



UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION

_____	)	
In re: Evanston Northwestern	)	Master Docket No.
Healthcare Corporation Antitrust	)	07-CV-4446
Litigation	)	
_____	)	Judge Lefkow
This Document Relates to:	)	
	)	Magistrate Judge Denlow
All Actions	)	
_____	)	

**EXPERT REPORT OF DR. DAVID DRANOVE**  
**SUPPORTING MOTION FOR CLASS CERTIFICATION**

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## I. Executive summary

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- (1) I have reviewed the facts surrounding this case, including the reports prepared by economists on behalf of both the Federal Trade Commission (FTC) and Evanston Northwestern Healthcare (ENH),<sup>1</sup> the Initial Decision of Administrative Law Judge Stephen McGuire,<sup>2</sup> and the unanimous Opinion of the full Commission written by Chairman Majoras.<sup>3</sup> I have also reviewed the data sources relied upon by these economists and the econometric methodologies they used to estimate postmerger price increases. The principal findings from my review of these materials, as well as from my knowledge of the structure of the industry, are as follows:
- There is substantial evidence that, following ENH's acquisition of Highland Park Hospital (HPH), prices at ENH hospitals increased to an anticompetitive level and by substantially more than they did at comparable hospitals. I will use the term "overcharges" to describe the extent to which ENH price increases exceeded those at comparable hospitals.
  - My review of the industry, particularly the structure and nature of contracts between insurers and hospitals, shows that the impact of price increases is intrinsically common to all categories of health care payers, so that any such prices increases would result in injury to all or substantially all class members.
  - A reliable methodology exists to compute overcharges and calculate damages within a common framework that may be applied to class members. This methodology is commonly referred to as "difference-in-differences."

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<sup>1</sup> Expert Report of Deborah Haas-Wilson, September 21, 2004 (as revised October 8, 2004) [hereinafter Haas-Wilson Report]; Rebuttal Expert Report of Deborah Haas-Wilson, undated; Expert Report of Jonathan B. Baker, November 2, 2004 (as supplemented December 23, 2004); *An Economic Analysis of the Geographic Market Issue*, Report of Kenneth G. Elzinga, September 21, 2004; Expert Report of Monica G. Noether, November 2, 2004 [hereinafter Noether Report]; Rebuttal Expert Report of Orley C. Ashenfelter, November 30, 2004 [hereinafter Ashenfelter Rebuttal Report]; Surrebuttal Report of Orley C. Ashenfelter, January 17, 2005 [hereinafter Ashenfelter Surrebuttal Report].

<sup>2</sup> *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), Initial Decision of Chief Administrative Law Judge Stephen J. McGuire ¶¶ 478–90 [hereinafter McGuire Opinion].

<sup>3</sup> *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), Opinion of Chairman Majoras (Aug. 6, 2007) at 14 [hereinafter Majoras Opinion].

- The data necessary to implement this methodology are already available or will likely be available to me. Experts for both sides in the FTC case identified sufficiently reliable and rich data to conduct difference-in-differences analyses, and I anticipate that similar data will be available in this matter.
- (2) Based on my review I conclude that if ENH overcharged an insurer by a certain percentage, all or substantially all class members covered by that insurer will be overcharged by approximately the same percentage. This is equally true across all types of fully and self-funded plan sponsors covered by an insurer, and it also applies to those uninsured who paid their hospital charges in full or approximately in full.

### I.1. Case background

- (3) In 2007, the five Commissioners of the FTC issued their unanimous opinion against ENH, the owner of Evanston Northwestern Hospital, Glenbrook Hospital, and, as of January 1, 2000, HPH.<sup>4</sup> In that opinion, the Commission held that ENH's acquisition of HPH resulted in an increase in ENH's market power and anticompetitive prices in violation of Section 7 of the Clayton Act.<sup>5</sup>
- (4) Geographically, the three hospitals form a triangle in Chicago's northern suburbs, with one side between Highland Park Hospital and Evanston Hospital lying on the Lake Michigan shore. Glenbrook Hospital is located approximately seven miles west of Evanston Hospital. Highland Park Hospital is located approximately 14 miles north of Evanston Hospital and approximately 13 miles north of Glenbrook Hospital.<sup>6</sup> There are no other hospitals in the triangle formed by these three hospitals.
- (5) Highland Park Hospital, Glenbrook Hospital, and Evanston Hospital all provide inpatient care. All three ENH hospitals also provide hospital-based outpatient services, including same-day surgery. The FTC case focused on inpatient care, which is the product market historically at issue in hospital merger cases. The record also

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<sup>4</sup> *Id.* at 14.

<sup>5</sup> "Having found that Evanston's acquisition of Highland Park violated Section 7 of the Clayton Act, we turn to fashioning the appropriate remedy." *Id.* at 88. "There is no dispute that ENH substantially raised its prices shortly after the merging parties consummated the transaction." *Id.* at 4.

<sup>6</sup> *Id.* at 13.

contains evidence that ENH increased the prices for outpatient care, and I intend to calculate overcharges for both inpatient and outpatient care.

I.2. Economists have reached consensus on the appropriate damages methodology for this case

- (6) In conjunction with the FTC's investigation, expert economists on behalf of both the FTC and the Defendant adopted the same empirical strategy to estimate the price effects of the ENH-HPH merger.<sup>7</sup> In short, they measured the effects of the merger by comparing price increases at ENH hospitals with price increases at a comparison group of other Chicago-area hospitals. The difference represents ENH overcharges. Using a unified research methodology, they estimated overcharges for each insurer that did a significant amount of business with ENH. Overcharges to an insurer result in injury to that insurer as well as to all or substantially all other class members who are covered by that insurer.
- (7) Both the FTC and Defendant economists used the same research methodology to estimate overcharges. This methodology, known as "difference-in-differences" (DID) regression, is widely used in economics research to measure changes in outcomes for an "experimental group" of individuals or firms while controlling for changes in outcomes due to other factors using a "control group."<sup>8</sup> In the ENH case, the FTC and Defendant experts measured changes in prices at ENH while controlling for changes in prices at comparable hospitals that did not merge. The DID methodology was accepted by the Administrative Law Judge and the Commissioners.<sup>9, 10</sup>

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<sup>7</sup> Transaction prices are the prices actually paid to hospitals. These are distinct from hospital charges, which are based on list prices. As I discuss herein, managed care purchasers usually negotiate transaction prices that are substantially less than charges.

<sup>8</sup> DID has been used to analyze market outcomes in a wide array of industries and settings. See, for example, Justine Hastings, "Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California," *American Economic Review* 94, no. 1 (2004): 317–28; Severin Borenstein, "Airline Mergers, Airport Dominance, and Market Power," *American Economic Review* 80, no. 2 (1990): 400–404; David Card and Alan B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," *American Economic Review* 84, no. 4 (1994): 772–93; and Joshua D. Angrist and Alan B. Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?" *The Quarterly Journal of Economics* 106, no. 4 (1991): 979–1014.

<sup>9</sup> McGuire Opinion at 78–90.

- (8) It is instructive to review a sample of the DID results from the reports of FTC expert Professor Haas-Wilson and ENH expert Professor Baker. Exhibit 1 summarizes the inpatient price increases estimated by Professor Haas-Wilson and Professor Baker for four large insurers.<sup>11, 12</sup> Both Haas-Wilson and Baker report the price increases in *percentage terms*. For example, Professor Haas-Wilson estimates that ENH increased prices for Aetna patients by }TGFCEVGF ; "above premerger levels. Because these estimates are derived from DID regression, they represent the increases in ENH prices *over and above* the increases that would have occurred absent the merger.<sup>13</sup> These constitute estimates of ENH overcharges.

**Exhibit 1. ENH's postmerger inpatient price increases estimated by Haas-Wilson and Baker**

Insurer	Haas-Wilson estimate	Baker Estimate
{REDACTED}	{REDACTED}	{REDACTED}

Source: *Ashenfelter Rebuttal Report* at 15.

- (9) Clearly, both experts identified sufficiently reliable and rich data to conduct DID analyses and to estimate ENH overcharges. ENH has produced that data in this case.<sup>14</sup> Based on my review of that data, I am confident that I will also be able to perform DID analysis and develop my own reliable estimates of the insurer-specific overcharges paid by class members. I provide details on the DID methodology in section IV.<sup>15</sup>

<sup>10</sup> Majoras Opinion at 31–35.

<sup>11</sup> The Commission did not explicitly accept or reject either Prof. Haas-Wilson's estimated price effects, which are in Exhibit 1, or Professor Baker's. Instead, the Commission notes that, "The economic testimony is marked by both agreement and disagreement over the correct way to estimate the price changes associated with the merger, but significantly for purposes of resolving this case, the results of the analyses differed very little." Majoras Opinion at 39.

<sup>12</sup> These four payers account }TGFCEVGF ; "inpatient stays and outpatient visits as reported in data provided by ENH. See Exhibit 8 in Appendix B.

<sup>13</sup> These estimates are consistent with the overcharges identified in the testimony of managed care executives. Majoras Opinion at 18–24.

<sup>14</sup> ENH produced data for 1997–2003, though the currently available 1998 data are not readable.

<sup>15</sup> Specifically, in my econometric analysis, I will examine transaction prices before and after the acquisition of HPH, as well as transaction prices at ENH and a control set of hospitals.

- (10) Econometric estimates of anticompetitive price effects appear to be borne out by non-econometric evidence. For example Jane Ballengee, Vice President for Network Development at PHCS, testified that absent the merger, she would have expected a 4%–8% price increase from ENH and HPH. After the merger, however, she testified that ENH sought and obtained a 60% price increase.<sup>16</sup> The Majoras Opinion reports similar testimony for other insurers.<sup>17</sup>
- (11) The FTC case focused primarily on inpatient care, but it appears likely that the HPH acquisition led to an anticompetitive increase in the price of outpatient care.<sup>18</sup> The DID methodology is equally well suited to the task of estimating overcharges for outpatient care.<sup>19</sup> Professor Baker, testifying on behalf of ENH, did so.<sup>20</sup> The data used in the FTC case extend only through 2003, but I believe sufficient data will be available for me to extend my analysis to later years and to analyze both inpatient and outpatient services.
- (12) Although both Haas-Wilson and Baker implement the DID methodology, they do not reach identical conclusions and sometimes report ambiguous results.<sup>21</sup> This is not

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(Transaction prices are contained in readily available hospital financial data.) These comparisons form the basis of the DID methodology, which allows for a common framework to estimate insurer-specific overcharges for all class members.

<sup>16</sup> Majoras Opinion at 18–19.

<sup>17</sup> *Id.* at 19–24.

<sup>18</sup> The record suggests that there were significant increases in prices for outpatient care: “Baker actually calculated higher-than-predicted average merger-coincident net price increases for inpatient and hospital-based outpatient services combined (11% or 12%) than he did for inpatient services alone (9% or 10%).” Majoras Opinion at 57 (citations omitted). That Baker’s price increase for inpatient and outpatient services combined exceeds the price increases for inpatient services alone indicates that outpatient prices increased by more than did inpatient prices.

<sup>19</sup> The ENH billing data contain patient-level data for inpatients, same-day surgery outpatients, and other outpatients. In order to estimate price increases for inpatient care, Prof. Haas-Wilson restricted her sample to inpatients. Estimating overcharges for outpatients (including same-day surgery patients) can be accomplished by instead restricting the sample of transactions to include only outpatients.

<sup>20</sup> Majoras Opinion at 27. Prof. Baker offered an alternative explanation for his estimated price increases, “learning about demand.” This alternative was rejected by the Commission, which said: “While no one type of evidence in the record is dispositive, we find that the totality of the record warrants rejecting respondent’s position that ENH’s learning-about-demand explains the substantially higher-than-predicted merger-coincident price increases.” *Id.* at 47.

<sup>21</sup> For example, the Haas-Wilson and Baker analyses do not resolve whether or not BCBS in

unusual when researchers are dealing with complex questions. With the benefit of hindsight, I will identify opportunities to improve the research methods and generate more robust, consistent, and reliable findings. Even so, it is important to emphasize that the DID methodology is reliable and well-accepted in the economic literature and, as evidenced by its use by both sides in the FTC case, is an appropriate methodology for estimating overcharges and damages in the current case.

- (13) I summarize my approach as follows:
- I will use the common framework of DID analysis to compute the extent to which ENH increased prices at a faster rate than did comparable hospitals not involved in the ENH-HPH merger (and not otherwise affiliated with ENH).
  - The excessive price increases, which I will measure in percentage terms, represent ENH overcharges.
  - I will apply the DID framework to compute overcharges for each insurer doing business with ENH.
- (14) In the next section I offer a brief discussion of hospital-insurer contracting. This discussion reveals that the insurer-specific overcharges form the basis for all damages calculations for all class members. I provide more details on contracting later in my report.

### I.3. The ways that hospitals charge for their services imply common impact of anticompetitive overcharges

- (15) The DID estimates of ENH overcharges represent the excessive increase in prices for the *average* ENH patient. In theory, an increase in average price does not imply that all patients pay higher prices. For example, it could be that prices escalated substantially more than average for some ENH patients but not at all for others. This is unlikely to be the case here. The nature of contracting between hospitals and insurers is such that when average prices increase, all or substantially all class members are affected. In other words, when I use DID to estimate the average

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fact faced price increases. I will conduct an independent analysis to determine whether ENH increased its prices to BCBS as well as to other payers.

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overcharges for each insurer, I am also providing reliable estimates of overcharges to all class members covered by that insurer.<sup>22</sup> I now explain why this is the case.

- (16) Hospital-insurer contracts typically specify that the hospital is paid using one of three primary systems: case rates, per diem rates, or discounted list charges.<sup>23, 24</sup> Under each of these systems, an increase in the average level of prices will cause an increase in the prices applicable to all or substantially all patients. Moreover, the increase is readily expressed in percentage terms. Thus, one can use DID methods to estimate the increase.
- **Case rate contracts** involve a single negotiated “base rate” that is applied to all patients. This base rate corresponds to the price for an inpatient receiving a treatment of “average complexity.” The price for any particular inpatient is obtained by multiplying the base rate by a “relative weight” that measures the complexity for that patient’s treatment. Relative weights are published by the Centers for Medicare and Medicaid Services (CMS). Under case rate contracts, if the base rate increases by a given percentage, *the price for every admission will increase by the same percentage.*
  - **Per diem contracts** specify that the insurer pay a fixed price for each day the patient is in the hospital. Some per diem contracts specify different rates based on the kind of inpatient admission. For example, a day in a standard medical/surgical acute bed may command one price, and a day in intensive care may command a

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<sup>22</sup> An insurer and a hospital may in some cases have distinct contracts or payment systems for the insurer’s various products (e.g., an insurer’s HMO and PPO plans may be reimbursed under different contractual terms). If this is the case, then it will be true that substantially all payments to a hospital under a given insurance *plan* will be determined by the same reimbursement rules. This would necessitate conducting the analysis at the plan level rather than at the insurer level. This does not pose a challenge to the computation of overcharges and damages, because the data identifying the insurer and plan are or are likely to be available. In fact, Prof. Haas-Wilson calculated overcharges at a plan level (Haas-Wilson Report, at 36–38.)

