf>.

⁵ For an example of a study that does estimate the performance of divested assets relative to the counterfactual of no merger, see Tenn, S. and Yun, J. (2011), 'The Success of Divestitures in Merger Enforcement: Evidence from the J&J–Pfizer Transaction', *International Journal of Industrial Organisation*, **29**:2, March, pp. 273–82.

⁶ In one of the nine unsuccessful divestitures, the divested assets were still in the market, but the buyer was not operating independently of the merged firm (See FTC, op. cit., pp. 9–10).

⁷ This is the approach I took with my colleague Christopher Taylor in estimating the price effects of the merger of two major refiners in the US Midwest. See Taylor, C. and Hosken, D. (2007), 'The Economic Effects of the Marathon - Ashland Joint Venture: The Importance of Industry Supply Shocks and Vertical Market Structure', *Journal of Industrial Economics*, **55**, pp. 419–51.

⁸ Carlton, D. (2009), 'Why We Need to Measure the Effect of Merger Policy and How to Do It', *Competition Policy International*, **5**:1, pp. 87–100.

⁹ See Table 1 in Ashenfelter, O. and Hosken, D. (forthcoming), 'The Effect of Mergers on Consumer Prices: Evidence from Five Mergers on the Enforcement Margin', *Journal of Law and Economics*.

¹⁰ This assumes that those mergers that do not affect competition should, on average, result in efficiencies that lead to lower consumer prices.

¹¹ For recent surveys, see Pautler, P. (2003), 'Evidence on Mergers and Acquisitions', *Antitrust Bulletin*, **48**, pp. 119–207; Hunter, G., Leonard, G.K. and Olley, G.S. (2008), 'Merger Retrospective Studies: A Review', *Antitrust Magazine*, **23**, pp. 34–41; and Weinberg, M. (2008), 'The Price Effects of Horizontal Mergers', *Journal of Competition Law and Economics*, **4**:2, pp. 43–7, June.

¹² The finding of ex post merger studies of the petroleum industry are decidedly mixed, with roughly half finding price increases and half finding no price effects. The findings of these studies are very sensitive to the modelling assumptions made by researchers (such as how to model the counterfactual, or specification of the time period in which merger effects take place).

¹³ Elzinga, K.G. and Hogarty, T.F. (1973), 'The Problem of Geographic Market Definition in Antimerger Suits', *Antitrust Bulletin*, **18**, pp. 45–81.

¹⁴ A special issue of the *International Journal of the Economics of Business* (February 2011) is devoted to recent findings in hospital merger analysis. In that issue, Ashenfelter, O., Hosken, D., Vita, M. and Weinberg, M. (2011), 'Retrospective Analysis of Hospital Mergers', *International Journal of the Economics of Business*, **18**:1, pp. 5–16, discusses the implications of recent ex post merger analysis for prospective merger analysis in hospital markets.

¹⁵ Peters, C. (2006), 'Evaluating the Performance of Merger Simulation: Evidence from the US Airline Industry', *Journal of Law and Economics*, **49**, pp. 627–49; Weinberg, M. and Hosken, D. (2008), 'Using Mergers to Test a Model of Oligopoly', Working Paper; Weinberg, M. (forthcoming), 'More Evidence on the Performance of Merger Simulations', *American Economic Review Papers and Proceedings*.

If you have any questions regarding the issues raised in this article, please contact the editor, Dr Gunnar Niels: tel +44 (0) 1865 253 000 or email g_niels@oxera.com

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