

Market Power And Hospital Pricing: Are Nonprofits Different?

New evidence suggests that in a consolidated market, market share may be what drives hospitals' pricing behavior.

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ABSTRACT: Dramatic changes in hospitals' operating environments are leading to major restructuring of hospital organizations. Hospital mergers and acquisitions are increasing each year, and conversions by hospitals to different forms of ownership also are continuing apace. Such changes require policymakers and regulators to develop and implement policies to ensure that consumers' interests are protected. An important consideration in this process is the impact on the price of hospital care following such transac-

tions. This paper reviews empirical evidence that mergers that reduce competition will lead to price increases at both merging hospitals and their competitors, regardless of ownership status. We show that nonprofit and government hospitals have steadily become more willing to raise prices to exploit market power and discuss the implications for antitrust regulators and agencies that must approve nonprofit conversions.

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IN THE FACE OF growing managed care penetration and price competition in the hospital sector, the number of hospital mergers and acquisitions has increased rapidly in recent years, from 100 in 1994 to 165 in 1996 to 184 in 1997. The 184 transactions in 1997 involved 290 hospitals and more than 47,500 beds.¹ As a result of this trend, antitrust regulatory agencies face more decisions regarding which mergers should be allowed to proceed and which ones should be challenged as anticompetitive. A unique feature of the health care sector—the presence of many nonprofit organizations—complicates such decisions. The nonprofit hospital sector has come to dominate hospital acquisitions in re-

cent years (Exhibit 1). In 1997, 71 percent of all hospitals and 77 percent of all beds were acquired by nonprofit hospitals. Acquisitions by publicly traded hospital management companies, generally thought to be the most active purchasers, made up less than 25 percent of all transactions in 1997.²

A CONTROVERSIAL ISSUE

Application of antitrust regulations to hospital mergers has been hampered by a shortage of empirical studies on hospital pricing behavior under differing competitive conditions and ownership status. In September 1996 a district court allowed a merger between the two largest hospitals in Grand Rapids, Michi-

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EXHIBIT 1
U.S. Hospital Mergers And Acquisitions, By Ownership Status, 1997

Ownership of acquirer	Ownership of target	Transactions	Hospitals	Beds
Nonprofit	All	134	207	36,852
	Nonprofit	122	192	32,956
	Publicly traded	8	9	2,146
	Private, for-profit	4	6	1,750
Publicly traded	All	39	72	10,273
	Nonprofit	32	44	7,544
	Publicly traded	2	17	1,241
	Private, for-profit	5	11	1,488
Private for-profit	All	11	11	778
	Nonprofit	7	7	435
	Private, for-profit	4	4	343
Total	All	184	290	47,903

SOURCE: *Health Care M&A Monthly* (February 1998): 2.

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gan, to proceed despite the fact that when combined they accounted for 73 percent of the market.³ In his ruling the judge stated that merging nonprofit hospitals were different from merging for-profit hospitals and that they were unlikely to raise their prices even if they acquired monopoly power. He based his ruling in large part on a single study published in the *Journal of Law and Economics* in 1995.⁴ The author, William Lynk, reported that for-profit hospitals would raise their prices following a merger but that merging nonprofit hospitals would not do so. He explained the finding on nonprofit pricing behavior using a conceptual model in which the hospital's board of directors constituted a "cooperative" of local citizens, who would not choose to impose monopoly price increases on themselves and their neighbors.

For a number of reasons, Lynk's study has become a subject of great interest and controversy since its publication. First, the judge relied on this study in his decision, citing Lynk's findings directly in his written opinion. Second, he referred to them as "undisputed" because this was, at the time, the only published empirical study that provided direct evidence on the pricing behavior of nonprofit hospitals. Third, methodological questions have been raised with regard to Lynk's paper.⁵ Indeed,

our own econometric study was one of three articles related to Lynk's study published in the *Journal of Health Economics* in early 1999.⁶ In this paper we synthesize our findings and other key perspectives in this debate and discuss how the findings might inform current policy making.

