

# Analysis of the Rationale for, and Consequences of, Nonprofit and For-Profit Ownership Conversions

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**Objectives.** To examine precursors to private hospitals conversion, both from non-profit status to for-profit status and from for-profit to nonprofit status, as well as the effect of hospital conversions on hospital profitability, efficiency, staffing, and the probability of closure.

**Data Sources.** The Health Care Financing Administration's Medicare Cost Reports and the American Hospital Association's Annual Survey of Hospitals.

**Study Design.** Bivariate and multivariate analyses comparing conversion hospitals to nonconversion hospitals over time were conducted.

**Data Extraction Methods.** The study sample consisted of all private acute care hospital conversions that occurred from 1989 through 1992.

**Principal Findings.** Hospitals that converted had significantly lower profit margins prior to converting than did nonconversion hospitals. This was particularly true for nonprofit to for-profit conversions. After converting, both nonprofit and for-profit hospitals significantly improved their profitability. Nonprofit to for-profit hospital conversions were associated with a decrease in the ratio of staff to patients. No association was found between for-profit to nonprofit conversion and staff-to-patient ratios. The difference seems partially attributed to the fact that nonprofit hospitals that converted had higher staff ratios than the industry average. For-profit to nonprofit hospital conversions were associated with an increase in the ratio of registered nurses to patients and administrators to patients, despite the fact that nonprofit and for-profit hospitals did not differ in these ratios.

**Conclusions.** The improvement in financial performance following hospital conversions may be a benefit to the community that policymakers want to consider when regulating hospital conversions.

**Key Words.** Nonprofit hospital operations, nonprofit, hospital conversions

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The recent increase in purchases of nonprofit hospitals by for-profit companies has generated considerable debate and public attention. Among the concerns raised about conversions are their impact on communities' charitable assets and access to quality healthcare services. Advocates of conversions have argued that they can result in new sources of capital, more efficient management, and greater negotiating clout with third-party payers and vendors. These benefits may also positively affect access and quality (Burstin et al. 1993). This research examines the degree to which hospital conversions involve the acquisition of hospitals in poor financial health and result in improved financial performance of the acquired hospital. It also examines the effect of conversions on staffing and on the probability of hospital closure. Both for-profit to private nonprofit conversions, and private nonprofit to for-profit conversions are studied and compared.

## BACKGROUND

Theories of nonprofit hospitals typically assume that hospital stakeholders maximize some objective function subject to a break-even constraint. The sale of a nonprofit hospital to a for-profit purchaser may contribute to a hospital's objectives or may be necessary due to its resource constraints. Because there is no residual claimant in nonprofit hospitals, it is difficult to determine the hospital's objective function and to predict the benefits, if any, that it might derive from a sale. Different theories have emphasized the interests of physicians (Pauly and Redish 1973), administrators (Newhouse 1970), and the community at large (Ben-Ner 1986) in shaping a hospital's objectives. Selling the hospital may address the interests of any or all of these stakeholders. For example, if a sale will result in greater capital expenditures, physicians may benefit through the purchase of more sophisticated technology. If the sale allows the community to transfer its investment to alternative uses that are more highly valued, such as public health interventions, the community may perceive a benefit from the sale. Because of the complexity of the hospital's

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objective function, it is difficult to predict the factors that will influence the decision to sell the hospital.

The limited research on hospital conversions indicates that financial pressures often play a role in the sale of nonprofit hospitals to for-profit organizations. A study of the financial characteristics of 50 nonprofit hospitals acquired by investor-owned chains between 1978 and 1983 found that the acquired hospitals tended to be small, with relatively low profitability, relatively old and depreciated assets, and a thin equity position (McCue and Furst 1986). Similarly, Mark and colleagues conducted eight case studies in 1996 of nonprofit to for-profit conversions and found that in four cases the hospital had been losing money prior to the sale (Mark, Cheng, Paramore, et al. 1997). Feder and Hadley examined the characteristics of six teaching hospitals that investor-owned chains acquired between 1983 and 1985. Only one of the six hospitals was experiencing serious financial trouble prior to the sale. However, administrators and medical school deans in each of the hospitals stated that they sold the hospital in order to provide "extra resources for research and education and, to a lesser extent, care to the poor" (Feder and Hadley 1987: 327). Finally, Townsend (1983) found in two of five case studies of hospital conversions that occurred in the early 1980s that the need to replace the hospital plant was the prime reason for the sale.

