Efficiencies Analysis: False Dichotomies, Modeling, and Applications to Health Care[*]

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1. Introduction

It's an honor to be invited to participate at this conference and to be among so many distinguished thinkers on antitrust issues. This conference is focused on efficiencies analysis in antitrust, and appropriately so. It's a very important area, and one that deserves attention. In this speech I want to make two main points: 1) conceptually there is no real dichotomy between competitive effects and efficiencies analysis, and this is important in guiding our thinking; and 2) economists should devote more attention to the modeling of efficiencies. Last, I want to discuss health care antitrust, as I think these issues are particularly salient and relevant in that sector, and that health care will help us learn about them more generally.

2. Efficiencies vs. Competitive Effects: A False Dichotomy

Much of the discussion of efficiencies in antitrust takes place as if efficiencies analysis and competitive effects analysis are two separate enterprises, conducted on parallel paths, and then brought together at the end to be weighed on a scale to see which tips the balance.

There is some accuracy to this perception. It's often how it's done in practice. However, I want to ask you to step back from that and consider what the goal of economic analysis of an antitrust matter is. The question that we're really asking is whether a merger or some type of conduct makes consumers better off. That means looking at all of the impacts, positive and negative, and assessing their collective impact.

Competitive impacts can't be fully assessed without assessing efficiencies. Put simply, pricing depends on marginal costs. If a merger (or some other action by firms) results in lower marginal costs, then that alters the firm's profit maximizing price. In particular, in a differentiated product oligopoly, which is very frequently the kind of market that is our focus, a change in marginal costs changes firms' best response functions and therefore changes equilibrium prices.[1] As a consequence, if we're considering the impact of a merger on prices we really should take into account any impacts on marginal costs.[2]

Now, this isn't really news. We do pass-through analysis when possible: we estimate (or simulate) the extent to which cost savings will get passed through to consumers in the form of lower prices.[3] However, in practice it's often the case that we're unable to do this.

In these situations we do the practical thing: we assemble the evidence on competitive effects and we assemble the evidence on efficiencies and then we proceed. This is a perfectly fine thing to do. In some matters this is easy: either there's little or nothing in the way of efficiencies or little or nothing in the way of competitive effects. But that's not where the rubber hits the road. The difficult matters are where there are some nontrivial efficiencies and some evidence of real competitive harms.

This is a real challenge, but there are some things, while not easy, that I think we can do. Having a coherent unified framework for thinking about efficiencies and competitive impacts is important because it reminds us of what we're really focused on, which is total impacts, and that means how efficiencies (if any) end up affecting consumers. It also provides discipline and structure for thinking about the issues and in particular in asking what information/evidence is informative. In particular, it can be very helpful for us in developing new methods for measuring and assessing the impacts of efficiencies.

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[1] The extent of the pass-through will depend on the shape of demand curves, see L. Froeb, S. Tschantz, and G.,Werden, 2005. *Pass through rates and the price effects of mergers*, International Journal of Industrial Organization. 23. 703-715.

[2] The 2010 Horizontal Merger Guidelines explicitly state: "To make the requisite determination, the Agencies consider whether cognizable efficiencies likely would be sufficient to reverse the merger's potential to harm customers in the relevant market, e.g., by preventing price increases in that market." U.S. Department of Justice and the Federal Trade Commission, 2010. *Horizontal Merger Guidelines*, 30-31 (http://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf).

[3] A structured alternative to pass-through analysis is to use the approach developed by Gregory Werden, to back out the the magnitude by which costs would have to decrease in order to keep prices at pre-merger levels (given pre-merger diversions and margins). See G. Werden, 1996. *A Robust Test for Consumer Welfare Enhancing Mergers Among Sellers of Differentiated Products*, Journal of Industrial Economics. 44. 409-413.

3. Modeling Efficiencies

An important thing that we as economists can do is to devote effort to modeling efficiencies. A great deal of effort over a long period of time has gone into modeling competitive effects, and we've gotten pretty good at this. We have more complete (and sometimes complicated) models we can estimate if we have enough data and time,[4] and we have quicker and easier summary measures derived from underlying models that we can use when we have more limited time or data.[5] Economists have been very clever and inventive in developing new approaches in this area.

