

*U*nresolved questions
relating to market definition
in hospital mergers

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It is generally recognized that market definition by itself does not provide guidance regarding the likely competitive effects of a merger, but, rather, provides the framework in which to assess the likelihood that a merger will facilitate the anticompetitive exercise of market power. Due to academic scholarship and to work by the FTC to attempt to assess the “direct effects” of consummated hospital mergers, market definition has become a less contentious and dispositive issue in the antitrust assessment of hospital mergers. In this article, we discuss remaining controversies related to both product and geographic dimensions of market definition in hospital mergers. We discuss why a traditional interpretation of hospital product markets may be inconsistent with the ongoing evolution of how health care is delivered. We also discuss the econometric methodologies that have recently been used to assess competition between hospitals, and provide some cautionary notes regarding their reliability.

KEY WORDS: *antitrust, hospital competition, hospital mergers, market definition, willingness-to-pay, diversion ratios, health care reform*

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I. INTRODUCTION

Federal and state antitrust enforcers lost seven consecutive challenges to hospital mergers during the 1990s. These losses, which reversed an earlier string of successes, are often attributed to courts accepting the merging hospitals' defense that they competed for patients in broad geographic areas—sometimes encompassing thousands of square miles—that contained a multitude of “competing” hospitals. As a result, the courts evaluating the likely competitive effects of these mergers never needed to venture much beyond the threshold market definition and market structure questions to reach their decisions.

Since then, due to efforts of the U.S. Federal Trade Commission (FTC) as well as academic scholarship, market definition has become a less contentious and dispositive issue in the antitrust assessment of hospital mergers. In an effort to reinvigorate hospital merger enforcement—in part by testing the courts' conclusions regarding the breadth of hospital geographic markets—in 2003 the FTC launched retrospective reviews of several consummated hospital mergers. These retrospective reviews claimed to assess “direct evidence” of competitive effects rather than beginning with market definition, as is customary in prospective antitrust analyses of hospital mergers. This direct evidence generally involved comparisons of price changes at the merging hospitals with price changes at supposedly otherwise comparable facilities.

These retrospective reviews led the FTC to challenge the 2000 acquisition of Highland Park Hospital by Evanston Northwestern Healthcare (now NorthShore University HealthSystem) based, in part, on an argument that, following the merger, prices had increased at the merging hospitals at a faster rate than prices had increased at comparison hospitals. In its 2004 challenge,¹ the FTC argued that its ability to measure the price effects of the merger—by comparing price changes at the merging hospitals with price changes at allegedly comparable

¹ Complaint at 3, *In re Evanston Nw. Healthcare Corp.*, No. 9315 (F.T.C. filed Feb. 10, 2004) (“The existence of this relevant geographic market is evidenced, among other things, by the ability of [Evanston Northwestern Healthcare], once it controlled Highland Park as well as the Evanston and Glenbrook hospitals, profitably to impose significant and non-transitory price increases upon private payers in their purchase of acute care hospital services at those hospitals.”). See also *In re Evanston Nw. Healthcare Corp.*, No. 9315 (F.T.C. Aug. 6, 2007).

hospitals—implied that delineating the market in which anticompetitive behavior was alleged to have occurred was unnecessary. While the FTC's complaint did define a geographic market, it justified its definition (a compact area within a triangle with the three merging hospitals at the vertices) largely based on its finding of higher-than-average price increases, rather than on more traditional types of evidence typically considered in defining geographic markets for hospitals.²

It is generally recognized that market definition by itself does not provide guidance regarding the likely competitive effects of a transaction. Rather, it provides the framework in which to measure market structure and to assess the likelihood that a merger will enable the merging parties to increase prices, reduce output, or decrease the quality of the services they provide. Market definition and market structure also provide a useful context to assess other evidence of the likely competitive effects of a merger, including the types of evidence enumerated in the 2010 Horizontal Merger Guidelines. As has been widely noted, the updated Merger Guidelines de-emphasized the role of market definition as the necessary predicate for any analysis of a merger's competitive effects, citing a variety of types of evidence that may be useful in performing the prospective analysis necessary to evaluate an unconsummated merger.³

² See Gregory Adams & Monica Noether, *Comment on 'Hospital Mergers and Competitive Effects: Two Retrospective Analyses'*, 18 INT'L J. ECON. BUS. 33 (2011) (noting that inferring competitive harm from relative price changes requires separating the effect of the merger on prices from all other market dynamics that might lead to changes in prices (or whatever other outcome is being measured)). In practical terms, it is difficult to define a control group sufficiently similar to the merging parties to be able definitively to rule out alternative explanations, although Garmon and Haas-Wilson argue that consistent findings of supracompetitive price increases using multiple control groups is one way of addressing this concern. Their alternative control groups, however, were quite similar to each other, and, therefore, did not represent independent tests. See Deborah Haas-Wilson & Christopher Garmon, *Hospital Mergers and Competitive Effects: Two Retrospective Analyses*, 18 INT'L J. ECON. BUS. 17 (2011).

³ U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES § 4 (2010) [hereinafter 2010 GUIDELINES] ("The Agencies' analysis need not start with market definition. Some of the analytical tools used by the Agencies to assess competitive effects do not rely on market definition, although evaluation of competitive alternatives available to customers is always necessary at some point in the analysis.").

Regardless, courts still appear to expect markets to be defined. The FTC has defined a market in all of the hospital mergers it has challenged since the Evanston-Highland Park merger, and, to our knowledge, no case (at least involving hospitals) has been decided without the context of a defined market. Even in the FTC's post-consummation challenge to the Evanston-Highland Park merger, the administrative law judge ruled only on the count that included a defined market while declaring the FTC's attempt to prove anticompetitive effects without a defined market as moot.⁴ The FTC's subsequent opinion opened up the possibility for future cases that did not rely on market definition, but it did not explicitly support the count based solely on anticompetitive effects.⁵

In this article we discuss both product and geographic dimensions of market definition in hospital mergers, but acknowledge that, historically, geographic market definition has been more controversial than product market definition. This is perhaps because the geographic component of defining a market for hospital services has tended to be a more important determinant of market shares and concentration than the product component. That is, expanding the size of the geographic market may introduce additional competitors, which may, in turn, significantly decrease the shares of the merging hospitals. However, expanding the set of services included in the product market typically has a smaller effect on market shares since even mid-sized hospitals can offer a range of primary, secondary, and tertiary inpatient, outpatient, and ancillary services. In some recent cases, however, and with the increasing trend toward integrated delivery systems, product market questions are also becoming more controversial.