Economic models of for-profit hospitals assume that their objective is to maximize shareholder wealth. This suggests that owners will sell a hospital if the financial benefit exceeds the net present value of the future expected profits. It follows that for-profit hospitals experiencing poor financial performance are more likely to be sold. Research on the sale of for-profit hospitals supports this notion to some extent. McCue and Clement (1992) examined the characteristics of hospitals that HCA and AMI divested. HCA and AMI were two of the leading for-profit hospital companies during the mid-1980s. The hospitals that HCA divested were more likely to have less growth in revenues and a higher debt to total assets position, although the same was not true for the hospitals that AMI divested. The author found no studies, however, that specifically looked at the acquisition of for-profit hospitals by nonprofit hospitals.

The effect of hospital conversions on hospitals' financial and operating performance is an empirical question rather than a theoretical one. The influence of the new owners on the performance of the hospital will depend on the new owners' objectives and their ability to meet those objectives (e.g., managerial skills, access to capital, market dynamics). At this time, the only known study to examine the effect of hospital conversions on

financial performance were case studies conducted by Mark and colleagues. By analyzing audited financial statements and Medicare cost reports, Mark, Cheng, Paramore, et al. (1997) found that six of the eight hospitals that converted had higher profit margins after converting.

## ANALYTIC APPROACH

In this section the study methods, data, and variables are reviewed.

### *Methods*

The characteristics of hospitals that convert were examined using both bivariate statistics and multivariate analyses. The variables were measured over the two years before the conversion occurred. For example, for hospitals that converted in 1989, hospital profitability was measured using data from 1988 and 1987. The model used for these analyses is:

$$R_{i,t} = g_0 + g_1 f_{i,t-1,2} + g_2 P_{i,t-1,2} + g_3 Y_{i,t-1,2} + g_4 M_{i,t-1,2} + \mu_{i,t} \quad (1)$$

where  $R$  indicates whether hospital  $i$  converted in year  $t$ ;  $f_{i,t-1,2}$  is hospital  $i$ 's total margin in the two years prior to converting;  $P_{i,t-1,2}$  is managed care penetration;  $Y_{i,t-1,2}$  is hospital size (i.e., inpatient equivalent discharges); and  $M_{i,t-1,2}$  are other hospital market characteristics (i.e., hospital market concentration as indicated by the Herfindahl index, whether the market is an MSA, hospital beds per capita, and per capita income). Because the dependent variable in these analyses is binary, logistic regression was used.

To examine the effects of hospital conversion on the acquired hospital's financial performance, reduced-form models of hospital profits, costs, and average revenues were estimated. Hospital costs and profits are assumed to be a function of input prices, output, and other hospital characteristics previously found to influence the production process. The volume of hospital services provided was assumed to be endogenous and therefore was excluded from the model; instead, factors that determine demand, such as market competition and per capita income, were included. Some of the unmeasured hospital characteristics that influence the demand for hospital services (e.g., perceived quality), as well as hospital productivity (e.g., managerial skill), were captured by using a hospital-fixed effect. Thus, the model for estimating the effect of conversion on a hospital's financial performance is:

$$F_{i,t} = \beta_0 + \beta_1 W_{i,t} + \beta_2 M_{i,t} + \beta_3 B_{i,t} + \beta_4 I_{i,t} + \beta_5 T_{i,t} + e_i + \eta_{i,t} \quad (2)$$

where  $F_{i,t}$  is hospital  $i$ 's financial performance in year  $t$ ;  $W_{i,t}$  are input prices;  $M_{i,t}$  are hospital market characteristics;  $B_{i,t}$  is a dummy variable that equals one if the hospital is for-profit and 0 otherwise;  $I_{i,t}$  is a term that equals one if the hospital was for-profit in 1987 and 0 otherwise;  $T$  are year dummy variables;  $e_i$  is a hospital-specific error term; and  $\eta_{i,t}$  is a random disturbance. The cost functions are estimated using a log-log specification. Therefore, one can interpret the coefficients as elasticities.

The model used to test the effect of conversion on staffing ratios is similar to the model of the effect of conversion on financial performance except that staffing ratios are adjusted for case mix.

Finally, simple frequencies were used to examine the extent to which hospitals that converted eventually closed. For each conversion that occurred between 1989 and the end of 1992, the probability of closure through the end of fiscal year 1995 was examined. Thus, a longer time period is reviewed for conversions that occurred in 1989 than for those that occurred in 1992.

### *Data*

Data for the study were primarily composed of the Health Care Financing Administration's (HCFA) Medicare Cost Report database, which includes detailed, audited financial and operating information from most community hospitals in the United States. In addition, the American Hospital Association's (AHA) Annual Survey of Hospitals provided information on staffing and was used to verify information about ownership and discharges as reported on the Medicare Cost Reports. Information on the hospitals' markets was obtained from the Bureau of Health Profession's Area Resource File (ARF).