It should be possible to make progress on modeling efficiencies, just as we made progress on modeling competitive effects. It won't be easy, but I think we can do the same on the efficiencies side.

There are some scientific literatures we can draw on in developing new approaches to modeling efficiencies. Back in the 1970s and 1980s economists put a lot of effort into developing econometric methods in order to learn about the nature of production (and cost).[6] These efforts were inspired in part by the need to understand the structure of costs in regulated industries (e.g., utilities, transportation, health care). Economic theory helped provide a framework for analysis and econometric methods were developed or adapted. The discipline has

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[4] A. Nevo, 2000. *Mergers with differentiated products: the case of the ready-to-eat cereal industry*, RAND Journal of Economics. 31. 395–421; G. Werden and L. Froeb, 1994. *The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy*, Journal of Law, Economics and Organization. 10. 407–26; J. Hausman, G. Leonard and J. Zona, 1994. *Competitive analysis with differentiated products,* Annales d'Economie et de Statistique. 34. 159–80; R. Epstein and D. Rubinfeld, 2001. *Merger Simulation: A Simplified Approach with New Applications*, Antitrust Law Journal. 69. 885.

[5] J. Farrell and C. Shapiro, 2010. *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition,* Berkeley Electronic Press Journal of Theoretical Economics. 10.; S. Salop and S. Moresi, 2009. *Updating the Merger Guidelines: Comments,* Public Comment to Horizontal Merger Guidelines Review Project available at http://www.ftc.gov/os/comments/horizontalmergerguides/545095-00032.pdf.; S. Jaffe and E. G. Weyl, 2013. *The First-Order Approach to Merger Analysis*, American Economic Journal: Microeconomics. 5. 188–218; O.D. Yaa, A. Antwi, M. Gaynor, and W.Vogt, *A Competition Index for Differentiated Products Oligopoly with an Application to Hospital Markets,* unpublished paper found at http://www.krannert.purdue.edu/faculty/smartin/ios/gaynor.pdf

[6] D. McFadden and M. Fuss, ed., 1978. Production Economics: A Dual Approach to Theory and Applications. Vol. I, 2-109, (North Holland: Amsterdam); W. E. Diewert, 1971. *An Application of the Shephard Duality Theorem: A Generalized Leontief Production Function*, Journal of Political Economy. 79 (3). 481-507; D. Caves, L. Christensen, & M. Tretheway, 1980. *Flexible Cost Functions for Multiproduct Firms*, Review of Economics and Statistics. 62. 477-881; L. Lau, 1972. *Profit Functions of Technologies with Multiple Inputs and Outputs*, The Review of Economics and Statistics. 54. 281-289; W. Baumol, J. Panzer, & R. Willig, 1982. Contestable Markets and the Theory of Industry Structure, Rev. ed. 1987 (Harcourt Brace Jovanovic, San Diego).

largely moved on to other problems and issues, but it may be time to return to this area, but with some new perspectives.

One of those new perspectives that should be useful is the economics of organizations (perspectives from the related disciplines of management and finance and accounting should be useful as well). This is a still somewhat small, but growing area in economics that has developed substantially over the last 20 years or so.[7] The economics of organizations goes inside "the black box" and tries to understand why there are differences across firms in productivity and costs by understanding how organizations work and what makes them function better. Examples of the kinds of factors that are considered are incentive pay for workers, how partnerships share profits, human resources practices, contractual relations, the impacts of risk, and the boundaries of the firm. As a matter of fact, I wrote my dissertation many years ago (there's no truth to the rumor that it was inscribed on cuneiform tablets) on the implications for productivity of how partnership firms divided up profits, as well as how many partners they chose to have (spoiler alert – they matter). These sorts of insights can be brought to bear on efficiencies analysis, potentially by being incorporated with (or into) econometric models of production or costs.[8]

Now, these are simply some initial thoughts on what might be some fruitful avenues to explore. I'm not sure what the approaches will be, nor do I want to prejudge what will be the most useful.

