

**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

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

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

**REDACTED VERSION
FOR PUBLIC FILE**

DECEMBER 8, 2009

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I. Qualifications and materials considered

- (1) 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 Northwestern since 1991; prior to that, I was an associate professor at the University of Chicago.
- (2) My qualifications were discussed in detail in my report of February 12, 2009, and are incorporated by reference to that report. A copy of my current curriculum vitae is included in Appendix A.
- (3) 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.

II. Executive summary

- (4) Dr. Noether makes four main points in her rebuttal report:
 1. She claims that contracts between hospitals and insurers are complex and that these complexities preclude the use of a common framework to study price increases.
 2. She claims that the damages methodology I described, despite its use by experts on behalf of both ENH and FTC, is not reliable.
 3. She claims that a number of class members suffered no impact.
 4. Finally, Dr. Noether argues that named plaintiffs are neither "typical" nor "adequate."

In this executive summary I assess each of these rebuttal points and explain why they do not undermine common impact. The remaining sections of my report provide an in-depth and point-by-point analysis.

- (5) Dr. Noether argues that the contracts between ENH and health insurers were so complex that any analysis within a common framework would be unreliable. In particular, she observes that contracts often specify different prices for different categories of service. Setting aside whether this is in fact "complex," it does not preclude using a common framework to analyze the exercise of market power. - REDACTED -

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Thus, the exercise of market power over, for example, inpatient services in a particular time period, can be reduced to a single number—the uniform inpatient price increase.¹ Given appropriate data (such as the data available and likely to be available to me in this case), it is a straightforward statistical exercise to compute the magnitude of that price increase.

- (6) Note that common impact is a direct consequence of the structure of the contracts between ENH and insurers and not the statistical analyses that I have conducted. The purpose of my statistical analyses is instead to *quantify* the magnitude of overcharges to a particular insurer (as well as the employers, other plan sponsors, and enrollees that insurer represents). That is,

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estimates of overall price increases for a given payer-plan are necessarily also valid and reliable estimates of the price increases applicable to *substantially all patients* covered by that payer-plan.²

- (7) Dr. Noether fails to note or account for this crucial fact about the uniformity of price increases. For example,

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¹ Suppose one knows that all students in a class grow in height at the same rate. Then, in order to know the amount by which *each and every* student grew in a year, all that is necessary is to know the average rate of growth of students in that class room. In this situation, which is analogous to the present case, the average growth rate is an accurate and reliable estimate of the growth rate of individual students. This is in stark contrast to the very different scenario in which one does not know that all students grow at the same rate. In such scenario, which is not analogous to the present case, the average rate of growth may not be an accurate estimate of any individual student's growth rate.

² Care must be taken to use the contracts between ENH as a guide to the appropriate level of aggregation for calculating overcharges. I discuss this in Section IV.5.

³ Expert Report of Monica G. Noether, PhD, Supporting Opposition to Plaintiffs' Motion for Class Certification at ¶ 38, June 9 2009 [hereinafter Noether Report].

⁴ - REDACTED -

- (8) In this report, I examine numerous contracts and addenda from seven different insurers.⁵

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- (9) In my experience discussing hospital contracting with insurance and hospital executives, I have learned that such across-the-board price increases are the norm.⁷ Payers and providers think of price increases in very simple terms and typically boil down the price increase to a single number.

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⁵ These payers are Aetna U.S. Healthcare of Illinois, a.k.a. Aetna Health of Illinois Inc., (Aetna); Humana Health Plan Inc., Humana HealthChicago, Inc., Humana Insurance Company, and Humana HealthChicago Insurance Company (collectively known as Humana); Cigna HealthCare of Illinois, Inc. (Cigna); HealthStar, Inc., HealthStar Managed Care Corp. (HealthStar); United HealthCare Insurance Company, UnitedHealthcare of Illinois, Inc. (UHC); Health Care Service Corporation (d/b/a Blue Choice/MCNP, BCBSI PPO, HMO Illinois, collectively referred to herein as BCBSI); and Private Healthcare Systems, Inc. (PHCS).

⁶ [REDACTED] - REDACTED -

⁷ I have substantial knowledge of hospital contracting. See Appendix A for my Curriculum Vita that describes various board memberships, honors, grants, and publications that are relevant to hospital contracting.

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■ [REDACTED]

■ [REDACTED]

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- (11) ENH's uniform exercise of market power has important implications for the DID damages methodology that I intend to implement. - REDACTED -

- REDACTED - the overcharges calculated by the DID methodology will accurately reflect the overcharges for individual inpatient and outpatient services. As I discuss below, it is straightforward to compute the increases to a given payer for inpatient services and for outpatient services. It is equally straightforward to calculate the difference between the price increase at ENH and the corresponding increases at a systematically chosen set of peer or control group hospitals. The implied DID regressions are simple, and appropriate control group data are available.¹⁵

- (12) Dr. Noether's second major point is that application of DID analysis is not reliable in this case because "hospitals are all unique,"¹⁶ and the control group must "[match] in every way

¹⁴ See Sections V.1 and VII.4 of my original report (Expert Report of Dr. David Dranove Supporting Motion for Class Certification, Feb. 12, 2009 [hereinafter Dranove Report]).

¹⁵ - REDACTED - I recognize that additional materials may be made available through discovery at a later point and that these materials might provide exceptions to the rule of uniform price increases. The DID framework can accommodate these exceptions, as I explained in my original report in Section VII.4 titled "The common framework can accommodate potentially complicating factors." Inexplicably, Dr. Noether appears to have completely ignored this section of my report. As I stressed in my original report, such exceptions can be accommodated within the common DID framework by appropriately defining service categories.

¹⁶ "In this case, hospitals are all unique ... as a result it is not possible to identify an ideal control group, and therefore it is not possible to be certain that the results of a DID analysis can in fact be attributed to the

with the studied firm except for the merger.”¹⁷ Curiously, in the FTC proceedings, Dr. Noether characterized Dr. Baker’s 18-hospital control group as “a meaningful benchmark.”¹⁸ In her rebuttal report, Dr. Noether does not describe any basis for her change in opinion. Not only is Dr. Noether’s current standard (i.e., that control groups must be identical in every way to experimental groups) at odds with her prior opinion, it is both extreme and absurd and would condemn all empirical research that does not rely on preselected treatment and control groups (e.g., the research framework applied in biomedical research). Such data are rarely available in the social sciences, but that has not precluded reliable and unbiased statistical inference.

- (13) The economics profession has long understood that exact matching is not remotely necessary for a reliable DID regression analysis, as evidenced by even a cursory examination of the published literature. This includes but is hardly limited to the DID studies that I cite in my expert report.¹⁹ Indeed, experts on both sides of the FTC litigation used DID analysis to estimate overcharges; these experts did not require exact matching.²⁰
- (14) For DID analysis to be reliable, the rate at which prices increase at the selected control group of hospitals should be similar to the rate at which prices would be expected to increase at ENH had ENH not acquired Highland Park Hospital (HPH). This requires that the supply and demand factors that determine price changes, such as wage inflation and demographic changes, evolve similarly at the control and ENH hospitals. This is both appropriate and far less onerous a requirement than exact matching across all hospital characteristics. In section IV of this report, I describe and implement a systematic method that selects an appropriate control group of hospitals.

merger.” (Noether Report, ¶ 58).

¹⁷ Noether Report, ¶ 58.

¹⁸ Expert Report of Monica G. Noether, PhD, at ¶ 174, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm’n, Nov. 2, 2004) [hereinafter Noether FTC Report].

¹⁹ Dranove Report at n.8.

²⁰ As noted above, Dr. Baker uses as a control a group of 18 hospitals that Dr. Noether herself identifies in her expert report for the FTC as “a meaningful benchmark” against which ENH is to be compared (Noether FTC Report at ¶ 174); Expert Report of Jonathan B. Baker, PhD, at ¶ 22, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm’n, Nov. 2, 2004) [hereinafter Baker FTC Report]. Dr. Haas-Wilson identifies three primary control groups, which include all general acute care hospitals in the Chicago PMSA, all general acute care hospitals in the Chicago PMSA that were not party to a merger between 1996 and 2002, and all teaching general acute care hospitals in the Chicago PMSA (Expert Report of Deborah Haas-Wilson at 34, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm’n, Sept. 21, 2004, revised Oct. 8, 2004) [hereinafter Haas-Wilson FTC Report]. None of the above control groups include hospitals that are sufficiently identical to ENH to meet the standard now espoused by Dr. Noether in her rebuttal report.

- (15) Dr. Noether attempts to support her conclusion that DID analysis is unreliable by estimating a DID model separately for each DRG and observing that it shows a substantial number of ENH prices exhibited an “undercharge.”²¹ In section IV.5, I review Dr. Noether’s DID analysis and demonstrate that it suffers from a number of conceptual and methodological flaws.
- (16) Dr. Noether additionally claims that sufficient data to implement a reliable DID analysis are not available.²² She appears to believe that detailed “transaction-level” data for both ENH and control group hospitals are required in order to account for case mix differences, payer mix differences, and other attributes.²³ I establish below that her claim is false by performing a DID analysis that is based on recently obtained PPO data from Blue Cross and Blue Shield of Illinois (BCBSI).²⁴ This demonstration establishes that appropriate data are available, or are likely to be available, to construct appropriately defined prices and to account for relevant hospital attributes such as case mix, length of stay, and payer mix.
- (17) Dr. Noether’s third major point is that a substantial number of class members were not impacted.²⁵ To take one example, she concludes, based largely on the declaration of BCBSI’s Joseph Arango, that BCBSI was not impacted.²⁶ While Mr. Arango may be knowledgeable about facts surrounding BCBSI’s contracting, I do not believe his opinion substitutes for a rigorous scientific evaluation.²⁷ I would be equally questioning of a similarly unsupported statement by a named plaintiff claiming to have been injured. Moreover, as Vice President of Provider Contracting and Strategy, Mr. Arango would likely have a strong incentive to characterize his own performance in obtaining favorable rates for BCBSI in a positive light.
- (18) Additionally, Dr. Noether’s assertion that BCBSI was not impacted is not internally consistent with her other claims. Specifically, in other parts of her rebuttal, Dr. Noether dismisses the reliability of the analysis done by both FTC and ENH experts in the FTC

²¹ Noether Report, ¶¶ 64–65.

²² Noether Report, ¶ 72.

²³ Noether Report, ¶ 79.

²⁴ I also use the IDPH data and Medicare Cost Reports for the purpose of systematically selecting the control group hospitals.

²⁵ Although this is not particularly prominent in her report, it appears that Dr. Noether is of the opinion that *no* anticompetitive price increase occurred (“... if an anti-competitive price increase had occurred, which I do not believe to be the case ...” Noether Report, ¶ 51). She offers no support for this opinion.

²⁶ Noether Report, ¶ 47.

²⁷ The relevant part of Mr. Arango’s declaration reads: “The conduct which Evanston Northwestern Healthcare allegedly engaged in, as stated in this case, did not cause BCBSI any injury or damage.” This remarkably brief statement does not indicate what (if any) methodology Mr. Arango used to come to this opinion. (Declaration of Joseph Arango in Further Support of Non-Party Blue Cross / Blue Shield of Illinois’ Objection to the Production by NorthShore University HealthSystem of BCBI’s Highly Confidential and Business-Sensitive Documents, Oct. 22, 2008).

litigation.²⁸ And yet, when it comes to BCBSI, she views DID analysis as reliable. In doing so, she also ignores Table 1 in Dr. Ashenfelter's report, which shows the range of DID estimates for BCBSI going as high as showing a 10% increase post-merger.²⁹ Additionally, Dr. Noether overstates by a substantial amount the share of ENH's revenue that is accounted for by BCBSI.³⁰

- (19) Moreover, the report of Dr. Jonathan Baker, one of ENH's own experts in the FTC proceedings, shows a set of simple DID estimates. Based on his assumptions, data, and analysis period (1998–2002), Dr. Baker finds a DID estimate (i.e., overcharges by ENH relative to his control group hospitals) of roughly 7% for inpatient and outpatient services overall for BCBSI through 2002.³¹ While Dr. Baker's analysis shows inpatient overcharges of zero for BCBSI during this period, his results also indicate outpatient overcharges of approximately 13%–16% during the same period.³²
- (20) As I stated previously, there is substantial evidence that, following ENH's acquisition of Highland Park Hospital, prices at ENH hospitals increased by substantially more than they did at comparable hospitals, to an anticompetitive level.³³ However, I was careful to state that I had not arrived at a definitive conclusion that BCBSI or any other particular payer had faced anticompetitive price increases. I stated in my original report that I would implement a common analytical framework based upon reliable DID methods at the payer-plan level to determine whether, as a result of the acquisition of HPH, ENH increased its prices to BCBSI and to other payers.³⁴ In this report, I demonstrate this approach by implementing a DID analysis of BCBSI's payments to ENH from 1999–2008.³⁵ This analysis demonstrates substantial injury to BCBSI.
- (21) Specifically, applying the appropriate DID framework to recently produced BCBSI data, I find that ENH's overcharges to BCBSI (and the self-funded plan sponsors and enrollees

²⁸ "In this case, hospitals are all unique As a result, it is not possible to identify an ideal control group, and therefore it is not possible to be certain that the results of a DID analysis can in fact be attributed to the merger." Noether Report, ¶ 58.

²⁹ Rebuttal Expert Report of Orley C. Ashenfelter, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm'n, Nov. 19, 2004) [hereinafter Ashenfelter FTC Report].

³⁰ Dr. Noether claims that [REDACTED] of ENH's private payer revenue is from BCBSI (Noether Report, ¶ 9); the correct number is approximately [REDACTED]. Because BCBSI pays ENH under a different system than other insurers, her computer program, *bcbs_share_enh_revenue_p9.sas*, incorrectly uses the "paid_amt" variable when it should use the "bcbs_paid_amt" variable.

³¹ Baker FTC Report, Table 2.

³² See *infra* note 121.

³³ Dranove Report, ¶ 1.

³⁴ Dranove Report, n. 21, ¶¶ 13, 106. See also Dranove Dep. at 177.

³⁵ While this demonstrates the methodology that I propose and is strongly suggestive of final results, I understand that I will have the opportunity to review additional facts and data as discovery proceeds.

represented by BCBSI) from 2000 to 2008 are approximately \$75.9 million for outpatient services, \$35.4 million for inpatient services, or a total of \$111.3 million. This entails overcharges persistently above 7% since 2002.

- (22) Dr. Noether's final opinion is about the typicality and adequacy of the named plaintiffs. Typicality and adequacy are not terms used or widely understood in economics; I understand them to be legal terms defined in the Federal Rules of Civil Procedure and through decades of case law. Thus, as an economist, I have no basis to offer an expert opinion on the non-economic questions of typicality or adequacy of the named plaintiffs.

III. Dr. Noether's claims about "complexity" are irrelevant to common impact

- (23) Dr. Noether's analysis of contracts leads her to conclude that contracts were too complex to analyze within a common framework. She argues that contracts typically set different prices for different service categories. Setting aside whether this qualifies as "complexity" or not, my main observation is that Dr. Noether fails to note that - REDACTED -

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³⁶ Noether Report, ¶ 38.

- (25) [REDACTED] - REDACTED - [REDACTED]
- (26) This evidence directly and forcefully proves common impact. Moreover, [REDACTED] it is straightforward to allocate damages to all or virtually all class members. The reason is that any estimate of the uniform price increase for a given payer-plan is *necessarily* also a valid and reliable estimate of the price increase applicable to every service category and patient covered by that payer-plan.³⁸
- (27) I can then compare this increase with price increases at control hospitals to determine the extent to which ENH's price increases reflected the exploitation of market power rather than trends in costs and demand. The implied DID regressions are remarkably simple, and appropriate control group data are available.
- (28) [REDACTED] - REDACTED - [REDACTED]
- [REDACTED] In my experience discussing payment methodologies with payers and hospitals, such restructuring has occurred off and on over the past several decades and should not be considered in the context of market power.⁴⁰ Instead, restructuring represents a way to strike a balance between efficiency (setting prices comparable to average costs), simplicity (setting few payment categories), and fairness (paying more for more complex cases.) These concerns are independent of any considerations of market power. As I show below, it is possible to separate the uniform price increase that results from the exercise of market power and the price increases that result from restructuring.

³⁷ Noether FTC report, ¶ 109.

³⁸ For an illustration, see footnote 1.

³⁹ "Originally, per diems were a blended rate for all services. As negotiations matured over the years, however, separate rates for ICU, obstetrics, psychiatry, neonatology, and other special areas were developed." Stefanie Daniels and Marianne Ramey, *The Leader's Guide to Hospital Case Management* (Sudbury, MA: Jones & Bartlett, 2004), 18.

⁴⁰ On August 22, 2007, the Centers for Medicare and Medicaid Services (CMS) announced a new DRG system that, among other changes, would increase the number of service categories for inpatient care (known as "Diagnosis Related Groups," or DRGs) by roughly 50%. ("Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2008 Rates," 72 *Fed. Reg.* 47130-48175 (Aug. 22, 2007) (to be codified at 42 C.F.R. pts. 411, 412, 413, and 489).

- (29) While the evidence currently available to me overwhelmingly indicates that ENH uniformly exercised its market power, I cannot definitively preclude the possibility that ENH selectively exercised its market power. My original report included an extensive discussion of how such exceptions could be incorporated into the common DID framework.⁴¹ In particular, within the section of my report titled “The common framework can accommodate potentially complicating factors,” I explicitly devoted subsections to each of the following considerations:
- Differential increases in the chargemaster (Dranove Report, § VII.4.1)
 - Multiple per diem rates (Dranove Report, § VII.4.2)
 - Mixed-model contracts (Dranove Report, § VII.4.3)
 - Outlier payments (Dranove Report, § VII.4.4)
 - Changes in the form of payments over time (Dranove Report, § VII.4.5)
- (30) Dr. Noether inexplicably ignores this discussion and erroneously asserts that I had, for example, assumed that mixed-model contracts do not exist and that the form of payments never changes over time.⁴² As I demonstrate in my DID analyses below, it is straightforward to estimate more than one overcharge where this is the case (e.g., one applicable to inpatient services and one applicable to outpatient services).
- (31) To summarize, while contracts may (arguably) be complex, this does not preclude studying the exercise of market power within a common framework. Hospitals, like most large firms, sell many products and services. Even so, hospitals typically increase prices across the board, which establishes common impact from price increases. The DID approach that I propose can easily and reliably estimate this common price increase. Moreover, the DID approach can accommodate any exceptional situations where price increases vary by service category.

III.1. ENH’s uniform exercise of market power

- (32) In my original report, I made several observations about the uniformity of price increases, which support my conclusion about common impact:
- “Payment rules are most commonly adopted across-the-board; that is, the contracted payment rules apply to all or nearly all inpatient services (or outpatient services for

⁴¹ Dranove Report, Section VII.4.

⁴² “Dr. Dranove assumes that a specific MCO contract tends to have a single payment rule (set rates, per diem rates, or discounts off of charges) and that the same payment rule tends to be employed in successive contracts between ENH and that MCO.” Noether Report, ¶ 34.

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.”⁴³

- “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). 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.”⁴⁴

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⁴³ Dranove Report, ¶ 87.

⁴⁴ Dranove Report, ¶ 87.

⁴⁵ Noether Report, ¶ 39.

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	2019	2020	2021
Overall	100%	100%	100%
Male	100%	100%	100%
Female	100%	100%	100%
White	100%	100%	100%
Black	100%	100%	100%
Hispanic	100%	100%	100%
Asian	100%	100%	100%
Native American	100%	100%	100%
Other	100%	100%	100%
Under 18	100%	100%	100%
18-24	100%	100%	100%
25-34	100%	100%	100%
35-44	100%	100%	100%
45-54	100%	100%	100%
55-64	100%	100%	100%
65+	100%	100%	100%

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Noether FTC Report, ¶ 108.

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- (43) These facts and statements are consistent with my understanding of how hospital and insurance executives usually think about pricing. Regardless of how many products and services are defined in the contract, negotiations focus on the bottom line figure, the overall price increase.⁶⁹ This increase is then often applied across-the-board. In some cases, as some of the above quotations demonstrate, there may be two price increases, one corresponding to inpatient services and one to outpatient services. - REDACTED -

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(45) [REDACTED] - REDACTED - [REDACTED]

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[REDACTED] I believe that other economic evidence has demonstrated that it is atypical for hospitals to limit their exercise of market power to certain inpatient services (e.g., intensive care days) or ailments (e.g., cardiac surgery).⁷⁴ And as I discuss in the next section, it is still possible to apply a common methodological framework to measure impact even in the atypical cases where ENH increased prices for different services at different rates.

III.2. Analysis at a service category level implies common impact even if ENH does not, in some cases, uniformly exercise market power

(46) While the evidence available to me to date overwhelmingly indicates that ENH uniformly exercised its market power across service categories, I cannot fully preclude the possibility that ENH selectively exercised its market power because I understand that discovery is ongoing. Even in this case, the common framework described in my original report remains reliable and appropriate.⁷⁵ I summarize this methodology in the remainder of this subsection.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

⁷⁴ Dranove Report, Sections V.1 and VII.4.

⁷⁵ Dranove Report, Section VII.4.

- (47) To illustrate, consider one form of complexity that I considered in my original report and which Dr. Noether uses in her rebuttal report to support her conclusion that an analysis within a common framework is unreliable or infeasible: an MCO contract that uses more than one payment methodology, or follows a “mixed-model.”⁷⁶ For example, suppose that “intensive care” is reimbursed at a per diem rate of \$2,200 and that “maternity care: C-section delivery” is reimbursed at a set, per case rate of \$6,750.⁷⁷ Now suppose, contrary to the evidence I reviewed above, that ENH exercised its market power only for intensive care visits. In that case my methodology will follow the guidance offered in the relevant contract and treat these two distinct service categories separately. This allows for an estimate of the overcharge associated with intensive care that differs from the estimate of the overcharge associated with C-section delivery. Moreover, because patient visits governed by this particular contract are reimbursed at these rates, my methodology ensures that injury from any particular C-section delivery or any particular intensive care stay is equal to the injury *estimated for that service category* (and so will not equal an inappropriately constructed average measure of injury).
- (48) To implement this methodology, to the extent this proves necessary, I will identify all of the service categories in the relevant series of MCO contracts. To illustrate, suppose that an MCO’s contract specified 10 per diem rates (e.g., medical/surgical, intensive care, maternity care, and so on). Suppose further that, upon contract renewal, the rates for some categories increase at a faster rate than for other categories. This hypothetical series of contracts implies that I would simply conduct as many as 10 analysis for the 10 service categories throughout the entire time period (fewer than 10 analyses would be necessary if the contracts show that some of the 10 service categories exhibited the same price increases, in which case I will analyze such service categories jointly). Assignment of patients to each of the 10 service categories would be done by DRG, revenue code, or other means as appropriate under the relevant contracts.⁷⁸

- (49) - REDACTED -
- REDACTED - Therefore, to the extent that the average patient visit *within* a

⁷⁶ I considered this complication in Section VII.4.3 of my original report titled “Mixed-model contracts.” Dr. Noether erroneously asserts that I assumed “that a specific MCO contract tends to have a single payment rule.” (Noether Report, ¶ 34).