The remainder of this article is organized as follows. In the next section, we briefly highlight a few unresolved issues related to prod-

⁴ *In re Evanston Nw. Healthcare Corp.*, No. 9315, at 200 (Oct. 20, 2005) (initial decision). Both Counts I and II of the *Evanston* complaint alleged that the merger represented a violation of section 7 of the Clayton Act, but Count I did so in the context of defined product and geographic markets, while Count II relied solely on evidence of anticompetitive effects.

⁵ *Evanston*, No. 9315, at 88 ("Consequently, we do not rule out the possibility that a future merger case may lead us to consider whether complaint counsel must always prove a relevant market.").

uct market definition in hospital mergers, and discuss why a narrow interpretation of product markets may be inconsistent with changes in how health care is delivered. In section III, we describe the methodologies that have been applied to defining geographic markets, including newer tools that reflect the interactions between hospitals and two types of consumers they compete to attract: managed care organizations (MCOs) and patients. We explain how these tools are currently used both to define markets and to assess competitive effects. We also provide some cautionary notes regarding their reliability. While it is apparent that the broad geographic markets adopted by the courts in their 1990s rulings are no longer commonly proffered by merging hospitals, the debate over the appropriate analytic tools used to identify competitors to merging hospitals remains lively.

II. PRODUCT MARKET DEFINITION

A. *Traditional product market definition approach*

Since 1989, courts have followed the district court's finding in *United States v. Rockford Memorial Corp.*, "that acute inpatient hospital care is the economically significant submarket of the healthcare industry that should be analyzed for purposes of determining the competitive effect of the defendants' consolidation."⁶ In recent years, this market has often been further restricted to focus only on general acute care inpatient services (GAC services)⁷ sold to *commercial* MCOs (that is, GAC services sold to government payors like Medicare and Medicaid are excluded from the product market, as are services directly billed to consumers who lack health insurance).⁸

⁶ *United States v. Rockford Mem'l Corp.*, 717 F. Supp. 1251 (N.D. Ill. 1989).

⁷ The focus on *acute* care inpatient services typically results in the exclusion of inpatient rehabilitation, psychiatric, substance use disorder, and long-term care services.

⁸ It is increasingly common that MCOs insure not only commercial patients, but also those covered by Medicare and Medicaid, and, most recently, participants in the new health insurance exchanges. While the FTC definition of commercial patients is vague, the term "commercial" in this context is generally limited to employment-based or direct-purchase (that is, individual) insurance.

While antitrust product markets are usually limited to services that are viewed by consumers as demand-side substitutes, most agree that it is appropriate to define hospital product markets to encompass a cluster of services that are not substitutable by patients; for example, hip replacements and treatment for pneumonia are not demand-side substitutes. This cluster-market approach reflects the fact that common inputs are used to provide the range of GAC services (that is, they are supply-side substitutes), and even if a hospital does not currently provide a particular type of acute care inpatient service, it could often rapidly offer that service in response to an anticompetitive increase in the price of the service. Moreover, while patients cannot substitute particular services under the GAC umbrella for one another, patients sometimes seek hospital care not fully knowing what particular services they require. In addition, MCOs—typically the primary customer on whom the antitrust agencies focus their investigations—generally purchase the entire bundle of GAC services from the hospitals with which they contract. Perhaps most importantly, competitive conditions tend to be similar for all the particular services within the GAC cluster, and, therefore, these services can be combined as a matter of analytical convenience.

B. Remaining product market controversies

One area of disagreement on product market definition in hospital mergers relates to the narrow focus on services provided to members of commercial MCOs. In recent years, the FTC has adopted a product market definition that is limited to GAC services sold to commercial MCOs (and their customers) in its challenges of hospital mergers, but this has been disputed by hospitals, and even the FTC has not limited its focus in other health care matters.⁹ While these may be the only

⁹ The FTC's proposed product markets in numerous recent challenges to hospital mergers all alleged a market limited to services sold to "commercial health plans." See Complaint, Fed. Trade Comm'n v. Inova Health Sys. Found., No. 061-0166 (E.D. Va. May 12, 2008); Complaint, *In re ProMedica Health Sys., Inc.*, No. 9346 (F.T.C. Jan. 6, 2011); Complaint, F.T.C. v. OSF Healthcare Sys. No. D-9349 (F.T.C. Nov. 18, 2011); Complaint, *In re Reading Health Sys.*, No. 121 0155 (F.T.C. Nov. 16, 2012); and Complaint, Fed. Trade Comm'n v. St. Luke's Health Sys., No. 121 0069 (F.T.C. Mar. 26, 2013). However, the F.T.C.'s challenge to Renown Health's acquisition of two cardiology

consumers for whom price competition is relevant, hospitals compete on multiple dimensions, including clinical quality, service, amenities, medical staffs, and availability of new technology. These dimensions of nonprice competition are relevant for all consumers of hospital services, and, therefore, the effects of a merger (either pro- or anticompetitive) along these dimensions are relevant for all consumers. Limiting the product market to services sold to commercial MCOs risks ignoring these effects. For example, if a merger enhances clinical quality because it enables the installation of a state-of-the-art electronic medical record system or clinical program at a smaller hospital that otherwise would not have found such an investment to be affordable from either a capital or operating cost perspective, this upgrade will benefit all of the hospital's patients, not just those who are insured by price-sensitive commercial MCOs.¹⁰

Moreover, the limited focus on commercial MCOs ignores the increasing number of Medicare and Medicaid beneficiaries who are also enrolled in managed care plans. About one third of all Medicare beneficiaries are currently enrolled in Medicare Advantage plans, and approximately three-quarters of Medicaid beneficiaries are insured through a managed care plan. In addition, the new health insurance exchanges (which are ultimately expected to cover many formerly uninsured patients) offer only managed care plans. As a result, as health care markets continue to evolve, the majority of hospitalized patients will likely be covered through some type of managed care plan

groups described the product market only as "adult cardiology services," with no limitation to those services sold to commercial health plans. *See* Complaint, *In re Renown Health*, No. 1110101 (F.T.C. Aug. 6, 2012).