I do have a couple of additional thoughts to offer on methodology. One, returning to my earlier point, approaching this from the perspective of total impacts can be quite useful. A total impacts analysis looks at demand, costs, and prices. Since these are all linked through firms' choices and market equilibrium, information from part of the system (e.g., demand, price) can help to identify what's happening in another part (e.g. costs, or vice versa).[9] Second, the ability to look at consummated mergers can help to develop these tools and understand how well

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[7] See J. Rebitzer and L. Taylor, 2011. *Extrinsic Rewards and Intrinsic Motives: Standard and Behavioral Approaches to Agency and Labor Markets*, in D. Card & O. Ashenfelter, ed., Handbook of Labor Economics, (Amsterdam:Elsevier), 701-772; E. Lazear and K. Shaw, 2007. *Personnel Economics: The Economist's View of Human Resource*, Journal of Economic Perspectives, 21, 91-114; R. Kosová, F. Lafontaine and R. Perrigot, 2013. *Organizational Form and Performance: Evidence from the Hotel Industry*, The Review of Economics and Statistics, 95, 1303-1323.

[8] M. Gaynor and M. Pauly, 1990. *Compensation and Productive Efficiency in Partnerships: Evidence from Medical Group Practice*, Journal of Political Economy, 98. 544-573.

[9] As mentioned previously, Gregory Werden employs this approach. *supra* note 3.

they work.[10] The advantage of consummated mergers is obviously that we can see post-merger prices, but we can also see post-merger demand patterns, and in some cases also have data on costs. There are a number of industries which have experienced a fair number of mergers and for which there are good data. These include health care, pharmaceuticals, retail consumer products, and supermarkets. The ability to use information on what happened post-merger where there are multiple mergers and multiple markets will be very helpful in estimating and refining models.

4. Health Care

Let me now talk briefly about health care and what we can learn from it. As you probably know, health care is one of the largest sectors in the US economy, occupying almost one-fifth of GDP (this makes the US health care sector roughly the size of the entire economy of France). Health care, and even its major constituent components, hospital and physician services, is substantially larger than almost all other industries in the US economy, e.g., computer and electronic products (1.29%), broadcasting and telecom (2.5%), and even brewing (0.11%). Its size alone makes one take notice, but of course the key factor is that health care, and how well the sector functions, can have a fundamental impact on the quality of our lives.

You probably will not be surprised to hear that health care is an industry in which the FTC has been very active. There is a great deal of ferment in the industry. Market participants feel a great deal of pressure to change and are merging and combining at a dizzying rate. There were 314 hospital mergers in the US from 2009-2012, with the number increasing every year over that period. The greatest area of competition enforcement activity for the FTC over the period 2009-2013 was health care (32%), and health care combined with pharmaceuticals amounted to almost half of all of our enforcement activity (46%).[11] Some of these mergers or combinations may generate greater efficiency and some may reduce competition. We need to be able to distinguish between those that benefit consumers and those that cause them harm. In order to do so we have to grapple with efficiencies and we have the opportunity to do so.

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[10] For example, a recent study investigated the net impact of a beer merger, considering the combined effects of distribution and shipping efficiencies with the price effects due to increased concentration. See O. Ashenfelter, D. Hosken and M. Weinberg, 2013. *Efficiencies Brewed: Pricing and Consolidation in the US Beer Industry*. Working Paper No. 19353 Cambridge, MA: National Bureau of Economic Research.

[11] Federal Trade Commission, Annual Highlights: Stats & Data, http://www.ftc.gov/reports/annual-highlights-2013/stats-data-2013 (2013)

We have very good evidence on competitive effects in health care, particularly for hospitals. It's well established that hospital mergers in concentrated markets can lead to price increases of 20, 30, 40, 50 percent.[12] This comes from research done by FTC economists and by academics – the results are very consistent across differing researchers and differing methods. There is also evidence that the quality of care delivered by hospitals (usually measured as patient mortality) is better in less concentrated markets. We do have some evidence on efficiencies in this sector, although not as much as on competitive effects. The available evidence doesn't show much support for reduced costs or increased quality due to hospital mergers.[13]

So this is an important area for antitrust, but not just because there are a lot of mergers. It's important because health care is a very large part of the economy, and how well it functions has a large impact on our welfare. In particular, the US health care system is based on markets, so the system will only function as well as the markets that undergird it. This also applies to the reforms embodied in the Affordable Care Act (ACA). The ACA is built upon the foundation of the existing health care system. The core of the ACA is the extension of insurance coverage (private, Medicaid) to the (previously) uninsured, who will obtain care in health care markets. As a consequence, the success of the ACA depends on health care markets, and antitrust is a key component in helping those markets to work as well as possible.

