Does It Matter Who Your Buyer Is? The Role of Nonprofit Mission in the Market for Corporate Control of Hospitals

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Abstract

The hospital industry is one of this country's largest mixed industries, with for-profit, nonprofit, and government hospitals operating in the same local markets. But how do ownership types differ? Previous studies have compared costs among different hospitals. However, these studies have not been entirely successful because costs cannot be meaningfully compared without controlling for hard-to-measure quality of service. In this study, we look to the market for corporate control—or takeovers—for evidence of ownership-related differences. We find that nonprofit and for-profit firms pay different prices and that these differences relate to the nonprofit's mission. Specifically, nonprofits and for-profits pay the same price when buying for-profits, but nonprofits pay less when buying a "like-minded" nonprofit (so religious nonprofits pay less for other religious nonprofits, for example). The resulting dual-price equilibrium suggests that nonprofits have a different objective than do for-profits but also that nonprofits behave competitively and efficiently when interacting with for-profits.

1. Introduction

Private nonprofit organizations are significant providers of education, the arts, medical care, and other services. But the very existence of nonprofits presents something of a puzzle to economists, who have devoted much more attention to understanding profit-maximizing firms. For-profits maximize profits, but what do nonprofits do? We posit that nonprofits pursue an objective function that differs from profit maximization and that is often characterized as a "social

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mission"; religious organizations, for instance, have long supplied health care.[1,2] Such a nonprofit objective function, if it deviates from profit maximization, should be observable in the market for corporate control. In particular, we hypothesize that a nonprofit's mission creates a wedge between the price a nonprofit seller will accept from a for-profit buyer and the price it will accept from a like-minded nonprofit buyer that would continue its mission.

When a nonprofit hospital's board of trustees decides to sell the hospital, the proceeds of the sale are entered into a public trust that is required by law to support the hospital's original mission. Nonprofit sellers often must choose between a for-profit buyer whose objective is profit maximization[3] and a nonprofit buyer whose objective is similar to its own. If the nonprofit and for-profit buyers offer identical bids, the nonprofit seller will prefer the nonprofit buyer because it shares a mission. This suggests that the nonprofit buyer could bid less and still win, a prediction that is supported by anecdotal evidence. For example, in 1995, the nonprofit Venice Hospital in Florida sold to the nonprofit Bon Secours Health System for $85.5 million after rejecting a $120 million offer from the for-profit Sarasota Memorial Hospital, citing the buyer's "culture, charitable mission, financial depth and management team" (Greene 1995, p. 18).

We predict that a for-profit buyer will pay an efficient price based on the net present value of expected future earnings, while a nonprofit will pay a discounted amount, where the discount represents the value of the nonprofit mission. Put another way, a nonprofit seller will charge a lower price to a buyer with better aligned incentives. The predicted price differential suggests a dual-price equilibrium based not on market failure or temporary information asymmetry but rather on different organizational forms.

We test whether the organizational forms of the buyer and seller affect the price paid for a hospital using data from hospital sales (1990–2000). After controlling for the past financial performance of the seller, we find that nonprofits pay almost 50 percent less for nonprofits than for-profits do. To show that this price differential relates to the nonprofit mission, we divide nonprofits into religious and nonreligious and find that religious nonprofits discount only to other religious nonprofits while nonreligious nonprofits discount to all nonprofits. This selective discounting is consistent with a mission-alignment interpretation, as Catholic buyers, for instance, can credibly commit to not performing

[1] There is a long literature speculating about the objective function of nonprofits in general and nonprofit hospitals in particular. For example, a nonprofit, instead of maximizing profit, might maximize quantity (Steinberg 1986), quality (Smith, Clement, and Wheeler 1995), or both (Newhouse 1970). Nonprofit hospitals are assumed to value serving the poor rather than shareholders (Frank and Salkever 1991; Norton and Staiger 1994; Thorpe and Phelps 1991) and indeed to lack owners altogether (Hansmann 1998; Becker and Sloan 1985). Others posit that nonprofit hospitals are owned by diffuse owners, such as the community (Sloan 2000) or physicians (Pauly and Redisch 1973).

[2] In a 2006 survey of U.S. hospitals (American Hospital Association 2007), of the 4,927 community hospitals, 2,919 were nonprofits, 889 were for-profits, and 1,119 were government owned.