¹⁰ Similarly, the F.T.C. ordered a remedy in *Evanston* that stopped short of requiring divestiture because it recognized that "this is a case in which a critical improvement was made to Highland Park after the merger was consummated (namely, the development and implementation of a cardiac surgery program). The record reflects that divestiture of Highland Park could have a substantial negative impact on Highland Park's cardiac surgery program." *In re Evanston Nw. Healthcare Corp.*, No. 9315, at 11 (Apr. 24, 2008) (opinion of Comm'r J. Thomas Rosch). While the Commission argued that the long time period between the merger's consummation and final resolution of the matter led the Commission to its unusual behavioral remedy, it did effectively acknowledge the breadth of the benefits the merger established.

that negotiates prices with hospitals. The agencies' justification for a narrow focus only on commercial health plans will become increasingly less relevant as other segments of the insured population will also be affected by price negotiations between MCOs and hospitals.

Another area of disagreement involves the focus of some hospital merger challenges on particular categories of inpatient services falling within the broad GAC market cluster. For example, in its challenge of ProMedica Health System's acquisition of St. Luke's Hospital,¹¹ the FTC alleged a product market limited to inpatient obstetrical services in addition to asserting a standard market for all GAC services. In so doing, the FTC noted that, unlike many other GAC services that were provided by four competing providers in its alleged geographic market of Lucas County, Ohio, inpatient obstetrical services were provided by only three, including both ProMedica and St. Luke's. Therefore, the FTC claimed, the market dynamics warranted separate analysis.¹² The administrative law judge hearing the case disagreed, noting that no previous hospital merger case recognized a separate product market for obstetrical services and there was no basis to separate obstetrical services because the MCOs in the area contracted for these services as part of the entire bundle of GAC services (and there was no evidence that hospitals could price discriminate for obstetrical services). The Commission majority and the U.S. Court of Appeals for the Sixth Circuit, however, sided with the FTC staff, noting the differences in competitive conditions for obstetrical services.

Such an argument, if taken literally, could rapidly lead to a service-specific analysis as other competitive differences across specific GAC services could also be used to argue that a much more detailed assessment of individual hospital services is appropriate. For instance, it has been widely observed that patients travel further for more complex services. Competing hospitals' medical staffs may vary

¹¹ Complaint, *Promedica*, *supra* note 9, at 4–7.

¹² Obstetrics is also among the hospital service lines most commonly used by the segment of the population subject to the FTC's focus, members of commercial MCOs who are largely working-age individuals and their families. As a result, if the merger were to have anticompetitive consequences in any service line, it would be obstetrics, where those effects would impact the greatest number of consumers.

systematically by specialty and this variation could also affect the nature of competition for different services provided by hospitals. Perceived or actual quality differences across hospitals may influence their respective competitive strengths in particular service lines. In a differentiated product market, such as inpatient hospital services, many factors affect the particulars of the competitive environment faced by any particular competitor. As Commissioner Rosch noted in his concurring opinion in *ProMedica*, defining a separate product market for obstetrics is redundant because such services are already included in the market for GAC services, and, in so doing, “the Commission would not only depart from the case law, but also risk accusations of ‘gerrymandering’ the relevant product market so as to make it more susceptible to a structural presumption of liability.”¹³ Such an argument often applies to other service lines or submarket definitions.

While there is no apparent uniform approach that the FTC uses to identify certain specific services as subjects of concern (while generally maintaining its position that an overall GAC product market is appropriate), the FTC has sometimes excluded tertiary or quaternary services from the product market in hospital mergers.¹⁴ In the Evanston–Highland Park merger, the Commission found that tertiary services were properly included in the product market, despite the fact that Highland Park Hospital provided a much narrower range of services than did Evanston Hospital, but departed from this in its decision in *ProMedica*. Generally, the arguments concerning the exclusion of tertiary and quaternary services are similar to the arguments described above: On the one hand, the competitive conditions for the provision of those services may be different (that is, fewer hospitals provide complex services), while on the other hand, MCOs tend to contract for the entire cluster of GAC services, including tertiary and quaternary services. The inclusion of tertiary and quaternary services

¹³ Commissioner Rosch dissented with respect to market definition, agreeing with the reasoning of the administrative law judge. *In re ProMedica Health Sys., Inc.*, No. 9346, at 1–2 (F.T.C. Mar. 28, 2012) (opinion of Comm’r J. Thomas Rosch).

¹⁴ Notwithstanding this, there is no generally accepted definition for the particular services that are considered to be tertiary, complex tertiary, or quaternary.

in the product market is also relevant for geographic market definition because, as mentioned above, patients tend to travel farther for those services, so their inclusion in the product market may appear to increase the breadth of the geographic market.¹⁵

Vertically integrated organizations comprising acute care hospitals and affiliated physicians combined with health plans also pose interesting questions for product market definition. For example, Kaiser Permanente (Kaiser) covers more than 9 million members with health plans that generally restrict members to receiving care from its 38 hospitals and 17,000 physicians.¹⁶ Other MCOs cannot contract with Kaiser-owned hospitals, and therefore, from an MCO's perspective, these facilities do not substitute for other hospitals. However, consumers or employers can certainly choose Kaiser's health plan to gain access to its hospitals. As a result, hospitals in geographic proximity to a Kaiser hospital often view themselves as competing with the Kaiser facility for patients, since an increase in the number of consumers enrolled in a Kaiser health plan will lead to a decrease in the number of patients seeking care at these hospitals. (These hospitals also compete with Kaiser for physicians who have a choice of employment by Kaiser Permanente Medical Group or affiliation with other medical groups and hospitals in the area.¹⁷ Moreover, local

¹⁵ The differentiation of the services provided by hospitals and the resulting competition they face for different services also requires a careful analysis of geographic market questions.

¹⁶ Kaiser Permanente, *Fast Facts about Kaiser Permanente*, <http://share.kaiserpermanente.org/article/fast-facts-about-kaiser-permanente/>. In some areas of the country, Kaiser Permanente does not operate hospitals, but instead offers narrow provider networks that include a limited number of other hospitals and select groups of affiliated physicians.