The AHA data was merged to the Medicare Cost Reports using the hospital's name and county. Cases that did not link, for example, because the hospital name cited on the AHA data set was different from that given on the Medicare Cost Reports, were reviewed and merged manually. The ARF was merged to the Medicare Cost Reports using the county and state identifiers.

The study sample for the effect of conversions consisted of the universe of hospitals that submitted Medicare Cost Reports and that engaged in private nonprofit to for-profit conversions, or for-profit to private nonprofit conversions, during the 1989–1993 period. From 1989 through 1992, 33 private nonprofit hospitals converted to for-profit status and 50 for-profit hospitals converted to private nonprofit status. Data were obtained for the 1987–1995 period; thus two years of data were available on the relevant variables prior to the conversions and at least two years of data on the period following conversion. Due to missing data, some conversion cases were “truncated,”

but because the number of cases was relatively small (six hospitals were missing 1995 data and four were missing 1987 data), the results are unlikely to be biased. If there were a bias, it would be toward finding no effect of conversions.

The comparison group consisted of approximately 3,800 acute care private hospitals that did not convert over the same period. Nine years of pooled time-series data were constructed for comparison hospitals in a manner comparable to those of the conversion sample. The final analytic sample consisted of approximately 32,000 observations. Public hospitals and non-acute care facilities were deleted from the sample.

### *Variables*

The financial variables examined included total profit margins, average inpatient Medicare costs per Medicare discharge, average operating expenses per inpatient-equivalent discharge, and average revenues per discharge. Total profit margins were measured as total revenues minus total expenses divided by total operating revenues. They were calculated before income taxes, but net of real estate and employment taxes.

Staffing ratios were calculated per case mix-adjusted patient day. Adjusted patient days combines a hospital's inpatient and outpatient volume into one value by multiplying inpatient days by the ratio of outpatient revenue to inpatient revenue. The resulting adjusted patient day figure is then adjusted for case mix by multiplying the number of adjusted patient days by the HCFA Medicare Case Mix Index. Four types of staffing ratios were calculated: total full time equivalents (FTE), all nurses, registered nurses, and administrators. Nursing staff was measured as the sum of all FTE registered nurses, licensed practical nurses, ancillary personnel (e.g., nurses' aides), physician assistants, and nurse practitioners. Several categories of nursing staff as well as information on administrative staff were not collected on the AHA surveys after 1993; therefore, for conversions that occurred in 1992, there is only one year of postconversion data on total nursing staff and administrative staff.

The number of closures was measured using the AHA Annual Survey of Hospitals, which lists hospital closures by year. In addition, the Department of Health and Human Services in each state in which a hospital closed was called to confirm that the hospital had indeed closed.

HMO penetration was measured as the percentage of a market's population enrolled in HMOs based on data collected by Interstudy and included on the ARF. A hospital's market was defined as the Metropolitan Statistical Area (MSA), for urban hospitals, and as the county and all contiguous counties for hospitals located outside of MSAs.

Total inpatient equivalent admissions (eq. discharges) is a calculation that combines a hospital's inpatient and outpatient volume into one value. Outpatient volume is estimated by multiplying inpatient discharges by the ratio of outpatient revenue to inpatient revenue. Input prices were measured using HCFA Area Wage Indexes, which are calculated for each MSA and have one value for all rural areas in a state. The index is based on wages and salaries of all hospital workers. Because hospital capital equipment and other supplies are purchased in national markets, materials costs were not expected to vary substantially across hospitals and were excluded from the regression models. Changes in competition and demand in a hospital's market was measured by the Herfindahl index (calculated as the sum of hospitals' market shares where market share is calculated based on discharges); by the number of acute care hospital beds per capita; and by per capita income. Because some hospitals submitted Medicare Cost Reports for less than a full year period, a variable to control for the number of months in a hospital's fiscal year was included. Means and standard deviations for the study variables over the study time period (1987 through 1995) are shown in Table 1.

## RESULTS

### *Financial Status Prior to Conversion*

Descriptive statistics indicate that hospitals that convert are more likely to have experienced a financial loss prior to conversion than the average hospital. Eighty percent of the profit margins of nonprofit hospitals that converted to for-profit status were negative in the two years before they converted. Similarly, 50 percent of the profit margins of for-profit hospitals that converted to nonprofit status were negative in the two years prior to their conversion. In comparison, over the same time period only 33 percent of all private acute care hospitals had negative margins.

Tables 2 and 3 show the results of the logistic regression estimates for the private nonprofit to for-profit conversions and the for-profit to private nonprofit conversions, respectively. For three of the four years studied (1989, 1991, and 1992), margins prior to conversion were statistically significant and negatively related to the probability of converting from private nonprofit to for-profit status. For one of the four years (1989), margins prior to conversion were also negatively related to the probability of converting from for-profit to private nonprofit status.