[3] If a nonprofit is sold to a for-profit organization, any preferential tax treatments or debt conditions associated with the nonprofit are terminated. Thus, a for-profit cannot purchase a nonprofit in order to benefit from tax or debt advantages.

abortions and other related actions. The discount is thus the value to the Catholic seller of a broad set of hard-to-contract behaviors.

Note that our approach is a departure from the primary empirical literature on nonprofit hospitals. Most studies concerned with finding differences between nonprofit and for-profit behavior assume nonprofit inefficiency and seek operating cost differentials, especially higher costs in nonprofits. However, these studies taken together have been mixed because they do not adequately control for quality of care and severity of patients' illnesses (see Sloan [2000] for a review of this literature). Our strategy avoids this problem and somewhat follows Leone, Van Horn, and Wedig (2005), who analyze stock prices of publicly traded for-profit hospitals buying nonprofits.

In the next section, we describe our data set and show that the data are representative of national hospital sales. We then describe our empirical methods, present results, and summarize with conclusions.

2. Data

Our data consist of 135 completed hospital transactions that span the years 1990–2000. With over two-thirds of the transactions occurring in the last half of the decade. We obtained the data from an investment bank that specializes in mergers and acquisitions in the hospital industry. The bank compiled the data to use as comparables for its merger-and-acquisition business. While in principle these data are publicly available, the bank has taken great care to reconcile the accounting standards of nonprofit and government hospitals with the more conventional accounting standards of for-profit hospitals, and bankers carefully standardized the measurement of key financial variables, especially assets. Assets are measured as the sum of all short-term and long-term tangible assets but exclude intangibles such as good will.

Our data set includes the sales price and a number of key financial variables such as assets, revenues, cash flow, earnings measured as earnings before interest, taxes, depreciation, and amortization (EBITDA), EBITDA growth rate, and debt. (Again note that while nonprofits have access to tax-free debt, for-profit buyers cannot benefit from this low-cost debt because nonprofit debt must be retired before ownership is transferred.) In addition to the financial variables, we have information on the number of beds, occupancy rate, and utilization rate. In 123 of 134 cases, we were also able to determine whether the buyer already owned a hospital in the seller's market. This could be important information because a hospital that buys another hospital in the same market might increase its market power or enjoy economies of scale.[4]

[4] We measure as a binary variable whether the buyer already owns a hospital in the seller's market, which can be quite small geographically (Capps, Dranove, and Satterthwaite 2003). But we lack measures of market concentration, which could affect any increases in market power; adding a hospital in a highly concentrated market would increase market power more than adding a hospital in an unconcentrated market.

Table 1
Comparison of Analysis Sample with the Population of Hospital Sales, 1995–99

	Population	Analysis Sample
Average sale price ($ millions)	69.4	72.4
Average EBITDA ($ millions)	8.7	9.0
Nonprofit seller (= 1)	.68	.71
Total number of sales	1,361	135

Note. EBITDA = earnings before interest, taxes, depreciation, and amortization.

Our sample looks remarkably close to the overall population of hospital sales. In Table 1, we compare a few of the characteristics of the hospitals in our sample to the population of hospital sales between 1995 and 1999 as reported by Irving Levin Associates (2000). Our data set represents about 10 percent of total sales during that period. The average sales price in the sample is $72.4 million, compared with $69.4 million for all hospitals. The average earnings measured by EBITDA of hospitals sold in the sample are $9.0 million, compared with $8.7 million in the population. Finally, 71 percent of hospitals sold in the sample were sold by a nonprofit or government organization, compared with 68 percent in the population.

Descriptive statistics, broken down by transaction type, are presented in Table 2. These variables represent the variety of variables in our data but omit those that are less useful for market valuation. Thus, variables like EBIT (earnings before interest and taxes) and Revenues are available in the data but explain less of the market value than the variables EBITDA and Assets.