¹⁷ Kaiser's website devotes a section to Physician Careers, which states that employment with the Kaiser Medical Group "offer[s] the opportunity to advance your career in a patient-focused practice that encourages professional autonomy, values cross-specialty collaboration and emphasizes work-life balance." Kaiser Permanente, Physician Careers, <http://paulroesner.com/clients/kaiser-national/kaiser-home.html>. See also Student Doctor Network, *Thoughts on Kaiser Permanente??*, Discussion in "Practicing Physicians" started July 25, 2009, [http://forums.studentdoctor.net/search/2314691/?q=Kaiser&o=date&c\[node\]=511](http://forums.studentdoctor.net/search/2314691/?q=Kaiser&o=date&c[node]=511), which includes several pages of discussion regarding the pros and cons of working for Kaiser.

health plans clearly compete with Kaiser's health plans, and these dynamics affect their negotiations with local non-Kaiser hospitals.¹⁸ Consistent with the statement in the 2010 Horizontal Merger Guidelines that "[v]ertically integrated firms are also included [in the market] to the extent that their inclusion accurately reflects their competitive significance,"¹⁹ these market dynamics suggest that Kaiser facilities (as well as the hospitals affiliated with other vertically integrated provider–health plan organizations) should be included as providers in the GAC product market. Similarly, in its ruling regarding California's challenge to the Sutter Health System's acquisition of Summit Hospital, the district court found that Kaiser's hospitals compete in the market for inpatient GAC services.²⁰

While Kaiser is the best-known example of a vertically integrated health system that combines providers into an MCO, there are an increasing number of other examples. In Pittsburgh, for example, the largest hospital system, University of Pittsburgh Medical Center, also offers an MCO, while Highmark, the largest MCO in western Pennsylvania, recently acquired the second-largest hospital system in the area, so that it too could compete as a vertically integrated entity. As health care reform initiatives—both publicly sponsored through the Affordable Care Act and privately fostered by cost-sensitive employers—expand, this trend toward vertical integration is likely to increase.²¹

Changes in the health care industry related to various public and private sector–initiated reforms have the potential to alter significantly the context in which product market definition issues are con-

¹⁸ See Paul Markovich, *A Global Budget Pilot Project Among Provider Partners and Blue Shield of California Led to Savings in First Two Years*, 31 HEALTH AFF. 1969 (2012) (describing how Blue Shield of California teamed up with a hospital system and large physician group to create an integrated system that shared risk in a health plan product designed to compete directly with Kaiser's health plan products.)

¹⁹ 2010 GUIDELINES, *supra* note 3, § 5.1

²⁰ *California v. Sutter Health Sys.*, 84 F. Supp. 2d 1057, 1068 (N.D. Cal.), *aff'd*, 271 F.3d 846 (9th Cir. 2000).

²¹ A list of 100 health systems compiled in 2013 indicated that more than thirty percent operated health plans in addition to integrated provider (hospital, physician, and other ancillary) services. Sabrina Rodak, *100 Integrated Health Systems to Know*, BECKER'S HOSP. REV., May 15, 2013.

sidered. As noted above, the post-reform health care marketplace likely encompasses a greatly expanded role for vertically integrated health care systems, such as Kaiser, that provide “medical homes” for patients and are accountable both clinically and financially for delivering comprehensive care to these patients. Under this approach, providers are no longer reimbursed on a fee-for-service basis for individual services, but rather the integrated systems are paid fixed amounts to keep their patients healthy. In this world, hospitals will be considered as cost rather than revenue centers.²²

Not only will the recent decline in usage of hospital inpatient services likely continue,²³ the incentives of the integrated delivery systems that will own and operate hospitals are fundamentally changed relative to today’s revenue and margin-generating freestanding hospital facilities. While competition will surely continue to play a critical role in ensuring that health care services are delivered in a cost-effective manner, the historic evaluation of mergers that focuses solely on their effect on the prices that commercial MCOs negotiate for GAC services will not reflect the market dynamics faced by these inte-

²² See, e.g., Annie Lowrey, *A Health Provider Strives to Keep Hospital Beds Empty*, N.Y. TIMES, Apr. 23, 2013, http://www.nytimes.com/2013/04/24/business/accountable-care-helping-hospitals-keep-medical-costs-down.html?pagewanted=all&_r=0. This article describes Chicago-based Advocate Health Care’s reduction in hospital admissions by six percent and hospital days by nine percent in a patient population for which it collaborated with BlueCross BlueShield of Illinois in a risk-sharing arrangement.

²³ Recent data from the American Hospital Association show that inpatient days declined by 5.4% between 2008 and 2012, while inpatient admissions declined by 3.7% over the same time period. See, AM. HOSP. ASS’N, AHA TRENDWATCH CHARTBOOK tbl.3.1 (2014). A study focused on the Chicago Metropolitan Area found a 5% decline in overall inpatient admissions per 1000 population between 2010 and 2012, but substantially larger declines for “ambulatory care sensitive admissions” defined by the Agency for Health Care Research in Quality as cases that should be treatable in outpatient settings. Similarly, the study found larger declines in inpatient utilization for patients treated in an accountable care organization (ACO) model rather than a traditional model. Robert York, Kenneth Kaufman & Mark Grube, *Where Have All the Inpatients Gone? A Regional Study with National Implications*, HEALTH AFF. BLOG (Jan. 6, 2014, <http://healthaffairs.org/blog/2014/01/06/where-have-all-the-inpatients-gone-a-regional-study-with-national-implications/>).

grated systems. Rather, the efficiencies generated by merger-induced increases in scale and scope are becoming key business determinants. In particular, the new model of integrated delivery systems will have to rely on sophisticated health information systems, which generate substantial fixed costs both to implement and to operate, to coordinate care over a wide variety of provider types. Second, the delivery systems themselves will have to manage and internalize the incentives of all their constituent providers. While this can be done by contract, providers often thought to be most effectively integrated (commonly cited exemplars include Kaiser, Geisinger, Cleveland Clinic, Mayo Clinic and Intermountain) all operate several hospitals and employ large numbers of physicians. Finally, accountability for delivery of high quality, cost-effective care will require the ability to manage financial risk, so it is not surprising that several of these same entities also operate their own health plans. All of these new requirements imply substantial greater scale and scope to operate effectively than has historically been the case, in addition to calling into question the continued relevance of a narrow focus on GAC services.