⁷⁷ - REDACTED -

⁷⁸ The mechanics of how to associate each patient visit with a service category depends on the particular contract in question. For example, - REDACTED -

service category faced an overcharge as a result of the exercise of market power, *all patient visits within that service category* faced the same overcharge. The empirical approach that I presented in my earlier report explicitly allows for calculation of different overcharges across different service categories.

- (50) While an approach based on a greater number of service categories appears more “complex” than an approach based on a smaller number of service categories, the implementation is simple and straightforward. Known as “regression with ‘slope dummies,’” this treatment is standard within social science statistical research.⁷⁹

- (51) - REDACTED -

III.3. Restructuring of pricing is not evidence of differential exploitation of market power and does not undermine common impact

- (52) - REDACTED -

⁷⁹ See, e.g., Christopher Dougherty, *Introduction to Econometrics*, 3d ed. (Oxford: Oxford University Press, 2007), § 5.3.

-

[illegible]

[REDACTED]

[illegible]

■ [REDACTED]
 ■ [REDACTED]
 ■ [REDACTED]

(54) - REDACTED -

(55) Although Dr. Noether is not explicit on this point, I understand that she uses these differential price increases to support her claim that complexity implies a lack of common impact. I strongly disagree. - REDACTED -

- REDACTED -

Instead, the only substantial change was the increase in market power that occurred in 2000 as a result of the ENH consolidation. And as I discussed in my earlier report, ENH would be expected to exploit this change with across-the-board price increases for inpatient and outpatient services.

(56) I believe that these particular pricing patterns had little to do with the exercise of market power and instead reflect an industry-wide pattern of periodically restructuring payment systems.^{85, 86} - REDACTED -

- REDACTED - It is therefore

⁸⁴ There was no substantial change in the number of nursery ICU beds, nursery intermediate care beds, or bassinets within the north and northwest suburban region of Chicago. In other words, there is no evidence of a significant change in the competitive landscape of nursery services. I review data establishing the absence of a substantial change in the scale or scope of provision of these services by hospitals within a 15-mile radius of the ENH hospital system from 1996 to 2006 in Appendix E.

⁸⁵ Observers have noted an industry-wide trend of calculating reimbursements based on more specific service categories rather than on a single broad service category. E.g., “Originally, per diems were a blended rate for all services. As negotiations matured over the years, however, separate rates for ICU, obstetrics, psychiatry, neonatology, and other special areas were developed.” Stefani Daniels and Marianne Ramey, *The Leader’s Guide to Hospital Case Management* (Sudbury, MA: Jones and Bartlett, 2004), 18–19.

⁸⁶ Research in healthcare has noted the general nature of changes in contract structure. For example, “[p]rospective payment for hospitals has become much more common over the last decade.” Grace M. Carter, Peter D. Jacobson, Gerald F. Kominski, and Mark J. Perry, “Use of Diagnosis-Related Groups by Non-Medicare Payers - Medicare Payment Systems: Moving Toward the Future,” *Health Care Financing Review*, Winter 1994, 1.

⁸⁷ - REDACTED -

a mistake to conclude that differential price changes of this sort are evidence of a lack of common impact from the exercise of market power. The correct conclusion is that ENH restructured prices (in some instances) *independently of* its exercise of market power.

- (57) The only remaining issue is how to distribute an anticompetitive price increase across several service categories at a time when prices are restructured. The beginning of an answer is revealed by noticing that [REDACTED] - REDACTED -

[REDACTED] As I have established, such a uniform increase is not the exception but rather the rule. I believe that this is compelling evidence that a price change that is due to the merger would be distributed uniformly over all service categories. Thus, the proper approach for handling the [REDACTED] period is to compute the average price increase at ENH relative to the control group hospitals across all categories (or separately for all inpatient services and all outpatient services, depending on the relevant contract); this is the merger-induced uniform price increase. Any remaining differences across categories are generally attributable to the restructuring of pricing that reflects industry trends and have much less to do with the exercise of market power.

- (58) [REDACTED] - REDACTED -

- (59) [REDACTED] - REDACTED -

[REDACTED] - REDACTED -

88 [REDACTED] - REDACTED -

89 [REDACTED] - REDACTED -

- (60) More generally, if the DID damages analysis reveals that [REDACTED] paid inpatient prices that were $X\%$ higher as a result of ENH's increased market power, each listed patient category would have overcharges of $X\%$, and the patients within those categories would also have damages of $X\%$. The same is true for outpatient services (in some cases, the overcharge percentage may be the same for inpatient and outpatient services).
- (61) In an analogous fashion, it is important to separate changes in the charges for individual services listed in the chargemaster due to restructuring from changes due to the exercise of market power, if any.
- (62) Although it had been my experience that hospitals tended to increase the chargemaster fairly uniformly across services, [REDACTED] - REDACTED - [REDACTED]
[REDACTED] It is unlikely that such non-uniform increases represent the differential exercise of market power, because hospitals rarely sell individual items listed on the chargemaster; rather, they bundle them into the product that they do sell—inpatient or outpatient services that treat specific medical conditions.
- (63) For example, suppose that ENH increased its charge for medical supplies by 20% but only raised price for med/surg acute bed days by 10%. For this to represent the differential exercise of market power, ENH would have had to gain more market power over the sale of medical supplies than it did over bed days. But a typical inpatient treatment for any illness would require both medical supplies and bed days. And any factor that would affect the hospital's market power, such as the entry or exit of a rival hospital, or for that matter the merger that created ENH, would have a roughly equal effect on market power for both supplies and bed days.⁹⁰
- (64) As with the example of differential per diem pricing, I conclude that differential increases in the charge master likely reflect restructuring that arises from, for example, differences in costs.⁹¹ It would be incorrect to conclude that the differential increases represented differential impact.

⁹⁰ In theory, the increase in market power need not be identical. Although there is no evidence to suggest the following scenario is realistic, suppose that ENH secured different increases in market power across the many treatments that it offers – a big increase for cancer care, less so for cardiac, etc. In principle, ENH could examine the exact mix of individual services offered for each treatment (e.g. more bedpans for cancer; more occupational therapy for cardiac) and apply some sort of algorithm to determine which services should command the highest price increases so as to correspond to the differential changes in market power across treatments. As an alternative to this complex explanation, it may simply be that ENH experienced different cost changes for different supplies and services and so changed its chargemaster accordingly. The latter explanation seems much more plausible, both because of the lack of evidence of differential increases in market power and because the suggested algorithm would be very difficult to implement.

⁹¹ A 2005 study of hospital chargemasters commissioned by the Medicare Payment Advisory Commission

IV. Difference-in-differences is reliable, and application of DID establishes injury to BCBSI

- (65) In this section, I describe the results of a number of DID analyses that I perform to assess damages. These analyses are directly relevant to claims made by Dr. Noether in her report. In particular, I organize the discussion of the DID analyses into three parts: (1) a description of the procedure I proposed to calculate damages, (2) a description of the data currently available to conduct a damages analysis, and (3) an assessment of Dr. Noether's assertion that BCBSI was not injured by the alleged conduct. In the process of evaluating Dr. Noether's assertion that BCBSI was not injured, I also demonstrate that the DID methodology can be used to reliably estimate damages on a class-wide basis in this case.
- (66) The procedure for calculating damages that I propose and demonstrate herein is a standard one in economics. This is evidenced by the fact that experts for both sides in the FTC proceedings used it to assess the extent to which prices were raised. Dr. Noether criticized the application of DID analysis in the current case because "hospitals are all unique,"⁹² and the control group must "[match] in every way with the studied firm except for the merger."⁹³
- (67) I find Dr. Noether's standard surprising in this respect for two reasons. First, in the FTC proceedings (and contrary to her current position), Dr. Noether characterized Dr. Baker's 18-hospital control group as "a meaningful benchmark."⁹⁴ In her rebuttal report, Dr. Noether does not describe any basis for her change in opinion. Second, in making this claim, Dr. Noether seems to despair of the possibility of finding a reliable control group for analyzing pricing by ENH. The economics profession has, however, long understood that exact matching is not required for DID regression, as evidenced by even a cursory examination of the published literature, which includes but is not limited to the DID studies that I cite in my

(MedPAC) describes the way hospitals review and update the charges in their chargemaster: "[The] Charge Master Team is typically composed of a senior level finance person, a charge description analyst and/or coder, and others, depending on the size of the hospital or hospital system. These individuals review any changes made to the chargemaster throughout the year, and work with the Chief Financial Officer (CFO) to determine how aggregate annual charge updates will be made." Lewin Group, "A Study of Hospital Charge Setting Practices: A study conducted by the Lewin Group for the Medicare Payment Advisory Commission," No. 05-4, December 2005 at i-ii.

The study also reports that "[t]he charge master generally reflects some amount above costs, otherwise known as a 'markup.'" *Id.* at iv.

⁹² "In this case, hospitals are all unique ... as a result it is not possible to identify an ideal control group, and therefore it is not possible to be certain that the results of a DID analysis can in fact be attributed to the merger" (Noether Report, ¶ 58).

⁹³ Noether Report, ¶ 58.

⁹⁴ Noether FTC Report, ¶ 174.

expert report.⁹⁵ As noted above, experts on both sides of the FTC litigation used DID analysis to estimate overcharges. These experts did not require exact matching.

- (68) In section IV.2 I review the available data sets that can be used to conduct a DID analysis in this case. Importantly, these data sets may be substantially augmented by additional data resulting from more complete discovery. Thus, the data that will underlie a DID analysis at the merits phase of the litigation may be significantly more comprehensive than data currently available. This possibility is underscored by BCBSI's recent production of data containing detailed information on payments to ENH and a large set of candidate control hospitals. I understand that attorneys for plaintiffs have recently requested similar data from other MCOs.
- (69) The DID methodology and the available data allow me to test directly Dr. Noether's assertion that BCBSI was not injured by the alleged conduct.⁹⁶ As I discuss below, I believe that Dr. Noether's foundation for such a strong conclusion is insufficient. In section IV.3, I show that the available evidence indicates that BCBSI was, in fact, injured by the market power created by ENH's acquisition of HPH. This result differs from analyses conducted by both sides in the FTC proceedings for two reasons. First, it includes outpatient claims. In the FTC proceedings, neither side offered an econometric study of outpatient claims (although experts offered evidence indicating that ENH's outpatient prices to BCBSI increased at a substantially faster rate than at the control set of hospitals).⁹⁷ Second, it allows for the possibility of delayed effects of the alleged conduct. This stands in contrast to the FTC proceedings in which Dr. Baker assumed that any effects would manifest at the start of 2000,⁹⁸ and Dr. Haas-Wilson assumed that any merger effects would be reflected in pricing subsequent to the first contract negotiation following the merger.⁹⁹
- (70) Based on my demonstrative DID analysis of injury and damages to BCBSI, I find the following:
- BCBSI suffered obvious injury in outpatient services throughout the post-merger period. Beginning in 2001, the prices paid by BCBSI for its PPO product to ENH for outpatient services increased substantially compared to the corresponding increase in prices paid by BCBSI to control group hospitals. My estimate of damages to BCBSI

⁹⁵ See Dranove Report, n. 8.

⁹⁶ Noether Report, ¶ 47.

⁹⁷ See Section IV.3.1.

⁹⁸ Baker FTC Report, Table 3, n. [c] and [e].

⁹⁹ The latest such new contract effective date in Dr. Haas-Wilson's analysis is January 1, 2001 (Haas-Wilson Report at 24).

(and the self-funded plan sponsors it represents) for outpatient services provided to enrollees in its PPO product between 2000 and 2008 is \$75.9 million.

- For inpatient services, BCBSI suffered injury, though with some delay. Specifically, the merger effect became apparent in 2004, with overcharges in excess of 10%, and continued at a similar rate in later years.¹⁰⁰ My estimate of damages to BCBSI (and the self-funded plan sponsors it represents) for inpatient services provided to enrollees in its PPO product between 2000 and 2008 is \$35.4 million.
- Overall, for inpatient and outpatient services, overcharges have been persistently above 7% since 2002. My estimate of overall damages to BCBSI (and the self-funded plan sponsors it represents) for services provided by ENH to enrollees in its PPO product are \$111.3 million dollars from 2000 to 2008.

- (71) Before turning in section IV.3 to my bases for these findings, I first review the DID methodology in section IV.1. I then review the currently available data in section IV.2.

IV.1. The DID procedure to calculate damages

- (72) I described the DID methodology in section VI.1 of my original report, so I only review it briefly here. DID analysis 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 the outcome for an otherwise similar group that was not affected by that event (the “control” group).
- (73) The term “difference-in-differences” is used to describe this analysis because the effect of the event is identified by comparing the change from before-to-after the event within the treatment group to the change from before-to-after the event within the control group. Figure 4 illustrates the DID methodology graphically. The X-axis represents time (including periods before and after the event) and the Y-axis represents price. The dashed vertical line represents the event of interest (e.g., a merger) that affects the treatment group hospitals but not the control group hospitals.
- (74) The blue upper line plots pricing over time for the treatment group, and the green lower line plots prices for the control group. As evidenced by the steepening of the upper, blue line, after the event prices in the treatment group increased significantly. However, it would be incorrect to attribute *all* of that post-event price increase to the event: the lower, green line

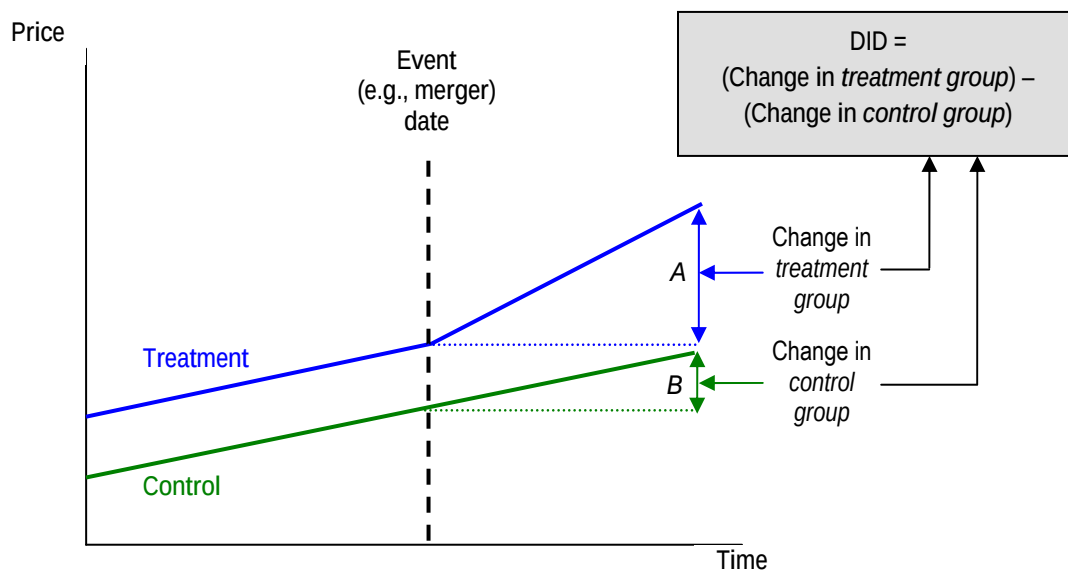
¹⁰⁰

- REDACTED -

shows that price also went up in the control group, which by construction is not affected by the event. This highlights the purpose of using a control group in this analysis; namely, the control group provides a reliable estimate of the change that would have occurred in the absence of the event.

- (75) The final step in computing the DID estimate is to calculate the change after the event for the treatment group (vertical distance *A* in the figure) and subtract from that the observed change after the event for the control group (vertical distance *B* in the figure). The resulting amount is the DID estimate of the effect of the event ($A - B$). In this illustration, the DID estimate is positive, because, after the event, prices went up more within the treatment group than within the control group.
- (76) One important note is that the control group need not match the treatment group in every way. For example, in this illustration, prices are higher in the treatment group than in the control group. The purpose of the control group is simply to provide a reliable estimate of the change in price that would have occurred even absent the event of interest. Thus, Dr. Noether's remark that "hospitals are all unique" is irrelevant.

Figure 4. Illustration of difference-in-differences (DID) methodology



IV.2. A review of the data currently available to undertake a DID analysis

- (77) A number of different data sets that may be relevant to a DID analysis have been produced in this matter or are publicly available. In this section, I describe these data sets and discuss additional data that may be reasonably expected to emerge. (I understand that discovery from third party managed care organizations is ongoing. Thus, I explicitly reserve the right to consider new sources of data as additional material is obtained.)
- (78) The data sets currently available are summarized in Figure 5. The figure summarizes the dates covered by each of the data sets, the extent of the data included in the set, the section of this report that uses the data set for analysis, and whether the data set contains transaction-level (i.e., patient visit level) data or aggregated (i.e., hospital-level) data.

Figure 5. Available data sets

Data set	Hospitals included	Analysis section	Dates covered	Transaction-level data
Baker	Baker's control group (18 hospitals and ENH)	IV.3.1	1998–2003	Y
BCBSI PPO	- REDACTED -	IV.3.2	-	
Illinois Dept. of Public Health (IDPH) Discharge Data	Nearly all Illinois hospitals	Appendix F	1996–2004	Y
COMPdata	Nearly all Illinois hospitals	Appendix F	2002–2007	Y
Medicare Cost Reports (MCR)	Nearly all U.S. hospitals	IV.5.2	1996–2008	N
Medicare base rates	Nearly all U.S. hospitals	Appendix F	1996–2009	N

- (79) The “Baker” data set is the data set used by ENH’s expert, Jonathan Baker, to carry out his DID analysis in the FTC proceedings. The Baker data provide information on payments for a relatively large set of candidate control hospitals by insurance plan. Dr. Baker used this data set to study the impact of the merger on payments to ENH by comparing changes in payments by MCOs to ENH to changes in payments by MCOs to other, control group hospitals.¹⁰¹ In her rebuttal report in the current case, Dr. Noether relies on these data to perform a DID analysis at the DRG level.¹⁰² The “Baker data” include pricing data only for ENH and Dr. Baker’s 18 control group hospitals.

¹⁰¹ Baker FTC Report, ¶¶ 20–23.

¹⁰² Noether Report, Figures 11–25.

- (80) The “BCBSI PPO” data set, which I understand BCBS of Illinois (BCBSI) submitted in response to a request from Plaintiffs, was provided to me by counsel for Plaintiffs.¹⁰³ These data include - REDACTED -

I understand that counsel for Plaintiffs have requested similar data from other insurance plans and I anticipate that such additional data will likely be available to me. (If such data are not available for certain plans, I can still compare ENH’s pricing to those plans with pricing at control hospitals using a combination of (1) the Baker data, (2) the ENH data used by Dr. Noether, (3) Medicare Cost Report data, and (4) the IDPH data and COMPdata discharge data sets.)

- (81) The “IDPH” discharge data set contains information on inpatient discharges from Illinois hospitals. Variables in this data set include the hospital identifier, patient length of stay, billed charges, Diagnosis Related Group (DRG) code, DRG weight, payer category, and discharge quarter (the IDPH data also contain “list” charges but not data on actual payments). Although the data do not identify the various private insurers, the data do identify payer categories such as Medicare, Medicaid, private, “self-pay” (i.e., uninsured), and “other.” The IDPH data do not identify hospitals by name; instead, hospitals are identified only by an identifier code. A lookup table for hospital identifiers is not directly available. However, another source of information on inpatient discharges, the COMPdata, does include hospital names (the COMPdata is however not available for years prior to 2002). By comparing IDPH data for Medicare fiscal year 2002 with COMPdata for the same period, I am able to assign hospital names to the hospital identifiers in the IDPH data.¹⁰⁵

¹⁰³ - REDACTED -

¹⁰⁴ - REDACTED -

¹⁰⁵ I use three variables to match hospitals in the IDPH data to hospitals in the COMPdata: total charges, number of patient visits, and mode of patient zip codes. This results in a very close match. The percent difference in total charges between the matched hospitals in the two data sets averages 0.3%; the percent difference in the number of patients between the matched hospitals averages 0.2%, and the modes of patient zip codes are the same for the matched hospitals (except for four hospitals whose zips are zeros in IDPH). Using this process, I am able to successfully link 192 hospital identifiers in the IDPH data to hospital names in the COMPdata.

- (82) Although the IDPH/COMP data do not provide information on payments by insurers, I am able to estimate a hospital's net inpatient revenue¹⁰⁶ from private insurers by removing the Medicare and Medicaid components of revenue from its total revenue. That is, I first use the public Medicare Cost Report (MCR) data from the Centers for Medicare and Medicaid Services (CMS) to estimate the amount reimbursed to hospitals for inpatient procedures by Medicare and Medicaid. Medicare reimburses hospitals for inpatient visits according to the DRG classification of the visit, the relative "weight" assigned to that DRG, and a hospital-specific base rate. The Medicare "formula" used to calculate these rates is available from the Medicare website and allows me to directly estimate the net yearly revenue that each hospital receives from Medicare.¹⁰⁷ (I calculate the net yearly inpatient revenue from Medicaid under the assumption that the Medicaid rate equals the Medicare rate).¹⁰⁸ This allows me to extract the non-Medicare/non-Medicaid portion of revenue from each hospital's total revenue. I also subtract from each hospital's total net inpatient revenue a portion of the self-pay and other¹⁰⁹ billed charges.¹¹⁰ Subtracting Medicare, Medicaid, and a fraction of self-pay and other revenue from each hospital's total net inpatient revenue generates estimated net inpatient revenue from private insurers.

IV.3. DID analysis of BCBSI data directly contradicts Dr. Noether's assertion that BCBSI was not injured and demonstrates that DID can be used to estimate damages reliably

- (83) In this subsection, I directly test Dr. Noether's assertion that BCBSI was not injured.¹¹¹ In summary, based on the data currently available to me, I find compelling evidence that BCBSI

¹⁰⁶ Net inpatient revenue is calculated by apportioning the total discount (difference between total revenue and net revenue) to inpatient and outpatient services.