Urban status was positive all four years for nonprofit conversions and positive only in 1991 for for-profit conversions, indicating greater conversion

Table 1: Means and Standard Deviations of Study Variables by Year, 1987-1995

Variable Name	1987	1988	1989	1990	1991	1992	1993	1994	1995
Total margin (%)	1.3 (0.113)	1.0 (0.116)	1.6 (0.107)	1.8 (0.106)	2.8 (0.093)	2.9 (0.094)	3.4 (0.087)	3.7 (0.099)	4.6 (0.092)
Average Medicare costs (per eq. discharge)	3,556 (1,350)	3,888 (1,462)	4,250 (1,578)	4,579 (1,668)	4,821 (1,667)	4,967 (1,735)	5,041 (1,762)	4,998 (1,756)	4,965 (1,720)
Average operating costs (per eq. discharge)	4,855 (2,603)	5,414 (2,910)	6,020 (3,096)	6,664 (3,274)	7,273 (3,330)	7,947 (3,642)	8,461 (3,813)	8,901 (4,013)	9,371 (4,250)
Average revenues (per eq. discharge)	4,704 (2,363)	5,230 (2,600)	5,801 (2,737)	6,404 (2,837)	7,153 (3,095)	7,796 (3,267)	8,352 (3,372)	8,825 (3,552)	9,355 (3,917)
FTEs per 1,000 adjusted patient days	8.99 (2.76)	8.86 (2.80)	8.82 (2.77)	8.90 (2.88)	8.97 (3.00)	9.07 (3.18)	9.02 (3.10)	9.42 (3.29)	9.49 (3.38)
Registered nurses per 1,000 adjusted patient days	2.20 (1.03)	2.13 (0.96)	2.13 (1.04)	2.10 (0.97)	2.12 (0.96)	2.12 (1.01)	2.16 (1.03)	2.34 (1.08)	2.38 (1.13)
Total nurses per 1,000 adjusted patient days	3.63 (1.49)	3.55 (1.47)	3.52 (1.51)	3.48 (1.48)	3.46 (1.43)	3.45 (1.60)	3.41 (1.57)	—	—
Administrators per 1,000 adjusted patient days	0.13 (0.16)	0.13 (0.16)	0.12 (0.15)	0.12 (0.16)	0.12 (0.16)	0.15 (0.21)	0.17 (0.22)	—	—
Wage index	0.95 (0.16)	0.94 (0.16)	0.95 (0.16)	0.96 (0.16)	0.94 (0.16)	0.94 (0.16)	0.93 (0.17)	0.93 (0.17)	0.94 (0.18)
Beds per capita	4.51 (1.49)	4.40 (1.46)	4.31 (1.51)	4.27 (1.55)	4.21 (1.55)	4.12 (1.55)	4.08 (1.54)	4.03 (1.53)	4.01 (1.51)
Percent population in HMO	0.099 (0.140)	0.113 (0.150)	0.12 (0.15)	0.12 (0.16)	0.12 (0.17)	0.13 (0.17)	0.14 (0.18)	0.15 (0.19)	0.15 (0.20)
Herfindahl index	0.18 (0.15)	0.17 (0.15)	0.18 (0.15)	0.18 (0.16)	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)
Per capital income	14,383 (3,087)	15,778 (3,395)	16,908 (3,597)	17,970 (3,637)	18,359 (3,669)	19,250 (3,780)	19,984 (3,941)	20,024 (3,964)	20,075 (4,046)
Months in fiscal year	11.8 (1.3)	11.7 (1.4)	11.8 (1.3)	11.8 (1.2)	12.0 (0.14)	12.0 (0.15)	12.0 (0.18)	11.7 (1.50)	11.6 (1.74)

Source: Health Care Financing Administration's Medicare Cost Reports, American Hospital Association's Annual Survey of Hospitals, Bureau of Health Professions Area Resource File.



**Table 2: Logistic Regression Results: Determinants of Nonprofit to For-Profit Hospital Conversion**

<i>Variable†</i>	<i>Year Conversion Occurred</i>			
	<i>1989</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>
Intercept	-1.41	-0.40	19.82	21.00
Total margin	-7.55***	0.34	-5.54***	-3.63**
Log(eq. discharges)	0.09	-0.38	0.07	-0.33*
Urban	3.15**	2.25*	2.88***	1.25*
Log(beds/capita)	3.27**	-0.61	1.36**	-2.25***
Log(HMO enrollment)	-0.34*	-0.33	-0.11	-0.16
Log(Herfindahl index)	-1.64***	-0.63	-0.47	-0.64*
Log(per capita income)	-2.14	-0.50	-3.11**	-2.68*
Months in fiscal year	0.08*	-0.27*	-0.16*	0.15
Log likelihood ratio	127	72	285	225
Chi-square (d.f.)	51(8)***	27(8)***	(75)***	32(8)***
<i>n</i>	7,725	7,612	7,461	7,143

\* $p < .1$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

†Variables measured over two-year period prior to conversion.