THE DEBATE OVER NONPROFITS

Lynk's conceptual model is one of many that have been proposed for nonprofit hospitals.⁷ In most models nonprofit hospitals depart from profit-maximizing production choices and prices by spending profits to attain other objectives with a break-even constraint. These other objectives might include lower prices (as in Lynk's model), education, charity care, improved quality, higher wages, or "dividends-in-kind" for managers or trustees. Nonprofit hospitals may choose to finance these other objectives by raising their prices to private-pay patients. Under managed care it is easier to raise prices in areas where managed care plans have fewer alternatives (that is, in more concentrated markets).

■ **EFFECT OF MANAGED CARE.** With a greater share of hospital revenues covered by managed care contracts over time, nonprofit hospitals will face increasing pressure on their prices. If they are to continue to meet

their stated objectives, they must improve their financial management practices, including market-based pricing practices. Thus, along with the growth of large corporate hospital systems, we are likely to see nonprofit hospitals paying greater attention to market conditions and raising their prices where competitive conditions permit it. There is a considerable empirical literature comparing nonprofit and for-profit hospital behavior regarding which goals they seek to maximize and, in particular, whether enough public goods are provided by nonprofit hospitals to justify their privileged tax status. However, data in many of these studies predate the growth of managed care and provider price competition and include (at best) limited measures of hospital prices (that is, they use data from a single year or older data based on charges and not prices).⁸

■ **EFFECT OF CONVERSIONS.** A related trend in the restructuring of the hospital sector is the increase in ownership conversions by hospitals. In 1995 the number of nonprofit hospital conversions doubled from the previous year.⁹ This increase has led to a call for greater oversight and regulation to ensure that consumers are protected, that benefits from the converted assets are appropriately valued, and that benefits inure to the community. The development of standards for fair valuation of converted assets has been hampered by the lack of empirical information, particularly about different types of conversions under different market conditions.

NEW EVIDENCE, DIFFERENT RESULTS

To better understand the current dynamics of hospital pricing behavior, we developed our own econometric study, which replicated, refined, and extended Lynk's study.¹⁰ Here we briefly summarize our study and discuss the

results that bear directly on the debate over nonprofits.

■ **METHODS.** We constructed a series of simulation models that estimate the effects on prices for both for-profit and nonprofit hospitals of hypothetical merger scenarios in each of four years: 1986, 1989, 1992, and 1994. We used multiple regression to estimate the relationship between hospital per diem prices for privately insured patients and selected patient-, hospital-, and market-level variables.

Our basic model was similar to Lynk's, but we extended the period of analysis and made other methodological improvements.

■ **DATA.** The econometric analysis incorporated data from three sources. Patient-level data were drawn from uniform discharge abstracts collected by the California Office of Statewide Health Planning and Development (OSHPD). Data elements obtained from this file included

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diagnosis-related group (DRG); length-of-stay; admission status (whether a case was routine); discharge status (whether a patient died); total charge; and the patient's age, sex, and race for each discharge. Hospital average price discounts were calculated from data in the OSHPD's annual hospital disclosure file. An area wage index was derived from the Medicare prospective payment system (PPS) impact file. Population data (average income, density) were drawn from the Area Resource File. Our study included all general acute care hospitals in California but excluded Kaiser Permanente hospitals (which do not report price), military hospitals, and specialty hospitals such as alcohol/drug/psychiatric, rehabilitation, and long-term care hospitals. We defined the ownership variables using a control code that characterized hospitals as nonprofit, investor-owned, and government (state, city/county, and district hospitals were combined in this category).