¹⁰⁷ "Overview Acute Inpatient PPS," <http://www.cms.hhs.gov/AcuteInpatientPPS/>; see also "Calculating Hospital Specific DRG Payments," http://www.resdac.umn.edu/Tools/TBs/TN-004_CalculatingHospitalDRG_508.pdf, for a summary on the CMS inpatient payment methodology.

¹⁰⁸ A 2008 American Hospital Association report suggests that Medicaid payments are roughly 97% of Medicare payments to hospitals ("For Medicare, hospitals received payment of only 91 cents for every dollar spent by hospitals caring for Medicare patients" whereas "For Medicaid, hospitals received payment of only 88 cents for every dollar spent by hospitals caring for Medicaid patients") American Hospital Association, "Underpayment by Medicare and Medicaid Fact Sheet," November, 2008, <http://www.aha.org/aha/content/2008/pdf/08-medicare-shortfall.pdf>.

¹⁰⁹ Payer identification numbers included as "other" are as follows: Black lung, Charity, Hill Burton Free Care (HBFC), Champva, Champva, Miscellaneous (identified by recipient, but not on self-administered insurance plan list, Blue Cross list, or covered in any other category) (The Public Data File User Guide, Illinois Department of Public Health). The "other" category accounts for 3% of discharges in the IDPH data.

¹¹⁰ I assume the fraction of self-pay and other billed charges that the hospital receives in payment is 50%.

¹¹¹ Noether Report, ¶ 9.

was in fact injured by ENH's post-merger exercise of market power.¹¹² Specifically, I find substantial evidence that ENH raised the prices it charged BCBSI for outpatient services immediately after the merger. And I find evidence that ENH raised its prices for inpatient services to BCBSI; this began in earnest in 2004, several years after the merger.¹¹³ Tables in Dr. Baker's report, as well as my analysis of recently produced data from BCBSI, support these conclusions.

- (84) Before proceeding, it is important to reiterate that Dr. Noether's basis for her opinion that BCBSI was not injured is, at best, extremely tenuous. She relies on a statement by Mr. Arango, who did not conduct a systematic analysis to determine whether BCBSI was injured.¹¹⁴ Additionally, Dr. Noether simultaneously and contradictorily dismisses the usefulness of DID analysis (when critiquing evidence of significant price increases) while relying on evidence from the DID analyses carried out in the FTC proceedings (when arguing that there was no impact to BCBSI).
- (85) My analysis is based on the data currently available, which are the result of an incomplete discovery record; as such, these results are preliminary and I reserve the right to incorporate additional information and data as they become available. The analyses I present in this section strongly support the conclusion that BCBSI was injured. These analyses further demonstrate that, notwithstanding Dr. Noether's criticisms, it is entirely feasible to estimate overcharges to a particular insurer on a class-wide basis.
- (86) My analysis proceeds in a number of steps:
1. I show that information in Dr. Baker's report on behalf of ENH in the FTC litigation (hereinafter, Baker FTC report) demonstrates injury to BCBSI. The overcharges implied by Dr. Baker's analysis are approximately 13% for outpatient, 0% for inpatient, and 7% overall.

¹¹² This finding is not inconsistent with conclusions or opinions submitted in the FTC proceedings. The analyses in the FTC proceedings focused primarily on the question of whether ENH's prices for *inpatient* services increased as a result of the merger in the time period *directly* after the merger. Additionally, as I discuss in Section IV.3.1, evidence in the FTC proceedings also showed increases in ENH's pricing of outpatient services to BCBSI in excess of the increase among the various control group hospitals analyzed by Dr. Baker and Dr. Haas-Wilson.

¹¹³ - REDACTED -

¹¹⁴ - REDACTED -

2. I review and describe the structure of the recently produced BCBSI PPO data.
 3. I establish that applying Dr. Baker's methodology, control group, and analysis period (which ends in 2003) to the recently produced BCBSI PPO data shows injury to BCBSI. The overcharges (through 2003 only) are approximately 14.2% for outpatient and -2.5% for inpatient. Adding together all inpatient and outpatient payments, injury to BCBSI is 7.7%.
 4. I establish that applying Dr. Baker's methodology and control group to the recently produced BCBSI PPO data, but extending the analysis through 2008, shows injury to BCBSI. The overcharges are approximately 17.9% for outpatient, 1.1% for inpatient, and 11.5% overall.
 5. I discuss the limitations and shortcomings of Dr. Baker's econometric model and control group selection process. I then apply an econometric framework that is more robust, informative, and systematic in two respects: (1) it does not embed needlessly restrictive assumptions as to the date or rate at which ENH did or did not begin to exercise market power with respect to BCBSI; and (2) it uses a systematic process for selecting control group hospitals. I apply this methodology to the BCBSI PPO data through 2008. The overcharges are approximately 12.1% for outpatient, 6.2% for inpatient, and 9.8% overall.
 6. I revisit and explain how these results relate to common impact. It is important to note the importance of outpatient services. Because prices for outpatient services sold to BCBSI increased substantially, and because outpatient services represent a large portion of total BCBSI payments, BCBSI was substantially injured by the merger. This directly rebuts Dr. Noether's claim that BCBSI was not injured. (While I at times may report an "overall" number to demonstrate overall injury to BCBSI, my actual analysis of damages to BCBSI calculates and applies separate overcharges in each year for inpatient and outpatient services.)
- (87) To be clear, I do not believe that the analyses in steps 3 and 4, which adopt Dr. Baker's framework, generate the most reliable estimates of overcharges to BCBSI. The purpose of these analyses is solely to establish that, even assuming the control group and econometric model deemed appropriate by ENH's own expert, there is clear evidence of impact to BCBSI. I believe that the analysis described in Step 5 is the most appropriate and reliable approach given the currently available data.
- (88) These analyses show not only that Dr. Noether's assertion of no impact to BCBSI is incorrect but also that she is incorrect when she states that "Dr. Dranove's methodology cannot demonstrate the alleged impact of the merger across all, or even most, members of the

proposed class, let alone estimate reliably the damages suffered by different members of the proposed class.”¹¹⁵

IV.3.1. Dr. Baker's FTC Report on behalf of ENH shows injury to BCBSI

- (89) Dr. Noether claims that experts in the FTC proceedings found little evidence that BCBSI paid higher prices as a result of the merger.¹¹⁶ They may have found little such evidence, but this turns out to be based on an incomplete picture because the analyses in the FTC proceedings largely do not focus on assessing damages incurred on outpatient services and they do not consider damages beginning any later than January 1, 2001 or ending any later than December 31, 2003.¹¹⁷ Dr. Noether's characterization also belies the information contained in Tables 1 and 2 of Dr. Baker's Report in the FTC Litigation—those tables show injury to BCBSI.
- (90) Specifically, while Dr. Baker did not explicitly identify the change in outpatient pricing to BCBSI, Tables 1 and 2 in his report show DID estimates of the post-merger price changes (1) for inpatient services only and (2) for inpatient and outpatient services.¹¹⁸ These tables do indeed show that, taking his control group selection and data processing steps as given, the price for inpatient services at ENH hospitals increased at the same rate as the price at control hospitals.
- (91) However, Tables 1 and 2 in the Baker FTC Report also show that the change in price at ENH for *inpatient and outpatient services* exceeded the corresponding change among his set of control hospitals.¹¹⁹ This necessarily implies that the rate of increase for outpatient services at ENH exceeded the rate of increase at the control hospitals. Moreover, based on the relative sizes of the inpatient and outpatient revenues, it is possible to infer the rate of increase for outpatient services only. I reproduce the relevant sections of Dr. Baker's tables in Figure 6 and add the “Outpatient only” DID results, which Dr. Baker did not include in his tables.¹²⁰

¹¹⁵ Noether Report, ¶ 10.

¹¹⁶ Noether Report, ¶ 9.

¹¹⁷ Dr. Baker treated all cases with a date of January 1, 2000, or later as potentially affected by the merger. (Baker FTC Report, ¶ 38). Dr. Haas-Wilson used a plan-specific post merger period based on the starting date of the first contract after the merger. (Haas-Wilson FTC Report, at 54). The four plans Dr. Haas-Wilson examined in greatest detail had all recontracted with ENH by the end of 2000 (BCBSI's PPO and MCNP contracts had the latest effective date, January 1, 2001). (Haas-Wilson FTC Report, at 24).

¹¹⁸ Baker FTC Report, Tables 1 and 2.

¹¹⁹ Baker FTC Report, Tables 1 and 2.

¹²⁰ - REDACTED -

Figure 6. BCBSI summary information from Baker Tables 1 and 2 indicates BCBSI outpatient injury

		ENH Constructed	Control	DID using ENH Constructed
Including obstetrics	Inpatient only	13%	13%	0%
	Inpatient and outpatient	20%	13%	7%
	Outpatient only*			13%
Excluding obstetrics	Inpatient only	5%	8%	-3%
	Inpatient and outpatient	16%	9%	7%
	Outpatient only*			16%

* Dr. Baker did not report "Outpatient only" DID estimates; these rows report information implicit in Dr. Baker's calculations.
Source: Baker FTC report, Tables 1 and 2.

- (92) The fact that Dr. Baker's "DID using ENH Constructed" measure is positive when he studies both inpatient and outpatient services shows that, while his analysis in these tables indicates that *inpatient* damages to BCBSI may be zero, his analysis also shows that *outpatient* damages were positive and substantial. Dr. Baker's data indicate that inpatient services account for roughly 48% of BCBSI's payments to ENH from 1998 to 2003. This statistic and algebraic calculations indicate that Dr. Baker's analysis necessarily implies that ENH's prices to BCBSI for outpatient services increased by 13% to 16% more than the corresponding prices at Dr. Baker's control group hospitals.^{121, 122} As a result of the merger, a 7% increase in total payments to ENH is due to (1) a 13% to 16% increase on the 52% of BCBSI's business with ENH that is outpatient services and (2) a -3% to 0% change on the 48% of BCBSI's business with ENH that is inpatient services.

IV.3.2. The recently produced BCBSI PPO data

- (93) I understand that discovery is ongoing in the current litigation. As such, additional data may be produced on which I can extend or update my damages analysis. For example,

[REDACTED]

¹²¹ The relevant formula is as follows:

$$48\% \cdot (\text{DID for Inpatient}) + 52\% \cdot (\text{DID for Outpatient}) = \text{Combined IP and OP DID}$$

Applying this to Dr. Baker's "Including obstetrics" results shows a post-merger outpatient price increase at ENH that is 13% higher than the outpatient price increase at Dr. Baker's control group hospitals; applying the formula to Dr. Baker's "Excluding obstetrics" results shows a 16% post-merger increase.

¹²² Dr. Haas-Wilson's analysis of ENH's outpatient service pricing for BCBSI's PPO product shows comparable price increases that range from 14%–18%. Haas-Wilson FTC Report, at 51-52.

¹²³ Summary of PPO Covered Charges and Allowances by Highest PPO Payments, YTD Thru June 30, 2009, Produced by Blue Cross / Blue Shield of Illinois (BCBSI-ENH027035–027105). [REDACTED]

Expert Report of David Dranove, Ph.D.

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(94)

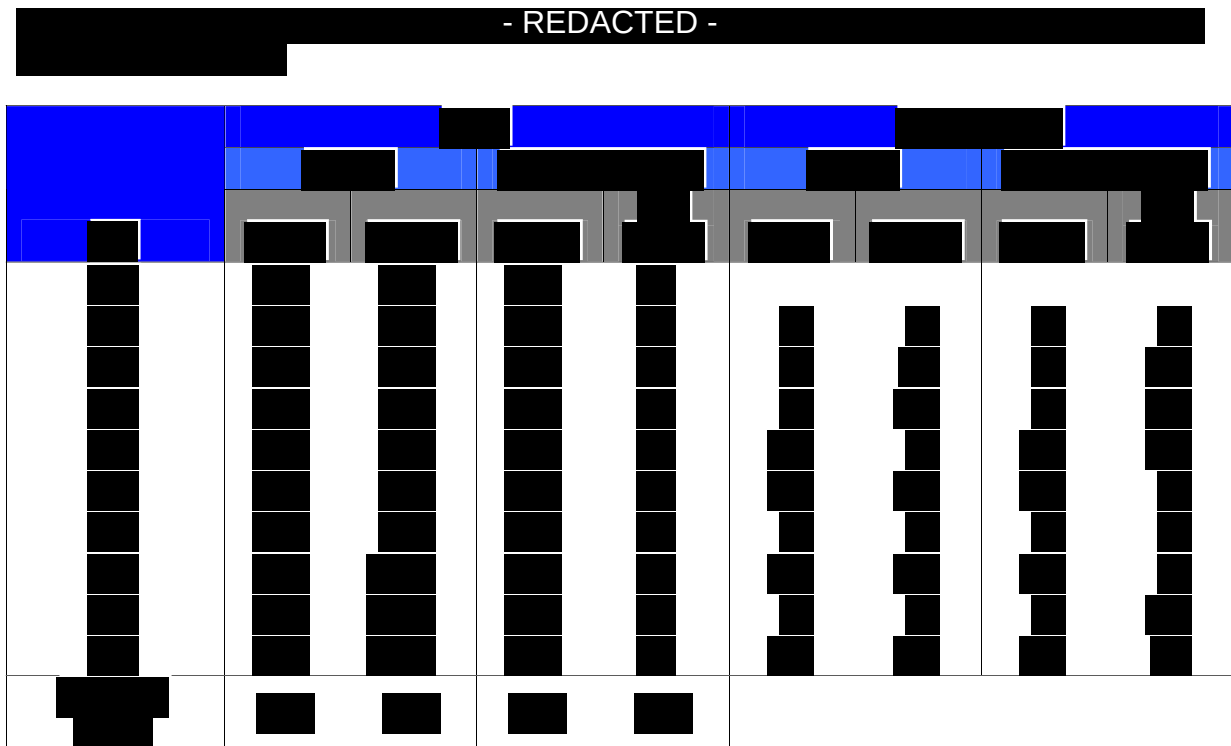
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- (95) While this summary information is illustrative, it does not substitute for rigorous analyses.

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I conduct such analyses in the following subsections. Each shows that BCBSI suffered substantial injury from the merger.

IV.3.3. Applying Dr. Baker's framework, control group, and analysis period to the BCBSI PPO data shows injury to BCBSI

- (96) These data are likely to be more reliable than the data used by Dr. Baker, for two reasons.

First, - REDACTED -

Second, Dr. Baker had to make a number of data processing decisions and assumptions in constructing his data.¹²⁹ Use of the BCBSI PPO data requires only the reasonable presumption that BCBSI is able to assess its own claims data reliably.

¹²⁸ - REDACTED -

¹²⁹ For example, Dr. Baker was unable to resolve data issues involving labor and delivery (Baker FTC Report, ¶

- (97) In the analysis in this section, to the extent possible, I adopt Dr. Baker's econometric model and his control group. There are three differences between my analysis and Dr. Baker's.
1. Dr. Baker runs separate patient-visit level models for each DRG and aggregates his results. My econometric model is the same as Dr. Baker's in that I use the same estimating equation and define the post period using a single dummy variable equal to 1 in calendar year 2000 and after (thereby assuming an identical merger effect for every year after the merger). My model must differ from Dr. Baker's because the BCBSI PPO data are aggregated to the yearly level. Accordingly, I use a single regression based on hospital-level data rather multiple regressions using patient-level data.
 2. Dr. Baker's control group contains 18 hospitals. The data for one of these, Advocate Northside Health Network, are incomplete in the BCBSI PPO data set, so I do not include it in my analysis.
 3. Dr. Baker only runs DID regressions for inpatient services. I conduct DID regressions for both inpatient and outpatient services (separately).
- (98) The equation I estimate for inpatient services is analogous to the model estimated by Dr. Baker and is specified as follows:¹³⁰

$$\ln(\text{price per case}) = \alpha_0 + \alpha_1 ENH + \alpha_2 Post + \alpha_3 ENH \times Post + \beta_1 \ln(\text{case mix}) + \beta_2 \ln(\text{los}) \\ + \phi \text{hospital_dummy} + \delta \text{year_dummy} + \varepsilon$$

- (99) The variables in this equation are defined as follows:
- $\ln(.)$ represents the natural logarithm.
 - "*price per case*" denotes the average price paid to each hospital for each case (i.e., each discharge).
 - "*ENH*" is a dummy variable equal to one if the hospital is part of ENH,¹³¹ and zero otherwise.
 - "*post*" is a dummy variable equal to one in calendar year 2000 and after, and zero otherwise.

29).

¹³⁰ See Baker FTC Report, ¶ 38. Dr. Baker included in his model age and gender of the patients; [REDACTED] - [REDACTED]. He also included a dummy variable for each insurance plan. This variable is unnecessary in my model, because I only focus on the PPO plan. Dr. Baker did not directly control for casemix in his regressions. However, he implicitly controlled for casemix by running the regressions at the DRG level and calculating the weighted average of price changes across DRGs.

¹³¹ ENH, HPH, and GBH are combined into a single unit by summing quantities and computing weighted averages of prices, length of stay, and case mix.

- “*ENH×post*” is a dummy variable equal to one for ENH in calendar year 2000 and after, and zero otherwise.
- “*case mix*” is a measure of average case complexity.
- “*los*” denotes the average length of stay.
- “*hospital_dummy*” is a set of hospital dummy (0/1) variables that control for unobserved time-invariant hospital characteristics (the “ $\bullet$ ” symbol denotes that a *set* of coefficients is interacted with a *set* of dummy variables, rather than a product of a single coefficient and dummy variable).
- “*year_dummy*” is a set of yearly dummy (0/1) variables (the “ $\bullet$ ” symbol denotes that a *set* of coefficients is interacted with a *set* of dummy variables, rather than a product of a single coefficient and dummy variable).

(100) The equation I estimate for outpatient services is as follows:

$$\ln(\text{price per case}) = \alpha_0 + \alpha_1 \text{ENH} + \alpha_2 \text{post} + \alpha_3 \text{ENH} \times \text{post} + \varphi \bullet \text{hospital_dummy} + \delta \bullet \text{year_dummy} + \varepsilon$$

(101) Variables in this equation are defined in the same way as the corresponding variables in the regression model for inpatient services.

(102) The resulting overcharges are in Figure 8.¹³² The results indicate that, from 2000 to 2003, for inpatient and outpatient services, BCBSI paid approximately 7.5% more to ENH than it would have absent the market power generated by the acquisition of HPH. Again, this takes both Dr. Baker’s framework and his control group as given. Figure 8 highlights one of Dr. Baker’s assumptions that I believe is needlessly restrictive. His econometric model needlessly assumes that the merger had an identical effect in each year from 2000 to 2003. A more flexible and informative specification, which I implement in section IV.3.5, will allow the effect of the merger on pricing to vary over time.

¹³² In Appendix G I discuss in detail how I calculate these overcharges.

Figure 8. Applying Dr. Baker's DID framework to the BCBSI PPO data shows injury to BCBSI

Year	Overcharge (%)			Overcharge (\$)		
	Inpatient	Outpatient	Overall ^[a]	Inpatient	Outpatient	Overall
2000	-2.5%	14.2%	7.6%	-\$360,331	\$3,111,384	\$2,751,053
2001	-2.5%	14.2%	8.0%	-\$441,502	\$4,241,165	\$3,799,663
2002	-2.5%	14.2%	7.5%	-\$639,017	\$5,334,249	\$4,695,232
2003	-2.5%	14.2%	7.5%	-\$773,025	\$6,480,950	\$5,707,925
TOTAL				-\$2,213,875	\$19,167,748	\$16,953,873

[a] Overall overcharges are calculated as the weighted average overcharges for inpatient and outpatient services in each year.

- (103) Note that the results in this section, which show an overall overcharge to BCBSI of 7.5–8.0%, are close to the results implicit in Tables 1 and 2 of the Baker FTC Report, which show an overall overcharge to BCBSI of 7% (see Figure 6). In other words, by applying Dr. Baker's framework to the new BCBSI data and making adaptations necessitated by the data, I generate results that are very similar to those reported by Dr. Baker. This result also gives me further confidence in the reliability of the BCBSI PPO data set.

IV.3.4. Extending Dr. Baker's framework and control group through 2008 shows injury to BCBSI

- (104) The analysis in the previous section did not make use of data for years 2004–2008, which [REDACTED] were not available to Dr. Baker when he conducted his analysis. The purpose of the analysis in the preceding subsection was to demonstrate that it is possible to derive results for the period through 2003 that are qualitatively similar to Dr. Baker's results. Differences that appear when I extend the analysis through 2008 are therefore unlikely to be the results of the steps I took to adapt Dr. Baker's framework to the newly available data (because I was able to generate results very similar to Dr. Baker's when I analyzed his time period). Instead, the differences are the result of incorporating additional years of data that were not available to Dr. Baker when he performed his analysis.

Figure 9. Extending Dr. Baker's DID model to the BCBSI PPO data through 2008 shows injury to BCBSI

Year	Overcharge (%)			Overcharge (\$)		
	Inpatient	Outpatient	Overall	Inpatient	Outpatient	Overall
2000	1.1%	17.9%	11.3%	\$162,312	\$4,080,156	\$4,242,468
2001	1.1%	17.9%	11.7%	\$197,711	\$5,561,724	\$5,759,435
2002	1.1%	17.9%	11.1%	\$285,834	\$6,995,118	\$7,280,952
2003	1.1%	17.9%	11.1%	\$349,796	\$8,498,874	\$8,848,670
2004	1.1%	17.9%	11.0%	\$447,815	\$10,469,483	\$10,917,298
2005	1.1%	17.9%	11.6%	\$476,395	\$13,155,025	\$13,631,420
2006	1.1%	17.9%	11.7%	\$589,217	\$16,583,015	\$17,172,232
2007	1.1%	17.9%	11.6%	\$656,564	\$18,152,510	\$18,809,074
2008	1.1%	17.9%	12.5%	\$700,073	\$24,026,280	\$24,726,353
TOTAL				\$3,865,717	\$107,522,185	\$111,387,902

- (105) When I extend the time period through 2008, overcharges at ENH are larger than when I only use data through 2003. Compared to the overcharges of 7.5–8.0% shown in Figure 8, overall overcharges in Figure 9 are 11.0–12.5%.¹³³ This implies that ENH increased prices to BCBSI at a higher rate from 2004 to 2008 than from 2000 to 2003, relative to the control group hospitals. This result is consistent with the timing of negotiations between BCBSI and ENH (see *supra* note 113).