**Table 3: Logistic Regression Results—Determinants of For-Profit to Nonprofit Hospital Conversion**

<i>Variable†</i>	<i>Year Conversion Occurred</i>			
	<i>1989</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>
Intercept	0.033	7.87	13.42	6.74
Total margin	-3.25***	-2.16	2.12	-1.16
Log(eq. discharges)	-0.17	-0.41*	-0.25	-0.31
Urban	-0.12	-0.05	1.08*	0.35
Log(beds/capita)	0.25	-0.47	-1.00*	0.21
Log(HMO enrollment)	-0.08	0.11	-0.09	-0.01
Log(Herfindahl index)	0.02	0.20	-0.67***	-0.13
Log(per capita income)	-0.39	-0.80	-1.66	-1.36
Months in fiscal year	-0.16*	-0.12	-0.16*	0.19
Log likelihood ratio	289	236	426	259
Chi-square (d.f.)	45(8)***	32(8)***	24(8)***	5(8)
<i>n</i>	7,713	7,599	7,451	7,142

\* $p < .1$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

†Variables measured over two-year period prior to conversion.

activity in urban markets among nonprofit hospitals. Per capita income was negative in 1991 and 1992 for nonprofit conversions and negative but statistically insignificant for all four years for for-profit conversions. One explanation

for this finding is that poorer areas are more likely to have financially distressed hospitals that, in turn, are more likely to undergo asset transfers. The Herfindahl index was negative in 1989 and 1992 for nonprofit conversions and negative in 1991 for for-profit conversions, indicating that conversion activity is more likely when hospital markets are more competitive. The coefficient on managed care penetration was marginally statistically significant only for the nonprofit to for-profit equation in 1989. Thus, managed care enrollment appears to play only a weak role in hospital conversions.

### *Effects of Hospital Conversions*

The results of the regression analyses of the effects of conversion on profitability, operating expenditures, Medicare expenditures, average revenues, and staffing are shown in Table 4.

*Profit Margins.* Profit margins following conversion were found to increase both for hospitals that converted from nonprofit to for-profit status and for hospitals that converted from for-profit to nonprofit status. The effect of conversion on profitability was slightly greater in the case of for-profit to nonprofit conversions.

The signs of most of the other coefficients are in the expected direction. The coefficients on beds per capita indicate that the greater the competition in the market, the lower the profit margins. HMO penetration was negative and significant at the .10 level. Per capita income was positively associated with profit margins. Curiously, the Herfindahl index was negatively associated with profit margins.

*Expenditures.* Both nonprofit to for-profit and for-profit to nonprofit conversions were associated with an increase in operating expenditures. One explanation for this finding is that after a hospital is acquired, investment in hospital capital is increased. In contrast, Medicare costs per Medicare discharge decreased in converted hospitals. The size of the decrease in Medicare costs was greater for nonprofit acquisitions of for-profit hospitals than for for-profit acquisitions of nonprofit hospitals. The signs on the other coefficients are in the expected direction. An increase in wages is associated with an increase in both operating and Medicare expenditures per case. Beds per capita and competition are negatively associated with operating and Medicare expenditures per case, while per capita income is positively associated with operating and Medicare expenditures per case.

*Revenues.* Average revenues increased after both types of conversions. Competition and beds per capita were negatively associated with average revenues, while per capita income was positively associated with average revenues.

Table 4: Results from Fixed-Effects Model—Effects of Conversion on Financial Performance and Staffing Ratios