3. Methods

Our hypothesis, that nonprofits pay less for nonprofits than for-profits do, requires that we compare sales prices for nonprofits while controlling for variables that affect the hospital's value. That is, since a more profitable hospital is worth more than an unprofitable hospital, profitability must be considered when comparing the sales price of these two hospitals.[5] Because our data contain a variety of variables, we consider several likely candidates in a regression based on a model of market value suggested by Hayashi (1982) and Hall (1993) and used extensively in the finance literature to study firm value.[6] Specifically, let

$$V = V(A_1, A_2, A_3 \ldots),$$

[5] In practice, investment bankers estimate the value of a seller by comparing it with other recently sold hospitals that are similar in asset size. The sales price of the similar hospital is divided by its earnings before interest, taxes, depreciation, and amortization (EBITDA) to obtain the market value as a multiple of EBITDA. This ratio is then multiplied by the EBITDA of the seller.

[6] Similar approaches have been used to study management buyouts (Kaplan 1989), to value firm research and development activities (Griliches, Pakes, and Hall 1986, 1991), and to measure the effect of management ownership (Morck, Shleifer, and Vishny 1988) and takeover defenses (Gompers, Ishii, and Metrick 2001).

Table 2
Sales by Type of Buyer and Seller

		Nonprofit Buyer (N = 48)			For-Profit Buyer (N = 87)		
Variable	All	For-Profit Seller	Nonprofit Seller	Government Seller	For-Profit Seller	Nonprofit Seller	Government Seller
Sales price ($ millions)	72.4	71.1	47.6	43.6	174.9	60.8	39.1
	(211.2)	(77.0)	(40.5)	(42.8)	(541.5)	(58.0)	(42.1)
Assets ($ millions)	79.3	55.5	82.2	53.7	137.2	76.1	45.5
	(166.3)	(27.9)	(63.6)	(35.8)	(418.3)	(66.8)	(52.8)
Tobin's q (sales price/assets)	.91	1.10	.63	.73	1.24	.86	1.16
	(.58)	(.87)	(.41)	(.41)	(.69)	(.42)	(.70)
EBITDA ($ millions)	9.0	4.1	7.7	5.1	18.4	8.9	6.0
	(24.9)	(9.1)	(6.7)	(5.6)	(63.1)	(8.7)	(8.6)
EBITDA growth rate (last 2 years)	.1	−.5	−.1	.1	.4	.2	.6
	(2.4)	(1.1)	(.8)	(.8)	(1.8)	(3.4)	(2.5)
Debt ($ millions)	34.8	25.1	32.2	18.6	69.9	35.1	9.1
	(88.9)	(26.3)	(29.6)	(20.9)	(224.9)	(32.1)	(13.2)
Buyer owns another hospital in the same market[a] (=1)	.44	.92	.86	.89	.28	.49	.25
Number of beds	224.5	177.9	213.2	145.9	369.3	227.1	129.1
	(346.1)	(82.2)	(141.3)	(61.5)	(859.9)	(136.4)	(104.5)
Number of admissions	7,727.0	5,528.1	8,072.7	6,072.1	12,032.9	7,544.2	4,998.9
	(12,863.7)	(3,017.8)	(5,421.6)	(3,561.5)	(32,056.9)	(5,026.9)	(4,847.5)
N	135	13	24	11	19	53	15

Note. Values presented are means, with standard deviations in parentheses. The full sample contains 32 for-profit sellers, 77 nonprofit sellers, and 26 government sellers. EBITDA = earnings before interest, taxes, depreciation, and amortization.
[a] Only 125 observations.

where V is the value of the firm and A_i is the book value of asset i. Hayashi (1982) shows that if the market for the firm's assets is competitive and the value function is homogenous of degree one, then the market value of hospital i in year t is a linear function of the book value of the assets:

$$V_{it} = q_{it}A_{it}, \tag{1}$$

where the multiplier is Tobin's q.

To get an estimable specification, we take the log of equation (1). Then the log value of hospital i in year t is

$$\ln(V_{it}) = \ln(q_{it}) + \ln(A_{it}). \tag{2}$$

We assume that the multiplier q is a function of the net present value of risk-adjusted expected future earnings, which we proxy using the current financial performance of the firm (controlling for year fixed effects):

$$\ln(q_{It}) = \beta_0 + \beta_1\left(\frac{E_{it}}{A_{it}}\right) + \beta_2\dot{E}_{it} + \beta_3\left(\frac{D_{it}}{A_{it}}\right) + \sum_m \lambda_m X_{mit} + \theta_t + \varepsilon_{it}, \tag{3}$$

where E_{it} is hospital i's earnings in year t; $\dot{E}_{it}$ is the recent growth in earnings; D_{it} is the firm's level of debt; the X_{mit} are nonfinancial strategic factors such as whether the buyer owns another hospital in the same market, hospital size, and occupancy; θ_t is a year dummy; and ε_{it} is a random error term.