Our independent variables included con-

founding hospital variables such as percent-age of admissions in each hospital covered by Medicare and Medicaid; capital ratio (total assets to total operating expenses); teaching status; and county measures such as density (population per square mile), per capita income in 1988, and the Medicare PPS wage/price index. Our primary interests were hospital ownership and three measures that are affected by mergers: number of admissions, market share, and market concentration. All hospitals were grouped into one of three categories: for-profit, private nonprofit, or government. The Herfindahl-Hirschman Index (HHI) measures concentration. Actual patient-flow data are used to calculate the HHI to give an accurate picture of the current market. We also used the county to define the hospital market in our simulations to reflect, in part, potential competitors that are not now competing. Markets defined by counties are generally broader in urban areas than are the historical markets for most hospitals.¹¹

■ **RESULTS.** We found that after 1986 all hospitals, regardless of ownership type, raised their prices in response to a merger (Exhibit 2). Furthermore, merger-related price increases tended to grow over time. Nonprofit and government hospitals showed the greatest change in pricing behavior over time, ex-

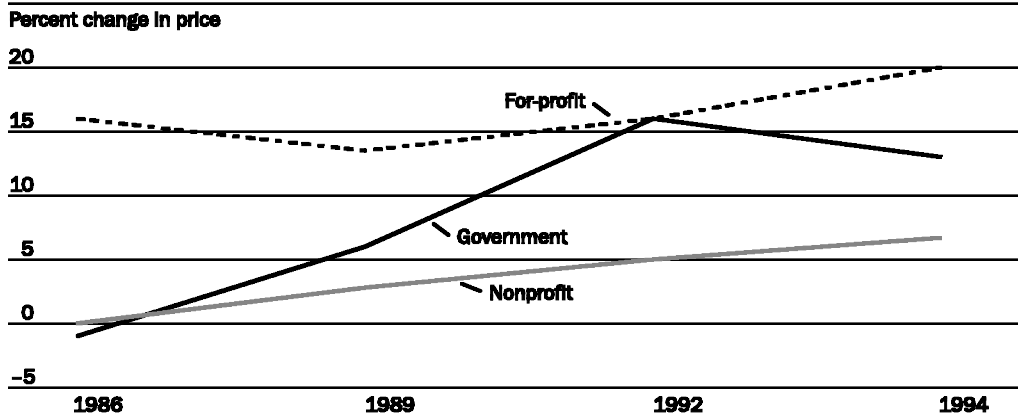
hibiting a greater willingness to raise their prices by larger amounts following a merger. The estimated price-increasing effects for nonprofit mergers rise continuously over time, from nil in 1986 to an increase of 6.7 percent in 1994. For-profits showed a greater price response to increased concentration than nonprofits did in all years, but this differential narrowed over time. Somewhat surprisingly, estimated price increases by merging government hospitals showed the greatest increase during the study period, from a small price reduction (-1 percent) in 1986 to a price increase of 13 percent in 1994. This may reflect a unique aspect of California's hospital sector, which includes many district hospitals that are affiliated with local governments.

We also found that the level of prices at for-profit hospitals was consistently higher throughout the period compared with prices at nonprofits. The average difference was 10 percent in 1994 in a market with average concentration.

■ **MARKETWIDE EFFECTS.** There are both direct and indirect price effects of a merger between direct competitors. Merging hospitals can raise their own prices. In addition, because the level of competition for all remaining participants in the market is reduced, nonmerging hospitals may be able to

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EXHIBIT 2 Effects Of Mergers On Hospital Prices Over Time, By Ownership Status, 1986-1994



SOURCE: Authors' calculations based on data from California Office of Statewide Planning and Development, Medicare prospective payment system impact file, and Area Resource File.

NOTE: Assumes merger of two hospitals, each with 25 percent market share.

raise their prices. The extent of the potential price increases is heavily dependent on the final combined market share of the merged hospitals. Using the county as the relevant market to illustrate this dependence, we simulated the price effects of mergers of different sizes, assuming that each of the merging hospitals has an equal share of the market before the merger. We estimated the price effects on the merging hospitals for different ownership categories, as well as the effects on the prices of the other hospitals competing in the market for 1994.