Returning to the theme of efficiency analysis, there is increased emphasis on efficiencies in health care matters. There have been calls for greater coordination among health care providers in order to improve the quality of care for patients and to reduce costs. Changes in the way hospitals and doctors are paid may result in them bearing more risk and may encourage different forms of organization. Merging parties are claiming such efficiencies. Antitrust enforcers are faced with the challenge of evaluating these claims, including whether a merger is necessary

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[12] D. Haas-Wilson and C. Garmon, 2011. *Hospital Mergers and Competitive Effects: Two Retrospective Analyses*, International Journal of the Economics of Business, 18. 17-32; S.Tenn, 2011. *The Price Effects of Hospital Mergers: A Case Study of the Sutter-Summit Transaction*, International Journal of the Economics of Business, 18. 65-82; A. Thompson, 2011. *The Effect of Hospital Mergers on Inpatient Prices: A Case Study of the New Hanover-Cape Fear Transaction*, International Journal of the Economics of Business 18. 91-102; C. Capps, D. Dranove and M. Satterthwaite, 2003. *Competition and Market Power in Option Demand Markets*, RAND Journal of Economics 34. 737-763; M. Gaynor and W. Vogt, 2003. *Competition Among Hospitals,* RAND Journal of Economics 34. 764-785.

[13] M. Gaynor and R. Town, 2012. *The Impact of Hospital Consolidation-Update*, The Synthesis Project, Robert Wood Johnson Foundation;. W. Vogt and R. Town, 2006. *How has Hospital Consolidation Affected the Price and Quality of Hospital Care?,* Robert Wood Johnson Synthesis Report; D. Dranove and R. Lindrooth, 2003. *Hospital Consolidation and Costs: Another Look at the Evidence*, Journal of Health Economics 22. 983-997.

to achieve the claimed efficiencies. This was front and center in the recently decided St. Luke's case, although it's also been key in recent hospital merger cases as well.[14] Efficiencies were a key component of the parties' defense, and were taken seriously by the FTC and by the court.[15]

It's critically important to be able to evaluate these claims. On the one hand, this is particularly challenging in health care, both because efficiency is multi-faceted (because of the importance of quality), and because there's so much activity and ferment in health care organizations. On the other hand, there are a lot of data in health care, and there is a great deal of work being done to develop new and better measures of quality and to try to understand organizational factors.[16]

In my view what's going on in health care encapsulates the issues surrounding efficiency, and provides us with the opportunity to get some traction on them. Some of the aspects are specific to health care, but I believe that there's a great deal we can learn in general and apply to matters that arise in other industries. So health care provides us with the challenge and the opportunity to advance our modeling and measurement of efficiencies, but most importantly our understanding of how to assess and incorporate them into economic analysis of antitrust issues.

5. Conclusion

In conclusion, I want to thank Bert Foer and AAI for organizing this conference and inviting me to speak, and to you for giving me the opportunity to share some thoughts with you on future directions for efficiencies analysis. I think this is both an important area and one where there can be fruitful research. I look forward to future occasions of this conference and hearing the results of the progress we've made. Thank you.

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[14] Federal Trade Commission, In the Matter of Evanston Northwestern. Healthcare Corp., No. 9315, www.ftc.gov/os/adjpro/d9315/070806opinion.pdf (August 6, 2007)

[15] Federal Trade Commission, *Federal Trade Commission v. St. Luke's Health System, Ltd.*, Findings of Fact and Conclusions of Law, Case No. 1:13-CV-00116-BLW (D. Idaho Jan. 24, 2014)

[16] The FTC has made progress in modeling efficiencies in health care. Romano and Balan developed a conceptual framework for evaluating efficiency claims in health care and implement it using data from the Evanston/Northwestern hospital merger. See P. Romano and D. Balan, 2011. *A Retrospective Analysis of the Clinical Quality Effects of the Acquisition of Highland Park Hospital by Evanston Northwestern Healthcare*, International Journal of the Economics of Business 18:1. 45-64.