<i>Independent Variable</i>	<i>Measured per Inpatient Equivalent Discharge</i>						
	<i>Profit Margins</i>	<i>Log of Average Operating Costs</i>	<i>Log of Average Medicare Costs</i>	<i>Revenues per Case</i>	<i>FTEs</i>	<i>Registered Nurses</i>	<i>All Nurses Administrators</i>
Nonprofit → For-Profit Conversion	0.026***	0.050***	-0.033***	284***	-0.21**	-0.050	-0.097
Interaction	0.008**	0.003	-0.031***	485***	0.15**	0.15***	0.018
Log(wage index)	0.084***	0.024***	0.18***	-842***	0.511	-0.074	0.134
Log(beds per capita)	-0.037**	-0.071***	-0.077***	-2,833***	-1.82***	-0.451***	-0.383***
Log(Herfindahl index)	-0.033***	0.142***	0.053***	845***	-0.112	-0.045	-0.164
Log(per capita income)	0.055***	1.44***	1.10***	12,610***	0.803***	0.156***	-0.641***
Log(HMO penetration)	-0.001*	-0.003	-0.0001	2.34	-0.002	0.004	0.015
Fiscal year length	0.007***	-0.0003***	-0.001***	6.29	-0.051***	-0.031***	-0.053***
For-Profit → Nonprofit Conversion†	0.034***	0.053**	-0.064***	769***	-0.06	0.10**	-0.079
<i>R</i> <sup>2</sup>	0.05	0.86	0.89	0.79	0.78	0.71	0.73
<i>n</i>	30,459	31,018	32,817	30,837	29,172	29,644	23,746

\*  $p \leq .10$ ; \*\*  $p \leq .05$ ; \*\*\*  $p \leq .01$ .

† Calculated by summing the coefficients of the for-profit conversion and the interaction variables, and calculating their joint significance.

*Staff-to-Patient Ratios.* Full model results where staff-to-patient ratios are the dependent variable are shown in Table 4 and summarized in Table 5. Nonprofit to for-profit conversion was associated with a decrease in total staff-to-patient ratios. The coefficients on the two nurse-to-patient ratios were negative but statistically insignificant, and the coefficient and the administrator-to-patient ratio were positive but also statistically insignificant. This suggests that after the for-profit hospitals acquired the nonprofit hospitals, for-profit hospitals may have reduced total staff-to-patient ratios by reducing the number of nurses and/or other technical and support staff not measured here (e.g., laboratory and x-ray technicians, custodial staff).

In contrast, no significant association was found between for-profit to nonprofit conversion and total staff-to-patient ratios. For-profit to nonprofit conversion was associated with an increase in registered nurse-to-patient ratios and with an increase in administrator-to-patient ratios. The coefficient on the total nurse-to-staff ratio was negative but statistically insignificant. The increase in the ratio of registered nurses and administrators to patients must have been balanced by a decrease in other types of staff since, overall, no change was found in the total of FTEs to patients. Nonprofit managers may have decreased the number of non-RN nurses or the number of other technical and support staff, or both.

The staffing ratio models also indicate that an increase in beds per capita is associated with a decrease in staffing ratios. In contrast, an increase in per capita income is associated with an increase in all staffing ratios except for total nurses, which was negatively correlated. HMO penetration was positively associated with administrator-to-patient ratios.

*Closure.* Of the 33 hospitals that converted from private nonprofit to for-profit status between 1989 and the end of 1992, three subsequently closed

Table 5: Summary of Association Between Conversion and Subsequent Staff-to-Patient Ratios

	<i>Sign of the Conversion Coefficient</i>			
	<i>FTEs</i>	<i>Registered Nurses</i>	<i>All Nurses</i>	<i>Administrators</i>
Nonprofit → For-profit Conversion	Sig-	-	-	+
For-profit → Nonprofit Conversion	-	Sig+	-	Sig+

Sig: Significant at at least  $p < .05$ .

Note: Staffing ratios are measured per inpatient equivalent discharge.

(11 percent) by 1995. Of the 50 hospitals that converted from for-profit to private nonprofit status, three also closed (6 percent).

*Ownership Effects.* To understand whether the effects of conversion are associated with a change in ownership and management or with the type of ownership, the differences in the financial and operating characteristics of for-profit and nonprofit hospitals across the seven years studied were examined. If nonprofit and for-profit hospitals differ significantly in these characteristics, one is more likely to attribute changes in operating and financial status following conversion to differences between nonprofit and for-profit organizations rather than to the fact that a hospital was sold to new owners. As shown in Table 6, these results suggest that the effects of conversion on profits, expenses, and staffing ratios should not be attributed primarily to differences between for-profit and nonprofit hospitals.

Profit margins were higher for nonprofit hospitals in 1989 and 1990, equivalent between nonprofit and for-profit hospitals in 1991, and higher for for-profit hospitals in 1992–1995. For six of the seven years examined, average operating expenses and average Medicare expenses were equivalent between for-profit and nonprofit hospitals. Average revenues were greater for for-profit hospitals than for nonprofit hospitals in all seven years examined. Thus, it is somewhat surprising that for-profit to nonprofit conversions had a greater positive effect on average revenues than did nonprofit to for-profit conversions.