The amount of expected price increase from two merging hospitals depended on two factors: ownership and the market share of the merging hospitals (Exhibit 3). For-profit hospital pricing is more affected by market concentration, so for-profits will tend to raise prices more than nonprofits will after a merger. The price increase from two for-profit hospitals' forming a single for-profit monopoly exceeds 40 percent. When two nonprofit hospitals, each with 50 percent share, merge to form a monopoly, their estimated price increase is less than that of for-profit hospitals, but it is still a substantial 24.6 percent.

Merging hospitals that end up with a bigger share of the market can use their power to raise prices much more than can merging hos-

pitals with a small share of the market. By an interesting coincidence, the increase in prices at two merging for-profit hospitals with an average share (20 percent) of the market (the example used in Lynk's original study) is exactly the same as the expected increase from two merging nonprofit hospitals that end up with 73 percent of the market, as in the Grand Rapids merger (14.4 percent) (Exhibit 2). In the latter case, we predict that an average mix of competitor hospitals would raise their prices by 8.3 percent. However, when two smaller nonprofit hospitals, each with 10 percent market share, merged, the merged hospitals raised prices by 4.5 percent and competitors raised theirs by 1 percent.

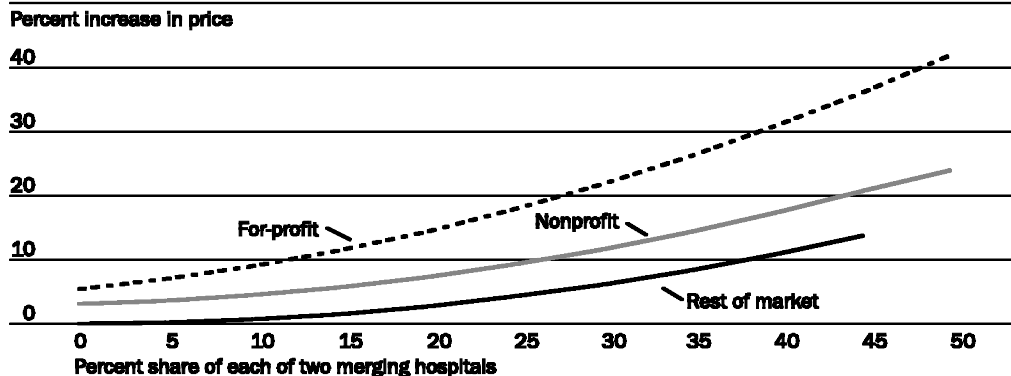
Finally, some experts suggest that many of the recent hospital mergers are designed not to consolidate and integrate facilities, but simply as a means to negotiate higher prices with managed care plans. Recalculation of our simulation models, assuming that merging hospitals do not consolidate, revealed that the estimated price increases are slightly smaller but are still positive and significant.

DIRECTIONS FOR POLICY

In our study we found strong evidence that the nature of hospital competition has changed over time and that a merger between

EXHIBIT 3

Estimated Effects Of Mergers On Prices: Merging Hospitals By Ownership Status And Hospitals In The Rest Of The Market, 1994



SOURCE: Authors' calculations based on data from California Office of Statewide Planning and Development, Medicare prospective payment system impact file, and Area Resource File.

NOTE: Assumes merger of two hospitals, each with the same share of the market.

two significant competitors in the same market will lead to a price increase in the market, regardless of ownership. Changes in hospital location are unlikely to explain our findings because there was little change in the numbers and locations of nonprofit hospitals in the period we studied. Instead, the changes that we observed in pricing behavior over time are consistent with the trend of increased price competition and more aggressive, market-based pricing by all hospitals.