IV.3.5. A more informative, flexible, and systematic DID model indicates substantial injury to BCBSI

- (106) In this section, I first describe the limitations of Dr. Baker's analysis, including his overly restrictive econometric model and Dr. Noether's unsystematic process for selecting control group hospitals (Dr. Baker uses as his control group a set of hospitals selected by Dr. Noether). I then introduce and implement a more systematic methodology for selecting control group hospitals and estimating the effect of ENH's acquisition of HPH on pricing to BCBSI.

IV.3.5.1. Limitations of Dr. Baker's framework

- (107) Dr. Baker interacted "*ENH*" with a single "*post*" dummy in his regressions, restricting the merger effect to be identical in each year from 2000 to 2003. As a result, Dr. Baker's model

¹³³ The restrictive assumption in Dr. Baker's specification is apparent in Figure 9, which shows an identical percentage price effect for inpatient and outpatient services in each year from 2000–2008. The implied overall overcharge does vary over time as a result of relatively minor changes in mix of inpatient and outpatient services provided by ENH to BCBSI and its enrollees.

can only measure the *average* DID effects from 2000 to 2003. His model has no ability to trace the *evolution* of the DID effects if those effects did not take place immediately following the merger in 2000. For example, the merger effects may have only begun in 2001, after ENH's new contract with BCBSI took effect. In this case, by using a single "*post*" dummy, Dr. Baker's approach would calculate a single average effect that combines a period with no effect (from 2000 to 2001) and a period with an effect (from 2001 to 2003). This needlessly estimates a single average effect across all years when a more flexible specification will allow the "data to speak" to the possibility that merger effects changed over time.¹³⁴

- (108) Dr. Baker adopts as his control group a set of 18 hospitals selected by Dr. Noether in her report for the FTC proceedings.¹³⁵ These are hospitals that fall into Dr. Noether's definition of the geographic market that ENH belongs to (an "area from which the hospital obtains 80% of its business"), as well as hospitals "that ENH identified as competitors in documents and that possess comparable characteristics to ENH."¹³⁶ Dr. Baker did not use a method of his own to select control group hospitals.
- (109) One flaw in Dr. Baker's control group is that he fails to exclude from his control group hospitals that merged between 1998 and 2003. In 2000, Victory Memorial Hospital merged operations with St. Therese Medical center;¹³⁷ that same year, Advocate Northside Health (doing business as Ravenswood Hospital Medical Center) merged with Illinois Masonic Hospital.¹³⁸ Including hospitals that merged around the same time as ENH may result in bias because those hospitals' pricing may also have been affected by mergers.

IV.3.5.2. A systematic method for selecting control group hospitals

- (110) I implement a systematic method to select for inclusion in the control group hospitals that are likely to face similar demand and supply factors as ENH and would therefore be subject to the same inflationary pressures. My first step involves applying four exclusion criteria:

¹³⁴ A more flexible specification could generate the result that the effect was the same in every year, if that is what the data show. But if the effect was not in fact the same in every year, a flexible specification will show that, whereas Dr. Baker's specification cannot.

¹³⁵ Baker FTC Report, ¶ 22.

¹³⁶ Noether FTC Report, n. 91 and ¶ 174.

¹³⁷ Statement of the Federal Trade Commission, re. Victory Memorial Hospital / Provena St. Therese Medical Center. File No. 011 0225. <http://www.ftc.gov/os/caselist/0110225/040630ftcstatement0110225.shtml>, last visited Oct. 28, 2009.

¹³⁸ PR Newswire, "Merger pursued by Advocate Health Care and Illinois Masonic Medical Center," Apr. 1, 2000.

1. I exclude hospitals located outside of the counties of Cook, DuPage, and Lake. Those hospitals are likely to be affected by market conditions that differ from those that ENH faces.
 2. I exclude hospitals with fewer than 100 beds because small hospitals may also face different supply and demand conditions.
 3. I exclude state and county owned hospitals, as well as navy and veterans affairs hospitals.
 4. I exclude hospitals whose shares of inpatient private charges are not comparable to ENH's.^{139, 140} Hospitals with a substantially different mix of patients are likely to face patient demographics and demand conditions that differ from those faced by ENH.
 5. I exclude hospitals that have been party to a merger or acquisition around the same time as the ENH merger. This includes, for example, MacNeal hospital (acquired by Vanguard Health Systems in 1999)¹⁴¹, Lincoln Park Hospital (which was bought out of bankruptcy by Merit Health Systems in 2002)¹⁴², and Advocate Illinois Masonic Medical Center.
- (111) I further conduct a statistical test to select and validate the control group hospitals. For a hospital to be a valid benchmark for ENH, its inpatient prices should respond to changes in market factors in ways similar to ENH. To test this, I focus on the effects of case mix and length of stay on pricing. The motivation for focusing on these variables is that total payments for an admission are determined by the level of baseline pricing as well as differences in acuity, as measured by length of stay and case mix. If changes in length of stay (and/or case mix) have a similar effect on pricing at ENH and other hospitals, this suggests that the process generating pricing at these hospitals is similar, which is the key feature that reliable control hospitals should exhibit. After identifying candidate control group hospitals, I select the control group hospitals by statistically testing whether their pricing and ENH's pricing respond to these two factors in the same way. This is a systematic approach to selecting control groups and can be implemented using a joint *F test* (see Appendix F for

¹³⁹ Using the IDPH data, I calculate ENH's share of private charges and the spread of the share of private charges across hospitals satisfying the first three conditions. I then select hospitals whose shares of private charges are within one standard deviation of ENH's share. Note that I use "charges" (from the IDPH data) rather than payments, because the purpose of this exercise is solely to measure the percentage of each hospital's total inpatient volume that is attributable to privately insured patients.

¹⁴⁰ Because I use the IDPH data to calculate the share of private charges and then use the BCBSI PPO data to conduct the DID analysis, hospitals must be in both of these data sets to be included in the control group.

¹⁴¹ Chicago Sun Times, "Hospital Chain Buys MacNeal," October 7, 1999.

¹⁴² Modern Healthcare, "Grant Hospital in Chicago is renamed Lincoln Park Hospital by new owner Merit Health Systems," February 24, 2003.

details). In addition to implementing the *F test*, I conduct sensitivity analyses that show that my results are to across alternative compositions of the control group of hospitals.

- (112) Applying the *F test* to the candidate hospitals remaining after I apply the four exclusion criteria results in a control group of 21 hospitals whose *p-values* are greater than 0.2. (These are hospitals 1–21 in Figure 10.) A *p-value* is a measure of the strength of the empirical evidence available against the null hypothesis, in this case, that pricing for a candidate control hospital responds to changes in case mix and length of stay in the same way as ENH's. The smaller the *p-value*, the stronger the basis for rejecting the null hypothesis. I exclude from the control group those candidate hospitals for which I can reject the null hypothesis of similar price responses. To assess the robustness of my estimation results, I also conduct a sensitivity analysis. That analysis shows that my results are not sensitive in an economically important way to my selection of 0.2 as the cut-off *p-value*. Specifically, regardless of the cut-off that I apply, I find consistent evidence of injury to BCBSI.¹⁴³

¹⁴³ The *F-test* procedure described above measures similarity of inpatient pricing. However, the economic reasoning behind the other four exclusion criteria is still valid for outpatient services. Therefore, part of my sensitivity analysis involves eliminating the *F-test* procedure above. My conclusion that BCBSI was injured as a result of the merger does not change.

Figure 10. Candidate control group hospitals

	Hospital name	<i>p-value</i>
1	CHRIST HOSPITAL (ADVOCATE)	0.99
2	NORTHWESTERN MEMORIAL HOSPITAL	0.88
3	CENTRAL DUPAGE HOSPITAL	0.86
4	HINSDALE HOSPITAL	0.84
5	WEST SUBURBAN HOSPITAL MEDICAL CENTER	0.81
6	SOUTH SUBURBAN HOSPITAL	0.80
7	LAKE FOREST HOSPITAL	0.76
8	EDWARD HOSPITAL AND HEALTH SERVICES	0.69
9	TRINITY HOSPITAL	0.68
10	PALOS COMMUNITY HOSPITAL	0.66
11	COPLEY MEMORIAL HOSPITAL	0.64
12	NORTHWEST COMMUNITY HOSPITAL	0.61
13	CONDELL MEDICAL CENTER	0.56
14	RUSH UNIVERSITY MEDICAL CENTER	0.56
15	LUTHERAN GENERAL HOSPITAL (ADVOCATE)	0.54
16	ALEXIAN BROTHERS MEDICAL CENTER	0.50
17	GOOD SHEPHERD HOSPITAL (ADVOCATE)	0.49
18	FOSTER G. MCGAW HOSPITAL	0.48
19	LAGRANGE MEMORIAL HOSPITAL	0.48
20	GOTTLIEB MEMORIAL HOSPITAL	0.39
21	ELMHURST MEMORIAL HOSPITAL	0.28
22	ST FRANCIS HOSPITAL AND HEALTH CENTER BLUE ISLAND	0.18
23	GOOD SAMARITAN HOSPITAL	0.11

- (113) In summary, I first identify a set of hospitals that may face market conditions similar to those faced by ENH; such hospitals can provide a meaningful basis upon which to evaluate price changes over time at ENH hospitals. I then conduct a formal test to select from this set those hospitals whose prices are affected by case mix and length of stay in the same way (statistically) as ENH's prices. Hospitals passing the test provide a reliable benchmark for ENH's pricing.
- (114) I describe the methodology that I employ to select control group hospitals in more detail in Appendix F. That appendix also contains a map indicating the geographic location of my control group hospitals and a list of the hospitals excluded from the control group with the reasons for each exclusion.

IV.3.5.3. Results from the more robust and informative econometric model show that BCBSI was injured

(115) In this subsection, I present a model that removes the limitations of Dr. Baker's model, which I discussed above. In particular, I do not pre-specify a starting date for any potential price effects, but instead use a specification that allows the "data to speak" as to whether and when such effects occurred. I also implement the more systematic process for selecting the control group that I described in the preceding subsection. And I analyze all years for which the BCBSI PPO data are complete.

(116) The equation I estimate is as follows:

$$\begin{aligned} \ln(\text{price per case}) = & \alpha_0 + \alpha_1 ENH + \alpha_2 post + \alpha_3 ENH \times post + \\ & + \sum_{t=1}^8 \gamma_t ENH \times post \times (\text{year} = 2000 + t) + \\ & + \beta_1 \ln(\text{casemix}) + \beta_2 \ln(\text{los}) + \\ & + \varphi \bullet \text{hospital_dummy} + \delta \bullet \text{year_dummy} \\ & + \varepsilon \end{aligned}$$

(117) Compared to Dr. Baker's specification, this equation contains eight additional variables; these are interactions of the $ENH \times post$ variable with dummies for each year from 2001 through 2008. Including these variables allows the DID effects to differ over time.¹⁴⁴ That is, the coefficients on these variables allow for a profile of changing DID effects over time.¹⁴⁵

(118) Using this model, I calculate the overcharges using the 21-hospital control group listed in Figure 10. The results are in Figure 11.¹⁴⁶

¹⁴⁴ The difference between ENH's actual and but-for log prices in a particular year is the sum of the coefficients α_3 and γ_t .

¹⁴⁵ If Dr. Baker's assumption of equal price effects throughout the post period were correct, the year-specific coefficients (the γ_t coefficients) would equal zero; they do not. When I estimate the model clustering by hospitals, five of the γ_t coefficients are positive and significant at the 5% level for inpatient services, and seven of the γ_t coefficients are positive and significant at the 5% level for outpatient services.

¹⁴⁶ The full econometric results are contained in Appendix G.

Figure 11. Applying a more flexible and informative model to the BCBSI PPO data through 2008 shows substantial injury to BCBSI

Year	Overcharge (%)			Overcharge (\$)		
	Inpatient	Outpatient	Overall	Inpatient	Outpatient	Overall
2000	1.8%	0.4%	1.0%	\$270,574	\$75,252	\$345,826
2001	-4.4%	7.3%	2.7%	-\$792,658	\$2,019,844	\$1,227,186
2002	-4.0%	14.4%	7.5%	-\$957,490	\$5,695,515	\$4,738,025
2003	-5.3%	19.1%	10.1%	-\$1,592,840	\$9,851,364	\$8,258,524
2004	11.3%	16.8%	14.6%	\$4,642,393	\$10,475,509	\$15,117,902
2005	9.9%	17.4%	14.7%	\$4,236,925	\$13,523,737	\$17,760,662
2006	15.1%	15.1%	15.1%	\$8,633,737	\$14,115,707	\$22,749,444
2007	13.3%	15.3%	14.6%	\$8,432,358	\$16,663,756	\$25,096,114
2008	17.6%	2.7%	8.1%	\$12,509,525	\$3,495,329	\$16,004,854
TOTAL				\$35,382,524	\$75,916,013	\$111,298,537

- (119) The results show that BCBSI suffered obvious injury in outpatient services throughout the post-merger period. Beginning in 2001, the prices paid by BCBSI to ENH for outpatient services increased substantially compared to the corresponding increase in prices paid by BCBSI to control group hospitals. My estimate of damages to BCBSI (and the self-funded plan sponsors it represents) for outpatient services between 2000 and 2008 is \$75.9 million.
- (120) For inpatient services, BCBSI suffered injury, though apparently with some delay. Specifically, the merger effect on pricing for inpatient services became apparent in 2004 (2004 was the first year of the second post-merger contract period),¹⁴⁷ with overcharges in excess of 10%. Overcharge of 9.9% or above continued in each subsequent year. My estimate of damages to BCBSI (and the plan sponsors and enrollees it represents) for inpatient services between 2000 and 2008 is \$35.4 million.
- (121) Overall, for inpatient and outpatient services, overcharges have been persistently above 7% since 2002. Estimated overall damages to BCBSI (and the self-funded plan sponsors it represents) are \$111.3 million dollars from 2000 to 2008. This clearly establishes impact to BCBSI.

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IV.3.5.4. Sensitivity analyses of my preferred specification show that the finding of injury to BCBSI is robust

(122) I have explored my results in detail, particularly as relates to (1) the composition of the control group and (2) the econometric specification that I adopt. These analyses demonstrate that results are generally not sensitive to the exact set of control group hospitals that I include in my analysis.¹⁴⁸ Specifically, I conduct the following sensitivity analyses:

1. Examine the effect on the estimated overcharges of varying the size of the control group by starting with a small control group and then enlarging it in order of the *p-value* from the *F*-tests. This adds additional control group hospitals in decreasing order of the similarity of their pricing responses to ENH's.¹⁴⁹
 - This analysis shows overcharges for inpatient and outpatient services for the period 2001–2008 that range from 8.6% to 13.9%, depending on the composition of the control group. The corresponding percentage overcharge to BCBSI from my baseline model (which I present on an annual basis in Figure 11), is 11.9%, which lies in the middle of this range.
2. Examine the effect on the estimated overcharges of varying the size of the control group by starting with a small control group and then enlarging it in order of the distance of each hospital to Evanston hospital. While this approach lacks the statistical basis of ordering by *p-values*, it reflects reasoning similar to that used by Dr. Noether in the FTC litigation when she selected the control group analyzed by Dr. Baker.¹⁵⁰
 - This analysis shows overcharges for inpatient and outpatient services for the period 2001–2008 that range from 7.0% to 12.8%. The corresponding percentage overcharge to BCBSI from my baseline model is 11.9%, which, at first glance, lies in the high end of the range. A closer examination of the results, however, reveals that as the control group size goes above seven, the percentage overcharges are consistently above 10%. Therefore, the overcharge from my baseline model is, again, in line with the range of overcharges generated as the size of the control group varies from 8 to 23.

¹⁴⁸ I believe that using the set of 21 hospitals generates the most reliable results, because it is based on the greater amount of information and all 21 exhibit price responses to changes in length of stay and casemix that are comparable to the responses for ENH. I only use the analyses described in this section and in Appendix H to assess the robustness of the results from the model that I believe is most reliable, which is the model I presented in Subsection IV.3.5.3.

¹⁴⁹ In particular, I examine the case where the *F-test* procedure is not employed (i.e., the control group comprises 23 hospitals). See footnote 143.

¹⁵⁰ - REDACTED -

- #### IV.4. The BCBSI PPO data establish injury to BCBSI and ENH contracts establish common impact

- ¹⁵¹ I made similar points in my original report (see, for example, Dranove Report, ¶ 1, 15, 30). That a demonstration of average injury is not, alone, sufficient for common impact is generally appreciated (see, for example, Richard Schmalensee, “Economic Analysis of Class Certification,” *GCP: The Online Magazine for Global Competition Policy*,” June 2008).

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1. *Common impact.* - REDACTED -

This means that when the average price of inpatient services increases by, say, 20%, the prices of each subcategory of inpatient services also increased by 20%. Accordingly, the prices to insurers and patients on behalf of the patients who receive those services will also have increased by 20%.¹⁵⁴

2. *Injury.* A systematic DID analysis shows that, in fact, there was substantial injury to BCBSI—the prices BCBSI paid to ENH for inpatient and outpatient services after the HPH acquisition increased by significantly more than BCBSI's payments to control group hospitals.¹⁵⁵

(127) From an economic perspective, I view the demonstration that common factors are predominant to be no less important than a quantification of damages to a particular insurance plan.¹⁵⁶ It is the demonstration that common factors are the predominant determinants of prices that allows me to conclude that my final insurer- or plan-specific quantification of damages, whatever the particular values turn out to be, are valid measures of damages for substantially all payments governed by the contracts of that insurer or plan. Moreover, because the DID analysis results in an insurer- or plan-specific (as indicated by the relevant contracts) quantification of damages, I conclude that the DID methodology will not erroneously attribute damages to uninjured parties (if such parties exist) regardless of the particular magnitude of damages.

IV.4.1. Allocation of damages

(128) In this report, I focus primarily on the key issues raised by Dr. Noether in her report—common impact and the reliability and feasibility of using DID analysis to estimate overcharges. Nevertheless, the findings summarized in the previous subsection also demonstrate the appropriate method for computing the realized damages from each patient visit. That method may be summarized as follows:

¹⁵³ - REDACTED -

¹⁵⁴ See *supra* note 38 for an example.

¹⁵⁵ There was little dispute in the FTC litigation that insurers other than BCBSI faced price increases substantially higher than those faced by BCBSI. Therefore, while I have not analyzed those insurers in this report (which focuses on common impact and feasibility), it is highly likely that these insurers were also injured.

¹⁵⁶ I note explicitly that I am not offering an opinion on the legal interpretation of common impact.

1. Use the DID methodology to compute the overcharges applicable to inpatient and outpatient services for a given plan-year. As discussed in section III.1 and elsewhere, the formulaic nature of the pricing of services for any given patient implies that the overall percentage overcharge is a reliable estimate of the percentage overcharge for any given enrollee in that plan-year. (Depending on the contract, there may be two relevant overcharges, one for inpatient services and one for outpatient services).¹⁵⁷
2. Multiply the actual payment made on behalf of the patient (i.e., the total payment for that patient's care, including payments by the plan or plan sponsor and the patient) by the appropriate percentage overcharge derived from the DID analysis. For example, if the payment for an outpatient service covered by the BCBSI PPO plan in 2004 was \$1,000, apply the overcharge percentage of 16.8% (see Figure 11) to compute the overcharge. That is, the overcharge is 16.8% of the payment and therefore equals \$168. Price would have been \$832 absent the market power created by the HPH acquisition and damages associated with this patient are \$168.
3. If a review of plan design indicates that it is necessary to compute overcharges at a finer level than outpatient/inpatient, the DID methodology can easily accommodate this, as I explained in section III.2. But the methodology for allocating damages would remain the same: apply the overcharge percentage that is appropriate for the individual class member to the payment for that member's visit. This scenario would apply in cases where some subset of inpatient or outpatient services has price increases that are contractually different from other inpatient or outpatient services. My review of contracts between ENH and various insurers indicates that such situations are not common (see section III.1).

(129) It is important to note that I do not use the overall inpatient and outpatient overcharge percentage to allocate damages to individual class members. The purpose of computing this overcharge is solely to establish *impact* to BCBSI (which refutes Dr. Noether's claim that BCBSI was not injured). Based on the results in Figure 11, it would clearly be inappropriate to allocate identical damages to inpatients and outpatients covered by BCBSI. Instead, Figure 11 provides a roadmap to appropriately allocating damages on a year-by-year basis to individual patients covered by BCBSI who received inpatient or outpatient care from ENH. For example, referring again to 2004, my allocation process will *not* use the single "overall" overcharge percentage of 14.6% but rather would apply 11.3% to inpatients and 16.8% to outpatients.

¹⁵⁷ While I have not seen any evidence to indicate that it is likely, it is possible that there are exceptions in that some contract may require computing more than two overcharges. If such a contract emerges then I will follow the procedure I describe in Section III.2.

IV.5. Dr. Noether's DID analysis is highly flawed and does not address the reliability of DID analysis

- (130) In paragraphs 64 and 65 of her report, Dr. Noether describes a DID analysis she undertook. She purports to analyze common impact through an analysis of pricing for individual DRGs. She, or her staff, committed several technical errors in the execution of this analysis; I enumerate those errors below. However, in my opinion, the key reasons Dr. Noether's analysis is uninformative as a test of common impact are (1) she fails to account for contract restructuring and (2) she conducts a DRG-by-DRG level analysis when she should instead analyze pricing for sets of DRGs whose pricing is contractually linked together. As my review of ENH's documents and contracts shows (see section III), her one-by-one DRG analysis is inappropriate. The first error leads her to erroneously conclude that the merger did not have common impact. The second error causes her to report erroneous statistics and incorrectly conclude that price changes were not statistically significant.

IV.5.1. Conceptual errors in Dr. Noether's DID analyses

- (131) Of the two key misunderstandings, Dr. Noether's failure to account for the restructuring of contracts (i.e., the restructuring described above in section III.3) is the most critical. As Figure 3 and the discussion that surrounds it point out, a naïve and incorrect application of DID analysis to individual service categories, such as the analysis Dr. Noether describes in her report, can lead one to misleadingly conclude that some prices have decreased over time.¹⁵⁸ This naïve application implicitly assumes that all restructuring of contracts was solely the result of the alleged increase in market power following ENH's acquisition of HPH. The evidence I have reviewed in this matter, as well as my experience as a healthcare economist, strongly rejects Dr. Noether's implicit assumption. That is, when Dr. Noether points to some prices having decreased as evidence of a lack of common impact, she fails to realize or take note of the fact that such changes are most likely the result of routine contract restructuring and would most likely have occurred even without the HPH acquisition. If contract restructuring would have occurred regardless of the exercise of market power by ENH, then the resulting decline in some prices due to restructuring says nothing about common impact from the exercise of market power.