We obtain our estimating equation by substituting equation (3) into equation (2):

$$\begin{aligned}\ln(V_{it}) = {} & \alpha\ln(A_{it}) + \beta_0 + \beta_1\left(\frac{E_{it}}{A_{it}}\right) + \beta_2\dot{E}_{it} + \beta_3\left(\frac{D_{it}}{A_{it}}\right) \\ & + \sum_m \lambda_m X_{mit} + \theta_t + \varepsilon_{it}.\end{aligned} \tag{4}$$

We first estimate equation (4) and test to see if α is equal to one as hypothesized in equation (3). Recall that a coefficient of one tests whether the market for hospitals is competitive.

If the data pass this test, we can then estimate a modified version of equation (3) to examine if hospital market value depends on whether the buyer and/or seller are nonprofit organizations:

$$\begin{aligned}\ln(q_{it}) = {} & \beta_0 + \beta_1\left(\frac{E_{it}}{A_{it}}\right) + \beta_2\dot{E}_{it} + \beta_3\left(\frac{D_{it}}{A_{it}}\right) + \sum_j\sum_k \phi_{jk}B_{ij}S_{ik} \\ & + \sum_m \lambda_m X_{mit} + \theta_t + \varepsilon_{it},\end{aligned} \tag{5}$$

where $q = V/A$, B_j is the buyer's ownership type, and S_k is the seller's ownership type.

4. Results

The estimation results for equation (4), which relates various accounting variables to sales price, are reported in Table 3. We estimate four different models, all of which condition on the log of assets and current earnings rate measured by EBITDA divided by the book value of assets. We add the debt-to-assets ratio in model 2 to adjust for risk, the earnings growth rate in model 3, and nonfinancial capacity utilization variables in model 4. In all four specifications, assets, earnings, and year fixed effects are significant. Not statistically significant are earnings growth, debt, and capacity and utilization measures (beds and admissions).

Note that the coefficient on log(Assets) is consistently equal to one. This result is of interest for two reasons. First, it satisfies Hayashi's (1982) condition for a competitive market, which is of concern given the private nature of this market, and contributes to a literature on the efficient, somewhat private, process of pricing firms, such as Boone and Mulherin's (2007) study of publicly traded firms. It also corroborates Leone, Van Horn, and Wedig's (2005) finding that the market for nonprofit hospitals is competitive. Second, because the coefficient of A is one, we can now estimate sales price divided by assets (that is, Tobin's q) as a dependent variable. We can thus estimate equation (5), which allows a straightforward comparison of market behavior by buyer and seller type.

The estimation results for equation (5) are presented in Table 4. Each specification includes EBITDA divided by assets and year dummies as controls. The independent variables of interest are dummy variables indicating the ownership type of the buyer and seller. In all cases the omitted type is a for-profit buyer and for-profit seller, which serves as our standard of comparison.

Model 1 is the basic specification. The coefficient on for-profits buying nonprofits and for-profits buying government hospitals is not significantly different from zero. This suggests that a for-profit pays the same price for a nonprofit and government hospital as for a for-profit hospital (our omitted combination). That is, for-profits always pay the same price, regardless of the organizational form of the seller. Similarly, the coefficient on nonprofits buying for-profits is also not significantly different from zero, which suggests that nonprofits and for-profits pay the same price for for-profits.

The two nonzero coefficients involve nonprofits as buyers. Nonprofits get a 43 percent discount[7] when buying a nonprofit and a 29 percent discount when buying government hospitals. This latter discount is statistically significant in model 2, when the coefficients on for-profit buyers are restricted to be zero.

To evaluate whether these discounts are driven by nonprofit mission, we

[7] The discount is 1 − antilog(coefficient). In this case, the nonprofit-nonprofit coefficient is −.565, and the nonprofit-government coefficient is −.344. So the discount would be 1 − .57 = 43 percent and 1 − .71 = 29 percent, respectively.