■ **THE GRAND RAPIDS CASE.** The Grand Rapids decision and Lynk's paper have generated considerable controversy about how nonprofits should be treated under antitrust law. Despite the controversy, there is some agreement on the results of these econometric exercises. Lynk showed that in 1989 for-profit pricing was more affected than nonprofit hospital pricing was by concentration in the market.¹² Our analyses support this result. However, Lynk reported in his earlier paper that nonprofits were unlikely to raise their prices should they acquire market power. Using data through 1994, we show that merging nonprofits can be expected to raise their prices, not lower them, and that those price increases are greater when the merged hospital's market share is greater. In our opinion, the judge's exclusive focus on ownership led him to the wrong decision. Our data show that more concentrated markets in California now have higher prices, whereas fifteen years ago they had lower prices. We believe that this is due to a change in the nature of hospital competition, from competing for patients by offering their doctors higher-quality services to competing for patients by offering their insurers lower prices.

■ **GOVERNANCE.** Improved financial management and larger hospital systems also may help to explain our findings. When hospitals join large systems, their financial and administrative expertise increases, leading to more market-driven pricing. In the past nonprofits may not have exploited their market power, but it appears that they now will also raise their prices as market concentration increases. Further, the increase in the number of

nonprofit systems may contribute to the increase in prices among nonprofits. Nonprofit hospitals with boards consisting of local community members are being superseded by nonprofits that are part of large regional or multistate systems, governed and controlled from remote corporate headquarters, which presumably have different objectives.

■ **CONVERSION PROCESS.** Many states are increasing their oversight of hospital conversions from nonprofit to for-profit status. Our data suggest that such conversions could lead to price increases, as it appears that for-profits charge higher prices—about 10 percent more—given the same level of market concentration. This price differential could have implications for the valuing of the assets in the conversion process, as well as for long-term price trends in the market. In addition, our findings suggest that regulators should consider the market concentration in their review and approval of conversions by nonprofit hospitals.

■ **ANTITRUST.** We found that mergers between direct competitors above a given size are likely to lead to price increases in the market. In contrast to Lynk's earlier result, we found that nonprofit hospital mergers also can lead to higher prices and that this effect has increased over time. Thus, antitrust regulators should be more vigilant in their enforcement of antitrust policy, including policies for nonprofits, rather than relaxing application of antitrust law to hospital mergers.

■ **SIZE OF MERGER.** Our findings with respect to the relationship between the size of the merger and its price effects suggest that mergers between small competitors (that is, those with market shares of 10 percent or less) may have only a small effect on market prices. Furthermore, there is some evidence in the literature that there is an improvement in quality when small hospitals merge.¹³ However, as the market shares of the merging hospitals increase, the price effects increase more than linearly, and our findings show large price increases when monopolies are formed, regardless of ownership. Thus, a merger between two small hospitals in a rural area, if it

results in a monopoly, can lead to significant price increases, regardless of ownership.

■ **INDIRECT EFFECTS.** Finally, our results provide an empirical estimate of the indirect effects of mergers, indicating that a merger between two competitors in a market can lead to price increases by the other competitors in a market, whether they are for-profit or nonprofit.