<sup>23</sup> The Majoras Opinion suggests that ENH primarily used per diem contracts and “discount off charges” contracts prior to the merger and that after the merger, ENH “converted a number of its contracts from per diem to discount off charges structures.” (Majoras Opinion at 10, 16).

<sup>24</sup> “Following the merger between Evanston and Highland Park Hospitals, ENH renegotiated its contracts with its major managed care insurers. For most of these insurers the renegotiated contracts included higher per diems, case rates, and other negotiated prices.” (Haas-Wilson Report, at 21.)

different price. Under per diem contracts, if the per diem rates increase by a given percentage, *the price for every admission will increase by the same percentage.*

- Under **discounted list charges contracts**, hospitals compute the medical bill using the “list prices” for each individual service provided, and then take a percentage discount that has been negotiated with the insurer. Under discounted list charges contracts, if the discount falls by a given percentage, *the price for every admission will increase by a fixed percentage.*<sup>25</sup>

(17) This discussion is important for two reasons:

- It indicates that if ENH raised its average price to an insurer by a given percentage, all or substantially all class members represented by that insurer would experience an increase in price by that same percentage. In other words, the extent of the injury is common to all or substantially all class members.
- Because all three mechanisms result in price increases that can be expressed in percentage terms, the DID analysis can be conducted without knowing the specific pricing mechanism. In other words, a 20% price increase is a 20% price increase, regardless of the specific contractual mechanism that led to the increase. DID regression will reveal that 20% increase, again without regard to contractual mechanism.

## II. Qualifications

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(18) I am the Walter McNerney Distinguished Professor of Health Industry Management at Northwestern University’s Kellogg School of Management, where I am the Director of the Health Enterprise Management Program and Director of the Center for Health Industry Market Economics. I also maintain a courtesy appointment in the Department of Economics at Northwestern University. I have been on the faculty at

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<sup>25</sup> As an example, suppose that the discount falls by 20%, from 40% to 32%, after the merger. In this case, a visit with list charges of \$10,000 would have a transaction price of \$6,000 before the merger. After the merger the transaction price at the lower 32% discount will be \$6,800. This corresponds to a 13.3% increase in the transaction price. If the list charges are instead \$20,000 then the transaction price will increase from \$12,000 to \$13,600—again, a 13.3% increase.

Northwestern since 1991; prior to that, I was an associate professor at the University of Chicago.

- (19) I received my B.A. in Genetics from Cornell University in 1977, my M.B.A. from Cornell University in 1979, and my Ph.D. in Economics, Business, and Policy from Stanford University in 1983.
- (20) I am an economist specializing in the fields of Microeconomics, Industrial Organization, and Health Economics. I have extensively studied competition in health care markets and published over 50 articles in peer-reviewed economics and health services research journals. I have also served as an associate editor for the *Journal of Health Economics*, the *RAND Journal of Economics*, *Health Services Research*, the *Journal of Medical Practice Management*, and *Management Science*. Many of my academic studies entail detailed theoretical and empirical analysis of competition and market power in healthcare provider markets.
- (21) I have created and taught the following graduate courses: Business Strategy, Health Economics, and Empirical Methods. I have also taught graduate-level Microeconomics and co-taught An Introduction to the Healthcare System.
- (22) In the last four years, I prepared two expert reports and was deposed in two matters. The first was *Official Committee of Unsecured Creditors of AHERF v. PriceWaterhouseCoopers LLP*. The case pertained to the bankruptcy of the Allegheny Health Education and Research Foundation. On behalf of the defendant, I prepared a report that testified as to issues in hospital strategy. The second matter was *Peoria Day Surgery Center v. OSF Healthcare System*. I prepared a report on behalf of the plaintiff, who alleged that the defendant engaged in anticompetitive exclusionary conduct. I also prepared an economic analysis on behalf of Edward Hospital of Naperville in support of its application to win Certificate of Need approval to build a new hospital in Plainfield, Illinois, and I testified on behalf of Edward Hospital to the Illinois Health Facilities Planning Board.
- (23) A copy of my curriculum vitae is included in appendix A.
- (24) While retained on this matter, I was assisted by a staff of economists associated with the consulting firm of Bates White, LLC. I directed the activities of my staff, made all final decisions concerning the analytic methods and their implementation, and

prepared this report. My analysis is ongoing, and I reserve the right to amend my opinion and testimony.

- (25) For my work in this matter, I am being compensated at a rate of \$650 per hour and \$750 per hour for time spent in deposition and at trial. Payment is not dependent on the outcome of this case.

### III. Scope of charge and materials considered

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- (26) I was retained by Counsel for Plaintiffs in this litigation. I have been asked to investigate whether it can be shown using common evidence that all or substantially all putative class members were overcharged for hospital services as a result of Evanston Northwestern Healthcare's acquisition of Highland Park Hospital. Counsel for Plaintiff has also asked me to determine whether a formulaic methodology that can reliably estimate damages to putative class members exists.

- (27) Counsel for Plaintiffs have informed me that the class for which they seek certification is defined as follows:

All persons or entities in the United States of America and Puerto Rico, except those who solely paid fixed amount co-pays, uninsureds who did not pay their bill, Medicaid and Traditional Medicare patients, governmental entities, defendant, other providers of healthcare services, and the present and former parents, predecessors, subsidiaries and affiliates of defendant and other providers of healthcare services who purchased or paid for inpatient hospital services or hospital-based outpatient services directly from NorthShore University Healthcare (formerly known as Evanston Northwestern Healthcare), its wholly-owned hospitals, predecessors, subsidiaries, or affiliates other than those acquired as a result of the merger with Rush North Shore Medical Center (the "Class") from at least as early as January 1, 2000 to the present (the "Class Period").

- (28) In forming my opinion, I have reviewed documents and data produced in the course of the Federal Trade Commission's case against Evanston Northwestern Healthcare. With respect to documents produced in that case, I have reviewed the expert reports produced by economists on behalf of the FTC and ENH. With respect to electronic

data from the FTC case, I have also reviewed the ENH data obtained by the FTC and analyzed by experts on behalf of the FTC and ENH.

- (29) With respect to publicly available information, I have reviewed the FTC opinion by Administrative Law Judge Stephen McGuire, the Opinion of the Commission authored by Chairman Majoras, and the concurring opinions of Commissioner Rosch and Commissioner Leibowitz. I have also reviewed relevant economics literature, press articles, Internet websites, data from the Centers for Medicare and Medicaid Services, data from the American Hospital Association's 2006 *Annual Survey Database*, and other materials. A list of the materials I have considered or relied upon in forming my opinions is attached as appendix B.

#### IV. Introduction

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- (30) In this report, I describe how the structure and nature of the hospital and health insurance industries indicates that the impact of price increases by hospitals is intrinsically common. I also describe how the magnitude of any such price increases can be reliably calculated using a common framework. My principal conclusions are as follows:
1. There is substantial evidence that Evanston Northwestern Healthcare (ENH), which owns Evanston Memorial Hospital, Glenbrook Hospital, and, as of January 1, 2000, Highland Park Hospital (HPH), significantly increased the prices it charges for inpatient and outpatient care following its acquisition of HPH.
  2. The evidence that ENH increased prices significantly following its acquisition of HPH is consistent with the findings of economics research that analyzes the effects of hospital mergers. That research has shown that hospital mergers that create market power typically lead to higher prices.
  3. The nature of contracting between hospitals and insurers is such that, if ENH increased the average prices it charged to an insurer by a given percentage, then all or substantially all patients covered by that insurer would face approximately the same percentage price increase. That is, the impact of price increases, which I refer to as "overcharges," would be common to substantially all putative class members.

4. I will be able to quantify the magnitude of such price increases using a common analytic framework that is widely used in economics. This methodology is commonly referred to as “difference-in-differences.”
  5. The data required for the difference-in-differences (DID) analysis is to some extent already available, and additional data necessary to complete my analysis are likely to be available from ENH and from public data sources.
- (31) I begin my report by describing the economics literature both as it relates to the price effects of hospital mergers generally and as it relates to ENH’s acquisition of HPH specifically. I then describe the DID methodology and show how it can be used to reliably calculate overcharges. I conclude with a discussion of the systems hospitals use to charge for their services and an explanation of why the structure of these payment systems implies common impact.

## V. Economists and the FTC have demonstrated that hospital mergers can lead to substantial price increases

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- (32) A great deal of economic research has been devoted to analyzing and quantifying the price effects of hospital mergers. When the required data are available, most of these studies apply the difference-in-differences (DID) methodology to estimate price effects. I believe this is appropriate, and I will follow this line of research in quantifying the price effects of the ENH-HPH merger.
- (33) In subsection V.1, I review the recent history of antitrust analysis of hospital mergers. I focus on economic research on hospital mergers and pricing and the FTC’s retrospective analysis of mergers. In subsection V.2, I review the FTC’s case against ENH in more detail.

### V.1. Background on hospital mergers

- (34) The ENH acquisition was by no means the first hospital merger of consequence in the United States. The 1990s witnessed a wave of hospital mergers and acquisitions.<sup>26</sup>

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<sup>26</sup> There were also many hospital mergers in the 1980s; only a handful of these were opposed by the FTC or DOJ. In that decade, the agencies won most hospital merger cases (e.g., *In re*

This wave peaked in 1996, when there were roughly 150 hospital mergers and over 300 mergers and system acquisitions.<sup>27</sup> Over the course of the hospital merger wave, the DOJ and FTC challenged only six hospital mergers, and they lost those challenges in each instance.<sup>28</sup> Neither federal agency challenged another hospital merger in court for six years thereafter. In a seventh case, after the FTC declined to take action, the

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*American Medical International, Inc.*, 104 F.T.C. 1 (1984); *In re Hospital Corporation of America*, 106 F.T.C. 361 (1985), *aff'd*, 807 F.2d 1381 (7th Cir. 1986); *F.T.C. v. University Health Inc.*, 1991-1 Trade Cas. (CCH) ¶69,444, *rev'd* 938 F.2d 1206 (11th Cir. 1991); *United States v. Rockford Mem. Hosp.*, 717 F. Supp. 1251 (N.D. Ill. 1989), *aff'd*, 898 F.2d 1278 (7th Cir.), *cert. denied*, 498 U.S. 920 (1990).

The exception to the agencies' successes in that era was *United States v. Carilion Health Sys.*, 707 F. Supp. 840 (W.D. Va.), *aff'd*, 892 F.2d 1042 (4th Cir. 1989) (unpublished opinion). A recent *Wall Street Journal* article, "Nonprofit Hospitals Flex Pricing Power," focused in large part on the effects of that merger, noting as follows:

In 1989, the U.S. Department of Justice tried but failed to prevent a merger between nonprofit Carilion Health System and this former railroad town's other hospital. The merger, it warned in an unsuccessful antitrust lawsuit, would create a monopoly over medical care in the area. Nearly two decades later, the cost of health care in the Roanoke Valley—a region in southwestern Virginia with a population of 300,000—is soaring. Health insurance rates in Roanoke have gone from being the lowest in the state to the highest. That's partly a reflection of Carilion's prices. Carilion charges \$4,727 for a colonoscopy, four to 10 times what a local endoscopy center charges for the procedure.

*Wall Street Journal*, August 28, 2008,

<http://online.wsj.com/article/SB121986172394776997.html>.

<sup>27</sup> "Mergers" are transactions in which separate hospitals combine their operations under a shared license. These mergers most commonly occur among hospitals located near one another. "Acquisitions" are transactions in which hospitals retain their licenses but are owned by a common governing body. See Allison Cuellar and Paul Gertler, "Trends in Hospital Consolidation: The Formation of Local Systems," *Health Affairs*, 22, no. 6 (2003): 77–87. Since 1996, system acquisitions, in which hospitals come under common ownership but do not consolidate licenses and typically do not consolidate operations, have outnumbered hospital mergers.

<sup>28</sup> These cases include *Ukiah Adventist Hospital v. FTC*, No. 93-70387 (9th Cir. May 18, 1994); *FTC v. Freeman Hospital*, 911 F.Supp. 1213 (W.D. MO. 1995), *aff'd* 69 F.3d 260 (8th Cir. 1995); *United States v. Mercy Health Services*, 902 F.Supp. 968 (N.D. Iowa 1995), *vacated as moot*, 107 F.3d 632 (8th Cir. 1997); *FTC v. Butterworth Health Corp.*, 946 F.Supp. 1285 (W.D. Mich. 1996), *aff'd per curiam*, No. 96-2440 (6th Cir. July 8, 1997) (unpublished); *United States v Long Island Jewish Medical Center*, 983 F.Supp. 121 (E.D.N.Y. 1997); and *FTC v. Tenet Healthcare Corp.*, 17 F.Supp. 2d 937, 943 (E.D. Mo. 1998), *rev'd* 186 F.3d 1045 (8th Cir. 1999).

State of California filed suit to oppose a proposed merger in Oakland, California.<sup>29</sup>  
The State of California also lost.

V.1.1. The FTC's hospital merger retrospective

- (35) In a 2002 speech, FTC Commissioner Tim Muris announced that the Commission had recently formed a new merger litigation task force to focus on hospital mergers and that the Commission was in the midst of a “retrospective study of consummated hospital mergers.”<sup>30, 31</sup> Commissioner Muris also noted, “The agency will announce the results of these studies regardless of the outcome. If the studies find efficiencies associated with some or all of the mergers, the staff will say so. If, on the other hand, the studies indicate that the mergers were anticompetitive, the Commission will carefully consider whether administrative litigation is appropriate.” DID is the methodology used in those FTC studies.
- (36) To date, three of the consummated hospital mergers investigated by the FTC have been publicly identified. The first is the merger of Victory Memorial Hospital and St. Therese Medical Center in Waukegan, Illinois.<sup>32</sup> The second is the acquisition of Highland Park Hospital by Evanston Northwestern Healthcare; this merger is discussed in detail in this report.<sup>33</sup> The third is the 2001 merger of Alta Bates Medical

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<sup>29</sup> *California v. Sutter Health Sys.*, 84 F. Supp. 2d 1057 (N.D. Cal.), *aff'd mem.*, 2000-1 Trade Cas. (CCH) U 87,665 (9th Cir. 2000), *revised*, 130 F. Supp. 2d 1109 (N.D. Cal. 2001).