III. GEOGRAPHIC MARKET DEFINITION

As noted in the introduction, questions surrounding the appropriate geographic contours within which to assess a hospital merger have generated substantial debate over the last three decades of hospital merger enforcement policy and have had a strong influence on the outcome of many challenges to hospital mergers.

A. *Traditional geographic definition*

In many of the failed merger challenges in the 1990s, the courts accepted defendants' arguments that hospitals compete over a wide geographic area. These arguments were often based on various analyses of inpatient discharge data that, for each hospital, provide information on where its patients reside. Elzinga and Hogarty²⁴ developed a commonly employed standard for defining geographic markets based on the "economic logic" that "a relevant market should comprise all the important demand and supply components that deter-

²⁴ Kenneth Elzinga & Thomas Hogarty, *The Problem of Geographic Market Delineation in Antimerger Suits*, 18 ANTITRUST BULL. 45 (1973).

mine the price in the market.”²⁵ As described in *Butterworth Hospital*, the Elzinga-Hogarty (E-H) test

[i]dentif[ies] an area around defendant hospitals (1) for which most of their admitted patients come, and (2) within which most residents remain for hospital care. The relevant geographic market is identified when each of these two measures reaches a minimum threshold percentage: 75% representing a weak market, and 90% representing a strong market.²⁶

Related analyses tie the results of the E-H test back to the hypothetical monopolist test described in the 2010 Merger Guidelines. This is done by arguing that the results of the E-H test imply that the likely patient loss ensuing from an anticompetitive attempt to raise hospital prices would exceed the “critical loss” that would make such an attempt unprofitable (in other words, a hypothetical monopolist in a putative geographic market could not profitably raise prices).²⁷ Conceptually, the critical loss is the smallest percentage reduction in demand for hospital services that would render an attempt to increase prices by some small but significant and nontransitory amount (often five percent) unprofitable. For a given price increase, the critical loss depends on the margins of the hospitals: for high-margin hospitals, the loss of relatively few of its highly profitable patients would make the price increase unprofitable, while low-margin hospitals would have to lose many more patients to make the price increase unprofitable. This critical loss is compared with the (estimated) actual loss in response to an increase in prices. If the actual loss exceeds the critical loss, the postulated price increase would be unprofitable and the geographic market should be expanded.²⁸

²⁵ Kenneth Elzinga & Anthony Swisher, *Limits of the Elzinga-Hogarty Test in Hospital Mergers: The Evanston Case*, 18 INT’L J. ECON. BUS. 1, 133 (2011).

²⁶ *FTC v. Butterworth Health Corp.*, 946 F. Supp. 1285 (W.D. Mich. 1996).

²⁷ Critical loss analysis was used to define geographic markets in at least two litigated hospital mergers during the 1990s: *United States v. Mercy Health Serv. Group*, 902 F. Supp. 968 (N.D. Iowa 1995), and *FTC v. Tenet Healthcare Corp.*, 186 F.3d 1045 (8th Cir. 1999).

²⁸ For a discussion and critique of critical loss analysis, see Michael L. Katz & Carl Shapiro, *Critical Loss: Let’s Tell the Whole Story*, ANTITRUST, Spring 2003, at 49, and Daniel P. O’Brien & Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST L.J. (2003). Katz and Shapiro note that

To calculate the actual loss, these analyses often identified “contestable” ZIP Codes for which it was argued that existing patient travel patterns (that is, if some patients residing in those ZIP Codes were discharged from hospitals outside a putative geographic market) indicated that even modest percentage increases in hospital prices would induce many other residents of the contestable ZIP Codes to seek hospitals in other areas for care. For example in *United States v. Mercy Health Services*,²⁹ the court found that while the two merging hospitals were the only substantial, full-service hospitals in a more than fifty-mile radius surrounding Dubuque, Iowa, they faced substantial competition from large hospitals located sixty to seventy-five miles distant because of the competition created through outpatient “outreach” clinics that the Dubuque and other hospitals had established in areas between Dubuque and other cities. Such competition, the court found, affected a sufficient number of patients to link otherwise disparate geographic areas.

There have been a variety of criticisms levied against E-H analysis, stemming from the FTC’s retrospective hospital investigation as well as new economic scholarship. Although experts defending the merger of Evanston and Highland Park Hospital did not base any of their conclusions on the E-H test, Professor Elzinga, one of the developers of the test, testified in 2005 on behalf of the FTC in its challenge to the acquisition that the use of E-H test was inappropriate in the context of hospital market definition. As summarized in Elzinga and Swisher,³⁰ the applicability of the E-H test to hospital market definition may be limited because of the “silent majority fallacy” and the role of third-party payors. The first criticism notes that use of the E-H test in defining hospital markets is predicated on the assumption that the presence of some patients who leave a putative market for hospital care implies that additional patients would be induced to leave in response to an increase in

proponents of the critical loss methodology argue both that the critical loss would be very small because hospitals have high variable margins and that the actual loss would be relatively large. But economic theory predicts an inverse relationship between margins and price elasticity (that is, actual loss), so arguing that a hospital enjoys high variable margins while facing large actual losses in response to a price increase may be inconsistent.

²⁹ *Mercy Health Services*, 902 F. Supp. 968.

³⁰ Elzinga & Swisher, *supra* note 25, at 136–39.

the prices of in-market hospitals. But the behavior of “leavers” may not be predictive of the behavior of “stayers”—the “silent majority” of patients—because the patients who leave may do so for idiosyncratic reasons (such as traveling to receive organ transplants, but preferring to deliver babies close to home). The second criticism of the E-H test is that it fails to account for the role that MCOs play in patient choice of hospitals. Many patients choose hospitals on the basis of considerations other than price, as their MCO is typically responsible for the vast majority of the cost of the patient’s stay, while the patient is responsible only for copayments, coinsurance, and deductibles. Because patients directly bear only a fraction of the cost of receiving hospital care (unlike in most markets in which consumers bear the entire cost of their purchase decisions), their incentives to choose a hospital based on price are muted. To the extent that patients are leaving a putative market to receive hospital care, they may be doing so for reasons unrelated to price. For example, they may travel for complex services that are unavailable locally or for which the quality of more distant facilities is perceived to be substantially greater. As before, then, the presence of patients leaving a putative market for nonprice reasons may not imply that even more patients would leave in response to an increase in the price of receiving hospital care in the putative market.