In six of the seven years, total staff-to-patient ratios and registered nurse-to-patient ratios were significantly higher in the for-profit hospitals than in the nonprofit hospitals. In each of the five of the years examined, total nurse-to-patient ratios were also higher in the for-profit hospitals than in the nonprofit hospitals. Thus, the finding that total staff-to-patient ratios decreased after nonprofit hospitals converted to for-profit status but not in for-profit to nonprofit conversions does not seem to be due to differences in staffing between nonprofit and for-profit hospitals. Similarly, the fact that registered nurse-to-patient ratios increased in the case of nonprofit acquisitions of for-profit hospitals does not appear to be due to differences by ownership. Finally, there was no difference in administrator-to-staff ratios by ownership. These results suggest that the differences in the effects of nonprofit and for-profit conversions on staffing may be a function of the types of hospitals that are acquired rather than of consistent differences in the operation of for-profit and nonprofit hospitals.

*Selection Effects.* To further distinguish whether the changes in hospitals that converted are a function of the characteristics of the acquired hospital or whether they stem from differences between for-profit and nonprofit

Table 6: Average of Hospital Operating Characteristics by Ownership Status and Year

	1989	1990	1991	1992	1993	1994	1995
Average operating costs							
Nonprofit	4,799*	5,335	5,365**	6,019	6,529	8,367	7,406
For-Profit	5,868*	6,076	7,319**	7,365	7,996	8,272	7,367
Average Medicare costs							
Nonprofit	4,238	4,564	4,820	4,961	5,059	5,054***	5,027
For-Profit	4,298	4,640	4,826	4,998	4,947	4,734***	4,703
Average profit margins							
Nonprofit	0.023***	0.022***	0.028	0.027**	0.031***	0.035*	0.042***
For-Profit	-0.01***	-0.002***	0.025	0.049**	0.047***	0.047*	0.061***
Average revenues per discharge							
Nonprofit	5,713***	6,349**	7,086**	7,723***	8,291**	8,826	9,306
For-Profit	6,154***	6,636**	7,456**	8,163***	8,671**	8,820	9,556
FTEs per 1,000 adjusted patient days							
Nonprofit	8.79	8.86**	8.90***	9.04	8.98*	9.37**	9.44*
For-Profit	8.91	9.08**	9.28***	9.20	9.21*	9.67**	9.70*
Registered nurses per 1,000 adjusted patient days							
Nonprofit	2.10***	2.08*	2.10***	2.12	2.14**	2.30***	2.32***
For-Profit	2.24***	2.16*	2.21***	2.16	2.27**	2.51***	2.65***
Total nurses per 1,000 adjusted patient days							
Nonprofit	3.44***	3.42***	3.40***	3.41***	3.35***	-	-
For-Profit	3.80***	3.72***	3.77***	3.67***	3.75***	-	-
Administrators/Assistant administrators per 1,000 adjusted patient days							
Nonprofit	0.12	0.12	0.12	0.16	0.17	-	-
For-Profit	0.12	0.13	0.12	0.14	0.16	-	-

\*  $p \leq .10$ ; \*\*  $p \leq .05$ ; \*\*\*  $p \leq .01$ .

Source: AHA Annual Survey and Medicare Cost Reports.

**Table 7: Two-Year Average of Hospitals' Operating Characteristics Prior to Conversion Versus Nonconversion Hospitals**

	<i>1987-1988</i>	<i>1988-1989</i>	<i>1989-1991</i>	<i>1990-1991</i>
<b>Average Medicare costs</b>				
Nonprofit to for-profit converts	4,227***	4,475	4,740	4,878
For-profit to nonprofit converts	3,495*	3,806	4,124*	4,302*
Nonconversions	3,778***	4,114	4,453*	4,744*
<b>Average prices</b>				
Nonprofit to for-profit converts	4,845	5,206	5,859	6,775
For-profit to nonprofit converts	5,024	5,547	6,002	6,545
Nonconversions	5,043	5,571	6,143	6,818
<b>FTEs per 1,000 adjusted patient days</b>				
Nonprofit to for-profit converts	10.14***	10.12***	9.92***	9.78***
For-profit to nonprofit converts	9.38	9.09	8.82	8.93
Nonconversions	8.89***	8.81***	8.83***	8.91***
<b>Registered nurses per 1,000 adjusted patient days</b>				
Nonprofit to for-profit converts	2.44**	2.27	2.23	2.31
For-profit to nonprofit converts	2.40	2.32	2.09	2.05
Nonconversions	2.17**	2.13	2.12	2.11
<b>Administrators per 1,000 adjusted patient days</b>				
Nonprofit to for-profit converts	0.17***	0.17***	.015	0.15
For-profit to nonprofit converts	0.18***	0.15	0.12	0.13
Nonconversions	0.12***	0.12***	0.12*	0.11

\*  $p \leq .10$ ; \*\*  $p \leq .05$ ; \*\*\*  $p \leq .01$ .