<sup>30</sup> The FTC task force focusing on hospital merger enforcement was announced several months prior to Muris's speech (FTC, “Federal Trade Commission Announces Formation of Merger Litigation Task Force,” news release, August 28, 2002, <http://www.ftc.gov/opa/2002/08/mergerlitigation.shtm>).

<sup>31</sup> Timothy J. Muris, “Everything Old is New Again: Health Care and Competition in the 21st Century,” speech, Nov. 7, 2002. (<http://www.ftc.gov/speeches/muris/murishealthcarespeech0211.pdf>) at 19.

<sup>32</sup> The FTC closed its investigation of this merger, though two commissioners voted against closing. *See* “Victory Memorial Hospital/Provena St. Therese Medical Center,” File No. 011-0225, June 4, 2006, <http://www.ftc.gov/os/caselist/0110225/040630ftcstatement0110225.shtm>, and “Statement of Commissioners Mozelle W. Thompson and Pamela Jones Harbour In the Matter of Victory/St. Therese,” File No. 011-0225, June 4, 2006, <http://www.ftc.gov/os/caselist/0110225/040630joint0110225.shtm>. *See also*, Deborah Haas-Wilson and Christopher Garmon, “Two Hospital Mergers on Chicago's North Shore: A Retrospective Study,” FTC Working Paper no. 294, January 2009.

<sup>33</sup> FTC, “The FTC in 2005: Standing Up for the Consumers and Competition,” April 2005 at 8, <http://www.ftc.gov/os/2005/04/0504abareportfinal.pdf>.

Center and Summit Medical Center; this is the same merger unsuccessfully challenged by the State of California in 2001.<sup>34</sup> Analyzing that merger, an FTC economist applied DID analysis and showed, based on claims data from large health insurers, that the postmerger price increase at Summit Medical Center was “among the largest of any comparable hospital in California.”<sup>35</sup>

V.1.2. Economic research on hospital pricing

- (37) The prominence of hospital merger activity prompted a substantial amount of economic research into the subject of hospital competition and pricing. By 2004, this research demonstrated that hospital mergers could result in anticompetitive price increases.
- (38) Two important studies released in the past few years take a comprehensive look at prior research on hospital competition. The first study, “Improving Healthcare: A Dose of Competition,” was released by the DOJ and the FTC in 2004 and examines all aspects of health care competition, including hospital mergers.<sup>36</sup> The report represented the culmination of 27 days of hearings conducted over a seven-month period in 2003. Those hearings convened representatives of industry participants, including providers and insurers, patient and consumer advocates, attorneys, and economists. This report summarizes the research on hospital competition and mergers as follows:<sup>37</sup>

Most studies of the relationship between competition and hospital prices have found that high hospital concentration is associated with increased prices, regardless of whether the hospitals are for-profit or nonprofit.

- (39) The second study synthesized the results of a comprehensive survey, “How Has Hospital Consolidation Affected the Price and Quality of Hospital Care?” The

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<sup>34</sup> *California v. Sutter Health Sys.*, *supra* note 29.

<sup>35</sup> Steven Tenn, “The Price Effects of Hospital Mergers: A Case Study of the Sutter-Summit Transaction,” FTC Working Paper No. 293, Nov. 2008, <http://www.ftc.gov/be/workpapers/wp293.pdf>, at 19. Note that this analysis is authored by a staff economist at the FTC and relies on data obtained under the FTC’s hospital merger retrospective, but the results do not represent an official statement by the Commission or any Commissioner.

<sup>36</sup> <http://www.ftc.gov/reports/healthcare/040723healthcarerpt.pdf>.

<sup>37</sup> *Id.*, Executive Summary at 15.

research was conducted by two leading health care scholars, William Vogt and Robert Town, funded by the prestigious Robert Wood Johnson Foundation, and released in 2006.<sup>38</sup> This study summarizes the research on hospital mergers as follows: “Research suggests that hospital consolidation in the 1990s raised prices [overall] by at least five percent and *likely by significantly more.*” (Emphasis added.)

- (40) Stemming from its hospital merger retrospective, the FTC had access to detailed insurer data at the three hospitals owned by ENH. As detailed below, the FTC’s analysis of those data showed that ENH successfully implemented significant price increases following its acquisition of Highland Park Hospital in 2000. On February 10, 2004, the FTC filed the its complaint against Evanston Northwestern Healthcare.<sup>39</sup>

#### V.2. The acquisition of Highland Park Hospital by Evanston Northwestern Healthcare

- (41) Evanston Northwestern Healthcare, which then comprised Evanston Hospital and Glenbrook Hospital, signed on July 1, 1999, a letter of intent to merge with Highland Park Hospital and, on October 29, 1999, entered into an Agreement and Plan of Merger. On January 1, 2000, the parties completed the merger and formed the Evanston Northwestern Healthcare Corporation.<sup>40</sup>
- (42) Geographically, the three hospitals form a triangle with one side between Highland Park Hospital and Evanston Hospital lying on the Lake Michigan shore. Glenbrook Hospital is located approximately seven miles west of Evanston Hospital. Highland Park Hospital is located approximately 14 miles north of Evanston Hospital and

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<sup>38</sup> William Vogt and Robert Town, “How has hospital consolidation affected the price and quality of hospital care?” *Research Synthesis Report No. 9*, Feb. 2006, <http://www.rwjf.org/files/research/no9researchreport.pdf>. See also the companion policy brief, Claudia Williams, William Vogt, and Robert Town, “How has hospital consolidation affected the price and quality of hospital care?” *The Synthesis Project Policy Brief No. 9*, Feb. 2006, [http://www.rwjf.org/pr/synthesis/reports\\_and\\_briefs/pdf/no9\\_policybrief.pdf](http://www.rwjf.org/pr/synthesis/reports_and_briefs/pdf/no9_policybrief.pdf).

<sup>39</sup> *In re Evanston Northwestern Healthcare Corp.*, FTC Docket No. 9315, <http://www.ftc.gov/os/caselist/0110234/040210emhcomplaint.pdf>.

<sup>40</sup> McGuire Opinion at 14.

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approximately 13 miles north of Glenbrook Hospital.<sup>41</sup> There are no other hospitals in the triangle formed by these three hospitals.

- (43) Evanston Hospital and Glenbrook together generated \$441 million in revenue in fiscal year 1998, and Highland Park Hospital generated \$101 million in revenue during the same fiscal year.<sup>42</sup> Evanston Hospital is the largest among the three; it has more than 400 beds, compared to 125–150 beds at Glenbrook Hospital and 150–200 beds in Highland Park Hospital.<sup>43</sup> Exhibit 2 presents summary data on the three hospitals prior to the 2000 acquisition.

**Exhibit 2. Characteristics of the ENH hospitals prior to the merger**

Parent	Hospital	Number of beds	Level of services	Services details	Revenue in FY1998
Evanston Northwestern Healthcare	Evanston Hospital <sup>[A]</sup>	400	Primary, secondary, and tertiary services	Obstetrical and pediatric services, psychiatric care, neurosurgery, radiation therapy, cardiology services, orthopedics, trauma centers, and a Kellogg Cancer Care Center	\$441 million <sup>[D]</sup>
	Glenbrook Hospital <sup>[B]</sup>	125	Primary and secondary services, but no obstetrical services	Inpatient and outpatient services, a Kellogg Cancer Care Center, center of excellence in orthopedics, significant neurology volume	
Lakeland Health Services	Highland Park Hospital <sup>[C]</sup>	150–200	Primary and secondary services	Obstetrical services, a level II prenatal center, pediatric services, diagnostic services, fertility center, psychiatric care, neurosurgery, radiation therapy, cardiology services, oncology program, level II trauma center	\$101 million <sup>[E]</sup>

<sup>[A]</sup> McGuire Opinion at 5–6

<sup>[B]</sup> McGuire Opinion at 6

<sup>[C]</sup> McGuire Opinion at 7

<sup>[D]</sup> Majoras Opinion at 12

<sup>[E]</sup> Majoras Opinion at 12

<sup>41</sup> *Id.* at 13. These appear to be straight line, as the crow flies, distances.

<sup>42</sup> *Id.* at 12.

<sup>43</sup> *Id.* at 5–7.

V.2.1. The FTC complaint

- (44) On February 10, 2004, the FTC filed a complaint challenging the merger under Section 7 of the Clayton Act.<sup>44</sup> The complaint alleged that the merger was anticompetitive and described the price effects as follows:<sup>45</sup>

Following the merger, ENH established a strategy of negotiating with private payers on behalf of the three hospitals as a single system. In many instances, this policy, with the addition of Highland Park to ENH, effectively forced private payers to accept price increases that were significantly higher than the price increases of other comparable hospitals, or face the loss of all three hospitals from their networks. Such a loss would have a significant adverse impact on their ability to market their managed care products.

Following the merger, ENH raised prices more than the price increases implemented by other comparable hospitals. Private payers regarded the ENH price increases as unwarranted. ENH also required many private payers to agree to pay prices set at a discount off of ENH's list prices in lieu of predetermined per diem prices for each day of inpatient care, a feature of many of the hospitals' pre-merger contracts with their major payers. Any pricing system based on list prices makes hospital payments less predictable for private payers and facilitates the hospitals' ability to impose unilateral price increases (by raising list prices). ENH raised its list prices several times following the merger.

Following the merger, ENH proposed large price increases to its major private payers. All but one of these large customers accepted ENH's significant postmerger increases rather than try to sell a health plan without any of the three ENH hospitals.

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<sup>44</sup> Complaint, *In the matter of Evanston Northwestern Healthcare and ENH Medical Group*. Docket No. 9315, Feb. 10, 2004, <http://www.ftc.gov/os/caselist/0110234/040210/emhcomplaint.pdf> [hereinafter Evanston Complaint.]

<sup>45</sup> *Id.* at ¶¶29–31.

### V.2.2. The FTC decisions

- (45) Chief Administrative Law Judge Stephen McGuire issued his initial decision on October 21, 2005. In that decision, Judge McGuire held that “[t]he merger violates [Section 7 of] the Clayton Act because the merger reduced competition in the relevant market and enhanced ENH’s market power.”<sup>46</sup> On October 26, ENH filed notice of appeal, and on October 28, the FTC filed notice of cross-appeal.<sup>47</sup> After reviewing the record *de novo*, the full Commission issued its opinion on August 6, 2007. Both opinions are lengthy and detailed; I turn to a review of the sections that are most relevant to the case at hand.

#### V.2.2.1. The relevant product and geographic markets

- (46) Under the DOJ and FTC *Horizontal Merger Guidelines*, the product market is defined “by asking whether a hypothetical monopolist of the proposed product market could impose a *small but significant and nontransitory increase in price* (SSNIP) and not lose an amount of its sales to alternative products that would make the price increase unprofitable.”<sup>48</sup> This test makes intuitive sense; if the hypothetical merger did not facilitate a price increase, it must be that the product in question faces close substitutes and therefore the market definition needed to be expanded to include those substitutes. The courts have historically considered acute inpatient hospital services to be a relevant product market, and the Commission followed this precedent in the ENH case.<sup>49</sup> This makes sense because there are many inpatient hospital services that lack good substitutes. The Commission also noted that including hospital-based

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<sup>46</sup> McGuire Opinion at 154.

<sup>47</sup> <http://www.ftc.gov/os/adjpro/d9315/051026enhnotofappeal.pdf>;  
<http://www.ftc.gov/os/adjpro/d9315/051028ccnotofcrossappeal.pdf>.

<sup>48</sup> Majoras Opinion at 55.

<sup>49</sup> *Id.* at 57. This does not rule out the possibility of anticompetitive price effects in other product markets such as outpatient care and does not directly address whether outpatient services or hospital-based outpatient services are relevant markets. The Commission did note, however, “We also find that even if we included hospital-based outpatient services in the relevant product market, as respondent proposes, it would not alter the outcome of this case.” *Id.*

outpatient services in the relevant product market would not change the outcome of the analysis.<sup>50</sup>

- (47) The relevant geographic market is also defined by applying the SSNIP test. If the firms in a geographic area could not profit by collectively raising price, it must be the case that consumers view firms outside the area as close substitutes. The geographic market would need to be expanded to include these additional firms. The Administrative Law Judge (ALJ) who issued the initial order in the case and the Commission, which reviewed the case *de novo*, identified different relevant geographic markets. The geographic market defined by the ALJ spans the region covered by three ENH hospital and four other hospitals—Lake Forest, Advocate Lutheran General, Rush North Shore, and St. Francis.<sup>51</sup>
- (48) In its review, the Commission adopted complaint counsel’s definition of the relevant market as the area spanning the triangle formed by the three ENH hospitals.<sup>52</sup> The Commission’s conclusion was based upon consideration of testimony by executives from MCOs and ENH, application of the SSNIP test, the empirical finding of postmerger price increases, and consideration of the bargaining process by which hospital prices are determined.<sup>53</sup> The Commission believed that hospitals outside of this triangle did not adequately substitute for the hospitals in the triangle.

#### V.2.2.2. Postmerger pricing by ENH

- (49) Administrative Law Judge Stephen McGuire issued his initial decision on October 21, 2005. Regarding postmerger price increases by ENH, he concluded as follows:<sup>54</sup>

The evidence of ENH’s negotiations with managed care organizations clearly demonstrates that the combined ENH had enhanced its market power from the premerger period when Evanston and Highland Park had been negotiating as independent competitors. This increase in market power occurred immediately after and solely due to the merger and not to

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<sup>50</sup> *Id.*

<sup>51</sup> McGuire Opinion at 35–38.

<sup>52</sup> Majoras Opinion at 64.

<sup>53</sup> *Id.* at 57–63, 78.

<sup>54</sup> McGuire Opinion at 164.

any other changes in market forces. Moreover, at the time, the price increases were never ascribed by the parties as being related to improvements in quality of care or any changes in the level of services provided by the ENH hospitals. Rather, ENH's ability to increase prices stemmed from its geographic exclusivity in an important region. ENH was fully aware of its enhanced market power as a result of the merger and utilized its newly-formed competitive position to obtain much more favorable contracts with managed care organizations than either Evanston or Highland Park could have negotiated as independent hospitals.

- (50) Both ENH and the FTC appealed aspects of Judge McGuire's ruling, leading the full Commission to review the case.<sup>55</sup> The Commission's 5-0 opinion, authored by Chairman Majoras, reinforced Judge McGuire's conclusions regarding pricing (citations omitted) as follows:<sup>56</sup>

After the merger closed, ENH rapidly increased the prices that it charged to most of its MCO customers to the higher of Evanston's or Highland Park's pre-merger rate for a particular service. ENH then set about negotiating a single contract for all three of its hospitals with each MCO. ENH did not offer the MCOs the option to enter into separate contracts for the hospitals, or to decline to use one or more of the three hospitals. In addition, ENH sought to raise its prices through the conversion of portions of some of its contracts from per diem to discount off charges payment structures.