While there may be greater congruence of views regarding the relatively local nature of hospital competition, the movement away from the tools previously used to define geographic markets, such as the E-H test and critical loss analysis, leads to the question of whether there are more reliable analytical tools for geographic market definition. As we discuss in the next section, while analytical techniques developed in the last decade are better grounded in economic theory and more fully reflect the nature of competition between hospitals, they may suffer weaknesses due to data limitations and the resulting inability to reliably estimate patients’ demand for hospitals.

B. Models used to assess hospital market definition and competitive dynamics and issues related to them

In the last decade, the contours of the debate regarding geographic market definition shifted as the arguments focused on the implications of the nature of competition among hospitals on market

definition (and on competitive effects). It is now commonly recognized that hospitals compete for two interrelated sets of customers: patients and the MCOs that insure many of them.³¹ In defining geographic markets, rather than focusing on the choices of patients—many of whom choose hospitals on the basis of factors other than price—the focus has shifted to the role of MCOs as hospitals' customers. Hospitals compete for MCO customers by negotiating contracts to become in-network hospitals for the MCOs. In-network hospitals provide care to MCO members at discounted rates and, in return for these discounts, MCOs create incentives to encourage their members to receive care at in-network hospitals. The question of geographic market definition then becomes what hospitals an MCO would include in its network in response to a hypothetical price increase at the merging hospitals, rather than what hospitals a patient would choose in response to the price increase.

As a result of this shift from patient-driven competition to MCO-driven competition in defining geographic markets, merging hospitals typically forsake arguments that geographic markets encompass large areas. Most observers agree that "[p]eople want to be hospitalized near their families and homes, in hospitals in which their own-local-doctors have hospital privileges"³² and that MCOs develop hospital networks to provide relatively local access to members accordingly. To the extent that merging hospitals argue for broad geographic areas, they rely on more sophisticated analysis of patient travel patterns, physician privilege overlaps, hospital strategic documents, and managed-care contracting practices that are consistent with the notion that competition extends across a broad area, rather than simple application of the E-H test.

In recent years, economists have posited models of hospital competition based on a dynamic in which hospitals negotiate with MCOs

³¹ See, e.g., Gregory Vistnes, *Hospitals, Mergers, and Two-Stage Competition*, 67 ANTITRUST L.J. 671 (2000). In addition, hospitals compete for physicians who admit patients, but the effect of competition for physicians to add to hospitals' medical staffs can generally be incorporated into models that are focused on the decisions of patients and MCOs.

³² *United States v. Rockford Mem'l Corp.*, 898 F. 2d 1278, 1285 (7th Cir. 1990).

to become part of their provider networks.³³ The price negotiated by a hospital is determined by the MCO's willingness-to-pay for the hospital, measured as the difference between the value to consumers of a network that includes access to the hospital and the value to consumers of a network that does not. The value to consumers of having in-network access to a hospital will depend on how desirable the hospital is to actual and potential members of the MCO and the alternative hospitals available to those consumers in the absence of that access. These models of hospital competition are based on firm conceptual foundations and address two shortcomings of analytical tools previously used in hospital mergers. First, these models reflect the role of MCOs in geographic market definition rather than solely focusing on the decisions of patients. Second, these models take into account the differentiated nature of hospital competition by allowing patients' valuation of hospitals to reflect their specific medical conditions, demographics, and the characteristics of the hospitals.

Implementation of these models generally proceeds in two steps. In the first step, a model of patients' demand for hospitals is estimated. A patient's demand for a particular hospital is determined by the patient's characteristics (such as age, gender, and medical condition), the hospital's characteristics (such as quality, amenities, number of beds, teaching status, and services offered), and the patient's travel time to the hospital. In the second step, a model of bargaining between hospitals and MCOs is estimated; in the bargaining model, the parties negotiate whether to include a hospital in an MCO's network and, if the hospital is in-network, at what price the MCO will reimburse the hospital for care provided to the MCO's members.³⁴

³³ See Robert Town & Gregory Vistnes, *Hospital Competition in HMO networks*, 20 J. HEALTH ECON. 5 (2001), and Cory Capps, David Dranove & Mark Satterthwaite, *Competition and Market Power in Option Demand Markets*, 34 RAND J. ECON. 4 (2003).

³⁴ Town & Vistnes, *supra* note 33, and Capps, Dranove & Satterthwaite, *supra* note 33, posit a relationship between the value that consumers place on having in-network access to a hospital and the prices that a hospital can negotiate with MCOs. For mergers between hospitals that consumers view as substitutes, the valuation that consumers place on in-network access to the merged hospital system will be greater than the sum of the valuations that consumers place on in-network access to each individual merging hospital.

While this second step can produce direct estimates of the price effects of mergers, estimation of the bargaining model typically requires data on the prices negotiated between hospitals and MCOs. The antitrust agencies can obtain these price data from MCOs in a merger investigation, but they are typically not available to the merging hospitals until litigation ensues. However, the data used to estimate the first step (inpatients' demand for hospitals) are usually readily available from state agencies, and the models of patients' hospital demand estimated using these data can be used to calculate diversion ratios or to delineate geographic markets without the need to estimate complex bargaining models.³⁵

While the use of statistical models of patients' hospital demand to define geographic markets has the theoretical potential to be a significant improvement over previously employed methodologies, the reliability of this approach critically depends on accurately estimating demand.³⁶

This is because the merger removes the ability of patients to substitute between the two hospitals. Before the merger, if consumers did not have access to one hospital, they could receive care at the other; after the merger, if one hospital is out of the network, the other hospitals in the system will also be. Since patients' valuation of the hospitals increases as a result of the merger, these models predict that the prices and profitability of the merging hospitals will follow suit. While Town & Vistnes, *supra* note 33, and Capps, Dranove & Satterthwaite, *supra* note 33, propose a simple reduced form bargaining model between MCOs and hospitals, more recent work has proposed a more sophisticated structural model of bargaining between MCOs and hospitals that can be used to simulate prices negotiated by MCOs and hospitals. See, e.g., Gautam Gowrisankaran, Aviv Nevo & Robert Town, *Mergers When Prices Are Negotiated: Evidence from the Hospital Industry* (Nat'l Bureau of Econ. Res. Working Paper 18875, Mar. 2013). Although the FTC has employed these models in two recent litigated hospital mergers, *In re ProMedica Health Sys., Inc.*, No. 9346, at 49–51 (F.T.C. Jun. 25, 2012), and *In re OSF Healthcare Sys.*, No. 9349, at 43–44 (F.T.C. Apr. 4, 2012), one former commissioner expressed skepticism regarding the merits of the models. *ProMedica*, No. 9346, at § III (opinion of Comm'r J. Thomas Rosch).