*Source: AHA Annual Survey and Medicare Cost Reports.*

hospitals, the operating performance of for-profit- and nonprofit-conversion hospitals was examined relative to that of nonconversion hospitals, in the two years prior to conversion. As shown in Table 7, it appears that the only results that may have been significantly influenced by selection effects are the effects of nonprofit to for-profit conversion on total staff-to-patient ratios. In all four periods examined, nonprofit hospitals that converted had higher total staff-to-patient ratios prior to converting than did nonconversion hospitals. The greater effect of nonprofit acquisitions on Medicare costs per case and average revenues do not appear to be due to selection effects.

## CONCLUSIONS

Before discussing the possible implications of this research, the limitations of the study should be highlighted. One limitation is that the postconversion study time period was only between three and six years. Had the study time

period been longer, there might have been a greater association between hospital conversion and closure. Moreover, the effect of conversion on staffing and financial performance might not have endured. A second limitation is that the study examined hospital conversions that occurred only during the 1989 to 1992 time period. The large number of conversions during 1995 and 1996 may differ in character from those of the earlier time period. Finally, the study did not examine whether the characteristics of hospital conversions differed by the type of acquiring company, such as the size of the acquiring chain and the location of its other hospitals. These limitations argue for additional research on hospital conversions.

The results of this study suggest that hospital conversion may be a response to a hospital's poor financial health. In addition, the study found that hospital conversion was, on average, associated with an improvement in a hospital's financial performance. One implication of this finding is that policymakers and regulators may need to weigh the risks of allowing a hospital to change ownership form against the risk that a hospital will close if it does not convert. In addition to the threat of closure, poor financial performance may prevent needed renovations and maintenance of the hospital's plant; delay the purchase of new equipment; reduce services; and result in lower staffing levels, wages, and benefits. As the hospital industry becomes more competitive and experiences greater pressure for cost containment, the transfer of assets that occurs through conversions may grow more frequent and may become a more important way to keep hospitals open and well maintained.

On the other hand, the extent of community benefits resulting from improved financial performance depends on the way in which financial health is restored and how the new profits are reinvested. Both for-profit and nonprofit hospital conversions were found to result in improved financial performance by generating higher revenues per case and reducing Medicare costs. Higher revenues may stem from improved collection policies, better investments, or higher prices. If hospital conversions result in increased prices, such a result may indicate that the acquisitions need further scrutiny from an antitrust perspective.

This study suggests that the improvement in hospitals' financial performance after a change in ownership may stem more from the acquiring hospital's better management and/or enhanced resources than from characteristics inherent in different ownership types. Both nonprofit and for-profit conversions resulted in improved financial performance, and both did so in relatively similar ways (i.e., by lowering Medicare costs and raising revenues per case). The similar ability of for-profit and nonprofit management to turn around



ailing hospitals is consistent with the fact that few corresponding differences in efficiency, cost, or profits by ownership form have been found in previous studies (Arrington and Haddock 1990; Bays 1979; Becker and Sloan 1985; Coelen 1986; Cowing, Holtman, and Powers 1983; Coyne 1982; Friedman and Shortell 1988; Gaynor and Anderson 1994; Granneman, Brown, and Pauly 1985; Herzlinger and Krasker 1987; Lewin, Derzon, and Margulies 1981; Ozcan, Luke, and Akserver 1992; Pattison and Katz 1993; Pattison 1980, Sloan and Vraciu 1983; Watt, Derzon, and Renn 1986a,b).

The main difference between for-profit to nonprofit and nonprofit to for-profit conversions seems to be the effect on staffing. For-profit management tended to reduce total staff-to-patient ratios following the acquisition of a nonprofit hospital, although there was evidence that this was in reaction to the fact that the acquired hospitals had higher staff-to-patient ratios than the industry norm. Nonprofit management tended to increase registered nurse-to-patient ratios and administrator-to-patient ratios following the acquisition of a for-profit hospital. This does not appear to be a reaction to lower staffing ratios in for-profit hospitals that convert, or to lower staffing ratios in for-profit hospitals in general, as compared to those in nonprofit hospitals. It may be a function of the management style of nonprofit purchasers of for-profit hospitals. For example, nonprofit managers may view increases in registered nurses as a method of attracting physicians and patients to the hospital. Similarly, nonprofit hospitals may have fewer administrators in corporate offices than the for-profit hospitals that they acquired. Clearly, these findings merit additional research with more detailed information on staffing patterns.

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