¹⁵⁸ For example, [REDACTED] - REDACTED - [REDACTED]

(132) To see how contract restructuring can lead Dr. Noether to conclude incorrectly that impact is not common, consider an illustrative hypothetical in which ENH and a payer change the structure of their contract in 2003.¹⁵⁹ The structure of the illustration is as follows:

- The contract in place prior to the merger specified a single per diem rate of \$1,500
- The contract is renegotiated in 2002 and specifies a single inpatient per diem rate of \$2,000. The 33% price increase is the result of the exercise of market power ENH obtained by acquiring HPH. Absent the merger, prices would have remained at \$1,500.
- The 2003 contract specifies two per diems: \$4,000 for intensive care and \$1,400 for all other inpatient care. ENH continues to have market power in 2003.
- Intensive care accounts for 25% of ENH's patients and all other inpatient care accounts for 75% of ENH's patients, implying an average per diem rate of \$2,050.¹⁶⁰

(133) In this scenario, Dr. Noether's analysis would report that 75% of patients paid less under the 2003 contract than they would have absent the HPH acquisition and that 25% of patients paid more. Dr. Noether's interpretation would require one to believe that in 2003, ENH *gained* significantly more market power in intensive care services and *lost* significant market power in all other inpatient care services.¹⁶¹ This interpretation is highly unlikely, as there is no evidence that ENH faced such divergent changes in its competitive environment. Consider instead the posited scenario in which ENH has experienced an across the board increase in market power and, simultaneously, has restructured some of its contracts. (I view this as the far more likely explanation for the actual pricing pattern.) In this case, we can analyze the pricing change as follows. Restructuring, by itself, caused the price of intensive care to increase and the regular per diem price to decrease. However, the exercise of market power caused both these restructured prices to have increased by 33%. Hence, instead of prices of \$4,000 and \$1,400 respectively, prices in the absence of market power would have been \$3,000 and \$1,050.¹⁶² Dr. Noether's attempt to perform a DID analysis does not recognize or

¹⁵⁹ - REDACTED -

¹⁶⁰ To keep this example simple, I also assume that the lengths of stay are the same for both intensive care and all other inpatient care patients.

¹⁶¹ - REDACTED -

¹⁶² Thus, as I stated in my original report, "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." Dranove Rep., ¶ 2.

attempt to account for contractual restructuring that would likely have occurred even absent the merger.

- (134) Dr. Noether's second error is that she estimates separate models for every DRG without reference to the relevant contractual structures. By doing so, Dr. Noether needlessly generates statistically imprecise results and increases the number of statistically insignificant price changes that she reports.¹⁶³ For example, - REDACTED -

As a result, many of her DRG-by-DRG regressions have, for no valid reason, very few observations and so it should not be surprising that she often finds statistically insignificant results.

- (135) - REDACTED -
- This is a thin basis upon which to identify statistically significant price changes, whether negative or positive.¹⁶⁵

- (136) I have not replicated Dr. Noether's DID analysis for just those DRGs with more than ten ENH observations in both periods because she has not actually implemented the methodology that I propose (that is, she has not selected the appropriate level of aggregation based on a review of the relevant contracts). Nevertheless, it is worth noting that when she performs her analysis at the Major Diagnostic Category (MDC) level, she finds only 1 MDC with a negative DID estimate for both Humana and United.¹⁶⁶ While she does not identify in

¹⁶³ Noether Report, Tables 2–4.

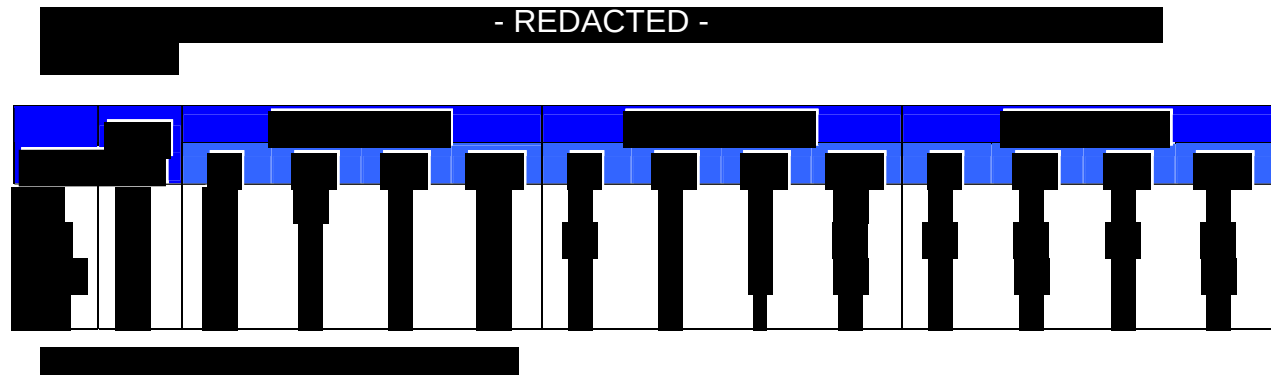
¹⁶⁴ - REDACTED -

¹⁶⁵ As I have noted, the appropriate level of aggregation for analyzing a particular payer or plan should be guided by the relevant contracts. Thus, if one set of DRGs (or services identified by some other code) are priced in one way and another set are priced in a different way, it may be appropriate to analyze the two sets separately. This does not imply that it is statistically appropriate to simply analyze each DRG separately.

¹⁶⁶ - REDACTED -

However, as I show in Section IV.3.5, ENH's price to BCBSI for inpatient

her report the particular MDC for which her estimate is negative, it accounts for only 0% to 1% of cases. (See Noether Report, Table 4).



IV.5.2. Technical errors and limitations in Dr. Noether's DID analysis

- (137) Perhaps the most notable technical error in Dr. Noether's DID analysis is that, in Table 3 of her report, she unwittingly analyzes many DRGs for which there are no ENH claims in the pre-merger period. Without pre-merger data for a particular DRG, it is clearly impossible to compute the change in price from before the merger to after. The likely reason Dr. Noether did not notice this problem is that the software package she used for this analysis still generates what appears to be a DID estimate; namely, a coefficient on the *postmerger* × *ENH* variable. When there are no pre-merger observations for a DRG, however, that coefficient is not the DID estimate.¹⁶⁷ This error causes Dr. Noether to overstate the number of DRGs with negative price increases in Table 3 of her report.
- (138) As noted above, for many other DRGs (the number depends on the plan in question), Dr. Noether's regressions include only a very small number of ENH observations (often only one observation in either the pre-merger or post-merger period). This, again, will generate statistically unreliable results.
- (139) By subdividing DRGs in this way, Dr. Noether tilts her analysis towards finding "Negative or Positive but not significant" results. To see why, suppose that Dr. Noether had further subdivided the data into DRG/day of the week. In other words, suppose she asked whether patients treated in a given DRG on a given day of the week experienced a price increase. By reducing the effective sample size for each comparison by one seventh, Dr. Noether would greatly reduce the number of positive and significant findings. I have previously explained

services increased substantially under the contract that took effect on January 1, 2004.

¹⁶⁷ See Appendix I for a more detailed discussion. Because Dr. Noether uses different software in analyzing Dr. Baker's data than in analyzing Dr. Haas-Wilson's data, she only commits this error in analyzing the latter.

why the contracts show that the exercise of market power would likely have common impact. By narrowly subdividing the classes of patients, Dr. Noether has generated misleading statistics regarding the exercise of market power.

(140) I also found additional errors in, or misleading aspects of, several of Dr. Noether's analyses and tables that relate to her attempt to implement a DID analysis. These are as follows:

- I was not able to fully replicate some of Dr. Noether's results using the data and computer code that she produced in conjunction with her report.¹⁶⁸
- In Tables 2, 3, and 4 of her report, Dr. Noether identifies counts of "Negative DRGs," by which she means the number of DRGs with negative DID estimates. While she does not make this clear, Dr. Noether is reporting as "Negative DRGs" both (1) DRGs with negative and statistically significant estimates and (2) DRGs with DID estimates that, while negative, are not statistically different from zero.
- Dr. Noether incorrectly describes one of her analyses. - REDACTED -

(141) In paragraphs 66–71 of her report, Dr. Noether also presents an analysis of the variation in billed charges for single DRGs in a single year. Based on this analysis, she reaches the following conclusion:¹⁶⁹

The wide variance in the amount of billed charges for a single DRG in a single year illustrates the variability in the underlying chargemaster items that are "triggered" by a specific patient service; even for patients who appear otherwise to be very similar. Since changes to the ENH chargemaster prices are not uniform or common, whether a specific patient is impacted by an increase to some ENH chargemaster prices will depend on which chargemaster items were included in the patient's bill. However, even **observationally equivalent patients (same DRG, same year)** are billed for very different combinations of chargemaster line items. Thus, impact from

¹⁶⁸ Specifically, I was unable to replicate Table 3 in Dr. Noether's report. Dr. Noether's backup materials produce a version of her Table 3 that indicates slightly fewer DRGs with negative DID estimates than the version of Table 3 in her report.

¹⁶⁹ Noether Report, ¶ 71.

changes in ENH chargemaster prices is not common across all class members who paid based on these prices. (Emphasis added.)

- (142) In order to reach this conclusion, Dr. Noether makes several bold assumptions if not outright errors. First, she assumes that differential changes in chargemaster prices reflect the differential impact of market power. As I explained earlier in this report, it is more likely that differential changes in chargemaster list prices reflect updating and restructuring that would have occurred even absent the merger.¹⁷⁰ Second, Dr. Noether implicitly assumes that individual chargemaster list prices *changing* at different rates over time is the only explanation for differential rates of change in total charges. But this is purely inferential and she does not offer direct evidence of such differential changes in charges.
- (143) Another problem with Dr. Noether's conclusion stems from her statement that "observationally equivalent patients (same DRG, same year) are billed for very different combinations of chargemaster line items." This is misleading and her analysis certainly does not establish her hypothesis on this point. Most notably, Dr. Noether fails to consider length of stay. First, length of stay is observable, so patients with the "same DRG, same year" are *not* generally observationally equivalent. Second and more importantly, within a DRG, patients with different lengths of stay will automatically have differing charges (for example, a patient with a 4-day stay will have one more daily room charge than a patient with a 3-day stay). But this basis for the difference in charges is observable. The same will be true for any other service that is repeated on a daily or periodic basis.
- (144) In short, Dr. Noether assumes but does not establish that variation in charges within a DRG is indicative of variation in increases in chargemaster prices that, in turn, reflects differential exercise of market power. Variation in charges is as likely or more likely to reflect the frequency with which common chargemaster items appear within a DRG, and should it prove necessary to conduct a DRG-level analysis—a possibility that, based on my review of contracts between ENH and insurers, I view as unlikely for most insurers—my regression analyses would control for observable drivers of within-DRG variation in charges (e.g., length of stay, as well as other potential control variables such as the primary diagnostic code and patient's age). And even if there remains variation in the level of charges for reasons that are not observable, this does not imply that charges change at non-uniform rates.
- (145) Finally, in paragraphs 72 through 79 of her report, Dr. Noether disputes the reliability of using Medicare Cost Report data to estimate price changes reliably within the set of control group hospitals. I believe her arguments and analysis fall short in a number of respects. First,

¹⁷⁰ For example, when charges for various supplies are set as a particular mark-up over cost (e.g., 200% of cost), changes in the cost of those supplies will lead to changes in charges, but those changes are not related to the exercise of market power.

Dr. Noether apparently believed at the time she wrote her report that the Medicare Cost Report (MCR) data would be the *only* source of post-2003 data on insurers' payments to hospitals other than ENH.¹⁷¹ To the contrary, however, BCBSI recently produced data that contain that very information through 2008, and I understand that counsel for Plaintiffs have requested similar data from other insurers. That said, I do in fact use the Medicare Cost Report (MCR) data in conjunction with the IDPH data to select my control group hospitals (see paragraph (82) and Appendix F), although my results are robust to reasonable changes in the control group.

- (146) Second, in constructing prices from the MCR and IDPH data, Dr. Noether does not actually implement the methodology I proposed. Instead, in footnote 54 of her report, Dr. Noether describes but does not implement a number of the steps that I proposed in order to isolate the private payer component of hospitals' net revenue. In selecting control group hospitals, I implemented these additional steps.
- (147) Finally, in attempting to calculate the "actual" inflation rates for ENH, Dr. Noether misinterprets the BCBSI data and, as a result, calculates BCBSI payments incorrectly. Specifically, she does not account for the BCBSI reimbursement system under which ENH records covered charges (which are very close to billed charges) in the payment field and then incorporates negotiated discounts in periodic reconciliations.¹⁷² For example, the average inpatient per-case payments in her data for BCBSI's PPO product are nearly twice as high as the average inpatient per-case payments actually reported in the data produced by BCBSI (because her "payments" upon which she bases her inflation rates do not reflect contractual discounts and so are not payments at all). Patients whose primary insurance is BCBSI account for over [REDACTED] of observations in Dr. Noether's data, so this error alone renders this analysis by Dr. Noether unreliable.¹⁷³

¹⁷¹ These paragraphs are contained in a section of Dr. Noether's report titled, "Sufficient Data Are Not Available for Many Payors for Any Time Period and Sufficient Data are Not Available After 2003 for Any Payor." Noether Report, ¶ 32. See also, Noether 2009 Dep. 105–106.

¹⁷² See *supra* note 30. See also, Noether 2009 Dep. 98–100.

¹⁷³ [REDACTED] private payer observations (i.e., claims) in Dr. Noether's analysis identify the payer as "BCBSI."

V. Dr. Noether's opinion that substantial numbers of class members were uninjured is either incorrect or unsupported

- (148) I disagree with Dr. Noether's opinion that substantial numbers of class members were not injured by the post-merger exercise of market power.¹⁷⁴ Perhaps the largest group of class members whom Dr. Noether claims were not impacted by the HPH acquisition is those covered by BCBSI. While I have not done an exhaustive investigation of the impact on BCBSI enrollees, I have now examined the impact on BCBSI's largest product (its PPO product), and I reported my findings in section IV of this report. My analysis clearly shows that BCBSI *was* impacted—after the acquisition, the increase in the prices BCBSI paid to ENH exceeded the corresponding increases in the prices BCSI paid to control group hospitals.
- (149) Dr. Noether makes several additional arguments in support of her claim that substantial numbers of class members were not injured in her Section V. In summary, I believe that that her arguments fall into two broad categories:
1. She claims that some class members suffered no injury because they were able to “pass on” any cost increase.
 2. She claims that some class members suffered no injury as a result of aspects of the product, price formation, or competition.

Dr. Noether also claims that some non-class members may only be identified as such on an individualized basis.

- (150) Dr. Noether offers the opinion that some entities suffered no injury because they pass on the full amount of any increase in their costs. These entities include third-party administrators, rental networks, and MCOs generally.¹⁷⁵ First, although I am not an expert in the law, I understand that considerations associated with pass-on and pass-through are not relevant in this matter. Second, basic economic theory informs us that when a firm's costs increase, its profits generally fall.¹⁷⁶ In other words, Dr. Noether's claims that firms completely avoided

¹⁷⁴ Although not particularly prominent in her report, it appears that Dr. Noether is of the opinion that *no* anticompetitive price increase occurred (“... if an anti-competitive price increase had occurred, which I do not believe to be the case” Noether Report, ¶ 51). She offers no support for this opinion.

¹⁷⁵ Noether Report, ¶¶ 27, 48–51.

¹⁷⁶ A fundamental theorem of oligopoly theory is that an oligopolist's profits decrease when its marginal costs increase. See Jean Tirole. *The Theory of Industrial Organization*. (Cambridge: MIT Press, 1994), 66. Note that the exception to this is for the case of undifferentiated goods in a market with perfect competition. These conditions are not likely to be present in the health insurance market.

any and all injury because they were able to pass on cost increases seems at odds with basic economic theory.

(151) Dr. Noether also speculates that some class members were not injured as a result of various aspects of the product, price formation, or competition.¹⁷⁷ At a purely theoretical level, Dr. Noether's claims may be correct. However, at a practical level, I believe that there is ample evidence (some developed by Dr. Noether herself) that these claims pertain to relatively few class members. Thus, while I do not contest that there *may* exist some class members that were not injured due to the reasons Dr. Noether offers, I believe that these reasons do not apply to substantial numbers of class members. I briefly review each of the reasons offered by Dr. Noether below.

- *Supplemental/secondary insurance.* Although Dr. Noether's opinion is not clear, I understand that she claims that individuals who have supplemental or secondary insurance may have no out-of-pocket expenditures, and therefore were not injured. At the outset, it is important to note that this issue involves claims allocation and does not affect the total amount of incurred damages. Second, my understanding is that a very large majority of secondary coverage involves Traditional Medicare patients who purchase supplemental coverage (a second large component involves "dual eligibles" —patients who are covered by both Traditional Medicare and Medicaid). Patients whose primary insurer is Traditional Medicare or Medicaid are not included in the class definition, so Dr. Noether's points on this account are entirely irrelevant for these patients.¹⁷⁸ Finally, beyond the concerns stated above, Table 7 in Dr. Noether report shows that only a very small proportion of non-government patient visits to ENH have multiple commercial insurers.¹⁷⁹
- *Usual and customary (U&C) charges.* Dr. Noether argues that out-of-network payments where terms are based on some external benchmark of "usual and customary" charges are not injured. Again, Dr. Noether presents no evidence that such a situation is common. In fact, her opinion in the FTC matter seems to be consistent with MCOs having large networks so that out-of-network payments would be rare.¹⁸⁰
- *Out-of-pocket maximums.* Dr. Noether claims that, even without elevated pricing due to the merger, some class members would reach a threshold above which they would

¹⁷⁷ Noether Report, ¶¶ 52–55.

¹⁷⁸ Plaintiffs' Motion for Class Certification, February 13, 2009, 1.

¹⁷⁹ Dr. Noether's Table 7 shows that - of patient visits are not paid by the government (i.e., do not involve Medicare or Medicaid). Table 7 also shows that - of patient visits are not paid by the government and involve multiple commercial insurers. Thus, approximately - REDACTED - of non-government visits may involve multiple commercial insurers (i.e., have the possibility of supplemental or secondary insurance).

¹⁸⁰ Noether FTC Report ¶¶ 24-26.

not pay additional out-of-pocket payments. She concludes that such class members would not be injured. Again, it is important to note that this issue involves claims allocation and does not affect the total amount of damages calculated. Setting this point aside, however, Dr. Noether offers a description in her Appendix 2 that refers to her Table 5 as evidence for the existence of out-of-pocket maximums. My observation is that, accepting Dr. Noether's own evidence for sake of argument, out-of-pocket maximums affects approximately [REDACTED] of visits. Given the substantial price increases caused by the merger, this figure likely overstates the percentage of visits for which the out-of-pocket maximum would bind if pricing had not been increased by the merger. See Appendix J for a discussion of this evidence.

- *Stop-loss insurance.* Similar to her logic for out-of-pocket maximums, Dr. Noether argues that, even without elevated pricing due to the merger, some self-funded groups would reach a threshold above which they would not make additional payments. She concludes that such class members would not be injured. Again, it is important to note that this issue involves claims allocation and does not affect the total amount of damages calculated. Additionally, while Dr. Noether testified that self-funded groups commonly have stop-loss insurance, she has offered no analysis that quantifies how often this insurance would protect class members from injury.¹⁸¹ Moreover, economic theory suggests that if a self-funded group reached its stop-loss threshold in a given year, an event made more probable by ENH's price increases, the cost to that group of obtaining stop-loss insurance in subsequent years would increase.
- *Imaging services and Lasik eye surgery.* Dr. Noether states that these were "unlikely to have been impacted by a merger between ENH and HPH, because they are provided in product and geographic markets that contain a substantial number of competitors." With respect to Lasik Surgery, Dr. Noether fails to note that ENH's billing data contain minimal observations for Lasik surgery. Moreover, the Lasik procedures performed at Glenbrook hospital are performed by Glenbrook Eye Associates, which is a distinct entity from Glenbrook hospital and ENH, though it is located on the Glenbrook campus.¹⁸²

(152) Dr. Noether offers three additional reasons why class members may have avoided injury. In summary, her reasoning is either contradicted by substantial evidence Dr. Noether ignores or does not, in fact, speak to injury.

- *Charges to the uninsured.* Dr. Noether's point here appears to be that the ENH has a charity care policy and that ENH never turns away emergency care patients for lack

¹⁸¹ Noether 2009 Dep. pp. 140-141.

¹⁸² Glenbrook Eye Associates, <http://glenbrook.cmititestbank.com/>. Glenbrook Eye Associates' independence from ENH was verified via a telephone call on Nov. 9, 2009.

of insurance. I do not understand this point to be related in any way to the question of injury. Of some relevance, however, is that the class definition explicitly excludes those “uninsured who did not pay their bill.”¹⁸³

- *Quality changes.* Dr. Noether argues that increases in quality may have offset any price increases. However, in order to potentially offset merger-induced price increases, quality increases would have to be the result of the merger (otherwise, the quality improvements would have occurred even absent the merger). Dr. Noether herself notes that “the FTC did not find all of these improvements to be merger-specific.”¹⁸⁴ In fact, the FTC’s conclusions went beyond this to stress that Highland Park Hospital had earmarked substantial amounts of capital for investments in service quality improvements prior to the merger, and that a variety of federal quality of healthcare measures recorded virtually no increase in the quality of healthcare at Evanston between 1999 and 2000.¹⁸⁵ I find that this evidence forcefully rejects Dr. Noether’s speculative argument on this point.
- *The FTC’s remedy.* Dr. Noether asserts that any patient who received services after the FTC remedy was not injured. In doing so, she assumes, rather than establishes, that the remedy was effective. She has performed no analysis to support that conclusion. My analysis of BCBSI PPO data in section IV.3 shows that, as late as 2008, BCBSI continued to pay elevated prices to ENH (relative to the control group).

- (153) In summary, consideration of these factors does not materially affect my conclusions. Generally, Dr. Noether offers only speculation with no supporting evidence. In one case, Dr. Noether raises objections that apply primarily to patients who are not included in the class definition. In another case, she raises objections related to a service not offered by ENH.

VI. Summary and conclusions

- (154) In my expert report I claimed that when hospitals increase prices to a given payer and health plan (e.g., Aetna’s HMO plan), they tend to implement across-the-board increases that apply

¹⁸³ Plaintiffs’ Motion for Class Certification, February 13, 2009, 1.