NOTES

1. *Health Care M&A Monthly* (New Canaan, Conn.: Irving Levin and Associates, February 1998).
2. *Ibid.*
3. *FTC v Butterworth Health Corp and Blodgett Memorial Medical Center*, No. 1:96-cv-49 (W.D. MI, 26 September 1996). Other court cases also have considered the argument that nonprofit hospitals should be exempted from antitrust prosecution because they are not likely to raise their prices following a merger. In *U.S. v Carilion Health System*, 707 F. Supp. 840 (W.D. Vir., 1989), the court accepted this argument, while in *U.S. v Rockford Memorial Corporation*, 717 F Supp. 1251 (N.D. Ill., 1989), *aff'd*, 898F 2d 1278 (7th Cir. 1990), the court rejected it.
4. W.J. Lynk, "Nonprofit Hospital Mergers and the Exercise of Market Power," *Journal of Law and Economics* 38, no. 2 (1995): 437-461.
5. M.C. Jaklevic, "Ownership and Pricing—Economists Knock Key Study in Grand Rapids Case," *Modern Healthcare*, 6 October 1997, 2-16; J.P. McConnell, "Article Unfair to Medic's Co-Founder," and S. Peltzman, "Journal Story Gave Incomplete Account," *Modern Healthcare*, 20 October 1997, 28; and D. Carlton, "Professor: Article Was Misleading," *Modern Healthcare*, 1 December 1997, 52.
6. E.B. Keeler, G. Melnick, and J. Zwanziger, "The Changing Effects of Competition on Non-Profit and For-Profit Hospital Pricing Behavior," *Journal of Health Economics* 18, no. 1 (1999): 69-86; D. Dranove and R. Ludwig, "Competition and Pricing by Nonprofit Hospitals: A Reassessment of Lynk's Analysis," *Journal of Health Economics* 18, no. 1 (1999): 87-98; and W.J. Lynk and L.R. Neumann, "Price and Profit," *Journal of Health Economics* 18, no. 1 (1999): 99-116.
7. J. Newhouse, "Toward a Theory of Nonprofit Institutions: An Economic Model of a Hospital," *American Economic Review* 60, no. 1 (1970): 64-73; P.M. Danzon, "Hospital 'Profits': The Effect of Reimbursement Policies," *Journal of Health Economics* (May 1982): 29-52; M.V. Pauly, "Non-profit Firms in Medical Markets," *American Economic Review* (May 1987): 257-262; M.A. Morrissey, G. J. Wedig, and M. Hassan, "Do Non-profit Hospitals Pay Their Way?" *Health Affairs* (Winter 1996): 132-144; and F. Sloan, "Not-for-Profit Ownership and Hospital Behavior," in *Handbook of Health Economics*, ed. A.J. Culyer and J.P. Newhouse (Amsterdam: Elsevier/North-Holland, 1999).
8. G.A. Melnick et al., "The Effect of Market Structure and Bargaining Position on Hospital Prices," *Journal of Health Economics* 11, no. 3 (1992): 217-233; Lynk, "Nonprofit Hospital Mergers;" R. Connor et al., "Which Types of Hospital Mergers Save Consumers Money?" *Health Affairs* (November/December 1997): 62-74; H.E. Frech III and J.M. Woolley, "Consumer Information, Price, and Nonprice Competition among Hospitals," in *Health Economics Worldwide: Conference Volume of the Second World Congress on Health Economics*, ed. Peter Zweifel and H.E. Frech III (Boston: Kluwer Academic Publishers, 1992), 217-244; and M. Noether, "Competition among Hospitals," *Journal of Health Economics* (November 1988): 256-279.

Robert Leibenluft, assistant director for health care of the Federal Trade Commission's Bureau of Competition, underscored the critical need for additional empirical evidence on nonprofit pricing behavior in a 1998 *Health Affairs* interview, in which he stated that "more research would be helpful concerning how nonprofits compete and what happens when hospital markets become more concentrated."

J.K. Iglehart, "The Federal Trade Commission in Action: The FTC's Robert F. Leibenluft," *Health Affairs* (September/October 1998): 65-74.

9. J. Needleman, D. Chollet, and J. Lamphere, "Hospital Conversion Trends," *Health Affairs* (March/April 1997): 187-191.
10. For discussion of comparison to Lynk and detailed description of data, methods, and econometric findings, see Keeler et al., "The Changing Effects of Competition on Non-Profit and For-Profit Hospital Pricing Behavior."
11. J. Zwanziger, G.A. Melnick, and J.M. Mann, "Measures of Hospital Market Structure: A Review of the Alternatives and a Proposed Approach," *Socio-Economic Planning Sciences* 24, no. 2 (1990): 81-95.
12. Lynk, "Nonprofit Hospital Mergers and the Exercise of Market Power."
13. Studies have shown that the smallest hospitals have lower quality, on average. See E.B. Keeler et al., "Hospital Characteristics and Quality of Care," *Journal of the American Medical Association* 268, no. 13 (1992): 1709-1714.