Table 3
Evaluation of Accounting Variables on Price

Independent Variable	Model 1	Model 2	Model 3	Model 4
Log(Assets)	.989** (.049)	.986** (.049)	.975** (.057)	1.083** (.079)
EBITDA/Assets	2.371** (.509)	2.241** (.515)	3.242** (.853)	3.123** (.934)
Debt/Assets		−.210 (.143)	−.226 (.175)	−.224 (.191)
EBITDA growth rate			.027 (.024)	.027 (.026)
Negative EBITDA			.308 (.265)	.282 (.301)
Beds/Assets				.043 (.030)
Admissions/Assets				.002 (.006)
Buyer has other hospital in seller's market				−.200 (.143)
F-statistic for year fixed effects	2.91**	2.87**	2.62**	2.06+
R^2	.79	.79	.80	.81
N	135	135	113	101

Note. Values are estimated coefficients, with standard errors in parentheses. The dependent variable is the log of the sales price. Year dummy variables are included in all of the models. EBITDA = earnings before interest, taxes, depreciation, and amortization.
+ Significantly different from zero at the 10% level.
** Significantly different from zero at the 1% level.

further decompose nonprofits into religious and nonreligious.[8] Thus, model 3 restricts to zero all buyer-seller combinations involving for-profits (as in model 2) and decomposes nonprofits buying nonprofits into combinations of religious and nonreligious nonprofits. Bearing in mind that for some buyer-seller types, our sample sizes are small, nevertheless, we find that religious nonprofits discount only to religious buyers, while nonreligious nonprofits discount to all nonprofits.

We interpret this differential discounting to mission, where, for example, a Catholic hospital selling to another Catholic hospital can be confident that abortions will not be performed but would be much less confident when selling to a nonreligious hospital. More generally, the agreement between buyer and seller on a broad set of behaviors amounts to incentive alignment (sharing the same objective function) or credible commitment (being able to commit to certain behaviors). The resulting discount between religious hospitals of about 48 percent can thus be interpreted as the market value of that agreement.

5. Robustness Checks

One concern about these results is that they are driven by nonlinearity; some sellers have negative EBITDA, but prices paid are always positive. We do a robustness check omitting the 15 negative EBITDA observations and get similar results on the buyer-seller types except that the coefficient on EBITDA/Assets is larger (that is, it has a steeper slope, which we would expect from dropping points below zero).

[8] Cutler and Horwitz (2000) argue that religious affiliation plays a role in nonprofit hospital behavior.

Table 4
Regression Results by Buyer and Seller Type

Independent Variable	Model 1	Model 2	Model 3	Model 4
EBITDA/Assets	2.414**	2.151**	2.075**	2.121**
	(.500)	(.475)	(.475)	(.5209)
Buyer and seller types:				
For-profit/nonprofit	−.078			
	(.164)			
For-profit/government	−.147			
	(.189)			
Nonprofit/for-profit	.022			
	(.201)			
Nonprofit/nonprofit	−.565**	−.551**		
	(.186)	(.128)		
Nonprofit/government	−.344	−.339+	−.354*	−.482*
	(.223)	(.178)	(.178)	(.243)
Religious nonprofit/religious nonprofit			−.668**	−.757*
			(.278)	(.329)
Nonreligious nonprofit/religious nonprofit			.023	.071
			(.293)	(.352)
Religious nonprofit/nonreligious nonprofit			−.637**	−.756**
			(.242)	(.284)
Nonreligious nonprofit/nonreligious nonprofit			−.690**	−.771**
			(.191)	(.247)
For-profit buyer owns hospital(s) in seller's market (=1)				−.055
				(.139)
Nonprofit buyer owns hospital(s) in seller's market (=1)				.059
				(.171)
F-statistic for year fixed effects	2.95**	3.79**	3.18**	3.18**
R^2	.40	.39	.43	.42
N	135	135	134	123

Note. The dependent variable is the log of Tobin's *q*. The omitted category in model 1 is for-profit buyer and for-profit seller. Year dummy variables are included in all of the models. For instance, taking the antilog of the EBITDA/Assets coefficient yields a range of 8 (antilog of 2.1) to 11 (antilog of 2.4). The nonprofit-nonprofit discount in model 1 would be 1 − antilog (−.565) = .43. EBITDA = earnings before interest, taxes, depreciation, and amortization.

+ Significantly different from zero at the 10% level.

* Significantly different from zero at the 5% level.