¹⁸⁴ Noether Report, ¶ 53. In fact, the FTC rejected the merger-specificity of all but one of ENH’s claimed efficiencies: “We find only one merger-specific improvement: the medical staff integration and affiliation with a teaching hospital.” *Majoras Opinion* at 51. In the same paragraph, however, the FTC concluded, “But this does not constitute verifiable evidence that any such improvement is of sufficient magnitude to offset the competitive harm that demonstrably has resulted from the merger.” *Id.*

¹⁸⁵ *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), Section II.D.2.b.

- (155) In her rebuttal report, Dr. Noether objects to my proposed methods based on her opinions that (1) contracts between hospitals and insurers are complex and these complexities preclude the use of a common framework to study price increases; and (2) the DID methodology is not reliable, in part because the characteristics of the control group used in DID analysis must exactly match the characteristics of the ENH hospitals. I strongly disagree with all but one minor aspect of these assertions.
- (156) Dr. Noether is correct to observe that many hospital contracts appear to be complex, in the sense that they sometimes specify different prices *at any given point in time* for dozens of services. Beyond that, her assertions are incorrect. What Dr. Noether crucially fails to observe is that this apparent complexity does not preclude the use of a common framework to study *the rate at which prices increase over time*. In fact, contracts between hospitals and insurers - REDACTED -
- REDACTED -
- REDACTED -
Thus, the exercise of market power over, for example, inpatient services in a particular time period, can be reduced to a single number—the uniform inpatient price increase.
- (157) This is typical industry practice. - REDACTED -
- REDACTED -
Common impact is inherent in the contracts that govern pricing: - REDACTED -
- REDACTED - estimates of overall price increases for a given payer-plan are necessarily also valid and reliable estimates of the price increases applicable to *substantially all patients* covered by that payer-plan.
- (158) I also strongly disagree with any assertion that the DID methodology is unreliable. To the contrary, DID methods are widely used in social science research. The economic experts in the FTC action against ENH, including Dr. Baker on behalf of ENH, used DID methods in their analyses of ENH's price increases. Moreover, these analyses were performed at either the payer-plan or payer level, exactly as I have proposed in general and implemented for BCBSI PPO.

- (159) I further disagree with Dr. Noether's assertion that exact matching is essential for DID regression. Exact matching is rarely, if ever, used in DID studies in the social sciences. Nor did the economists in the ENH case use exact matching. For DID analysis to be reliable, it is sufficient that the evolution of prices at the control group of hospitals should be similar to the evolution of prices at ENH but for a merger. This does not remotely require exact matching, as even a cursory review of the economic literature establishes.¹⁸⁶
- (160) Dr. Noether furthers her claim that DID analysis is unreliable by estimating a DID model separately for each DRG and observing that it shows a substantial number of ENH prices exhibited an "undercharge." In this analysis, Dr. Noether commits conceptual and statistical errors and mischaracterizes her results. Among the most substantial of her errors is her confusing price changes resulting from increases in market power with price changes resulting from restructuring of contracts.
- (161) Dr. Noether raises the following two additional objections:
- A number of class members suffered no impact.
 - Named plaintiffs are neither "typical" nor "adequate."
- (162) BCBSI is the most prominent example of a class member that Dr. Noether concludes was not impacted. Her conclusion relies on the declaration of BCBSI's Joseph Arango and the analysis done by FTC and ENH experts in the FTC litigation.¹⁸⁷ The first key point is that Dr. Baker's own analysis in the FTC matter shows impact to BCBSI (see section IV.3.1 of this report). Tables 1 and 2 in the Baker FTC Report indicate that, while the price for inpatient services at ENH hospitals increased at the same rate as the price at control hospitals, the rate of price increase for outpatient services at ENH exceeded the rate at the control hospitals. Overall, the change in price at ENH for *inpatient and outpatient services* exceeded the change among Dr. Baker's set of control hospitals.
- (163) As I stated repeatedly in my original report, I will conduct an independent analysis to determine whether ENH increased its prices to BCBSI as well as to other payers. Indeed, I have done so using data recently produced by BCBSI for its PPO product. The results show substantial impact to BCBSI:
- Beginning in 2001, the prices paid by BCBSI to ENH for outpatient services increased substantially compared to the corresponding increase in prices paid by BCBSI to control group hospitals. My estimate of damages to BCBSI (and the self-

¹⁸⁶ Dranove Report, n. 8.

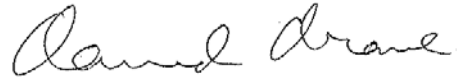
¹⁸⁷ Noether Report, ¶ 47.

funded plan sponsors it represents) for outpatient services between 2000 and 2008 is \$75.9 million.

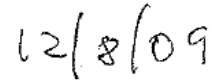
- For inpatient services, BCBSI suffered injury, though with some delay. Specifically, the merger effect became apparent in 2004, with overcharges in excess of 10%, and continued at a similar rate in later years. My estimate of damages to BCBSI (and the self-funded plan sponsors it represents) for inpatient services between 2000 and 2008 is \$35.4 million.
- Overall, for inpatient and outpatient services, overcharges have been persistently above 7% since 2002. Estimated overall damages to BCBSI (and the self-funded plan sponsors it represents) are \$111.3 million dollars from 2000 and 2008.

- (164) These results show that Dr. Noether's claim that BCBSI was not injured is false, and they also establish that it is entirely possible to use DID analysis to assess damages on a class-wide basis. I have done so for BCBSI in this report, and I expect that data sufficient to the task of analyzing overcharges to other plans, insofar as they are not currently available, will be available to me in the future.
- (165) Dr. Noether's final opinion concerns the typicality and adequacy of the named plaintiffs. As an economist, I have no basis to offer an expert opinion on the typicality or adequacy of the named plaintiffs.
- (166) I conclude that the exercise of market power by ENH is likely to have had common impact for all or substantially all class members and that the magnitude of that impact can be reliably estimated on a class-wide basis, at the payer-plan level, using widely accepted and reliable DID methods. None of Dr. Noether's objections change this conclusion.

Expert Report of David Dranove, Ph.D.



David Dranove



December 8, 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

A.5.1 Current

RAND Journal of Economics

A.5.2 Previous

Journal of Health Economics

Health Services Research

Management Science

A.6. Grants

“Effects of Changes in the Illinois Medicaid Formulary,” Eli Lilly Corporation, 1985–86 (Principal Investigator)

“An Evaluation of SPRANS Ventilator Assisted Children Programs,” State of Illinois Division of Services for Crippled Children, 1984–87 (Economics Director)

“International Collaborative Study of Oral Health Outcomes,” World Health Organization, 1987–1992 (Economics Director)

“The Geographic Extent of Hospital Services Markets,” Fishman-Davidson Center for the Study of the Service Sector, 1988–1989 (Principal Investigator)

“The Effects of Regulation on the Research and Development of New Chemical Entities,” Merck & Co./Burroughs-Wellcome, 1989–1991 (Principal Investigator)

“Health Systems Integration Study” Consortium of Health Care Systems, 1991–1994 (Economics Director)

“Technological Change and the Rising Costs of Medical Care” Robert Wood Johnson Foundation, 1993–1994 (Co-principal Investigator)

“Continuous Quality Improvement in Hospitals” Center for Health Management Research of the Western Network 1993–1995 (Economics Director)

“Recent Evidence on Competition in Hospital Markets” Department of Veterans' Affairs, 1993 (Principal Investigator)

“The Costs and Benefits of Vitamin E” Henkel Corporation, 1994 (Principal Investigator)

“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)

“Assessing the Implementation and Impact of CQI Efforts” 1995–1997 (Co-Principal Investigator)

“The Effects of Managed Care on Physicians” Agency for Health Care Policy Research 1995–1996 (Co-Principal Investigator)

“Assessing Health Data Needs in a Changing Environment” Agency for Health Care Policy Research 1996–1997 (Co-Principal Investigator)

“How do PBMs Make Formulary Adoption Decisions?” Hoerscht Marion Roussel 1997–1998 (Principal Investigator)

“The Role of the Regulatory Affairs Professional in Strategic Decision Making” Regulatory Affairs Professional Society 2001–2002 (Principal Investigator)

“Hospital Bailouts and Economic Efficiency” Searle Fund 2002–2003 (Principal Investigator)

“The Effects of Hospital Mergers on Prices Paid by Managed Care Organizations” Anonymous Funder 2002–2004 (Principal Investigator)

“Is the Government Regulating Medicare HMOs Out of Business?” Searle Fund 2003–2004 (Co-Principal Investigator)

“New Approaches to Antitrust Definitions of Hospital Markets” Robert Wood Johnson Foundation 2004–2006 (Principal Investigator)

“Is the Impact of Managed Care on Hospital Prices Decreasing?” Robert Wood Johnson Foundation 2004–2006 (co-Principal Investigator)

“Has the Malpractice ‘Crisis’ Affected Access to Medical Care” Searle Fund, 2005–2006 (Principal Investigator)

“Health Services Market Areas in the Netherlands” Netherlands Competition Authority, 2006 (Principal Investigator)

“Economic Impact of Adverse Health Events on the Uninsured Near Elderly” Robert Wood Johnson Foundation, 2007, (Principal Investigator)

“Willingness to Pay for Ovarian Cryopreservation” National Cancer Institute, 2007–2009, (Principal Investigator)

A.7. Refereed publications

“A Comment on ‘Does Practice Make Perfect’,” *Medical Care*, Vol. 22, October 1984.

“An Empirical Study of a Hospital-Based Home Nursing Care Program,” *Inquiry*, Vol. 22, Spring 1985.

“Do State Rate Setting Programs Really Lower Hospital Expenses?” with Kenneth Cone, *Journal of Health Economics*, Vol. 4, June 1985.

“Why Did States Enact Hospital Rate Settings Laws?” with Kenneth Cone, *Journal of Law and Economics*, Vol. 29, October 1986.

“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.

“Rate Setting by Diagnosis Related Groups and Hospital Specialization,” *Rand Journal of Economics*, Vol. 18, Autumn 1987.

“Agency and the Organization of Health Care Delivery,” (with William D. White) *Inquiry*, Vol. 24, Winter 1987.

“Demand Inducement and the Physician/Patient Relationship,” *Economic Inquiry*, Vol. 26, April 1988.

“Pricing by Non-Profit Institutions: The Case of Hospital Cost Shifting,” *Journal of Health Economics*, Vol. 7, Spring 1988.

“Medicaid Drug Formulary Restrictions,” *Journal of Law and Economics*, Vol. 32, April 1989.

“Agency Theory: Offering New Insights into the Health Care Industry,” with William D. White, *Journal of Medical Practice Management* Vol. 4, Winter 1989.

“Antitrust Challenges to Hospital Mergers,” with Henry Allen and Greg Tucker, *The Health Lawyer*, Summer 1989.

“A Note on Relational Aspects of Hospital Market Definitions,” (with Mark Shanley) *Journal of Health Economics* Vol. 9, February 1990.

“Information Spillovers, Incumbency, and New Ventures,” with Tommy Tan, *International Journal of Industrial Organization*, Vol. 8, Winter 1990.

“The Costs of Compliance with the 1962 FDA Amendments—Editorial,” *Journal of Health Economics*, Vol. 10, July 1991.

“How Fast are Hospital Prices Really Rising?” with William D. White and Mark Shanley, *Medical Care* Vol. 29, August 1991.

“Is Hospital Competition Wasteful?” with Mark Shanley and Carol Simon, *RAND Journal of Economics* Vol. 23, Summer 1992.

“Monopolistic Competition When Price and Quality are not Perfectly Observable,” with Mark Satterthwaite, *RAND Journal of Economics* Vol. 23, Winter 1992.

“Segmentation in Local Hospital Markets,” with William D. White and Lawrence Wu, *Medical Care* Vol. 31, January 1993.

“The Changing Nature of Competition in Health Care,” with William D. White, *Journal of Medical Practice Management*, Vol. 8, Spring 199.

“Price and Concentration in Hospital Markets: The Switch from Patient-driven to Payer-driven competition,” with Mark Shanley and William D. White, *Journal of Law and Economics*, Vol. 36, April 1993.

“Physician-Induced Demand for Childbirths,” with Paul Wehner, *Journal of Health Economics*, March 1994.

“Recent Theory and Evidence on Competition in Hospital Markets,” with William D. White, *Journal of Economics and Management Strategy*, Volume 4, No. 1, 1994.

“The Economic Side Effects of Dangerous Drug Announcements,” with Chris Olsen, *Journal of Law and Economics*, October 1994.

“Do Important Drugs Reach the Market Sooner?” with David Meltzer, *RAND Journal of Economics*, Autumn 1994.

“A Problem with Consumer Surplus Measures of the Cost of Physician Practice Variations,” *Journal of Health Economics*, September 1994.

“The Vertical Chain of Research and Development in the Pharmaceutical Industry,” with Michael Ward, *Economic Inquiry*, January 1995.

“Cost Reductions versus Reputation Enhancements as Motives for Mergers: The Logic of Multihospital Systems,” with Mark Shanley, *Strategic Management Journal*, January–February 1995.

“Specialization, Option Demand and the Pricing of Medical Services,” with William D. White, *Journal of Economics and Management Strategy*, Summer 1996.

“Are Multihospital Systems More Efficient?” with Amy Durkac and Mark Shanley, *Health Affairs*, Spring 1996.

“The Impact of Managed Care on the Physician Marketplace,” with Carol Simon and William D. White, *Public Health Reports*, May/June 1997.

“Emerging Issues in the Antitrust Definition of Healthcare Markets,” with Will White, *Health Economics Letters*, November 1997.

“Is There Underinvestment in R&D About Prevention?” *Journal of Health Economics*, January 1998.

“Economies of Scale in Non-revenue Producing Cost Centers: Implications for Hospital Mergers,” *Journal of Health Economics*, January 1998.

“Medicaid-Dependent Hospitals and Their Patients: How Have They Fared?” with Will White, *Health Services Research*, April 1998.

“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.

“The Determinants of Managed Care Penetration,” with Carol Simon and William White, *Journal of Health Economics*, December 1998.

“Do Strategic Groups Exist: An Economic Framework for Analysis,” with Mark Shanley and Margaret Peteraf, *Strategic Management Journal*, Fall 1998.

“Pricing by Nonprofit Hospitals: A Reevaluation of Lynk’s Methods,” with Richard Ludwick, *Journal of Health Economics*, March 1999.

“The Cost of Efforts to Improve Quality,” with Stephen Shortell, et al., *Medical Care*, October 1999.

“Competition” Among Insurers Offering Health Insurance,” with Kathryn Spier and Loren Baker, *Journal of Health Economics*, January 2000.

“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.

“Exploiting Cost Advantages and Coping with Cost Disadvantages,” with David Besanko and Mark Shanley, *Management Science*, February 2001.

“Is Managed Care Leading to Consolidation in Healthcare Markets?” with Will White and Carol Simon, *Health Services Research*, May 2002.

“Antitrust Policy and Hospital Mergers: Recommendations for a New Approach,” with Cory Capps, Shane Greenstein, and Mark Satterthwaite, *Antitrust Bulletin*, Winter 2002.

“Economic and Organizational Determinants of HMO Formulary Adoption Decisions,” with Ed Hughes and Mark Shanley, *Health Services Research*, February 2003.

“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.

“Hospital Consolidation and Costs: Another Look at the Evidence,” with R. Lindrooth, *Journal of Health Economics*, November 2003.

“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.

“Competition and Market Power in Option Demand Markets,” with Cory Capps and Mark Satterthwaite, *RAND Journal of Economics*, December 2003.

“A Theory of Utilization Review,” with Kathryn Spier, *Contributions to Economics and Policy*, 2003.

“Differentiation and Competition in HMO Markets,” with Anne Gron and Michael Mazzeo, *Journal of Industrial Economics*, December 2003.

“Hospital Consolidation and Negotiated PPO Prices” with Cory Capps, *Health Affairs*, March 2004.

“Has the Malpractice Crisis in Florida Affected Access to Care? with Anne Gron, *Health Affairs*, March 2005.

“The Effect of Physician-Hospital Affiliations on Hospital Prices in California,” with Federico Ciliberto, *Journal of Health Economics*. January 2006.

“Medical Bankruptcy: Myth versus Fact,” with M. Millenson, *Health Affairs*, February 2006.

“Is the Impact of Managed Care on Hospital Prices Decreasing?” with Richard Lindrooth and William White, *Journal of Health Economics*, forthcoming.

“Hospital Vertical Integration and Patient Referrals,” with Cory Capps and Sayaka Nakamura, *Journal of Economics and Management Strategy*, forthcoming.

“Start Spreading the News: A Structural Estimate of the Effects of New York Hospital Report Cards,” with Andrew Sfekas, *Journal of Health Economics*, forthcoming.

“Do Report Cards Tell Consumers Anything They Don’t Already Know? The Case of Medicare HMOs,” with Leemore Dafny, *RAND Journal of Economics*, forthcoming.

“Regulatory Exploitation and the Market for Corporate Control,” 2008, (with Leemore Dafny), *Journal of Law and Economics*

“Influence and Deterrence: How Obstetricians Respond to Litigation against Themselves and their Colleagues,” 2008, (with Yasutora Watanabe) *American Law and Economics Review* (forthcoming)

“Does Major Illness Cause Financial Catastrophe?” 2009, (with Keziah Cook and Andrew Sfekas) *Health Services Research*

“The Revolution in Healthcare Antitrust: New Methods and Provocative Implications,” 2009, (with Andrew Sfekas) *Milbank Quarterly*

“Hospital Closures and Economic Efficiency,” 2009, (with Cory Capps and Richard Lindrooth) *Journal of Health Economics* (forthcoming)

“Quality Disclosure,” 2009, (with Ginger Jin) *Journal of Economic Literature* (forthcoming)

A.8. Current working papers

“Profiting from Gaizhi: Management Buyouts during China’s Privatization” 2007, (with Feng Susan Lu)

“Does the Market Punish Aggressive Experts? Evidence from Caesarean Sections,” 2008, (with Subramaniam Ramanarayanan)

“Out of Their Depth? Are Bargainers Rational and Does it Matter?” 2009, (with Mark Satterthwaite and Andrew Sfekas)

“Willingness to Pay for Ovarian Cryopreservation,” 2009, (with Andrew Sfekas)

A.9. Book chapters and monographs

“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)

“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

“The Five W's of Utilization Review” in *American Health Policy*, Robert Helms, ed. American Enterprise Institute (1992)

“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).

“Can Competition Cut the Mustard?” *Health Management Quarterly* Vol. 16, (Second Quarter, 1994)

“Doing a Number on Doctors” (with William D. White) *American Enterprise Magazine* (July/August 1994)

“Local Multi-hospital Systems Will Be Critical to the Success of Teaching and Community Hospitals” *Compendium of Hospital Economics Newsletter* (Spring 1994)

“Measuring Costs” (Chapter 2 in *Valuing Health Care* F. Sloan (ed.) Cambridge: Cambridge University Press, 1994.)

Clinton's Specialist Quota: Shaky Premises, Questionable Consequences Washington, D.C.: American Enterprise Institute, 1994

“Strategically Organizing Vertical Boundaries” (with David Besanko and Mark Shanley) *Business Week Executive Brief* (1995)

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)

“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.

“Direct Sputum Analysis for TB by PCR vs. Conventional Techniques in a Public Hospital” (With K. Kaul) 1996, Evanston Hospital Research Brief.

“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.

“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)

“Market Definitions in Antitrust Analysis: Applications to Health Care” in *Managed Care and Changing Health Care Markets* (Washington: American Enterprise Institute, 1998)

“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.

“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.

“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

The Economics of Strategy New York: Wiley Press, 1995, 1999, 2003, 2006 (joint with David Besanko, Mark Shanley, and Scott Schaefer)

How Hospitals Survived (with Will White) American Enterprise Institute, 1999

The Economic Evolution of American Healthcare: From Marcus Welby to Managed Care Princeton University Press, 2001

What's Your Life Worth? Financial Times/Prentice Hall, 2003

Kellogg on Strategy (with Sonia Marciano) Wiley Press, 2005

Code Red Princeton University Press, 2008

Appendix B. Materials relied upon or cited

B.1. Discovery documents

B.1.1. Expert reports

Expert Report of Monica G. Noether, PhD, Supporting Opposition to Plaintiffs' Motion for Class Certification, June 9 2009

Expert Report of Dr. David Dranove Supporting Motion for Class Certification, Feb. 12, 2009

Rebuttal Expert Report of Orley C. Ashenfelter, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm'n, Nov. 19, 2004)

Expert Report of Jonathan B. Baker, PhD, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm'n, Nov. 2, 2004)

Expert Report of Deborah Haas-Wilson, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm'n, Sept. 21, 2004, revised Oct. 8, 2004)

Expert Report of Monica G. Noether, PhD, *In re Evanston Northwestern Healthcare Corp. and ENH Med. Group, Inc.*, No. 9315 (Federal Trade Comm'n, Nov. 2, 2004)

B.1.2. Confidential billing data

Evanston Northwestern Healthcare's billing data, as produced by Dr. Jonathan Baker in connection with the FTC proceedings

Evanston Northwestern Healthcare's billing data, as produced by Dr. Monica Noether

- REDACTED -

Expert Report of David Dranove, Ph.D.

