

MARKET WATCH

Making Profits And Providing Care: Comparing Nonprofit, For-Profit, And Government Hospitals

Discussion of the value of nonprofit hospital ownership must account for the differences in service offerings among hospital types.

by Jill R. Horwitz

ABSTRACT: Three types of entities—nonprofit, for-profit, and government—own hospitals. Yet we know neither whether hospital types specialize in different medical services nor how service profitability affects specialization. In this econometric analysis of American Hospital Association data for every U.S. urban, acute care hospital (1988–2000), more than thirty services were categorized as relatively profitable, unprofitable, or variable. For-profits are most likely to offer relatively profitable medical services; government hospitals are most likely to offer relatively unprofitable services; nonprofits often fall in the middle. For-profits are also more responsive to changes in service profitability than the other two types.

HOW DO FOR-PROFIT hospitals make profits? One theory is that they manage their case-mix more carefully than nonprofit and government hospitals do. For example, they differentially locate in areas with relatively well-insured patients.¹ Underlying this concept of profit making is the assumption that all general hospitals, regardless of ownership, are alike in the types of medical services they provide. They merely differ in their patient mix.

This paper advances a different mechanism of profit making. It proposes that for-profit hospitals are more likely than other types to decide which medical services to offer based on service profitability. Under this theory, general hospitals do not provide a standard array of medical services. Instead, they specialize. Analyzing 1988–2000 data on medical service provision for every U.S. urban, general hospital, this paper tests whether hospital types specialize in services based on profitability.

Which profit-making method hospitals adopt, and to what degree hospital types employ them, matters a great deal for tax policy, structuring reimbursement, and quality of care.

Two-thirds of all U.S. urban hospitals are nonprofit, with the remainder split between for-profit and government ownership. These hospital types operate under different legal rules. For-profits may distribute accounting profits to shareholders, whereas government and nonprofit hospitals enjoy income and property tax exemptions. However, there is reason to expect all hospitals to provide a similar array of medical services: General hospitals all treat patients with a mix of needs, contract with the same insurers and government payers, operate under the same health regulations, and employ staff with the same training and ethical obligations. Consequently, it is not surprising that much of the empirical literature on corporate ownership finds little difference among hospital types.²

Jill Horwitz (jrhorwit@umich.edu) is an assistant professor of law at the University of Michigan Law School in Ann Arbor.

Although the ownership literature is voluminous and widely debated in the United States and abroad, it is incomplete.³ Studies have mainly examined financial topics such as costs, profits, billing, the value of uncompensated care, and responsiveness to financial pressure. Important subjects such as quality, physician control, and patient access have been studied less frequently, have focused on a limited number of services, and have generated inconclusive results.⁴

Researchers have not previously looked broadly at whether any hospital types systematically offer relatively profitable services and avoid relatively unprofitable ones. To that end, this study investigates how ownership affects the central activity of hospitals: medical care provision. It evaluates more than thirty services, ranging from sports medicine to AIDS treatment, to ask whether ownership is correlated with offering services and how those choices relate to profit seeking.

Study Data And Methods

■ **Hospital population.** Data are from the American Hospital Association's (AHA's) Annual Surveys of Hospitals during 1988–2000 and the 1990 U.S. census. The AHA survey had almost a 20 percent nonresponse rate, and nonrespondents were disproportionately for-profit hospitals (1988: 3 percent nonprofit, 4 percent government, 18 percent for-profit; 2000: 14 percent nonprofit, 20 percent government, 26 percent for-profit). Since the same hospitals were not missing in all years, however, the results should be valid. The analysis included all nonrural, acute care hospitals that operate in metropolitan statistical areas (MSAs) with at least two general medical and surgical hospitals, excluding military, uncategorized federal, and prison hospitals. I excluded rural hospitals because there are relatively few for-profit hospitals in rural areas and they provide a limited range of services. In 1995, for example, of the roughly 2,500 rural hospitals, approximately 8 percent were for-profit, and only a few provided open-heart surgery.

■ **Study variables.** Hospitals were classified by ownership: nonprofit, for-profit, and

government. They were asked whether each service was offered at the hospital or another hospital, or was not available (1988–1993), or whether the service was offered at the hospital or a subsidiary, another location in the system, the network, or a joint venture (1994–2000). Because the study assessed hospital-based services, the first categories in the two survey versions were treated as equivalent. Roughly forty variables were included in the data on acute care services, of which thirty-two were sufficiently well-defined and consistent across the relevant time period to be useable (Exhibit 1).

I imputed missing values using data from the years before and after the missing year. For the end years (1988, 2000) I based the imputation on the next or previous two years. Where several values were missing, I excluded the observations. Generally, I imputed fewer than 4 percent of observations for each service.

■ **Determining profitability.** To test hospitals' responsiveness to service profitability, I sorted services into three categories: relatively high, low, and variable profitability (see Exhibit 1). The classifications were based primarily on the peer-reviewed medical and social science literature. Also, because Medicare payments are the largest single source of hospital revenues, I consulted Medicare Payment Advisory Commission (MedPAC) and Prospective Payment Assessment Commission (ProPAC) reports to Congress for the relevant years.⁵ Interviews with hospital administrators and doctors, as well as analyses of the socioeconomic or insurance status of patients likely to demand various services, supported the case that a service was relatively profitable or unprofitable.