The record reflects that ENH's post-merger negotiation strategy was highly successful. ENH negotiated with its MCO customers a single contract for all three of its hospitals with substantial price increases, and converted a number of its contracts from per diem to discount off charges structures. In addition, from 2002 to 2003, ENH increased its chargemaster rates four times.

As we describe in detail below in our findings about the econometrics, the actual amount of ENH's price increases depends on the calculation method. Using data that included all patients in Illinois, complaint

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<sup>55</sup> Majoras Opinion at 7.

<sup>56</sup> *Id.* at 16.

counsel's economist, Deborah Haas-Wilson, computed that from 1998 through 2002, ENH increased its per day average net prices by 48% for all patients; 46% for the commercial and self-pay patients; and 46% for commercial, self-pay, self-administered, and HMO patients.

- (51) Of note, the Commission's review of the evidence presented by experts for *both* the FTC and ENH indicated that the merger was followed by price increases for acute inpatient services at ENH hospitals that were significantly larger than the increases at comparable hospitals.<sup>57</sup>
- (52) Also consistent with Judge McGuire's conclusions, the Commission found that those price increases were the result of the exercise of market power that ENH gained from the acquisition of Highland Park Hospital. The Commission stated that "[i]n summary, we find that the merger enabled ENH to exercise market power, and that ENH used this market power to increase its average net prices to MCOs for acute inpatient hospital services by a substantial amount—at least the 9% or 10% calculated by Baker."<sup>58</sup>

## VI. Economists agree on the appropriate methodology to compute overcharges

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### VI.1. The difference-in-differences methodology

- (53) The price increases quoted by Judge McGuire and by the Commission were derived from analyses by Professor Haas-Wilson and Professor Baker, both of whom used DID to estimate postmerger price increases at ENH.<sup>59</sup> My analysis will use the same methodology, though it is likely that I will identify and implement refinements to

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<sup>57</sup> "We find that the econometric work of both [FTC expert] Haas-Wilson and [ENH Expert] Baker supports our finding that the higher-than-predicted merger-coincident increases in ENH's prices reflect the exercise of market power caused by the merger." Majoras Opinion at 38–39.

<sup>58</sup> Majoras Opinion at 78.

<sup>59</sup> While criticizing Professor Baker's implementation of DID, Professor Ashenfelter also endorsed the DID methodology. Ashenfelter Rebuttal Report at 4–6.

their analyses. In this section, I provide a brief formal overview of the DID methodology and the data necessary for implementation.

- (54) DID regression examines the change in an outcome of interest for a group of individuals or firms affected by an event such as a merger (the “treatment” group) while controlling for the contemporaneous change in outcome for an otherwise similar group that was not affected by that event (the “control” group). In the current context, the outcome is price, the “treatment” group is the ENH hospitals, and the “control” group is a set of hospitals that did not merge during the time period of interest but that is otherwise similar to the ENH hospitals.
- (55) The term “difference-in-differences” arises because the first step is to compute the difference in the outcome before and after the event for both the control and treatment groups. The second step is to compute the difference between the differences across the two groups. This DID estimate tells us whether there is any additional difference in the outcome in the treatment group above and beyond what occurred in the control group.
- (56) For example, if ENH hospitals raise prices by 30% after the merger and a control group of hospitals raises price by 10%, then the “differences” are 30% and 10%, and the “difference-in-differences” is approximately 20% ( $30\% - 10\% = 20\%$ ).<sup>60</sup> This DID estimate of 20% represents ENH overcharges.
- (57) To be mathematically precise about DID estimation, let  $Y_{it}$  represent the outcome of interest (e.g., price), where  $i$  denotes the group (treatment or control) and  $t$  denotes the time period (pre-event or post-event), and let  $E(\cdot)$  represent the expectations (i.e., expected value) operator. The DID estimator  $\gamma$  can be computed as:

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<sup>60</sup> The reason the DID price increase is approximately 20%, rather than exactly 20%, is that the baseline ENH price has increased in this example. Suppose the premerger price at both ENH and the control hospitals is \$10,000 and that after the merger, prices went up by 30% at ENH and 10% in the control group. The postmerger prices are \$13,000 at ENH and \$11,000 in the control group. Therefore, the ENH price is \$2,000 above what it would have been, \$11,000, absent the merger. \$2,000 is 18.2% of \$11,000, so the DID estimate in percentage terms is 18.2%.

$$\begin{aligned} \gamma &= \left[ E(Y_{it} | i = treatment, t = post) - E(Y_{it} | i = treatment, t = pre) \right] - \\ &\quad \left[ E(Y_{it} | i = control, t = post) - E(Y_{it} | i = control, t = pre) \right] \\ &= \Delta E(Y_i | i = treatment) - \Delta E(Y_i | i = control) \end{aligned}$$

- (58) The DID estimate  $\gamma$  can be calculated by first computing the four expected values in the above equation and then performing the required simple algebraic calculations. In practice,  $\gamma$  is usually estimated via regression due to the large amount of data involved.
- (59) It is straightforward to translate the above expression for  $\gamma$  into a regression equation. Define  $Treatment_i$  as a dummy (0/1) variable that equals 1 if observation  $i$  is from the treatment group and 0 otherwise;  $Post_t$  as a dummy variable that equals 1 if observation  $t$  is from the post period. The regression equation is

$$Y_{it} = a_0 + a_1 Treatment_i + a_2 Post_t + \gamma (Treatment_i * Post_t)$$

- (60) The coefficient on  $(Treatment_i * Post_t)$  equals  $\gamma$ , the DID estimate, as demonstrated in the following table:

**Exhibit 3. Derivation of the DID estimate**

Group	Period	E(Y)	Change in E(Y)	DID
Treatment	Post	$a_0 + a_1 + a_2 + \gamma$	$a_2 + \gamma$	$\gamma$
	Pre	$a_0 + a_1$		
Control	Post	$a_0 + a_2$	$a_2$	
	Pre	$a_0$		

- (61) In practice, a researcher performing DID regression will include additional control variables that capture other factors that might affect the outcome of interest. In this case, we would want to control for other factors that might predict price changes independent of the merger. For example, in a regression that included hospitals from many different parts of the nation, the researcher might include a variable that measures changes in local wages, because rising labor costs would contribute to rising hospital costs. Because all of the hospitals in our proposed study are in the Chicago region and health care labor costs within a region tend to change similarly over time, there would be no need to include such a measure in the proposed DID

analysis.<sup>61</sup> Other factors that could contribute to rising prices would be changes in patient medical conditions, as well as changes in hospital characteristics such as teaching status. This information is available in publicly available hospital discharge data from the American Hospital Association's *Annual Survey Database* and in other sources such as Medicare Cost Reports and, when appropriate, I will control for these factors in my DID analysis.

VI.2. Data necessary to perform the difference-in-differences analysis are available or likely to be available

- (62) Implementing the DID analysis requires several types of data. First, it is necessary to have ENH's prices. This information is available for both inpatient and outpatient care in ENH's own billing records. ENH billing data for the years 1997 through 2003 are already available.<sup>62, 63</sup> It is very likely that the same or very similar data for years 2004 and after will be available from ENH.<sup>64</sup> I describe the ENH billing data in detail in Appendix C. In short, the data contain one record for each inpatient or outpatient episode of care at an ENH hospital. (An episode could be an inpatient admission or a visit to an outpatient clinic.) Each record indicates whether the episode of care was for inpatient care, same-day surgery (i.e., outpatient surgery), other outpatient care, diagnostic information (DRG, ICD-9 procedure codes, and ICD-9 diagnosis codes),<sup>65</sup> basic demographic information on the patient, list charges, payments (i.e., the transaction price), and a "Plan code" that identifies the insurer, if any, reimbursing the hospital for care.

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<sup>61</sup> For example, the Centers for Medicare and Medicaid Services (CMS) uses a Chicago-region wage index to adjust Medicare payments for local labor costs for all hospitals in the region. See "Acute Inpatient PPS Wage Index Files," <http://www.cms.hhs.gov/AcuteInpatientPPS/WIFN/list.asp>.

<sup>62</sup> I have copies of the same ENH billing data relied upon by the experts in the FTC case. These data span the years 1997 through 2003. However, the CD containing 1998 data is unreadable. I assume ENH can produce a readable copy of this information.

<sup>63</sup> Separate data for HPH for 1997–1999, the three years before HPH was acquired by ENH, are also already available.

<sup>64</sup> In general, it is easier for companies to produce more recent data than to produce older data.

<sup>65</sup> The World Health Organization promulgates the international classification of diseases (ICD) classification system, which contains a taxonomy of medical diagnoses and medical procedures. See <http://www.who.int/classifications/icd/en/>.

- (63) The DID methodology also requires data on pricing at "control" hospitals. In principle, this information could be obtained by acquiring billing data from those other hospitals. I view this as both unlikely and unnecessary. Pricing at other hospitals can be reliably estimated using publicly available hospital discharge and financial data, employing techniques previously applied by research economists (including myself).<sup>66</sup>
- (64) Hospital discharge data contain information very similar to that in ENH's billing records.<sup>67</sup> Each record identifies the hospital providing care, patient demographic information, relevant clinical information (DRG and ICD-9 codes), and the list charges associated with the episode of care. There are two notable differences: (1) hospital discharge data contain list charges but not payments, and (2) hospital discharge data identify the type of payer (e.g., Medicare/Medicaid/Commercial/self-pay) but not the identity of the payer.
- (65) It is possible to estimate a hospital's average transactions prices from its list charges. This requires one additional piece of information—the average discount from list charges that the hospital gives to private payers. For example, if a hospital reports list charges of \$100,000 and an average discount of 40%, then a reasonable estimate of the transaction price is \$60,000. The publicly available CMS Medicare Cost Reports include data sufficient to compute this average discount. In particular, the Medicare Cost Reports identify, for virtually all hospitals in the United States (including Illinois), gross patient revenue and net patient revenue. The difference between these is primarily the result of hospitals' discounts from list charges. The average discount offered by a hospital, expressed as a percentage is defined as follows:

$$\text{Average Percent Discount} = \frac{\text{Net Patient Revenue}}{\text{Gross Patient Revenue}} \times 100\%.$$

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<sup>66</sup> See, e.g., William Lynk, "Nonprofit Hospital Mergers and the Exercise of Market Power," *Journal of Law and Economics* 38, no. 2 (1995): 437–61; David Dranove and Richard Ludwick, "Competition and Pricing by Nonprofit Hospitals: A Reassessment of Lynk's Analysis," *Journal of Health Economics* 18, no. 1: 87–98; Emmett Keeler, Glenn Melnick, and Jack Zwanziger, "The Changing Effects of Competition on Non-profit and For-profit Hospital Pricing Behavior," *Journal of Health Economics* 18, no. 1: 69–86.

<sup>67</sup> Hospital discharge data for Illinois hospitals, commonly referred to as the "COMPdata," is available from the Illinois Hospital Association.

- (66) Professor Haas-Wilson adopted this and other approaches to measure prices in her report,<sup>68</sup> with qualitatively similar results under each approach.<sup>69</sup> Thus, we can reliably estimate transactions prices in control hospitals using list prices available in discharge data and discounts estimated from CMS data.<sup>70</sup>
- (67) Applying the DID methodology to compute overcharges for outpatient services provided by ENH requires a measure of the price changes for hospital-based outpatient care among the control group hospitals. Hospital discharge data do not contain information on outpatient care. However, Medicare Cost Reports allow us to estimate the net revenue that hospitals receive from outpatient care as well as the total number of outpatient visits. Simple division gives us an estimate of the average price per visit. By examining these prices over time, we can compute outpatient overcharges in much the same way as we compute inpatient overcharges. This exercise is complicated if a hospital adds an outpatient service that is markedly more or less expensive per patient than its existing services. I can control for this directly by examining and incorporating each hospital's service offerings, which are available in the American Hospital Association's *Annual Survey of Hospitals Database*.<sup>71</sup>

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<sup>68</sup> Haas-Wilson Report at 30–32, 39–40.

<sup>69</sup> Professor Haas Wilson implemented her DID analysis using two data sources: data from selected large payers in Chicago and publicly available hospital discharge and Medicare Cost Report data (Majoras Opinion at 28). Both yield qualitatively similar results (“The fact that Haas-Wilson obtained similar results from her regressions using the Illinois data also suggests that the payer data, as well as the Illinois data, were sufficiently reliable to instill confidence in Haas-Wilson’s and Baker’s results” Majoras Opinion at 49–50).

<sup>70</sup> Because the DID analysis compares *changes* in prices at ENH hospitals to *changes* in prices at the control group hospitals, it is not necessary to precisely identify the level of prices at the control group, only the changes in prices. (“Haas-Wilson compared the average percentage changes in ENH’s prices to those of the control groups because hospitals are differentiated and thus a simple cross-section comparison of price levels may be less informative” Majoras Opinion at 31.)

<sup>71</sup> <http://www.ahadata.com/ahadata/html/AHASurvey.html>.

## VII. Common impact is an immediate consequence of the ways hospitals charge for their services

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- (68) Hospitals typically use standard methodologies to determine pricing. In this section, I review these methodologies and conclude that an increase in average price will have a common impact on all or substantially all class members. In implementing my DID analysis, described above, I will focus not on the payment methodology but rather on the object of direct interest—changes in actual transaction prices.
- (69) In subsection VII.1, I review the three payment methodologies by which hospitals charge for inpatient care (per diem rates, case rates, and discounted list charges payments) and describe how each implies common impact from increases in average prices. A similar logic applies to outpatient care and the uninsured, which I discuss in subsections VII.2 and VII.3. In subsection VII.4, I consider deviations from these standard contracting forms and describe how they do not change my conclusion of common impact.

### VII.1. Payment methodologies for inpatient care imply common impact

- (70) It is important to examine the methods used by insurers to pay hospitals in order to determine whether a common framework can be used to estimate damages for all class members. In this section, I provide details about each of the three basic payment methodologies. My discussion explains why, as a general rule, if a hospital overcharges an insurer by a certain percentage, all or substantially all class members covered by that insurer will be overcharged by approximately the same percentage, regardless of the payment methodology specified in the relevant contract.<sup>72</sup> In other words, I can use the DID estimate of average overcharges to reliably compute damages for substantially all class members.

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<sup>72</sup> An insurer and a hospital may in some cases have distinct contracts or payment systems for the insurer's various products (e.g., HMO and PPO plans may be reimbursed under different payment systems). If this is the case, it will be true that substantially all payments to a hospital under a given insurance *plan* will be determined by the same reimbursement rules. This would necessitate conducting the analysis at the plan-hospital level rather than at the insurer-hospital level. This does not pose a challenge to the computation and allocation of damages, because the data identifying the insurer and plan are or are likely to be available.