** Significantly different from zero at the 1% level. Observe that because the model estimates ln(*q*), it may help to interpret the antilog of the coefficients.

We also investigate whether a for-profit might buy another hospital in the same market in order to gain market power. The increase in profits from having more market power would put a premium on a seller. We test for this possibility in model 4 in Table 4 and reject the hypothesis that buyers would pay more for another hospital in the same market. However, another hypothesis is that for-profit buyers are more likely than nonprofit buyers to be motivated by this strategy. In model 4, we interact the ownership status of the buyer with whether the buyer owns another hospital in the same market. We find that owning another hospital in the area is not statistically significant regardless of the buyer's ownership type.

Table 5
Nonprofit and Government Seller Performance

	Ln(Assets)	EBITDA/Assets	Debt/Assets
Nonprofit seller:			
For-profit buyer	4.01	.10	.33
Nonprofit buyer	3.93	.12	.47
Difference	.08 (.34)	−.02 (1.12)	−.14 (.67)
Government seller:			
For-profit buyer	3.82	.09	.26
Nonprofit buyer	3.20	.10	.26
Difference	.62 (1.39)	−.01 (.50)	0 (.00)

Note. Values are means; *t*-statistics are in parentheses. EBITDA = earnings before interest, taxes, depreciation, and amortization.

Finally, there is also a possible selection problem in which the nonprofits that sell to for-profits are somehow different than those that sell to nonprofits. For instance, Norton and Staiger (1994) observe a location selection issue because nonprofit hospitals tend to locate in undesirable inner-city neighborhoods. To test whether some other systematic difference explains our results, we compare the mean financial performance of nonprofit hospitals selling to for-profit buyers to the mean performance of nonprofits selling to nonprofit buyers in Table 5. We find no difference in assets, profits, or debt. In a separate study, Horwitz (2007) also tests for a similar selection problem and also fails to find any bias.

6. Discussion

The difference between nonprofits and for-profits may at times be difficult to discern, especially in the hospital industry, where some hospitals have recently lost (or been threatened with losing) their tax-exempt status for lack of charity care (Lagnado 2004). Moreover, nonprofits competing with for-profits may be driven to resemble for-profits (Glaeser 2002). Finally, empirical studies that attempt to quantify differences between nonprofit and for-profit hospitals, by measuring cost inefficiencies at nonprofits, have a mixed record (Sloan 2000).

This study takes a different tack in identifying ways in which nonprofits differ from for-profit hospitals. Using data from the active takeover market for hospitals, we show that nonprofits behave differently in the competitive market for corporate control. When dealing with for-profits, nonprofits behave like for-profits, buying and selling at the same prices. But when dealing with nonprofits, they behave markedly differently, selling at a substantial discount to like-minded nonprofits. Religious hospitals discount only to other religious hospitals, while less restrictive nonreligious nonprofits discount to all nonprofits. Given the religious alignment of these results, we interpret the nonprofit mission as playing a deciding role in price discrimination. That said, the mission need not be religious; in the anecdote cited, a nonreligious nonprofit sold to another non-

religious nonprofit at a discount, while the losing for-profit bidder, Columbia/HCA, was later convicted of Medicare fraud.

In addition to demonstrating a behavioral difference attributable to nonprofit mission, our finding of nonprofit discounting amounts to a dual-price equilibrium in an important nonprofit industry. Whether other mixed industries exhibit this sort of dual pricing remains for future research to determine, although the labor market for scientists might be one example (Stern 2004), and differential penalties on for-profit and nonprofit polluters by government agencies (Fialka 2007) might suggest another.

References

American Hospital Association. 2007. *Fast Facts on US Hospitals*. Chicago: American Hospital Association.

Becker, Edmund R., and Frank A. Sloan. 1985. Hospital Ownership and Performance. *Economic Inquiry* 23:21–36.

Boone, Audra L., and J. Harold Mulherin. 2007. How Are Firms Sold? *Journal of Finance* 62:847–75.

Capps, Cory, David Dranove, and Mark Satterthwaite. 2003. Competition and Market Power in Option Demand Markets. *RAND Journal of Economics* 34:737–63.