Because this project is concerned primarily with hospitals' behavior and motivation, I checked the scientific literature with a review of trade publications, business magazines, and newspaper reports. The qualitative evaluation of relative service profitability was critical to the project because perceptions of whether a service would be profitable were likely as important determinants of service investment choices as whether services turned out to be profitable. The various sources yielded re-

EXHIBIT 1
Percentage Of Hospitals Offering Services And Relative Profitability Status, 1988–2000

Service	Percent	Relatively profitable	Relatively unprofitable	Variable
AIDS (outpatient)	11		●	
AIDS services	54		●	
AIDS unit	4		●	
Alcohol beds	30		●	
Alcohol/drug (outpatient)	33		●	
Angioplasty	40	●		
Birthing room	69	●		
Burn treatment	5		●	
Cardiac catheterization lab	54	●		
Computed tomography (CT) scanner	92	●		
Child psychiatric services	25		●	
Diagnostic radioisotope facility	81	●		
Emergency room	96		●	
Extracorporeal shock-wave lithotripter	17	●		
Fitness center	24	●		
HIV test	60		●	
Home health	44			●
Magnetic resonance imaging (MRI)	46	●		
Neonatal intensive care	35	●		
Obstetrics (beds)	73		●	
Obstetrics (births)	71		●	
Open-heart surgery	34	●		
Orthopedic surgery	92	●		
Pediatric intensive care unit	22	●		
Positron emission tomography	6	●		
Psychiatric (inpatient)	49		●	
Psychiatric emergency services	48		●	
Skilled nursing	35			●
Single photon emission CT	45	●		
Sports medicine	32	●		
Trauma center	25		●	
Ultrasound	96	●		
Women's center	47	●		

SOURCE: Author's analysis of American Hospital Association Annual Surveys, 1988–2000.

NOTE: Includes all nonrural, general medical and surgical hospitals, in metropolitan statistical areas with more than one hospital.

markably similar results.⁶ Abbreviated examples of three services follow.

Open-heart surgery, for example, is relatively profitable. Like almost all surgical and related services, cardiac services—including cardiac catheterization labs, angioplasty, and coronary artery bypass graft (CABG)—are widely known to be hospital profit centers.⁷

Insurers typically reimburse heart attack treatments at high rates, patients receiving CABG are unusually well insured since most are covered by Medicare, and there is high and increasing spending on cardiac care.⁸ From 1984 to 1994, the real price for bypass surgery among Medicare patients rose 2.3 percent annually, from \$29,176 to \$36,564 (1991 dollars),

while the share of patients receiving the treatment increased by one percentage point annually, from 5 percent to 15 percent.⁹ The costs of supplying CABG in real terms either were flat or fell during the period.¹⁰ In 1991, because spending on bypass surgery was so high, the Centers for Medicare and Medicaid Services (CMS, then HCFA) ran a pilot program in which hospitals and physicians negotiated prices.¹¹ During the study period, for-profit corporations opened single-service cardiac surgery centers, while neighboring hospitals complained of losing profitable business.¹²

Conversely, hospital-based, psychiatric emergency services are relatively unprofitable for several reasons: (1) the emergency department (ED) is a comparatively unprofitable setting, which attracts patients whose admissions are more costly than those of patients who are admitted to the hospital by other means; (2) psychiatric care reimbursement is uncertain and often low relative to cost; and (3) the care attracts a poor, poorly insured, sick, and difficult-to-manage population.¹³

Compared with that of acute care, the profitability of postacute services varied dramatically during the 1980s and 1990s. With legal challenges to reimbursement resolved and the hospital prospective payment system (PPS) implemented, postacute services became highly profitable by the early 1990s.¹⁴ Unlike acute services diagnosis-related group (DRG) payments in which hospitals receive a per episode payment for each patient, Medicare paid hospitals a cost-related reimbursement for postacute services. Hospitals could increase reimbursements by unbundling the services and transferring patients to postacute care at the end of their hospital stay.¹⁵ There is considerable evidence of these transfers. From 1981 to 1998 the number of inpatient days for Medicare beneficiaries fell at an average annual rate of 4.1 percent; from 1986 to 1998 home health visits for Medicare beneficiaries grew at an average annual rate of 15.6 percent.¹⁶ Payments were particularly generous to new entrants, with skilled nursing facilities (SNFs) and home health services exempt from cost limits for the first years of operation. In fact, home

health payments grew from \$3.9 billion to more than \$18.3 billion between 1990 and 1996.¹⁷ Hospital administrators and regulators alike recognized the profitability potential of postacute care.¹⁸

With passage of the 1997 Balanced Budget Act (BBA) of 1997, however, the profit-making opportunities plummeted. Medicare payments were reduced, the CMS developed a PPS for postacute services, and home health care spending fell by a factor of two.