## VII.1.1. Case rates

- (71) Under case rate pricing, the hospital's reimbursement is determined by the Diagnosis Related Group (DRG) applicable to a given admission. Software is used to assign DRGs based on the patient's diagnosis, comorbidities, age, applicable procedure(s), and discharge status.<sup>73</sup> DRGs for Medicare patients are defined by the Centers for Medicare and Medicaid Services (CMS).<sup>74</sup> CMS also defines a "relative value weight" (often referred to as a "DRG weight") for each DRG. An "average" DRG receives a case weight of 1. DRG weights measure the relative cost of treating a patient in each DRG, relative to the cost of an "average" DRG, as determined by national estimates of the average cost of providing inpatient care to patients in each DRG.
- (72) Under a private case rate contract, the hospital and payer negotiate a single base payment rate. This represents the payment for a patient with the "average" DRG. Payments for each DRG are then scaled using the "relative weight" of the DRG. Both the base payment rate and the relative DRG weights are common across all transactions for a given hospital-insurer or hospital-plan pair. For example, suppose the insurer negotiates a base payment rate of \$4,000. If a patient has a DRG with a relative DRG weight of 4.0, then the hospital will receive a payment of  $4.0 * \$4,000 = \$16,000$ . More generally, the payment for a patient in a given DRG is defined as follows:

$$\text{Payment} = (\text{Base rate}) \times (\text{DRG weight}).$$

- (73) Contracts between insurers and hospitals may use the DRGs and DRG weights published annually by CMS. Some contracts instead use proprietary weighting systems, and others use commercially available weighting systems. Because the

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<sup>73</sup> For example, DRG 135 represents "Cardiac Congenital & Valvular Disorders Age >17 [With Complicating Condition]," DRG 136 represents "Cardiac Congenital & Valvular Disorders Age >17 [Without Complicating Condition]," and DRG 137 represents "Cardiac Congenital & Valvular Disorders Age 0-17." Most hospitals use commercially available software, commonly known as a "grouper," to assign DRGs.

<sup>74</sup> In 2007, there were 579 Medicare DRGs. The 2006–2007 list is available at <http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=none&filterByDI D=-99&sortByDID=2&sortOrder=ascending&itemID=CMS1185262&intNumPerPage=2000>. CMS implemented a substantial revision of the DRG payment system in fiscal year 2008. This revision is not relevant for the purpose of computing damages in the case at hand.

diagnosis—as opposed to the volume of services rendered—is the primary factor in determining the payment under case rate contracts, the provider bears most of the financial risks of caring for a given patient.<sup>75</sup>

- (74) All prices in the case rate system are computed from the same basic formula and depend on just two factors: a negotiated base rate and the DRG weights. Thus, any negotiated price increase takes the form of an increase in the base rate. This increase is then multiplied through the formula to determine the price increase for all DRGs. As a result, the percentage price change applicable to each patient will equal the percentage change in the base rate.
- (75) It is possible to infer the increase in the base case rate by examining the overall increase in average payments. For example, if overall payments increase by 20%, then the base rate must have increased by 20%. This, in turn, implies that prices for all patients increased by 20%.

#### VII.1.2. Per diem rates

- (76) Per diem rates specify a daily payment for hospital stays; in other words, the total payment to the hospital is a function of the patient's length of stay. A contract may specify a uniform per diem rate applicable to all inpatient care, or it may specify a small set of rates applicable to a few different classes of care. For example, an insurer and a hospital might negotiate a contract that specifies one per diem rate that is applicable to general medical/surgical inpatient care, another rate for maternity care, and a third rate for days in an intensive care unit.<sup>76</sup>
- (77) An important feature of per diem rates is that a given increase in those rates will result in a common percentage increase in the price for all patients. For example, suppose that the per diem rate increases by 20%, from \$2,500 to \$3,000. Then the price for a patient who is hospitalized for three days will increase by 20%, from

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<sup>75</sup> Because the diagnosis, which is determined before care is rendered, is the primary factor determining payment, the case rates system used by CMS for inpatient payments is also referred to as the "Inpatient Prospective Payment System" (IPPS). Outlier provisions serve to lessen the risk faced by the hospital under a per case contract. I discuss outlier payments, which apply to only a small number of patients, in section VII.4.4.

<sup>76</sup> Philip Jacobs and John Rapoport, *The Economics of Health and Medical Care*, 5th ed. (Boston: Jones and Bartlett, 2004), 155.

\$7500 to \$9000. Likewise, the price for a patient who is hospitalized four days will increase by 20%, from \$10,000 to \$12,000. Indeed, the total payments to the hospital for every patient to whom the per diem rates apply will increase by 20% regardless of the patient's length of stay, diagnoses, or course of treatment.

- (78) If an insurer pays a hospital on a uniform per diem basis, it is possible to infer the increase in the per diem rate by examining the overall increase in average payments. For example, if overall payments increase by 20%, the per diem rate must have increased by 20%. It is also possible to make inferences about rate increases when there are multiple per diem rates, as I describe in section VII.4.2.

#### VII.1.3. Discounted list charges and hospital chargemasters

- (79) Hospitals maintain detailed price lists, referred to as chargemasters, for each of the services they provide. The chargemaster for a hospital contains "prices" for hundreds of distinct services. Hospitals are generally free to specify the prices in their chargemasters; however, these prices are "list prices" that rarely correspond to the actual transaction prices paid by insurers and patients (self-pay patients are an exception; I discuss these patients in section VII.3). In the industry parlance, the sum of list prices for an inpatient stay is often referred to as "list charges," "full charges," or simply "charges." The terms "payments" and "reimbursement" describe the amount of money the hospital actually receives (i.e., transaction prices). Payments to in-network providers are typically well below charges, often 40%–60% below.<sup>77</sup>
- (80) Over the course of an inpatient episode of care, list charges accumulate as the hospital provides additional services. A discounted list charges contract between a payer and a hospital specifies that the payer receive a fixed percentage discount from list charges. For example, if a contract specifies a 40% discount, then the payment for an episode of care would be 60% of the total list charges. More generally, the payment for a patient under a discounted list charges system is defined as follows:

$$\text{Payment} = (1 - \% \text{Discount}) \times (\text{List charges}).$$

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<sup>77</sup> Judith Graham, "Pricing Health Care? It's Not that Easy," *Chicago Tribune*, August 10, 2006, C1; Tom McGrath, "My Daughter's \$29,000 Appendectomy," *Philadelphia Magazine*, May 2008.

- (81) Price increases under discounted list charges contracts can take several forms. The two most common are a decrease in the negotiated discount and an across-the-board increase in the list prices contained in the hospital chargemaster. Mathematically, there is no meaningful distinction between these two; the same price increase can be achieved by reducing the discount or increasing the list price.<sup>78</sup> Common impact is also inherent in the discounted list charges payment system. If list prices increase by 20%, then the payment for every patient increases by 20%. Similarly, if the discount decreases from 50% to 40%, then every patient pays 20% more.<sup>79</sup>
- (82) If an insurer pays a hospital for inpatient care on a discounted charges basis, it is possible to infer the net increase in the discounted charge by examining the overall increase in average payments. For example, if overall payments increase by 20%, then the chargemaster list prices net of discounts must have increased by 20%.

#### VII.2. Payment methodologies for outpatient care also imply common impact

- (83) Hospital-based outpatient care consists of procedures performed by a hospital that do not require an overnight stay. The most common payment methodology for outpatient care is a discounted list charges system very similar to the inpatient system described in the previous section. Under this system, insurers negotiate a discount from the hospital's list charges for outpatient services.<sup>80</sup> Common impact is also inherent in

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<sup>78</sup> One exception applies in extreme cases: discounts, by definition, can only be reduced to zero. So if the current discount is 50%, prices can only be 100% by reducing the discount (losing a 50% discount is equivalent to facing a 100% price increase while retaining the 50% discount). To impose larger price increases would require increasing list charges. One could, alternatively, view increases in the list prices as "negative" discounts, in which case there is no distinction.

<sup>79</sup> Suppose list charges are \$10,000. With a 50% discount, the payment is \$5000. If the discount falls to 40%, the payment would increase to \$6000, which is an increase of 20%.

<sup>80</sup> In some cases, an insurer may negotiate a "percent of Medicare" contract under which the hospital is reimbursed a fixed percentage (typically greater than 100%) of the amount Medicare pays for the same service. For example, a contract between an insurer and hospital could specify outpatient prices equal 150% of the Medicare rates. If there is a contract that specifies rates relative to Medicare, an increase in the price of outpatient care from 150% of Medicare would impose a 33% price increase on every outpatient.

the discounted list charges payment system as applied to outpatient care. If list prices increase by 20%, then the payment for every outpatient increases by 20%. Similarly, if the discount decreases from 50% to 40%, then every outpatient pays 20% more.

- (84) As is the case for inpatient discounted list charges contracts, it is possible to infer the net increase in the discounted charge for outpatient care by using the DID framework to calculate the increase in average payments for outpatient care.

### VII.3. Payment methodologies for the uninsured imply common impact

- (85) Uninsured patients are typically billed at full (i.e., list) charges. In many cases, particularly for inpatient care, the uninsured may not pay their hospital bills. But many do. Those that do pay their hospital bills in full or approximately in full, whether for inpatient or outpatient care, are readily identified by data that either are or are likely to be available to me. I will use the same DID analysis of actual payments by the uninsured to compute overcharges to these patients.
- (86) As noted in my discussion of the discounted list charges payment system, to the extent that ENH increased prices by reducing discounts and imposing across-the-board increases in list charges in its discounted list charges contracts, common impact is inherent in the discounted list charges payment system. The same logic applies to the uninsured (who can be viewed as paying under a discounted list charges system in which the discount is zero).

### VII.4. The common framework can accommodate potentially complicating factors

- (87) The discussion of payment methodologies leads to a compelling conclusion. In the basic implementation of each of the three payment systems, one can infer the percentage increase in the price of each transaction by examining the same statistic—the increase in the average price estimated using the DID methodology. Nevertheless, I have examined how these payment methodologies are implemented in practice, with the goal of understanding whether a departure from the most basic forms of implementation could reasonably undermine my finding of common impact. For example, it is possible that a lack of common impact would result from ENH raising prices for one set of inpatient services but not another. After review, I have concluded

that such disparate effects are not likely to be a significant issue in this matter for the following reasons:

- Payment rules are most commonly adopted across-the-board; that is, the contracted payment rules apply to all or nearly inpatient services (or outpatient services for outpatient contracting). For example, a DRG-based payment system is applied to all DRGs, and any increase in the price for a base case DRG is therefore applied across-the-board.
- Consistent with this practice, healthcare antitrust economists (including the FTC) have found that, in practice, hospitals do not limit their exercise of market power to certain inpatient services (e.g., intensive care days) or ailments (e.g., cardiac surgery).<sup>81</sup> In fact, the antitrust product market definition uniformly adopted in hospital merger cases—acute inpatient care—implies that hospitals price collections of inpatient services as a whole.

(88) Notwithstanding the previous two reasons, which imply that hospitals are unlikely to limit their exercise of market power to certain sets of services, the DID approach described above can be adapted to estimate damages at, for example, the plan-hospital-DRG level. A DRG-based DID analysis would ensure that my estimated damages will reflect underlying service line specific price increases, should such selective increases exist.

(89) I now discuss the most likely variations and describe how I would adjust my DID analysis in response, should such adjustments prove necessary.

#### VII.4.1. Differential increases in the chargemaster

(90) When payments are based on discounted list charges, the same percentage discount nearly always applies to all charges. If, over time, all list charges change by the same proportion, then the overcharge resulting from the DID methodology will apply equally to all patients. As noted above, there is no reason to expect that ENH would exercise its market power selectively, and in my experience discussing these issues with hospital and insurance executives, hospitals typically implement across-the-board increases in their chargemasters. Even so, it is theoretically possible that ENH increased charges for different services at substantially different rates. Should this

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<sup>81</sup> See section V.1.

prove to be the case, the exercise of market power will still have a common impact on class members, but the magnitude of that impact could differ across class members. My analysis can readily incorporate this possibility.

- (91) A review of ENH's strategic documents, contracts with insurers, and the chargemaster itself, both of which are or are likely to be available, will indicate whether ENH increased the list prices in its chargemaster at substantially different rates for different services. If my review indicates that increases are not substantially different, then the damages estimated by the DID analysis will very closely approximate actual damages for each class member. To the extent that there were substantially differential increases in list charges, I can (1) identify the service classes subject to different percentage increases by reviewing ENH billing documents that report charges and DRGs, (2) include in the DID analysis dummy variables for those services that faced a differential increase, and (3) obtain an estimate of the overcharges that reflects the differential increases.

#### VII.4.2. Multiple per diem rates

- (92) Some contracts specify a set of per diem rates rather than a single per diem rate applicable to all inpatient visits. In these cases, the number of per diem rates is typically small. For example, a contract might specify one per diem rate for general medical/surgical days, a different per diem for intensive care days, and a third rate for maternity days. If ENH implemented a postmerger price increase by increasing all per diem rates by approximately the same percentage, then the average overcharge implied by the DID analysis will be a reliable estimate of the actual overcharges for each class member.
- (93) As I mentioned at the outset of this section, there is no a priori reason to expect that ENH would have limited its exercise of market power in the market for general acute care to particular lines of service.
- (94) Nevertheless, if it proves to be the case that an ENH contract employed multiple per diem rates and that ENH exercised its market power by increasing per diem rates by substantially different amounts, the impact will still be common. But the magnitude of the overcharge, expressed in percentage terms, may differ across patients according to the applicable per diem. Any such differential increase will be readily apparent in both the relevant contracts and in ENH's billing data (ENH's billing data

records the payment and the length of stay, so the per diem rate can be recovered directly) and can be readily incorporated into the estimation of overcharges.

- (95) Suppose, for example, that my DID analysis shows that one per diem rate increased by 20% and another increased by 30% (both figures represent the increase in excess of what would have occurred absent the merger). In this case, I would not apply a single overcharge of, say, 25%, to all patients. Instead, my analysis will apply the separate figures of 20% and 30% as appropriate.<sup>82</sup> Note that it is possible that ENH's per diem contracts either do not use multiple per diem rates or that all per diem rates increased by the same percentage. Thus, this refinement may not be necessary.