³⁵ Martin Gaynor, Samuel A. Kleiner & William B. Vogt, *A Structural Approach to Market Definition with an Application to the Hospital Industry* (Nat'l Bureau of Econ. Res. Working Paper 16656, Jan. 2011).

³⁶ For a discussion of the merits of these models, see Sean M. May, *How Well Does Willingness-to-Pay Predict the Price Effects of Hospital Mergers?* (Charles River Associates Working Paper, Oct. 2013); Brian Keating, et al.,

As mentioned previously, individual patient discharge level data are typically used to estimate the demand model. These data contain detailed information about patients' demographics and medical conditions, which are combined with data on the characteristics of the hospitals from which the patients can choose. Although in some circumstances, this type of data may produce realistic estimates of substitution patterns (such as diversion ratios) among hospitals, previous researchers have demonstrated that, even with rich micro data on consumer characteristics and choice attributes, demand models of this type can generate unrealistic predictions concerning substitution among differentiated products.³⁷ As has been widely noted by economists, these substitution patterns are the result of a statistical assumption that, although analytically convenient and widely used, places important restrictions on the pattern of patients' substitutions among hospitals.³⁸ This shortcoming is of particular importance in the context

Comment on Joseph Farrell, David J. Balan, Keith Brand, Brett W. Wendling, 'Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets' (Compass Lexecon Working Paper, May 4, 2012); and Michael J. Doane, Luke Froeb & R. Lawrence Van Horn, How Well Do Travel Cost Models Measure Competition Among Hospitals? (Vanderbilt Univ. Owen Grad. Sch. of Mgmt. Working Paper Series, Mar. 10, 2012).

³⁷ In a seminal paper on applied industrial organization, Berry, Levinsohn and Pakes estimated a logit model using micro data on vehicle choice and found that the model predicted that every consumer's second-choice automobile was a best-selling Ford pick-up truck, regardless of whether, for example, their first-choice automobile was a Honda Accord or Lexus LS400. Then estimating a more sophisticated model that incorporated data on consumers' stated second-choice automobile, the authors found that this more sophisticated model predicted that the second choice of Honda Accord owners was a Toyota Camry and the second choice of Lexus LS400 owners was a Mercedes Benz. Steven Berry, James Levinsohn & Ariel Pakes, *Differentiated Product Demand Systems from a Combination of Micro and Macro Data: The New Car Market*, 112 J. POL. ECON. 1 (2004).

³⁸ Specifically, the model assumes that the value a patient places on receiving care at a particular hospital includes a random component with an extreme value distribution that is independent of patient and hospital characteristics and is also independent of the random component of receiving care at all other hospitals. This assumption implies that the cross-elasticity of demand between hospital *A* and alternative hospitals *B* and *C* depends only on the characteristics of hospitals *B* and *C*, but not on the characteristics of hospital

of geographic market definition since the question being answered by market definition is: Which hospitals do patients, and by extension MCOs, view as close substitutes for the merging hospitals?

The problem of unrealistic substitution patterns may be exacerbated because many of the patient and hospital characteristics that are available in the discharge data used to estimate the model of hospital choice are poor predictors of patients' choices of hospitals. As an example, May³⁹ estimates two models of hospital demand in the context of the Evanston–Highland Park merger. The first includes the determinants of hospital demand that have been typically adopted by economists in academic work, while the second includes only travel time, the square of travel time, and hospital fixed effects.⁴⁰ The corre-

A. Stated differently, if an improvement in the quality of hospital *A* reduces the demand for hospital *B* by ten percent, it will also reduce the demand for every other hospital by ten percent (that is, there is proportional diversion). See KENNETH E. TRAIN, *DISCRETE CHOICE MODELS WITH SIMULATION* 45–50 (2d ed. 2009).

A well-known manifestation of this problem is the “red bus–blue bus” problem. Suppose that in a model for transportation demand, a consumer can get to work either by taking a red bus or by driving, and that the likelihood the consumer chooses each option is one-half. Now suppose that a blue bus is added as an alternative, and the consumer considers it to be identical to the red bus. The proportional diversion property means that the ratio of the likelihood of choosing a red bus or driving must remain the same (that is, one-to-one), and the likelihood of choosing a red bus or blue bus must be the same because the choices are identical to consumers. Together this implies that the likelihood of choosing each option—red bus, blue bus, or driving—must be one-third. But common sense suggests that the likelihood of driving to work should remain at one-half, and that consumers should split evenly between the red and blue buses so that the likelihood of taking one or the other should be one-fourth. May, *supra* note 36, shows that this problem is also present in estimating hospital demand. Using an estimated model of patients' hospital demand he simulates constructing a new hospital that is identical to an existing hospital. Construction of the new hospital results in a fifty-six percent increase in aggregate demand for the two hospitals, whereas common sense would suggest that there should be no increase in aggregate demand.

³⁹ May, *supra* note 36.

⁴⁰ Hospital fixed effects are constant across all patients and medical conditions. They are meant to capture dimensions of demand for hospitals that are invariant across consumers, such as a hospital's reputation for clinical quality, amenities, and cleanliness.

lation between the two estimates of hospital demand is over ninety-five percent, which implies that, of all the predictors included in the model, the primary determinants of patients' demand for hospitals in this particular example are travel time and fixed effects.⁴¹ In practical terms, the model predicts that every patient residing in the same area will have similar preferences for hospitals regardless of their demographics or medical conditions, and that substitution patterns for patients in an area will generally be proportional to hospitals' shares of discharges within that area. Proportional diversion within a ZIP Code has implications that are similar to the arguments often made in connection with the traditional E-H test or critical loss analysis. In those analyses, it is argued that, in response to an increase in the price of hospital care, patients residing in some putative geographic market would substitute to hospitals outside that market in proportion to the outside hospitals' share of discharges in the market. In either case, this finding does not accord with the highly differentiated nature of competition among hospitals and the substantial heterogeneity in patients' demographics, medical conditions, and preferences within a ZIP Code.