B.1.3. Contracts between Evanston Northwestern Healthcare and MCOs

Beginning Bates Range	End Bates Range	Beginning Bates Range	End Bates Range
ENHCA-012-000008	ENHCA-012-000081	ENHCA-012-003901	ENHCA-012-003907
ENHCA-012-000184	ENHCA-012-000194	ENHCA-012-004546	ENHCA-012-004580
ENHCA-012-000195	ENHCA-012-000219	ENHCA-012-005179	ENHCA-012-005195
ENHCA-012-000450	ENHCA-012-000561	ENHCA-012-006508	ENHCA-012-006509
ENHCA-012-000716	ENHCA-012-000751	ENHCA-012-006529	ENHCA-012-006531
ENHCA-012-001939	ENHCA-012-002001	ENHCA-012-006533	ENHCA-012-006534
ENHCA-012-002007		ENHCA-012-007233	ENHCA-012-007233
ENHCA-012-002110	ENHCA-012-002121	ENHCA-012-007243	ENHCA-012-007246
ENHCA-012-003224	ENHCA-012-003226	ENHCA-012-009568	ENHCA-012-009587
ENHCA-012-003491	ENHCA-012-003517	ENHCA-012-009614	ENHCA-012-009640
ENHCA-012-003574	ENHCA-012-003577	ENHCA-012-009687	ENHCA-012-009696
ENHCA-012-003578	ENHCA-012-003580	ENHCA-012-009697	ENHCA-012-009736
ENHCA-012-003582	ENHCA-012-003585	ENHCA-012-009748	ENHCA-012-009777
ENHCA-012-003672	ENHCA-012-003682	ENHCA-012-009809	ENHCA-012-009819
ENHCA-012-003893	ENHCA-012-003900	ENHCA-012-013484	ENHCA-012-013502

B.1.4. Other Bates stamped documents

Beginning Bates Range	End Bates Range	Beginning Bates Range	End Bates Range
CIGNA-IL 0001		ENHCA-012-004793	
CIGNA-IL 0011		ENHCA-012-006542	ENHCA-012-006546
ENHCA-012-000446		ENHCA-012-007262	ENHCA-012-007266
ENHCA-012-001519		ENHCA-012-007944	ENHCA-012-007950
ENHCA-012-001525		ENHCA-012-007971	ENHCA-012-007972
ENHCA-012-001705		ENHCA-012-010186	ENHCA-012-010189
ENHCA-012-001725	ENHCA-012-001726	ENHCA-012-010414	ENHCA-012-010420
ENHCA-012-002267		ENHCA-012-010700	ENHCA-012-010708
ENHCA-012-004092		ENHCA-012-013569	ENHCA-012-013573
ENHCA-012-004743	ENHCA-012-004744	ENHCA-012-013901	ENHCA-012-013905

B.2. Legal documents and deposition testimony**B.2.1. Complaints**

Consolidated Class Action Complaint, Nov. 8, 2008

Complaint, *In re Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc.*, No. 9315 (Fed. Trade Comm'n Feb. 10, 2004)

B.2.2. Depositions

Deposition of Joseph Arango, Sept. 23, 2009

Deposition of David Dranove, May 8, 2009

Deposition of Monica Noether, Oct. 21, 2009

B.2.3. Opinions

In the Matter of Evanston Northwestern Healthcare Corporation and ENH Medical Group, Inc., No. 9315 (Fed. Trade Comm'n Apr. 28, 2008), *Initial Decision of Chief Administrative Law Judge Stephen J. McGuire* (Oct. 25, 2005), Section II.D.2.b.

B.2.4. Other relevant court documents

Declaration of Joseph Arango in Further Support of Non-Party Blue Cross / Blue Shield of Illinois' Objection to the Production by Northshore University HealthSystem of BCBI's Highly Confidential and Business-Sensitive Documents, Oct. 22, 2008

Plaintiffs' Motion for Class Certification, Feb. 13, 2009

B.3. Publicly available data

American Hospital Association Data

- AHA Guides to the Health Care Field, 1997–2008
- 1997 AHA Annual Survey of Hospitals database
- 2006 AHA Annual Survey of Hospitals database

Centers for Medicare & Medicaid Services (CMS)

- 1996–2006 PPS Impact Files,
<http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/list.asp?listpage=1> (last visited Aug. 18, 2009)
- 2005 Acute Inpatient DRG Relative Weights,
<http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=dual,%20keyword&filterValue=weights&filterByDID=0&sortByDID=2&sort>

[Order=ascending&itemID=CMS022597&intNumPerPage=10](#) (last visited June 25, 2009))

- 2006 Acute Inpatient DRG Relative Weights,
<http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=dual,%20keyword&filterValue=weights&filterByDID=0&sortByDID=2&sortOrder=ascending&itemID=CMS022658&intNumPerPage=10> (last visited June 25, 2009)
- 2007 Acute Inpatient DRG Relative Weights,
<http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=dual,%20keyword&filterValue=weights&filterByDID=0&sortByDID=2&sortOrder=ascending&itemID=CMS061850&intNumPerPage=10> (last visited June 25, 2009)
- Acute Inpatient Historical DRG File,
<http://www.cms.hhs.gov/AcuteInpatientPPS/FFD/itemdetail.asp?filterType=dual,%20keyword&filterValue=weights&filterByDID=0&sortByDID=2&sortOrder=ascending&itemID=CMS1185262&intNumPerPage=10> (last visited June 25, 2009)
- MSIS State Summary Datamart, <http://msis.cms.hhs.gov/> (last visited Aug. 18, 2009)

IDPH Hospital Discharge Data, Public Data Files 1996-2004,
<http://app.idph.state.il.us/hospitaldischarge/HD-PublicDataFiles.htm> (last visited Oct. 19, 2009)

2002-2007 COMPdata, <http://www.compdatainfo.com> (last visited Jan. 2, 2009)

B.4. Publicly available documents

American Hospital Association, “Underpayment by Medicare and Medicaid Fact Sheet,” November, 2008, <http://www.aha.org/aha/content/2008/pdf/08-medicare-shortfall.pdf> (last visited Nov. 13, 2008)

“Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2008 Rates,” 72 Fed. Reg. 47130–48175, Aug. 22, 2007

Chicago Sun Times, “Hospital Chain Buys MacNeal,” October 7, 1999.

CMS Office of the Actuary, “Alternative weighting of the hospital market basket input price index,” Nov. 13, 2008,

<http://www.cms.hhs.gov/MedicareProgramRatesStats/Downloads/alternativeindexweights.pdf> (last visited Aug. 27, 2009)

Lewin Group, “A Study of Hospital Charge Setting Practices: A study conducted by the Lewin Group for the Medicare Payment Advisory Commission,” No. 05-4, December 2005, http://www.medpac.gov/publications/contractor_reports/Dec05_Charge_setting.pdf

Modern Healthcare, “Grant Hospital in Chicago is renamed Lincoln Park Hospital by new owner Merit Health Systems,” February 24, 2003.

PR Newswire, “Merger Pursued by Advocate Health Care and Illinois Masonic Medical Center,” Apr. 1, 2000

“Overview Acute Inpatient PPS,” <http://www.cms.hhs.gov/AcuteInpatientPPS/> (last visited Oct. 16, 2009)

Statement of the Federal Trade Commission, re. Victory Memorial Hospital/Provena St. Therese Medical Center. File No. 011 0225. <http://www.ftc.gov/os/caselist/0110225/040630ftcstatement0110225.shtm> (last visited Oct. 28, 2009)

B.5. Economic literature

B.5.1. Textbooks

A. Colin Cameron and Pravin K. Trivedi. *Microeconometrics Using Stata*. College Station: Stata Press, 2009

Daniels, Stefanie, and Marianne Ramey. *The Leader's Guide to Hospital Case Management*. Sudbury, MA: Jones & Bartlett, 2004

Dougherty, Christopher, *Introduction to Econometrics*, 3d ed. Oxford: Oxford University Press, 2007

Tirole, Jean. *The Theory of Industrial Organization*. Cambridge: MIT Press, 1994.

B.5.2. Journal articles and others

Carter, Grace M., et al. “Use of Diagnosis-Related Groups by Non-Medicare Payers - Medicare Payment Systems: Moving Toward the Future,” *Health Care Financing Review*, Winter 1994

Duan, N. “Smearing Estimate: A Nonparametric Retransformation Method.” *Journal of American Statistical Association* 78 (1983)

Expert Report of David Dranove, Ph.D.

Manning, W.G. "The Logged Dependent Variable, Heteroskedasticity, and the Retransformation Problem." *Journal of Health Economics* 17 (1998)

B.6. Others

All documents cited in my original report are incorporated by reference

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Appendix C. Example of uniformity of price increases by procedure: - REDACTED -



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- REDACTED -

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Appendix D. - REDACTED -

(174) The figures in this appendix include two categories of prices:

- Standard Groups
- Carve-out Groups

Standard Groups include prices that are not explicitly labeled as “carve-outs” or “exclusions” in the contract. *Carve-out groups* include prices that are either specifically designated as “carve-outs” or “exclusions,” or prices that the contract clearly separates from the standard group prices.

(175) These figures include two “rate type” fields in each category:

- Dollar prices
- % rates

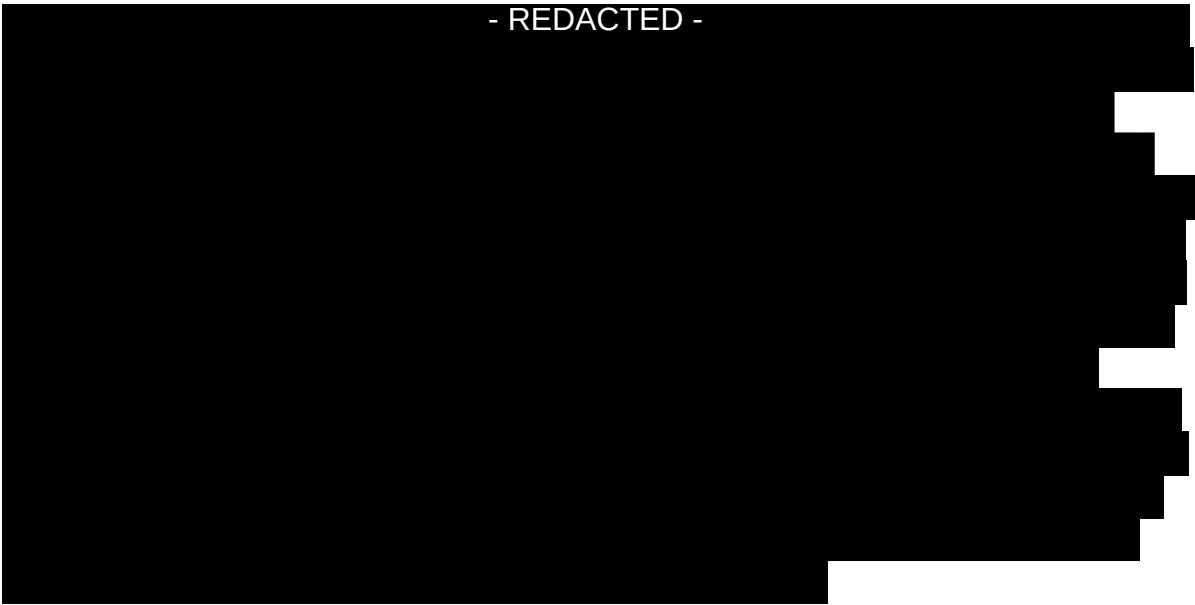
Dollar prices include all contractual prices that are stated in dollar amounts (e.g., set rates, per diem rates, base rates);¹⁸⁸ *% rates* include all prices that are expressed in percentage terms (e.g. discount rates). Each cell records two numbers separated by a dash. The number to the left of the dash represents the total number of prices that fall under a particular category and rate type in that year’s contract. The number to the right of the dash represents the number of price rates, if any, that *do not change at the same rate* as all others in that category and rate type. For example, “14-2” indicates 14 distinct prices, 12 of which changed at a common rate and 2 of which changed at a different rate than the other 12.

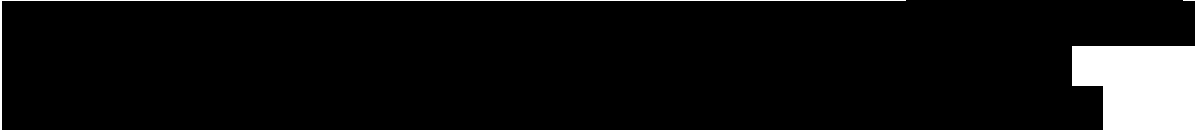
(176) The *Percentage common* column reflects the uniformity of price increases. It is the percentage of all prices that changed at the modal rate (i.e., the same rate as most others in their category and rate type), divided by the total number of rates specified in the contract. A value of 100% means that price increases were perfectly uniform.

(177) - REDACTED -

¹⁸⁸ “Set rates” refers to rates where the price for a particular service is explicitly specified. “Base rates” refers to the inpatient pricing system under which a single base rate is specified in a contract and then the actual payment for particular services is a multiple of that base rate (based, for example, on the “relative weight” for that service). See Dranove Rep., ¶¶ 71–74.

- REDACTED -



- (178) Notice that this analysis excludes contracts that restructure payment categories from prior contracts. (See section III.3 for a discussion of contract restructuring.) - REDACTED -
- 

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The image displays a 10x10 grid representing a 1000m x 1000m area, divided into 100 100m x 100m cells. The grid is divided into four main sections by vertical lines at columns 3, 6, and 9. The top row is mostly black, with some gray cells in the middle and bottom rows. The grid shows various patterns of black and gray cells, representing different land use or vegetation types.

[REDACTED]

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[illegible]

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A 10x10 grid representing a 1000m x 1000m area. The grid is divided into four 5x5 quadrants. The top-left quadrant is blue, the top-right is black, the bottom-left is white, and the bottom-right is gray. A vertical black bar runs down the center of the grid, and a horizontal black bar runs across the center. The grid is labeled with '1000m' on the left and '1000m' on the top.

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[illegible]

[REDACTED]

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Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black

[REDACTED]

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[illegible]

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[illegible]

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[illegible]

Appendix E. Changes in nursery capacity in hospitals near ENH over time

- (179) Figure 28 shows the changes in the number of different types of nursery beds at hospitals within a 15-mile radius of ENH between 1997 and 2006. The number of bassinets and intermediate care nursery beds is as a proxy for hospitals' basic nursery capacity (e.g., Nursery Level I) and the number of intensive care nursery beds is a proxy for hospitals' advanced nursery capacity (e.g., Nursery Level IV). Figure 28 indicates an absence of major changes in the various types of nursery beds over the nine-year period. In other words, there is no evidence of dramatic changes in the competitive environment of nursery services.

Figure 28. Change in the number of intermediate care nursery beds, intensive care nursery beds, and bassinets at hospitals near ENH between 1997 and 2006

	Number of Hospitals		
	Bassinets	Intermediate care nursery beds	Intensive care nursery beds
Decreased	14	4	2
Increased	13	6	7
Stayed same	10	15	16
Total	36	24	24

Note: Includes hospitals within 15 miles of Glenbrook Hospital, Evanston Northwestern Hospital, or Highland Park. Hospitals for which the number of intermediate care nursery beds, intensive care nursery beds, or bassinets are missing in the AHA data are omitted from the counts.

Source: American Hospital Association Annual Survey, 1997 and 2006.

Appendix F. A systematic approach to selecting the control group hospitals

- (180) Selection of control group hospitals proceeds in two steps. The first step identifies hospitals in Illinois that have similar demand and cost conditions to ENH based upon their location, size, type, and share of private charges (see Figure 30). In addition, I exclude hospitals that are not in the BCBSI PPO data or the IDPH data. The second step tests whether two price determinants, case mix and length of stay, have a statistically distinguishable effect on ENH and each of the control hospital candidates identified in the first step. Formally, I perform this test based on the following regression model:

$$\ln(P_{it}) = \alpha_0 + \alpha_1 ENH_i + \alpha_2 post_t + \alpha_3 (ENH_i \times post_t) + X'_{it}\beta + (ENH_i \times X'_{it})\gamma + \varepsilon_{it}$$

- (181) P_{it} is the private payer inpatient price at hospital i in year t .¹⁸⁹ ENH_i is a dummy variable that equals one for ENH hospitals and equals zero otherwise; $post_t$ is a dummy variable that equals one if year t is after the merger and equals zero otherwise; $ENH_i \times post_t$ denotes the product of ENH_i and $post_t$; X_{it} is column vector containing hospital i 's average case mix and length of stay in year t ; $ENH_i \times X_{it}$ denotes the product of ENH_i and X_{it} ; and ε_{it} is an error term capturing unobserved factors that may affect pricing. If case mix and length of stay influence price identically for both ENH and a candidate control hospital, one should observe $\gamma = \underline{0}$, where the underscore indicates that γ is a column vector with both entries being zeros. Therefore, I test

$$\begin{cases} H_0 : \gamma = \underline{0} & (include) \\ H_1 : \gamma \neq \underline{0} & (exclude) \end{cases}$$

using an F statistic, and I allow the data to tell whether a candidate hospital is appropriate for the control group. This testing approach selects control hospitals in a systematic fashion and generates objective estimation results.

- (182) Figure 29 shows the geographic location of hospitals in the tri-county area around ENH, with ENH marked in red, hospitals selected into the control group by my methodology marked in blue, and hospitals excluded from my analysis marked in green. Figure 30 presents a detailed list of the hospitals that I exclude from the control group, and the specific reason(s) for each exclusion.

¹⁸⁹ The price measure is average price per discharge paid by private insurers to hospital i in year t . I calculate average price per discharge as net inpatient revenues from private insurers divided by number of discharges from private insurers, using both the MCR data and the IDPH data, as described in paragraph (82).

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Figure 29. ENH hospitals, control group hospitals, and other hospitals

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Figure 30. Hospitals in Cook, Lake, and DuPage counties not included in the control group

Hospital Name	Hospital zip code	Drive time to Evanston Hospital (min)	Reasons for rejection from control group					
			Fewer than 100 beds	Owned by state, county, navy, or veteran affairs	Share of private charges is not comparable to ENH's	Not in IDPH data	Fails the F test at 20% level	Party to a merger / acquisition
Adventist GlenOaks Hospital	60139	46			X			
Advocate Good Samaritan Hospital	60515	41					X	
Advocate IL Masonic Medical Center	60657	25						X
Holy Cross Hospital	60629	41			X			
Ingalls Memorial Hospital	60426	50			X			
Jackson Park Hosp & Medical Center	60649	39			X			
Jesse Brown VA Chicago System	60612	28		X				
John H Stroger Jr Hospital	60612	28		X				
Lincoln Park Hospital	60614	26						X
Little Company of Mary Hospital	60805	44				X		
Loretto Hospital	60644	32			X			
Louis A Weiss Mem Hospital	60640	19			X			
MacNeal Hospital	60402	41						X
Mercy Hospital and Medical Center	60616	32				X		
Methodist Hospital of Chicago	60640	19				X		
Michael Reese Hosp & Medical Center	60616	32				X		
Midwestern Regional Medical Center	60099	48	X					
Mount Sinai Hospital	60608	31			X			
Naval Hospital	60088	35	X	X				
Norwegian American Hospital	60622	28				X		
Oak Forest Hospital of Cook County	60452	51		X				
Our Lady of Resurrection Center	60634	22			X			
Provident Hosp of Cook County	60615	34		X				
Resurrection Medical Center	60631	23			X			
Roseland Community Hospital	60628	42			X			
Rush Oak Park Hospital	60304	35			X			
Sacred Heart Hospital	60624	29			X			
Saint Anthony Hospital	60623	33			X			
Saint Francis Hospital	60202	8			X			
Saint Joseph Hospital	60657	24			X			
South Shore Hospital	60617	42			X			
St Alexius Medical Center	60194	40			X			
St Bernard Hospital	60621	35				X		
St Francis Hosp & Health Center	60406	45					X	
St James Hospitals & Health Centers	60461	57				X		
St Mary & Elizabeth Medical Center	60622	26			X			
Swedish Covenant Hospital	60625	17			X			
Thorek Memorial Hospital	60613	21			X			
University of Chicago Medical Center	60637	37			X			
University of IL Medical Center at Chicago	60612	29		X				
Veterans Affairs Hines Hospital	60141	38		X				
Vista Medical Center East	60085	43			X			X
Westlake Hospital	60160	37			X			

Appendix G. DID analysis using a more robust and flexible method

- (183) I employ a more robust and flexible DID method than Dr. Baker. My methodology, even when applied to Dr. Baker's control group, is more robust and flexible because it allows the "data to speak" as to whether and when any merger effects occurred.¹⁹⁰ Specifically, I estimate the following equation:

$$\begin{aligned} \ln(\text{price per case}) = & \alpha_0 + \alpha_1 \text{ENH} + \alpha_2 \text{post} + \alpha_3 \text{ENH} \times \text{post} + \\ & + \sum_{t=1}^8 \gamma_t \text{ENH} \times \text{post} \times (\text{year} = 2000 + t) + \\ & + \beta_1 \ln(\text{casemix}) + \beta_2 \ln(\text{los}) + \\ & + \varphi \bullet \text{hospital_dummy} + \delta \bullet \text{year_dummy} \\ & + \varepsilon \end{aligned}$$

- (184) Compared to Dr. Baker's specification, this equation contains eight additional variables that are interactions of the *ENH* × *post* variable with dummies for each year from 2001 through 2008. These interaction variables allow the estimated DID effects to vary over time. It is entirely possible for this approach to generate DID effects that do not vary over time, if that is what the underlying data reveal. Dr. Baker, in contrast, uses a specification that necessarily results in DID estimates that are constant over time, regardless of what the underlying data show.
- (185) I estimate the equation with errors clustered by hospitals, because observations from the same hospital may well be correlated over time.¹⁹¹
- (186) The estimation results for inpatient services are in Figure 31 and results for outpatient services are in Figure 32.

¹⁹⁰ This analysis uses the BCBSI PPO data for ENH and for the 21 control group hospitals selected by the systematic process described in Section IV.3.5.2 and Appendix F. The data span the period 1999 through 2008.

¹⁹¹ Clustered errors are errors that are correlated *within* a cluster/group and are uncorrelated *across* clusters/groups. A leading example involves panel data with independence across units of analysis (e.g., hospitals or patients) but with correlation over time for a given unit of analysis. In the presence of clustered errors, OLS estimates are unbiased but the OLS standard errors may be quite wrong, leading to incorrect inference. In such cases, cluster-robust standard errors should be calculated instead. For a more detailed discussion, see, for example, Section 3.3.5 in A. Colin Cameron and Pravin K. Trivedi, *Microeconometrics Using Stata* (College Station: Stata Press, 2009).