Cutler, David M., and Jill R. Horwitz. 2000. Converting Hospitals from Not-for-Profit to For-Profit Status: Why and What Effects? Pp. 45–79 in *The Changing Hospital Industry: Comparing Not-for-Profit and For-Profit Institutions*, edited by David M. Cutler. Chicago: University of Chicago Press.

Fialka, John J. 2007. Friars Who Owned Polluted Mine Get All Sorts of Help. *Wall Street Journal*, April 20, p. A1.

Frank, Richard G., and David S. Salkever. 1991. The Supply of Charity Services by Nonprofit Hospitals: Motives and Market Structure. *RAND Journal of Economics* 22:430–45.

Glaeser, Edward L. 2002. The Governance of Not-for-Profit Firms. Working Paper No. 1954. Harvard Institute for Economic Research, Cambridge, Mass.

Gompers, Paul A., Joy L. Ishii, and Andrew Metrick. 2001. Corporate Governance and Equity Prices. Unpublished manuscript. Harvard Business School, Cambridge, Mass.

Greene, Jay. 1995. Fla. Hospital Sold to Bon Secours. *Modern Healthcare*, July 3.

Griliches, Zvi, Ariel Pakes, and Bronwyn H. Hall. 1986. The Value of Patents as Indicators of Inventive Activity. Working Paper No. 2083. National Bureau of Economic Research, Cambridge, Mass.

———. 1991. The Value of Patents as Indicators of Inventive R&D, Patents, and Market Value Revisited: Is There a Second (Technological Opportunity) Factor? *Economics of Innovation and New Technology* 1(3):183–201.

Hall, Bronwyn H. 1993. The Stock Market's Valuation of R&D Investment during the 1980's. *American Economic Review* 83:259–64.

Hansmann, Henry. 1998. *The Ownership of Enterprise*. Cambridge: Harvard University Press.

Hayashi, Fumio.1982. Tobin's Marginal *q* and Average *q*: A Neoclassical Interpretation. *Econometrica* 50:213–24.

Horwitz, Jill R. 2007. Does Corporate Ownership Matter? Service Provision in the Hospital Industry. *Yale Journal on Regulation* 24:139–204.

Irving Levin Associates. 2000. *Hospital Acquisition Report.* 6th ed. Norwalk, Conn.: Irving Levin Associates.

Kaplan, Steven. 1989. The Effects of Management Buyouts on Operating Performance and Value. *Journal of Financial Economics* 24:217–54.

Lagnado, Lucette. 2004. Hospital Found "Not Charitable" Loses Its Status as Tax Exempt. *Wall Street Journal,* February 19.

Leone, Andrew J., R. Lawrence Van Horn, and Gerard J. Wedig. 2005. Abnormal Returns and the Regulation of Nonprofit Hospital Sales and Conversions. *Journal of Health Economics* 24:113–35.

Morck, Randall, Andrei Shleifer, and Robert W. Vishny. 1988. Management Ownership and Market Valuation: An Empirical Analysis. *Journal of Financial Economics* 20: 293–315.

Newhouse, Joseph P. 1970. Towards a Theory of Nonprofit Institutions: An Economic Model of a Hospital. *American Economic Review* 60:64–74.

Norton, Edward C., and Douglas O. Staiger. 1994. How Hospital Ownership Affects Access to Care for the Uninsured. *RAND Journal of Economics* 25:171–85.

Pauly, Mark, and Michael Redisch. 1973. The Not-for-Profit Hospital as a Physicians' Cooperative. *American Economic Review* 63:87–99.

Sloan, Frank A. 2000. Not-for-Profit Ownership and Hospital Behavior. Pp. 1:1142–74 in *Handbook of Health Economics*, edited by Anthony J. Culyer and Joseph P. Newhouse. Amsterdam: Elsevier Science.

Smith, Dean G., Jan P. Clement, and John R. C. Wheeler. 1995. Philanthropy and Hospital Financing. *Health Services Research* 30:615–35.

Steinberg, Richard. 1986. The Revealed Objective Functions of Nonprofit Firms. *RAND Journal of Economics* 16:508–26.

Stern, Scott. 2004. Do Scientists Pay to Be Scientists? *Management Science* 50:835–53.

Thorpe, Kenneth E., and Charles E. Phelps. 1991. The Social Role of Not-for-Profit Organizations: Hospital Provision of Charity Care. *Economic Inquiry* 29:472–84.