#### VII.4.3. Mixed-model contracts

- (96) The payment methodologies described above are not mutually exclusive. A given contract between a payer and a hospital might specify that some services, such as maternity admissions or organ transplants, are reimbursed based on case rates and that other services are reimbursed on a per diem basis. If the per diem rate and the base rate increase by the same percentage, the combination of two payment methodologies does not affect the analysis.
- (97) If the percentage increases for the per diem rate and the case rate differ, my DID analysis of overcharges can again account for this by including suitably defined dummy variables. In this case, including a dummy variable that equals 1 for classes of services that are reimbursed under a per diem rate will identify the differential overcharges under the two systems.
- (98) This approach generalizes in a straightforward fashion to encompass more complicated possibilities. Consider a contract that specifies one per diem rate for general medical/surgical days, another per diem rate for intensive care days, a carve-out specifying that maternity visits are reimbursed using case rates, and another carve-out specifying that cardiac surgery is reimbursed at a 30% discount from list

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<sup>82</sup> The DID regression can accomplish this by incorporating dummy (0/1) variables for differing classes of service. The applicable contract will likely identify the classes of services that should have a dummy variable. For example, if a contract specifies one per diem rate for maternity stays and another for general medical/surgical stays, then a dummy variable that equals one if the patient is a maternity patient will suffice to estimate any differential effect for these patients. The most likely basis upon which to define classes of service is the patient's diagnosis related group (DRG).

charges.<sup>83</sup> This scenario combines three payment methodologies. The payment methodology applicable to each patient is readily observable in the data that is or is likely to be available (i.e., ENH's billing data and contracts), and so this situation can be addressed, if necessary, using suitably defined dummy variables. In this case, three dummy variables are required to estimate the percentage price increases for the four classes of service.<sup>84</sup>

#### VII.4.4. Outlier payments

- (99) Outlier provisions are common in contracts between payers and hospitals when the hospital bears a substantial portion of the risk associated with the cost of care, as occurs under case rate contracts.<sup>85</sup> These provisions typically specify that when list charges associated with a patient exceed some predetermined threshold, payment will be made on a discounted list charges basis rather than a per diem or per case basis.<sup>86</sup>
- (100) Conceptually, this possibility is very similar to the mixed-model scenario described above. A case rates contract that includes outlier provisions combines case rate payments with discounted list charges payments. The only difference is that, in the preceding example, the form of the payment is determined by the class of service. In

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<sup>83</sup> Such a contract would be unusual; this example is only illustrative.

<sup>84</sup> Three rather than four dummy variables are required to define four classes of services because the categories are mutually exclusive. For each patient, if the dummy variables for three of the service classes equal zero, that necessarily implies that the patient is in the fourth class of service.

<sup>85</sup> The Prospective Payment System used by CMS contains outlier provisions. CMS computes both operating and capital costs from list charges using hospital-specific cost-to-charge ratios. It computes a total cost threshold, which is adjusted for prevailing local wages and other factors. This total cost threshold is used, in turn, to calculate operating and capital thresholds. If the total costs exceed the total cost threshold, CMS compares operating and capital costs to their respective thresholds. It then makes an outlier payment equal to a DRG-specific percentage of operating and capital costs above the respective thresholds. "Outlier Payments," Centers for Medicare and Medicaid Services, [http://www.cms.hhs.gov/AcuteInpatientPPS/04\\_outlier.asp](http://www.cms.hhs.gov/AcuteInpatientPPS/04_outlier.asp) (last visited Jan. 2, 2009).

<sup>86</sup> Philip Jacobs and John Rapoport, *The Economics of Health and Medical Care*, 5th ed. (Boston: Jones and Bartlett, 2004), 156. Outlier provisions may specify that payments are "first dollar" or "second dollar." Under a first dollar outlier provision, if the list charges exceed the threshold, the entire case is reimbursed on a discounted list charges basis. Under a second dollar outlier provision, only list charges in excess of the outlier threshold are reimbursed on a discounted list charges basis.

this scenario, the form of the payment is determined by the level of list charges. Incorporating a dummy variable into the DID analysis that equals 1 if list charges exceed the outlier threshold will estimate any differential overcharge for outlier patients.<sup>87</sup>

#### VII.4.5. Changes in the form of payments over time

- (101) I can still employ the DID framework to compute damages reliably, even if the form of contracts between hospitals and insurers changed over time. In fact, the Commission noted that such changes in contracts did occur and opined that this was the result of the exercise of ENH's postmerger market power.<sup>88</sup> Specifically, the analysis in this case will still focus on transaction prices rather than on the form of the payment.<sup>89</sup> The necessary adaptation is that the DID analysis must be conducted at the level of services. Diagnosis Related Groups (DRGs) provide a natural way to measure prices for specific services in a way that ensures that I make an apples-to-apples comparison of prices before and after the merger.<sup>90</sup> The following example illustrates the logic and process of using the DID framework to analyze prices at the DRG level.

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<sup>87</sup> Another possibility is that the outlier threshold changed as a result of ENH's exercise of market power. Such a change would have a minimal effect on my calculation of damages for two reasons. First, by the definition of the term "outliers," such a change would apply to only a small number of patients. Second, the effect of a shift in the outlier threshold will have a second order effect relative to increases in the baseline prices.

<sup>88</sup> "In addition, ENH sought to raise its prices through the conversion of portions of some of its contracts from per diem to discount off charges payment structures. . . . The record reflects that ENH's postmerger negotiation strategy was highly successful. ENH negotiated with its MCO customers a single contract for all three of its hospitals with substantial price increases, and converted a number of its contracts from per diem to discount off charges structures." (Citations omitted.) Majoras Opinion at 16.

Haas-Wilson similarly noted, "For some of the plans at particular insurers the renegotiated contracts [after the HPH acquisition] included changes in the methodology for calculating prices, as well. Specifically, some plans changed from fixed rate prices, such as per diems and case rates, to prices based on discount-off-charges calculations." Haas-Wilson Report at 21.

<sup>89</sup> Transaction prices at ENH hospitals are available for both the pre and postmerger periods, regardless of any changes in the form of payment. And transaction prices can be estimated for control group hospitals, as described in section VI.2.

<sup>90</sup> See section VII.1.1 for a description of DRGs.

- (102) For simplicity, suppose there are only two DRGs: DRG 106, “Coronary bypass with PTCA” and DRG 235, “Fracture of femur.” Further suppose that prior to the merger, ENH had a contract with Payer Z that used case rates. After the merger, ENH substantially raises prices to Payer Z and negotiates a new, discounted list charges contract with Payer Z. Because the pricing system before the merger is based on case rates, the transaction price for each admission is determined by referencing the negotiated base rate as well as the relative weight for each DRG. As shown in Exhibit 4, the premerger base rate is \$4,000, and the relative weights for the two DRGs are 7.3062 and 0.7512, yielding premerger transaction prices of \$29,225 for DRG 106 and \$3,005 for DRG 235.
- (103) Under the postmerger discounted list charges pricing system, the transaction prices at ENH increase to \$58,000 and \$5,500 for these DRGs. These represent increases of 98% and 83%. The next step in this (hypothetical) DID analysis is to compare this change in transaction prices at ENH hospitals to the change in transaction prices at the control group hospitals, as shown in Exhibit 5. Note that the analysis of price changes for the control group does not require any information about the payment methodologies used at those hospitals, only the changes in transaction prices.<sup>91</sup>

**Exhibit 4. Computing the percentage change in price at ENH hospitals when the payment methodology changes from case rates to discounted list charges**

DRG	Premerger: Case rates			Postmerger: Discounted list charges	% Change
	Relative weight	Base rate	Transaction price	Transaction price	
106	7.3062	\$4,000	\$29,225	\$58,000	98%
235	0.7512	\$4,000	\$3,005	\$5,500	83%

**Exhibit 5. Computing the percentage change in price at control group hospitals**

DRG	Premerger	Postmerger	% Change
	Transaction price	Transaction price	
106	\$32,000	\$38,400	20%
235	\$3,500	\$4,550	30%

<sup>91</sup> As explained in section VI.2, I will use Illinois hospital discharge data and data from the Medicare Cost Reports to estimate transaction prices at the control group hospitals.

- (104) The percentage changes in transaction prices at the control group hospitals for these two hospitals are 20% and 30%. These are the best estimates of the changes in price at ENH that would have occurred absent the merger (i.e., the price change resulting from factors other than the merger, such as changes in input prices or changes in technology). Exhibit 6 shows how to combine the information in Exhibit 4 and Exhibit 5 to obtain the estimated overcharge for each DRG. The overcharge is calculated as the difference between actual prices charged by ENH after the merger and the prices ENH would have charged had it followed the pricing trend in the control group hospitals.

**Exhibit 6. DID estimation of overcharges when the payment methodology changes from case rates to discounted list charges**

ENH premerger price	ENH price change absent merger (%)	Post period prices		Overcharge	
		Absent merger	Actual	\$	%
\$29,225	20%	\$35,070	\$58,000	\$22,930	65%
\$3,005	30%	\$3,906	\$5,500	\$1,594	41%

- (105) The only difference for the case of a transition from per diem rates to discounted list charges is that the premerger price is determined by multiplying the patient's length of stay times the applicable per diem rate.<sup>92</sup>

## VIII. Summary and conclusions

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- (106) Expert economists on behalf of the FTC and ENH used difference-in-differences (DID) regression analysis to estimate insurer-specific overcharges resulting from the exercise of market power.<sup>93</sup> I will similarly apply the framework of DID analysis to determine the magnitude of any overcharges imposed by ENH following its acquisition of HPH and compute the resulting damages. I will apply the same DID methods to all class members.

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<sup>92</sup> Under contracts specifying multiple per diem rates (see section VII.1.2), the applicable per diem rate is most likely identified by the patient's DRG.

<sup>93</sup> See Exhibit 1 for a summary of overcharges. See also Haas-Wilson Report at 58–60.

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- (107) My review of the industry, including the structure and nature of contracts between insurers and hospitals, shows that the impact of overcharges is intrinsically common to all categories of private health care payers, so that any such overcharges would result in injury to all or substantially all class members.
- (108) DID analysis reports overcharges as *percentage increases* in prices. An examination of hospital-insurer contracting indicates that these percentage increases form the basis for all damages calculations for all class members. In general, no knowledge of the specific payment rules is required to infer damages.
- (109) There may be some exceptions, such as when payment rules change over time, or when patients are treated as “outliers” for payment purposes. These cases should be readily identifiable from information about ENH contracts and information in ENH’s own billing data. The same DID methodology can be applied to estimate percentage overcharges and compute damages in these cases.
- (110) The data required for DID estimation is to some extent already available, and such additional data as is necessary to complete my analysis is likely to be available from ENH and from public data sources.



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David Dranove

2/12/2009

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February 12, 2009

## Appendix A. Curriculum vita of David Dranove

Kellogg School of Management  
Northwestern University  
2001 Sheridan Road  
Evanston, IL 60208  
(847) 491-8682  
d-dranove@kellogg.northwestern.edu

### **A.1. Education**

- Ph.D. (Economics, Business, and Policy), Stanford University, 1983
- M.B.A. (Health Administration), Cornell University, 1979
- B.A. (Genetics), Cornell University, 1977

### **A.2. University experience**

#### **A.2.1. Northwestern University, Kellogg School of Management**

- Currently:
  - Walter McNERney Distinguished Professor of Health Industry Management
  - Professor of Management and Strategy
  - Director, Center for Health Industry Market Economics
  - Director, Health Enterprise Management Program
- Past Positions:
  - Chair, Department of Management and Strategy, 1996–2000
  - Richard Paget Distinguished Professor of Management and Strategy, 1995–2000
  - Associate Professor of Management and Strategy and Health Services Management, 1991–1995
- Service Positions at Northwestern University:
  - University Program Review Council
  - Faculty Committee on Conflict of Interest and Conflict of Commitment

- Faculty Committee on Intellectual Property
- Roadmap Committee for the Biological Sciences
- Kellogg Personnel Committee (promotion and tenure case)

#### **A.2.2. University of Chicago, Graduate School of Business**

- Associate Professor of Business Economics, 1987–1991
- Assistant Professor of Business Economics, 1983–1987
- Co-director, Graduate Program in Health Administration and Policy, 1990–1991

#### **A.3. Board membership**

- American Association of Nurse Anesthetists (1993–1995)
- Clean Air Engineering (Professional services firm) (1996–1998)
- Beecken Petty & Company (Health care venture capital firm) (1997–1999)
- Children’s Memorial Hospital Pediatric Faculty Foundation (2000–2005)
- Roycemore School (2005–2006)
- Yellowbrick (Psychiatric Residential and Outpatient Care) (2006–present)

#### **A.4. Honors**

- 1993, John D. Thompson Prize in Health Services Research. The Thompson Prize, awarded by the Association of University Programs in Health Administration, recognizes outstanding contributions to health services research by an individual under the age of 40.
- 1993, Marriott Corporation Health Care Services Faculty Publication of the Year: “Is Hospital Competition Wasteful?” This prize is awarded by the Marriott Corporation and the American Academy of Medical Administrators.
- 1994, Marriott Corporation Health Care Services Faculty Publication of the Year: (1st Runner Up): “Price and Concentration in Local Hospital Markets: The Switch from Patient-Driven to Payer-Driven Competition”
- 1996, Marriott Corporation Health Care Services Faculty Publication of the Year: “Cost Reductions versus Reputation Enhancements as Motives for Mergers”

- 1998, National Institute for Health Care Management Research Paper of the Year: “Medicaid Dependent Hospitals and Their Patients: How Have They Fared?”
- 1998, Association for Health Services Research Paper of the Year: “Medicaid Dependent Hospitals and Their Patients: How Have They Fared?”
- 1999, Marriott Corporation Health Care Services Faculty Publication of the Year: “Medicaid Dependent Hospitals and Their Patients: How Have They Fared?”
- 2002, 2005 Kellogg School of Management: Sidney Levy Teaching Award
- 2002, National Institute for Health Care Management Research Paper of the Year: “Is More Information Better: The Effects of “Report Cards” on Health Care Providers”
- 2005, Kellogg School of Management: Stanley Reiter Best Paper Award

#### **A.5. Editorial boards**

- Journal of Health Economics
- RAND Journal of Economics
- Health Services Research
- Journal of Medical Practice Management
- (Previously) Management Science

#### **A.6. Grants**

1. “Effects of Changes in the Illinois Medicaid Formulary,” Eli Lilly Corporation, 1985–86 (Principal Investigator)
2. “An Evaluation of SPRANS Ventilator Assisted Children Programs,” State of Illinois Division of Services for Crippled Children, 1984–87 (Economics Director)
3. “International Collaborative Study of Oral Health Outcomes,” World Health Organization, 1987–1992 (Economics Director)
4. “The Geographic Extent of Hospital Services Markets,” Fishman-Davidson Center for the Study of the Service Sector, 1988–1989 (Principal Investigator)
5. “The Effects of Regulation on the Research and Development of New Chemical Entities,” Merck & Co./Burroughs-Wellcome, 1989–1991 (Principal Investigator)