Figure 31. Coefficient estimates underlying the results in Figure 11—Inpatient services

Independent Variable	Coeff. Estimate	Std. Err.	P-value
<i>log_case_mix</i>	0.4134	0.2305	0.087
<i>log_los</i>	0.3155	0.3672	0.400
<i>ENH</i> × <i>post</i>	0.0184	0.0291	0.535
<i>ENH</i> × <i>post</i> ×2001	-0.0611	0.0361	0.105
<i>ENH</i> × <i>post</i> ×2002	-0.0576	0.0310	0.078
<i>ENH</i> × <i>post</i> ×2003	-0.0700	0.0382	0.081
<i>ENH</i> × <i>post</i> ×2004	0.1020	0.0423	0.025
<i>ENH</i> × <i>post</i> ×2005	0.0863	0.0392	0.039
<i>ENH</i> × <i>post</i> ×2006	0.1454	0.0542	0.014
<i>ENH</i> × <i>post</i> ×2007	0.1245	0.0548	0.034
<i>ENH</i> × <i>post</i> ×2008	0.1750	0.0461	0.001
<i>Constant</i>	8.7562	0.4681	0.000
No. of observations=219	$R^2 = 0.8802$		

Figure 32. Coefficient estimates underlying the results in Figure 11—Outpatient services

Independent Variable	Coeff. Estimate	Std. Err.	P-value
<i>ENH</i> × <i>post</i>	0.0039	0.0217	0.859
<i>ENH</i> × <i>post</i> ×2001	0.0717	0.0121	0.000
<i>ENH</i> × <i>post</i> ×2002	0.1514	0.0258	0.000
<i>ENH</i> × <i>post</i> ×2003	0.2074	0.0362	0.000
<i>ENH</i> × <i>post</i> ×2004	0.1800	0.0283	0.000
<i>ENH</i> × <i>post</i> ×2005	0.1868	0.0346	0.000
<i>ENH</i> × <i>post</i> ×2006	0.1603	0.0378	0.000
<i>ENH</i> × <i>post</i> ×2007	0.1625	0.0451	0.002
<i>ENH</i> × <i>post</i> ×2008	0.0239	0.0464	0.612
<i>Constant</i>	6.6268	0.0284	0.000
No. of observations=219	$R^2 = 0.8732$		

- (187) The hospital and year dummies, which are included in the regressions, are omitted from Figure 31 and Figure 32. The *ENH* dummy and the *post* dummy are dropped from the regression due to their collinearity with the hospital and year dummies.
- (188) Based on the estimation results, I calculate the inpatient and outpatient overcharges separately, in the following six steps:

1. Compute the level of the ENH price (using the smearing adjustment to properly transform the log price into a price level) predicted by the model; this price includes the effect of the merger, as measured by the α_3 and γ_t parameters.
2. Compute the ENH price “but for the merger,” which is the price computed by setting the interaction term between the *ENH* dummy and the *post* dummy and the eight interaction terms between the *ENH* dummy and the post-merger year indicators to zero, and then properly transform the log price into the price level.¹⁹²
3. Calculate the difference between the model predicted ENH price and the “but for” ENH price for each case.
4. Multiply the differences calculated in step 3 by the number of cases in year t to obtain the overcharge (in dollars) by ENH in year t .
5. Compute the percentage overcharge by ENH in year t as the overcharge by ENH in year t divided by total model-predicted ENH revenue in year t .
6. Compute the percentage overcharge by ENH from year t onwards as the total overcharge by ENH from year t onwards divided by total model-predicted ENH prices from year t onwards.¹⁹³

(189) For inpatient and outpatient services, I calculate overall overcharges as follows:

1. The overall overcharge (in dollars) in year t is the sum of inpatient and outpatient overcharges in year t (dollar overcharges are the total difference between model-predicted payments and but-for payments).
2. The overall percentage overcharge in year t is the overall overcharge (in dollars) in year t divided by the sum of inpatient and outpatient ENH prices predicted by the model in year t .
3. The overall percentage overcharge from year t onwards is the overall overcharge from year t onwards divided by the sum of inpatient and outpatient ENH prices predicted by the model from year t onwards.

(190) The overcharges calculated from the estimation results are presented in Figure 33 (the results in Figure 33 are also the basis for the figures in Figure 11).

¹⁹² For a detailed discussion of this statistical issue, see Ashenfelter FTC Report, ¶ 35.

¹⁹³ I calculate the average percentage overcharges using five time windows: from year 2000 onwards, from year 2001 onwards, from year 2002 onwards, from year 2003 onwards, and from year 2004 onwards.

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Figure 33. Overcharges calculated from the more robust and flexible method

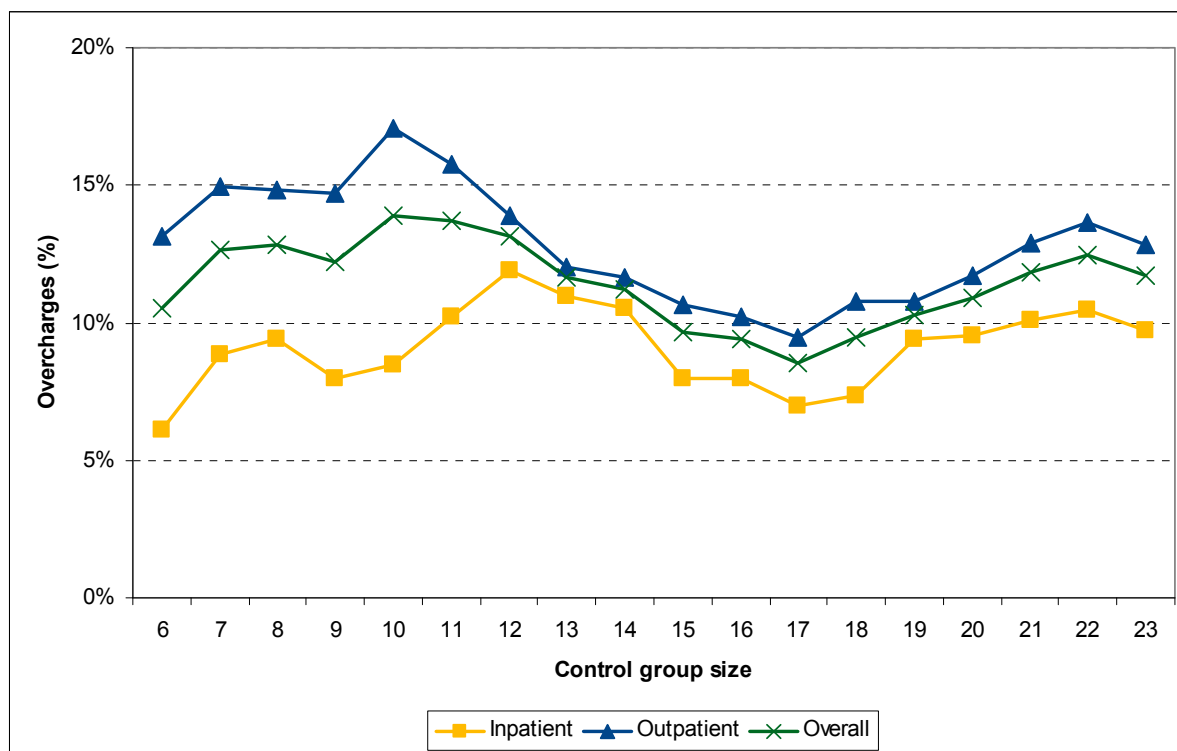
Year	Overcharge (%)						Overcharge (\$)		
	IP	OP	Overall	Overcharge: year <i>t</i> onwards			IP	OP	Overall
				IP	OP	Overall			
2000	1.8%	0.4%	1.0%	9.8%	12.5%	11.5%	\$270,574	\$75,252	\$345,826
2001	-4.4%	7.3%	2.7%	10.1%	12.9%	11.9%	-\$792,658	\$2,019,844	\$1,227,186
2002	-4.0%	14.4%	7.5%	10.9%	13.2%	12.3%	-\$957,490	\$5,695,515	\$4,738,025
2003	-5.3%	19.1%	10.1%	12.1%	13.1%	12.7%	-\$1,592,840	\$9,851,364	\$8,258,524
2004	11.3%	16.8%	14.6%	14.0%	12.4%	13.0%	\$4,642,393	\$10,475,509	\$15,117,902
2005	9.9%	17.4%	14.7%				\$4,236,925	\$13,523,737	\$17,760,662
2006	15.1%	15.1%	15.1%				\$8,633,737	\$14,115,707	\$22,749,444
2007	13.3%	15.3%	14.6%				\$8,432,358	\$16,663,756	\$25,096,114
2008	17.6%	2.7%	8.1%				\$12,509,525	\$3,495,329	\$16,004,854
TOTAL							\$35,382,524	\$75,916,013	\$111,298,537

Appendix H. Sensitivity analyses establish that my results are robust

- (191) A number of analyses show that my results are generally not sensitive to the specific hospitals that I include in the control group. My results are not sensitive to adopting the same transformation implemented by Dr. Baker and by Dr. Haas-Wilson (i.e., analyzing the logarithm of price rather than the level of price). I describe my robustness and sensitivity analyses in this appendix.
- (192) With respect to the composition of the control group hospitals, I perform two experiments. Both involve assessing the effect of using alternative control groups on the overcharges estimates by analyzing control groups that include a different number of hospitals than the 21 that are in the control group I use in my baseline specification.¹⁹⁴
- (193) In the first experiment, I examine the effect of varying the size of the control group on the estimated overcharges by starting with a small control group and then enlarging it in order of the *p-value* from the *F*-tests (as the *p-value* for a potential control hospital is higher, the effects of changes in length of stay and case mix on price for that hospital are increasingly statistically indistinguishable from the corresponding effects for ENH). That is, I begin with a control group formed by the first six hospitals in Figure 10 (hospitals in this figure are ordered by descending rank of the *F* test *p-values*), and then iteratively enlarge the control group by adding the seventh hospital, the eighth hospital, and so on, until the twenty-third hospital is included.
- (194) I then plot the estimated overcharge to BCBSI (from 2001 to 2008) as the size of the control group increases from 6 to 23. Figure 34 shows that the estimated average overcharge from 2001 onwards ranges between 6.1% and 11.9% for inpatient services, between 9.5% and 17.1% for outpatient services, and between 8.6% and 13.9% overall. These results show that the finding of injury to BCBSI is not driven by the precise composition of the control group.

¹⁹⁴ I believe that using the full set of 21 hospitals generates the most reliable results, as it is based on the greater amount of information and all 21 hospitals exhibit price responses to changes in length of stay and casemix that are comparable to the same responses for ENH.

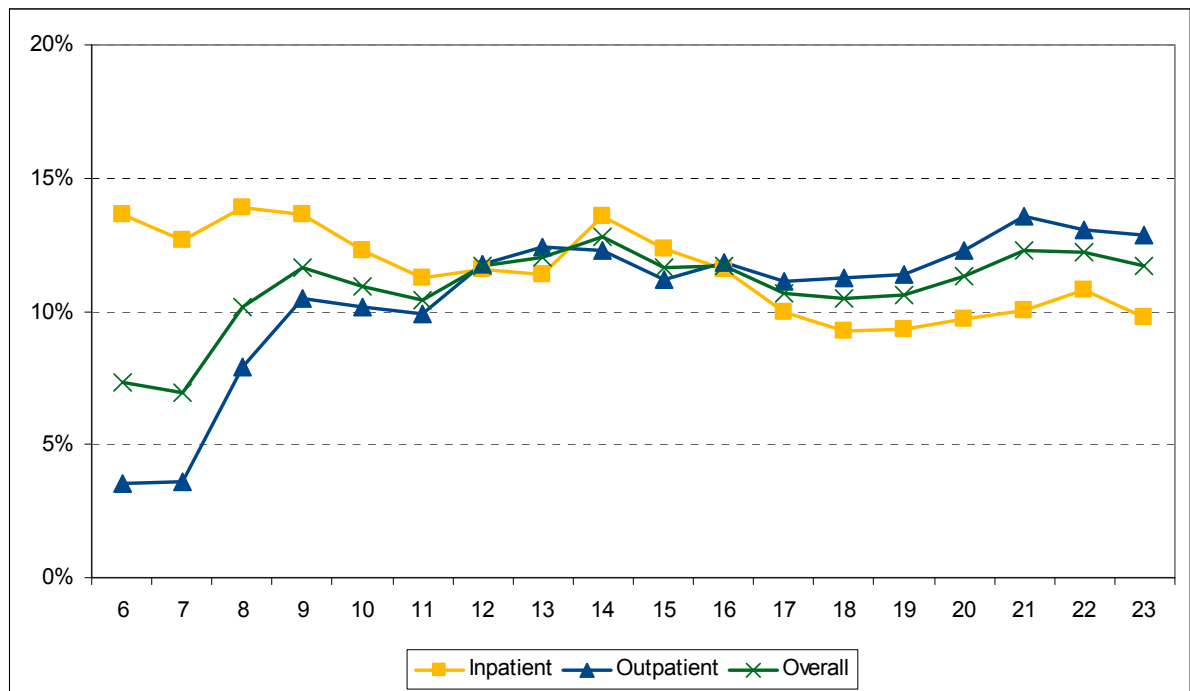
Figure 34. Overall percentage overcharge (aggregated from 2001 to 2008) as the size of the control group is increased (ordered by *F*-test statistics)



- (195) In the second experiment, I repeat the same iterative process, but I order the included hospitals by the distance of each to Evanston Hospital.¹⁹⁵ From the 23 hospitals in Figure 10, I begin with a control group consisting of the six hospitals that are nearest to ENH. I then expand the control group by adding the next nearest hospital, until I include all 23 hospitals in the control group. Figure 35 presents the estimated average overcharge by ENH from 2001 onwards as the size of the control group grows from 6 to 23. This sensitivity analysis also shows consistent evidence of positive overcharges. The estimated average overcharge to BCBSI from year 2001 onwards ranges between 9.3% and 13.9% for inpatient services, between 3.6% and 13.6% for outpatient services, and between 7.0% and 12.8% overall.

¹⁹⁵ Insofar as the hospitals closest to ENH react to price increases by ENH by increasing their own prices, a control group containing primarily hospitals close to ENH will result in estimated price effects that are biased towards zero (i.e., underestimates of the merger-induced price increase).

Figure 35. Overall percentage overcharge (aggregated from 2001 to 2008) as the size of the control group is increased (ordered by distance to Evanston Hospital) ¹⁹⁶



(196) I also examine whether my results are affected in any meaningful fashion by the decision, which both Dr. Baker and Dr. Haas-Wilson adopted, to use the log of price as the dependent variable.

(197) In using the log of price as the dependent variable, I take care to avoid the mistake that Dr. Baker made when attempting to make statements about the *level* of prices. Specifically, Dr. Baker incorrectly transformed the predicted log price back to a predicted price level using simple exponentiation. In his report on behalf of the FTC, Dr. Ashenfelter pointed out this error: “since the logarithm is a non-linear function, the average of the antilogs of the predicted log prices does not equal the average of the dollar values of the prices.”¹⁹⁷

(198) To correctly transform log prices to price levels, I adopt a method proposed by Duan (1983) and Manning (1998).^{198, 199} I estimate the price levels for a hospital by applying a “smearing

¹⁹⁶ None of the 18 control groups ranked by distance is not the same as any of the 18 control groups ranked by the *F* test *p*-values.

¹⁹⁷ Ashenfelter FTC Report, ¶ 35.

¹⁹⁸ N. Duan, “Smearing Estimate: A Nonparametric Retransformation Method,” *Journal of American Statistical Association* 78 (1983): 605–10.

¹⁹⁹ W. G. Manning, “The Logged Dependent Variable, Heteroskedasticity, and the Retransformation Problem,”

estimator” which equals the antilog of the predicted log price multiplied by the average of the antilog of the regression residuals over the observations for the hospital.

- (199) In order to test the sensitivity of my results to the mechanics of the smearing correction, I also estimate a model using the *level* of price as the dependent variable. This regression model is linear and prices can be predicted directly from the regression without using the smearing adjustment. Figure 36 reports the overcharges derived from a linear model (i.e., that uses the level rather than the log of price as the dependent variable) that includes in the control group the 21 hospitals indicated in Figure 10.

Figure 36. Using the level of price as the dependent variable shows injury to BCBSI

Year	Overcharge (%)			Overcharge (\$)		
	Inpatient	Outpatient	Overall	Inpatient	Outpatient	Overall
2000	1.4%	0.6%	0.9%	\$187,528	\$106,261	\$293,789
2001	-6.3%	8.9%	2.8%	-\$1,064,174	\$2,235,488	\$1,171,314
2002	-4.4%	16.8%	8.7%	-\$994,002	\$6,155,178	\$5,161,176
2003	-7.5%	21.8%	11.0%	-\$2,122,755	\$10,548,044	\$8,425,289
2004	12.0%	20.3%	17.0%	\$4,698,456	\$11,914,918	\$16,613,374
2005	10.6%	21.0%	17.3%	\$4,337,494	\$15,403,740	\$19,741,234
2006	19.0%	18.9%	18.9%	\$10,477,521	\$16,662,317	\$27,139,838
2007	16.4%	19.0%	18.1%	\$10,063,405	\$19,673,338	\$29,736,743
2008	18.8%	6.6%	11.0%	\$12,994,285	\$7,943,572	\$20,937,857
TOTAL				\$38,577,758	\$90,642,856	\$129,220,614

- (200) The overcharges in Figure 36 are similar in magnitude to those in Figure 11, where overcharges are calculated with log price as the dependent variable and with the same 21 hospitals as control group. This further demonstrates the robustness of the results in Figure 11.

Appendix I. Dr. Noether's statistical error in her DID analysis using the Haas-Wilson data

- (201) Dr. Noether conducts a DID analysis for individual DRGs in her report in this matter. Specifically, to generate Table 3 in her report, Dr. Noether runs DID regressions using the same framework and same data that Dr. Haas-Wilson used in the FTC proceedings, but at the DRG level. In these regressions, Dr. Noether made several statistical errors, one of which is particularly significant.
- (202) Dr. Noether's estimation equation is as follows:²⁰⁰
- $$\begin{aligned} \ln(\text{allowed}) = & \beta_0 + \beta_1 \text{postmerger_dummy} + \beta_2 \text{postmerger} \times \text{ENH dummy} + \beta_3 \text{plan_type} + \\ & + \beta_4 \ln(\text{length of stay}) + \beta_5 \ln(\text{public share}) + \beta_6 \ln(\text{fte beds}) + \\ & + \varphi \bullet \text{hospital_dummy} + \delta \bullet \text{year_dummy} + \\ & + \varepsilon \end{aligned}$$
- (203) For this DID analysis to work, meaning that β_2 is DID estimate of the effect of the merger, data must exist for ENH and for control group hospitals both *before* the merger and after the merger.
- (204) Out of the DRGs for which Dr. Noether reports results, many have no pre-merger ENH transactions (the number varies by payer).²⁰¹ The DID analysis cannot be conducted for these DRGs. Dr. Noether reported these meaningless estimates, most likely because her software program (STATA) reports a coefficient estimate for *postmerger* × *ENH dummy* even for DRGs with no pre-merger ENH observations.
- (205) The reason that her software package reports results even for these DRGs is that when there is perfect collinearity between two variables (i.e., one variable is an exact linear expression of the other), the software arbitrarily drops one of them.²⁰² In this case, when there is no pre-merger ENH transaction for a DRG, the *ENH dummy* is collinear with the *postmerger* × *ENH dummy*.²⁰³ For some of these DRGs, Stata drops *ENH dummy* rather than *postmerger* × *ENH dummy*; as a result, Stata does report a coefficient estimate for *postmerger* × *ENH dummy* and

²⁰⁰ See Noether Report, Table 3.

²⁰¹ - REDACTED -

²⁰² Intuitively, both variables cannot be included because they contain the *exact same* information, and so the effects of these variables on the dependent variable cannot be itemized. A regression analysis cannot calculate separate coefficients for two collinear variables.

²⁰³ Although the *ENH dummy* is not separately listed in the estimation equation, it is one of the hospital dummies in the vector, "*hospital_dummy*."

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Dr. Noether includes those coefficient estimates in Table 3 of her report. However, in these cases, the coefficient on *postmerger*ENH dummy* does not measure the DID effect.

Appendix J. Dr. Noether's own analysis shows that minimal numbers of class members were affected by an out-of-pocket maximum

(206) Dr. Noether discusses out-of-pocket maximums in Appendix 2 of her report. Specifically, she attempts to use the ENH claims data to calculate the degree to which out-of-pocket maximums insulate patients from ENH price increases. Her results are summarized in Tables 5 and 6 in her report. Before proceeding to show that this analysis implies that only minimal numbers of class members were potentially affected by an out-of-pocket maximum, I note several inaccuracies in Dr. Noether's interpretation and description of these data.

(207) A first point of clarification pertains to Dr. Noether's statement that - REDACTED -

I note three issues with this statement:

What Dr. Noether calculates (and what she can calculate using her data) is the percentage of *visits* (as shown in titles of her Table 5 and Table 6), not the percentage of *patients*. Table 5 and Table 6 cannot be used to make deductions about how many *patients* are affected by out-of-pocket maximum.

- REDACTED -

Even accepting that the pattern in Table 5 is consistent with *some* patients hitting out-of-pocket maximums, Dr. Noether does not quantify whether these patients comprise a substantial proportion of ENH's patients.

(208) A second point of clarification pertains to Dr. Noether's statement that - REDACTED -

This statement is inaccurate and misleading. It is inaccurate because she multiplies the January to December difference by two. The figure of interest is *not* the percentage of visits that hit an out-of-pocket maximum compared to the percentage of visits that make payments; rather it is simply the percentage of visits that hit an out-of-pocket maximum compared to *all* visits - REDACTED -. This statement is misleading, because it only reports (albeit

204 - REDACTED -

205 - REDACTED -

erroneously) the percentage of visits for a single month. A more informative calculation involves considering the entire calendar year.

- (209) A final point of clarification pertains to Dr. Noether statement that - REDACTED -
 In fact, this decrease is not consistent across plans - REDACTED - .
 Additionally, Dr. Noether's analysis aggregates years together, so it cannot be used to study whether these purported decreases are consistent across years. Finally, Dr. Noether does not describe a test for statistical significance in her report, nor has my staff located one in her backup materials.
- (210) Despite these issues, I use Dr. Noether's Table 5 to calculate the number of visits hitting an out-of-pocket maximum over the course of the year as a percentage of total visits during the year, assuming Dr. Noether's procedure is useful. For each MCO, the calculation proceeds in three steps:
1. Compute the difference in the number of visits with patient payments between January and each month. This difference, according to Dr. Noether's procedure, represents the number of visits hitting the out-of-pocket maximum in that month. I note that if the number of visits with patient payment increases above January levels, Dr. Noether's methodology results in a negative percentage of visits hitting the out-of-pocket maximum (i.e., there is no evidence for substantial numbers of patients hitting an out-of-pocket maximum in that month, and there is evidence that one or more of the presumptions in her analysis is false). For these instances, I conservatively change the value to zero. This occurs relatively frequently and in particular - REDACTED -
 2. Sum these differences over all 12 months.
 3. Divide the sum obtained in step 2 by the total number of visits over the 12 months. This yields the percentage of visits affected by out-of-pocket maximums.

The results of the above calculation are summarized in Figure 37 below. Importantly, it shows that, on average and accepting Dr. Noether's methodology, only about - of visits hit an out-of-pocket maximum. This figure likely overstates the percentage of visits that would have hit an out-of-pocket maximum but for the substantial price increases that likely resulted from the merger.

²⁰⁶ Noether report, Appendix 2, ¶ 3.

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CERTIFICATE OF SERVICE

I, Mary Jane Fait, hereby certify that on December 14, 2009, service of the foregoing document was served on all counsel of record and was accomplished pursuant to ECF as to Filing Users.

/s/ Mary Jane Fait

Mary Jane Fait