While many of the predictors of hospital choice used in estimating these demand models have little value, economists typically are unable to observe predictors of hospital choice that might be expected to improve the performance of these models, such as where a patient's physician has privileges⁴²; which hospitals are in-network or out-of-network for each patient; the out-of-pocket cost to the patient of receiving care at a hospital (most estimated models assume out-of-pocket costs to be constant across hospitals, but many plans require coinsurance payments, which vary with the hospitals' fees, rather than fixed copayments); and whether the patient has previously received care at a hospital.

⁴¹ With the large number of observations (individual patient level discharges) available, coefficients on other variables are generally statistically significant; however, they add little to no overall explanatory power to the model.

⁴² The models focus exclusively on MCO negotiations with hospitals, although typically MCOs will also be concerned with the physician panels that they can include.

In addition to these problems with inferring geographic markets on the basis of models of patients' demand for hospitals, these models can generate implausible predictions regarding patients' valuations of hospital care.⁴³ As an example, Doane et al. show that a model of hospital demand for cardiac catheterization implies that patients would be willing to travel less than three minutes more for a reduction in mortality risk in their procedure of one percentage point. The authors note that if travel time is valued at \$25 per hour (following the environmental economics literature) and patients value their own lives at, say, \$5 million, a one percent reduction in mortality risk should be worth \$50,000 to patients, not less than \$2 (three minutes at a rate of \$25 per hour). The authors conclude that their findings "raise[] questions about how well travel cost models measure demand for medical care [and] competition among hospitals."⁴⁴

IV. CONCLUSION

Many of the issues that used to be controversial with respect to market definition as applied to hospital mergers are no longer areas of substantial disagreement, but these issues have been replaced by new areas of debate. Among the currently contentious issues are the limitation of the product market to services provided to the customers of commercial managed care organizations, and the diminishing relevance of a narrow focus on inpatient GAC services in a world that is

⁴³ Doane, Froeb & Van Horn, *supra* note 36.

⁴⁴ *Id.* at 5. As another example, Doane, Froeb and Van Horn compare the loss in consumer utility resulting from a hypothetical hospital merger in Philadelphia using two methods. First, they calculate the price effects of the merger following the hospital merger simulation methodology described in Town and Vistnes, *supra* note 33, and Capps, Dranove and Satterthwaite, *supra* note 33. Following this methodology, they find that the merger should increase hospital prices by 10.6% (in other words, the cost of a \$10,000 inpatient hospital stay should increase by \$1,060). Second, they use the model of hospital demand to measure the change in consumer surplus, measured in minutes of travel time, associated with the merger. The change in consumer surplus is 2.2 minutes per inpatient admission; using a valuation of \$25 per hour of travel time, this translates to a reduction in consumer surplus of roughly \$1 per admission. Doane, Froeb & Van Horn, *supra* note 36, at 12.

evolving toward integrated delivery systems that bear financial and clinical risk for a population of patients. As health care providers are pressured by both public and private payors to focus on how most effectively to “bend the cost curve” through more efficient delivery of health care services, there is a need for productive research that accurately measures the implications of the new delivery paradigm on economies of scale and scope. Requirements for sophisticated health information technology, coupled with demands that providers prepare to manage “population health,” appear to be pointing to the need for larger organizations that require substantial patient volumes to operate efficiently. How should this trend be balanced against the goal of maintaining competition? Indeed, a district court recently wrestled with this issue in its decision regarding the acquisition by St. Luke’s Health System of the Saltzer Medical Group in the city of Nampa, Idaho.⁴⁵ In that decision, the court recognized the cost and quality benefits of integration but concluded that these benefits could be achieved through other means that posed lower risk of competitive harm.⁴⁶

Although models of demand for hospital services offer many advantages over traditional tools of geographic market definition, further research is needed to determine the practical utility of these models to address questions of geographic market definition and likely competitive effects of mergers. These models rest on solid conceptual foundations but may be hampered by the limited data used to estimate them, and so it is important to understand how serious these shortcomings are and whether anything can be done to overcome them. In particular, further work, most likely through retrospective analysis, would be useful to determine how accurately these models predict the actual competitive effects of mergers. Moreover, as MCOs increasingly shift toward narrow networks that exclude many competitors in a market,⁴⁷ it is not clear how well historic analyses will predict future competitive dynamics.

⁴⁵ *Alphonsus Med. Ctr.–Nampa, Inc. v. St. Luke’s Health Sys., Ltd.*, No. 1:12-CV-560-BLW (D.C. Idaho Dec. 20, 2012).

⁴⁶ See Monica Noether, *The St. Luke’s Saltzer Case: Can Antitrust and Health Care Reform Policies Converge?*, CPI ANTITRUST CHRON., Apr. 2014, for further discussion of this issue.

⁴⁷ A recent analysis found that seventy percent of silver-level products offered on the new health care exchanges (the most commonly selected level)

Finally, the underlying importance of market definition to accurate assessment of hospital merger competitive effects remains unanswered. While it is generally acknowledged that market definition (applied in any industry) serves only to provide the framework for valid analysis of competitive effects, it is often difficult to draw accurate conclusions regarding the dynamics of competition without such a framework to serve at least as a guide. This is certainly true with respect to prospective analysis, but can also be true in the case of retrospective analyses. Although, in the latter situation, it is possible to observe the changes in prices, output, or quality that follow a merger, it is not always straightforward to link these changes unambiguously to the merger itself. This is particularly true in a rapidly evolving industry such as health care, whose members react to the changes in a variety of ways.

exclude at least thirty percent of the twenty largest hospital systems in the area, and thirty-two percent exclude at least seventy percent. These “narrow network” products are priced on average twenty-six percent lower than comparable broad network offerings. MCKINSEY CENTER FOR U.S. HEALTH SYSTEM REFORM, HOSPITAL NETWORKS: CONFIGURATIONS ON THE EXCHANGES AND THEIR IMPACT ON PREMIUMS, (Dec. 14, 2013).