6. “Health Systems Integration Study” Consortium of Health Care Systems, 1991–1994 (Economics Director)
7. “Technological Change and the Rising Costs of Medical Care” Robert Wood Johnson Foundation, 1993–1994 (Co-principal Investigator)
8. “Continuous Quality Improvement in Hospitals” Center for Health Management Research of the Western Network 1993–1995 (Economics Director)
9. “Recent Evidence on Competition in Hospital Markets” Department of Veterans' Affairs, 1993 (Principal Investigator)
10. “The Costs and Benefits of Vitamin E” Henkel Corporation, 1994 (Principal Investigator)
11. “Direct Sputum Analysis for TB by PCR vs. Conventional Techniques in a Public Hospital” 1994–1995 Department of Health and Human Services (Co-Principal Investigator)
12. “Assessing the Implementation and Impact of CQI Efforts” 1995–1997 (Co-Principal Investigator)
13. “The Effects of Managed Care on Physicians” Agency for Health Care Policy Research 1995–1996 (Co-Principal Investigator)
14. “Assessing Health Data Needs in a Changing Environment” Agency for Health Care Policy Research 1996–1997 (Co-Principal Investigator)
15. “How do PBMs Make Formulary Adoption Decisions?” Hoerscht Marion Roussel 1997–1998 (Principal Investigator)
16. “The Role of the Regulatory Affairs Professional in Strategic Decision Making” Regulatory Affairs Professional Society 2001–2002 (Principal Investigator)
17. “Hospital Bailouts and Economic Efficiency” Searle Fund 2002–2003 (Principal Investigator)
18. “The Effects of Hospital Mergers on Prices Paid by Managed Care Organizations” Anonymous Funder 2002–2004 (Principal Investigator)
19. “Is the Government Regulating Medicare HMOs Out of Business?” Searle Fund 2003–2004 (Co-Principal Investigator)
20. “New Approaches to Antitrust Definitions of Hospital Markets” Robert Wood Johnson Foundation 2004–2006 (Principal Investigator)

21. "Is the Impact of Managed Care on Hospital Prices Decreasing?" Robert Wood Johnson Foundation 2004–2006 (co-Principal Investigator)
22. "Has the Malpractice 'Crisis' Affected Access to Medical Care" Searle Fund, 2005–2006 (Principal Investigator)
23. "Health Services Market Areas in the Netherlands" Netherlands Competition Authority, 2006 (Principal Investigator)
24. "Economic Impact of Adverse Health Events on the Uninsured Near Elderly" Robert Wood Johnson Foundation, 2007, (Principal Investigator)
25. "Willingness to Pay for Ovarian Cryopreservation" National Cancer Institute, 2007–2009, (Principal Investigator)

#### **A.7. Refereed publications**

1. "A Comment on 'Does Practice Make Perfect'," *Medical Care*, Vol. 22, October 1984.
2. "An Empirical Study of a Hospital-Based Home Nursing Care Program," *Inquiry*, Vol. 22, Spring 1985.
3. "Do State Rate Setting Programs Really Lower Hospital Expenses?" with Kenneth Cone, *Journal of Health Economics*, Vol. 4, June 1985.
4. "Why Did States Enact Hospital Rate Settings Laws?" with Kenneth Cone, *Journal of Law and Economics*, Vol. 29, October 1986.
5. "The Effect of Injecting Price Competition into the Hospital Market: The Case of Preferred Provider Organizations," with Mark Satterthwaite and Jody Sindelar, *Inquiry*, Vol. 23, Winter 1986.
6. "Rate Setting by Diagnosis Related Groups and Hospital Specialization," *Rand Journal of Economics*, Vol. 18, Autumn 1987.
7. "Agency and the Organization of Health Care Delivery," (with William D. White) *Inquiry*, Vol. 24, Winter 1987.
8. "Demand Inducement and the Physician/Patient Relationship," *Economic Inquiry*, Vol. 26, April 1988.
9. "Pricing by Non-Profit Institutions: The Case of Hospital Cost Shifting," *Journal of Health Economics*, Vol. 7, Spring 1988.

10. "Medicaid Drug Formulary Restrictions," *Journal of Law and Economics*, Vol. 32, April 1989.
11. "Agency Theory: Offering New Insights into the Health Care Industry," with William D. White, *Journal of Medical Practice Management* Vol. 4, Winter 1989.
12. "Antitrust Challenges to Hospital Mergers," with Henry Allen and Greg Tucker, *The Health Lawyer*, Summer 1989.
13. "A Note on Relational Aspects of Hospital Market Definitions," (with Mark Shanley) *Journal of Health Economics* Vol. 9, February 1990.
14. "Information Spillovers, Incumbency, and New Ventures," with Tommy Tan, *International Journal of Industrial Organization*, Vol. 8, Winter 1990.
15. "The Costs of Compliance with the 1962 FDA Amendments—Editorial," *Journal of Health Economics*, Vol. 10, July 1991.
16. "How Fast are Hospital Prices Really Rising?" with William D. White and Mark Shanley, *Medical Care* Vol. 29, August 1991.
17. "Is Hospital Competition Wasteful?" with Mark Shanley and Carol Simon, *RAND Journal of Economics* Vol. 23, Summer 1992.
18. "Monopolistic Competition When Price and Quality are not Perfectly Observable," with Mark Satterthwaite, *RAND Journal of Economics* Vol. 23, Winter 1992.
19. "Segmentation in Local Hospital Markets," with William D. White and Lawrence Wu, *Medical Care* Vol. 31, January 1993.
20. "The Changing Nature of Competition in Health Care," with William D. White, *Journal of Medical Practice Management*, Vol. 8, Spring 199.
21. "Price and Concentration in Hospital Markets: The Switch from Patient-driven to Payor-driven competition," with Mark Shanley and William D. White, *Journal of Law and Economics*, Vol. 36, April 1993.
22. "Physician-Induced Demand for Childbirths," with Paul Wehner, *Journal of Health Economics*, March 1994.
23. "Recent Theory and Evidence on Competition in Hospital Markets," with William D. White, *Journal of Economics and Management Strategy*, Volume 4, No. 1, 1994.
24. "The Economic Side Effects of Dangerous Drug Announcements," with Chris Olsen, *Journal of Law and Economics*, October 1994.

25. "Do Important Drugs Reach the Market Sooner?" with David Meltzer, *RAND Journal of Economics*, Autumn 1994.
26. "A Problem with Consumer Surplus Measures of the Cost of Physician Practice Variations," *Journal of Health Economics*, September 1994.
27. "The Vertical Chain of Research and Development in the Pharmaceutical Industry," with Michael Ward, *Economic Inquiry*, January 1995.
28. "Cost Reductions versus Reputation Enhancements as Motives for Mergers: The Logic of Multihospital Systems," with Mark Shanley, *Strategic Management Journal*, January–February 1995.
29. "Specialization, Option Demand and the Pricing of Medical Services," with William D. White, *Journal of Economics and Management Strategy*, Summer 1996.
30. "Are Multihospital Systems More Efficient?" with Amy Durkac and Mark Shanley, *Health Affairs*, Spring 1996.
31. "The Impact of Managed Care on the Physician Marketplace," with Carol Simon and William D. White, *Public Health Reports*, May/June 1997.
32. "Emerging Issues in the Antitrust Definition of Healthcare Markets," with Will White, *Health Economics Letters*, November 1997.
33. "Is There Underinvestment in R&D About Prevention?" *Journal of Health Economics*, January 1998.
34. "Economies of Scale in Non-revenue Producing Cost Centers: Implications for Hospital Mergers," *Journal of Health Economics*, January 1998.
35. "Medicaid-Dependent Hospitals and Their Patients: How Have They Fared?" with Will White, *Health Services Research*, April 1998.
36. "The Effect of Managed Care on the Income of Primary Care and Specialty Physicians: A State Level Analysis," with Carol Simon and William D. White, *Health Services Research*, September 1998.
37. "The Determinants of Managed Care Penetration," with Carol Simon and William White, *Journal of Health Economics*, December 1998.
38. "Do Strategic Groups Exist: An Economic Framework for Analysis," with Mark Shanley and Margaret Peteraf, *Strategic Management Journal*, Fall 1998.

39. "Pricing by Nonprofit Hospitals: A Reevaluation of Lynk's Methods," with Richard Ludwick, *Journal of Health Economics*, March 1999.
40. "The Cost of Efforts to Improve Quality," with Stephen Shortell, et al., *Medical Care*, October 1999.
41. "Competition" Among Insurers Offering Health Insurance," with Kathryn Spier and Loren Baker, *Journal of Health Economics*, January 2000.
42. "Assessing the Impact of Total Quality Management and Organizational Culture on Multiple Outcomes of Care for Coronary Artery Bypass Graft Surgery Patients," *Medical Care*, February 2000.
43. "Exploiting Cost Advantages and Coping with Cost Disadvantages," with David Besanko and Mark Shanley, *Management Science*, February 2001.
44. "Is Managed Care Leading to Consolidation in Healthcare Markets?" with Will White and Carol Simon, *Health Services Research*, May 2002.
45. "Antitrust Policy and Hospital Mergers: Recommendations for a New Approach," with Cory Capps, Shane Greenstein, and Mark Satterthwaite, *Antitrust Bulletin*, Winter 2002.
46. "Economic and Organizational Determinants of HMO Formulary Adoption Decisions," with Ed Hughes and Mark Shanley, *Health Services Research*, February 2003.
47. "Is More Information Better? The Effects of Report Cards on Cardiovascular Providers and Consumers," with M. Satterthwaite, D. Kessler, and M. McClellan, *Journal of Political Economy*, June 2003.
48. "Hospital Consolidation and Costs: Another Look at the Evidence," with R. Lindrooth, *Journal of Health Economics*, November 2003.
49. "The DVD vs. DIVX Standard War: Empirical Evidence of Network Effects and Preannouncement Effects," with Neil Gandal, *Journal of Economics and Management Strategy*, Fall 2003.
50. "Competition and Market Power in Option Demand Markets," with Cory Capps and Mark Satterthwaite, *RAND Journal of Economics*, December 2003.
51. "A Theory of Utilization Review," with Kathryn Spier, *Contributions to Economics and Policy*, 2003.

52. "Differentiation and Competition in HMO Markets," with Anne Gron and Michael Mazzeo, *Journal of Industrial Economics*, December 2003.
53. "Hospital Consolidation and Negotiated PPO Prices" with Cory Capps, *Health Affairs*, March 2004.
54. "Has the Malpractice Crisis in Florida Affected Access to Care?" with Anne Gron, *Health Affairs*, March 2005.
55. "The Effect of Physician-Hospital Affiliations on Hospital Prices in California," with Federico Ciliberto, *Journal of Health Economics*. January 2006.
56. "Medical Bankruptcy: Myth versus Fact," with M. Millenson, *Health Affairs*, February 2006.
57. "Is the Impact of Managed Care on Hospital Prices Decreasing?" with Richard Lindrooth and William White, *Journal of Health Economics*, forthcoming.
58. "Hospital Vertical Integration and Patient Referrals," with Cory Capps and Sayaka Nakamura, *Journal of Economics and Management Strategy*, forthcoming.
59. "Start Spreading the News: A Structural Estimate of the Effects of New York Hospital Report Cards," with Andrew Sfekas, *Journal of Health Economics*, forthcoming.
60. "Do Report Cards Tell Consumers Anything They Don't Already Know? The Case of Medicare HMOs," with Leemore Dafny, *RAND Journal of Economics*, forthcoming.
61. "Regulatory Exploitation and the Market for Corporate Control," 2007, with Leemore Dafny, *Journal of Law and Economics*, forthcoming.

#### **A.8. Current working papers**

1. "The Silent Majority Fallacy of the Elzinga-Hogarty Critique", 2002, (with C. Capps, S. Greenstein, and M. Satterthwaite) NBER Working Paper 8216
2. "Hospital Closures and Economic Efficiency", 2006, (with Cory Capps and Richard Lindrooth; in revision for *Journal of Health Economics*)
3. "Profiting from Gaizhi: Management Buyouts during China's Privatization" 2007, (with Feng Susan Lu)

4. "Influence and Deterrence: How Obstetricians Respond to Litigation against Themselves and their Colleagues," 2008, (with Yasutora Watanabe; in initial journal review)
5. "Does the Market Punish Aggressive Experts? Evidence from Caesarean Sections," 2008, (with Subramaniam Ramanarayanan)
6. "How Rational are Bargainers? Using the Stole/Zweibel Bargaining Model to Examine Hospital Selective Contracting," 2008 (with Mark Satterthwaite and Andrew Sfekas)
7. "Does Major Illness Cause Financial Catastrophe?" (with Keziah Cook and Andrew Sfekas; in initial journal review)

#### **A.9. Book chapters and monographs**

1. "What Impact Did the Programs Have on the Costs of Care for Ventilator Assisted Children," in *Pediatric Home Care: Results of a National Evaluation of Programs for Ventilator Assisted Children*, Pluribus Press (1988)
2. "The Implications of Resource-Based Relative Value Scales for Physicians' Fees, Incomes, and Specialty Choice" (with M. Satterthwaite), in *Regulating Doctor's Fees: Costs, Competition, and Controls under Medicare*, H. E. Frech, ed. American Enterprise Institute, 1991
3. "The Five W's of Utilization Review" in *American Health Policy*, Robert Helms, ed. American Enterprise Institute (1992)
4. "The Case for Competition" In *Competitive Approaches to Health Care Reform*, Richard Arnould, Richard Rich and William D. White (eds.) Washington, D.C.: Urban Institute Press (1993).
5. "Can Competition Cut the Mustard?" *Health Management Quarterly* Vol. 16, (Second Quarter, 1994)
6. "Doing a Number on Doctors" (with William D. White) *American Enterprise Magazine* (July/August 1994)
7. "Local Multi-hospital Systems Will Be Critical to the Success of Teaching and Community Hospitals" *Compendium of Hospital Economics Newsletter* (Spring 1994)

8. "Measuring Costs" (Chapter 2 in *Valuing Health Care* F. Sloan (ed.) Cambridge: Cambridge University Press, 1994.)
9. Clinton's Specialist Quota: Shaky Premises, Questionable Consequences Washington, D.C.: American Enterprise Institute, 1994
10. "Strategically Organizing Vertical Boundaries" (with David Besanko and Mark Shanley) *Business Week Executive Brief* (1995)
11. *Navigating the Changing Tides of Managed Care and Health Reform* A guide to business strategy for physicians. (Prepared in conjunction with the Health Economics Practice Group of McBride, Baker, and Coles)
12. "The Economic Foundations of Strategic Group Theory" (with Margaret Peteraf and Mark Shanley) General Motors Research Center for Strategy and Management, Discussion Paper No. 93-59.
13. "Direct Sputum Analysis for TB by PCR vs. Conventional Techniques in a Public Hospital" (With K. Kaul) 1996, Evanston Hospital Research Brief.
14. "The Industrial Organization of Health Care" (with Mark Satterthwaite) in *The Handbook of Health Economics*, edited by Joseph Newhouse and A. J. Culyer, North-Holland, 2000.
15. "Managed Care and the Physician Marketplace" (with Carol Simon, William White, and Patricia Born) in *Managed Care and Changing Health Care Markets* (Washington: American Enterprise Institute, 1998)
16. "Market Definitions in Antitrust Analysis: Applications to Health Care" in *Managed Care and Changing Health Care Markets* (Washington: American Enterprise Institute, 1998)
17. "Network Effects, Standardization, and the Internet: What Have We Learned from the DVD vs. DIVX Battle?" (with Neil Gandal) in *The Commodification of Information*, edited by Niva Elkin-Koren and Neil Netanel, Kluwer Law International, 2000.
18. "Surviving a Standards War: Lessons Learned from the Life and Death of DIVX" (with Neil Gandal), in *Advances in the Economics of Information Systems* edited by Kerem Tomak, Idea Group, 2004.
19. "The Price of Palliative Care: Towards a Complete Accounting of Costs and Benefits" (with A. Boni-Saenz and A Lo Sasso), in *Clinics in Geriatric Medicine*, Elsevier, 2004.

**A.10. Books**

1. *The Economics of Strategy* New York: Wiley Press, 1995, 1999, 2003, 2006 (joint with David Besanko, Mark Shanley, and Scott Schaefer)
2. *How Hospitals Survived* (with Will White) American Enterprise Institute, 1999
3. *The Economic Evolution of American Healthcare: From Marcus Welby to Managed Care* Princeton University Press, 2001
4. *What's Your Life Worth?* Financial Times/Prentice Hall, 2003
5. *Kellogg on Strategy* (with Sonia Marciano) Wiley Press, 2005
6. *Code Red* Princeton University Press, 2008

## Appendix B. Materials relied upon or cited

### **B.1. Discovery documents**

#### **B.1.1. Expert reports**

- *An Economic Analysis of the Geographic Market Issue, Report of Kenneth G. Elzinga, September 21, 2004*
- *Expert Report of Deborah Haas-Wilson, September 21, 2004 (as revised October 8, 2004)*
- *Expert Report of Jonathan B. Baker, November 2, 2004 (as supplemented December 23, 2004)*
- *Expert Report of Monica G. Noether, November 2, 2004*
- *Rebuttal Expert Report of Deborah Haas-Wilson, undated*
- *Rebuttal Expert Report of Orley C. Ashenfelter, November 30, 2004*
- *Sur-rebuttal Report of Orley C. Ashenfelter, January 17, 2005*

#### **B.1.2. Confidential billing data**

- ENH billing data production

### **B.2. Legal documents**

#### **B.2.1. Complaints**

- *In re: Evanston Northwestern Healthcare Corporation Antitrust Litigation, No. 07 C 4446, Consolidated Class Action Complaint*
- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc., No. 9315 (Fed. Trade Comm'n April 28, 2008), Complaint (Feb. 10, 2004)*

#### **B.2.2. Opinions**

- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc., No. 9315 (Fed. Trade Comm'n April 28, 2008), Initial Decision of Chief Administrative Law Judge Stephen J. McGuire (Oct. 25, 2005)*

- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), *Opinion of Chairman Majoras* (Aug. 6, 2007)
- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), *Concurring Opinion of Commissioner Jon Leibowitz* (Aug. 6, 2007)
- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), *Concurring Opinion of Commissioner J. Thomas Rosch* (Aug. 6, 2007)

### **B.2.3. Other relevant court documents**

- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), *Complaint Counsel's Notice of Cross-Appeal* (Oct. 27, 2005)
- *In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n April 28, 2008), *Notice of Appeal* (Oct. 26, 2005)

### **B.3. Publicly available data**

- 2006 AHA *Annual Survey of Hospitals* database
  - <http://www.ahadata.com/ahadata/html/AHASurvey.html>, accessed January 2, 2009
- Centers for Medicare & Medicaid Services (CMS)
  - Historical DRG Weight File, <http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=none&filterByDID=-99&sortByDID=2&sortOrder=ascending&itemID=CMS022531&intNumPerPage=10>, accessed January 2, 2009
  - Outlier Payments, [http://www.cms.hhs.gov/AcuteInpatientPPS/04\\_outlier.asp](http://www.cms.hhs.gov/AcuteInpatientPPS/04_outlier.asp), accessed January 2, 2009
  - Acute Inpatient PPS Wage Index Files, <http://www.cms.hhs.gov/AcuteInpatientPPS/WIFN/list.asp>, accessed January 2, 2009

- Hospital Cost Reports, [http://www.cms.hhs.gov/CostReports/02\\_HospitalCostReport.asp#TopOfPage](http://www.cms.hhs.gov/CostReports/02_HospitalCostReport.asp#TopOfPage), accessed January 2, 2009
- Other
  - MapQuest.com
  - COMPdata, <http://www.compdatainfo.com>, accessed January 2, 2009
  - Illinois Hospital Association, <http://www.ihatoday.com>, accessed January 2, 2009
  - World Health Organization. “International Classification of Diseases (ICD),” <http://www.who.int/classifications/icd/en>, accessed January 2, 2009

#### **B.4. Publicly available documents**

##### **B.4.1. Industry background**

- Claxton, Gary and others, *Employer Health Benefits: 2008 Annual Survey*, Kaiser Family Foundation, 2008, 154, <http://ehbs.kff.org/pdf/7790.pdf>, accessed December 31, 2008
- Cunningham, Peter and others, *The Fraying Link between Work and Health Insurance*, Henry J. Kaiser Family Foundation, November 2008, , <http://www.kff.org/uninsured/upload/7840.pdf>, accessed January 2, 2009
- DeNavas-Walt, Carmen and others, *Income, Poverty, and Health Insurance in the United States: 2007*, (U.S. Census Bureau, August 2008), 19, <http://www.census.gov/prod/2008pubs/p60-235.pdf>, accessed January 5, 2009
- FTC and DOJ. *Improving Health Care: A Dose of Competition*, Washington, D.C., 2004

##### **B.4.2. Press articles**

- Carreyrou, J. “Nonprofit Hospitals Flex Pricing Power”. *Wall Street Journal*, August 28, 2008, <http://online.wsj.com/article/SB121986172394776997.html>, accessed January 2, 2009
- Graham, J. “Lawmaker’s bill would limit costs for uninsured,” *Chicago Tribune*, May 2, 2008, SSW1

- Graham, J. "Pricing Health Care? It's Not that Easy," *Chicago Tribune*, August 10, 2006, C1
- Japsen, B. "Assessor looks at exempt hospitals; Collection practices could hurt tax status," *Chicago Tribune*, July 29, 2006, C1
- Kiplinger.com, "Fee-for-Service Health Coverage," *Kiplinger.com*, July 2007, <http://www.kiplinger.com/basics/archives/2003/11/fee.html>, accessed January 2, 2009
- Lydersen, K. "Weird Charity; A lawsuit claims that Advocate overcharges the uninsured," *Chicago Reader*, July 9, 2004, <https://securesite.chireader.com/cgi-bin/Archive/abridged2.bat?path=2004/040709/ADVOCATE&search=>, accessed January 2, 2009
- McGrath, T. "My Daughter's \$29,000 Appendectomy," *Philadelphia Magazine*, May 2008
- Scheier, L. "Busted! Whether you're uninsured or underinsured, a serious illness can destroy you financially," *Chicago Tribune*, January 2, 2005, C15

#### **B.4.3. Prior legal cases**

- *California v. Sutter Health Sys.*, 84 F. Supp. 2d 1057 (N.D. Cal.), *aff'd mem.*, 2000-1 Trade Cas. (CCH) U 87,665 (9th Cir. 2000), *revised*, 130 F. Supp. 2d 1109 (N.D. Cal. 2001)
- *FTC v. Butterworth Health Corp.*, 946 F.Supp. 1285 (W.D. Mich. 1996), *aff'd per curiam*, No. 96-2440 (6th Cir. July 8, 1997) (unpublished)
- *FTC v. Freeman Hospital*, 911 F.Supp. 1213 (W.D. MO. 1995), *aff'd* 69 F.3d 260 (8<sup>th</sup> Cir. 1995)
- *FTC v. Tenet Healthcare Corp.*, 17 F.Supp. 2d 937, 943 (E.D. Mo. 1998), *rev'd* 186 F.3d 1045 (8th Cir. 1999)
- *FTC v. University Health Inc.*, 1991-1 Trade Cas. (CCH) ¶69,444, *rev'd* 938 F.2d 1206 (11th Cir. 1991)
- *In re American Medical International, Inc.*, 104 F.T.C. 1 (1984)
- *In re Hospital Corporation of America*, 106 F.T.C. 361 (1985), *affirmed*, 807 F.2d 1381 (7th Cir. 1986)
- *Ukiah Adventist Hospital v. FTC*, No. 93-70387 (9th Cir. May 18, 1994)

- *United States v. Carilion Health Sys.*, 707 F. Supp. 840 (W.D. Va.), *aff'd*, 892 F.2d 1042 (4th Cir. 1989) (unpublished opinion)
- *United States v Long Island Jewish Medical Center*, 983 F.Supp. 121 (E.D.N.Y. 1997)
- *United States v. Mercy Health Services*, 902 F.Supp. 968 (N.D. Iowa 1995), *vacated as moot*, 107 F.3d 632 (8th Cir. 1997)
- *United States v. Rockford Mem. Hosp.*, 717 F.Supp. 1251 (N.D. Ill. 1989), *aff'd*, 898 F.2d 1278 (7th Cir.), *cert. denied*, 498 U.S. 920 (1990)

## **B.5. Economic literature**

### **B.5.1. Textbooks**

- Philip Jacobs and John Rapoport, *The Economics of Health and Medical Care*, 5<sup>TH</sup> Ed. Boston: Jones and Bartlett, 2004

### **B.5.2. FTC publications**

- FTC, “Federal Trade Commission Announces Formation of Merger Litigation Task Force,” news release, August 28, 2002, <http://www.ftc.gov/opa/2002/08/mergerlitigation.shtm>, accessed January 2, 2009
- FTC, “Statement of the Federal Trade Commission In the Matter of Victory Memorial Hospital/Provena St. Therese Medical Center,” File No. 011-0225, June 4, 2006, <http://www.ftc.gov/os/caselist/0110225/040630ftcstatement0110225.shtm>, accessed January 2, 2009
- FTC, “Statement of Commissioners Mozelle W. Thompson and Pamela Jones Harbour In the Matter of Victory/St. Therese Medical Center,” File No. 011-0225, June 4, 2006, <http://www.ftc.gov/os/caselist/0110225/040630joint0110225.shtm>, accessed January 2, 2009
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Appendix C. Overview of the ENH data relied upon in the FTC case

- (111) The data provided by ENH to the FTC, which ENH also produced in the current matter, cover patients discharged from one of the ENH facilities in fiscal years 1997 and 1999–2003.<sup>94</sup> The facilities included in the data are Evanston Hospital, Glenbrook Hospital, Highland Park Hospital, Highland Park Hospital Skilled Nursing Unit, and Evanston Hospital Transitional Care Unit. I will focus my analysis on inpatient and outpatient care provided by the three hospitals and exclude the skilled nursing and transitional care facilities. I refer to these data as the “ENH data.” Exhibit 7 summarizes these data.

**Exhibit 7. {REDACTED}**



Source: ENH data

- (112) Exhibit 8 reports the number of patients by insurer across all hospital campuses for the period 1999–2003. This table shows that the vast majority of privately insured patient visits are accounted for by a relatively small number of insurance companies. {REDACTED}

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<sup>94</sup> 1998 data are available but have not yet been provided in a readable format. Premerger data for HPH are in separate files.





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- (114) Exhibit 10 shows the relative frequency of the three types of care, *inpatient*, *same-day surgery*, and *other outpatient*.

**Exhibit 10. {REDACTED}**



Source: ENH data

Note: Excludes observations with negative payments or charges.

- (115) }TGFCEVGF ;

- (116) Exhibit 11 through Exhibit 13 present, on an annual basis, basic payment and utilization data for each of the three ENH hospitals. }TGFCEVGF ;

- (117) }TGFCEVGF ;

- (118) {REDACTED}

- (119) {REDACTED}

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**Exhibit 11. {REDACTED}**



Source: ENH data

Notes: Includes Medicare and Medicaid patients. Excludes observations with negative payments or charges. Averages are calculated for positive values only.

**Exhibit 12. {REDACTED}**



Source: ENH data

Notes: Includes Medicare and Medicaid patients. Excludes observations with negative payments or charges. Averages are calculated for positive values only.

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**Exhibit 13. {REDACTED}**



Source: ENH data

Notes: Includes Medicare and Medicaid patients. Excludes observations with negative payments or charges. Averages are calculated for positive values only. Observations for Highland Park Hospital are missing or limited for 1999–2000.

(120) Exhibit 14 through Exhibit 16 present data on average payments for the three types of service at each hospital campus for five insurers, as well as for all other payers combined. {REDACTED}

(121) {REDACTED}

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**Exhibit 14. {REDACTED}**

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Source: ENH data

Notes: Excludes observations with negative payments or charges. Excludes Medicare and Medicaid. Payor data are aggregated across plans offered by each insurer.

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**Exhibit 15. {REDACTED}**

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Source: ENH data

Notes: Excludes observations with negative payments or charges. Excludes Medicare and Medicaid. Payor data are aggregated across plans offered by each insurer.

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**Exhibit 16. {REDACTED}**

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Source: ENH data

Notes: Excludes observations with negative payments or charges. Excludes Medicare and Medicaid. Payor data are aggregated across plans offered by each insurer. Observations for Highland Park Hospital are missing or limited for 1999–2000.

- (122) Exhibit 17 through Exhibit 19 present data on the number of patients for the three types of services at each hospital campus for five insurers, as well as for all other payers combined.

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**Exhibit 17. {REDACTED}**



Source: ENH data

Notes: Excludes observations with negative payments or charges. Excludes Medicare and Medicaid. Payor data are aggregated across plans offered by each insurer.

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**Exhibit 18. {REDACTED}**



Source: ENH data

Notes: Excludes observations with negative payments or charges. Excludes Medicare and Medicaid. Payor data are aggregated across plans offered by each insurer.

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**Exhibit 19. {REDACTED}**

**CERTIFICATE OF SERVICE**

I, John E. Tangren, one of the attorneys for plaintiffs, hereby certify that on February 18, 2009, service of the foregoing document was accomplished by ECF and by email upon the following:

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/s/John E. Tangren  
John E. Tangren