■ **Statistical analysis.** Using a probit model, I analyzed whether ownership was correlated with the probability of offering each of approximately thirty medical services (Exhibit 1). Independent variables included ownership, year, and the interaction of the two.

To correct for potential biases, I controlled for hospital and market characteristics. Hospital variables included size (measured by admissions), teaching status (measured by teaching association membership), and a dummy variable for location by geographic region. Market characteristics included patients' sex, race, household income, and age. These were compiled using the ten-mile radii around the centers of the hospitals' ZIP codes, the mean distance that captures 75 percent of discharges among acute care urban hospitals.¹⁹

I adjusted for heteroskedasticity, and, because the probability of offering a service is not independent among years, I allowed for an arbitrary covariance matrix within each hospital over time. By varying the hospital's ownership type while holding the independent variables constant (at 1994 levels or the next-closest year), I predicted the probabilities that each hospital in each year would offer a service. I then averaged the individual predicted probabilities to obtain a single probability that a hospital type would offer a service each year.

I performed sensitivity tests on the three services described above. Because size is the best predictor of service offering, I restricted the regressions to the observations in the top, bottom, and middle two quartiles of hospitals measured by admissions.

To ensure that ownership, rather than geography, explained these results, I ran several

sensitivity tests related to hospital regions. John Wennberg and others have observed that medical service provision varies considerably by small region.²⁰ Consequently, one might think that firm types chose where to operate based on the local character of demand. I tested this alternative explanation for the results by using a fixed-effects approach, including an indicator variable for the year 2000 Hospital Referral Regions (HRRs) in which each hospital operates. I also altered the region variable to account for areas of high for-profit penetration (for example, the South and Southwest) and included dummy variables for all nine AHA regions.

To test the sensitivity to other market characteristics, I added age-squared categories for the percentage of the population over age sixty-five and over age eighty. Because state payment policies for mental health services vary considerably, I included state dummies and state-year interactions for the psychiatric emergency service estimations. In addition, to test variation within the government hospital category, I excluded hospitals in the Department of Veterans Affairs (VA) system.

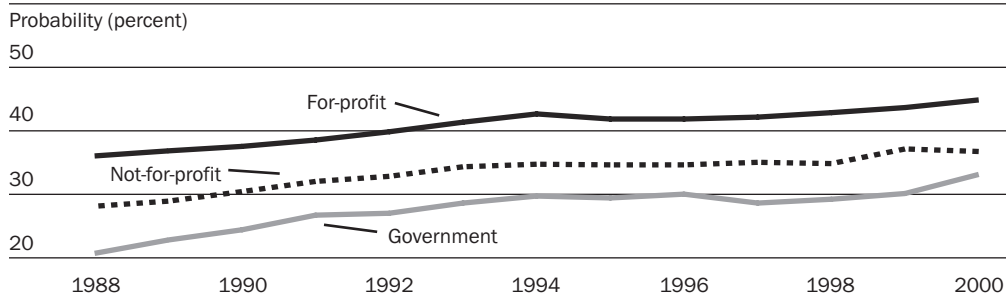
Sensitivity tests also included propensity score analysis, a method used to make causal inferences when assignment to a group, such as nonprofit ownership status, is not random.²¹ The results confirmed that I compared hospitals that differed primarily by ownership and

not other hospital characteristics such as hospital size. More specifically, I determined the conditional probability of corporate ownership (nonprofit versus for-profit; nonprofit versus government, government versus for-profit), given the observed characteristics used in the Probit estimates (the propensity scores), created five subcategories defined by the estimated propensity score, and predicted the probability of a hospital type's offering a service in a given year, controlling for the propensity grouping.

Study Results

The results demonstrate that among comparable hospitals, for-profits are more likely than nonprofits, which in turn are more likely than government hospitals, to offer open-heart surgery. The magnitude of these differences seems large, given the importance of the decision to offer the service and the constraints to doing so. For-profits are, on average, 13.0 percentage points more likely than government hospitals (40.9 percent versus 27.9 percent, $p < .001$) and 7.3 percentage points more likely than nonprofit hospitals (40.9 percent versus 33.6 percent, $p < .001$) to offer open-heart surgery (Exhibit 2). Restricting the data to the smallest hospitals—those in the bottom two admissions quartiles—the nonprofit-government difference for open-heart surgery was insignificant. This result is expected because so

EXHIBIT 2 Hospitals' Probability Of Offering Open-Heart Surgery, By Ownership Type, 1988–2000



SOURCE: Author's analysis of data from American Hospital Association Annual Surveys, 1988–2000.

NOTES: Probit predicted probabilities include all nonrural, general medical and surgical hospitals in metropolitan statistical areas with more than one hospital. *P* values are based on the chi-square test of the differences between average predicted probabilities of offering services in 1988–2000 by hospital type. Not-for-profit versus for-profit, $p < .001$; not-for-profit versus government, $p = .001$; for-profit versus government, $p < .001$.

few small hospitals offer open-heart surgery.

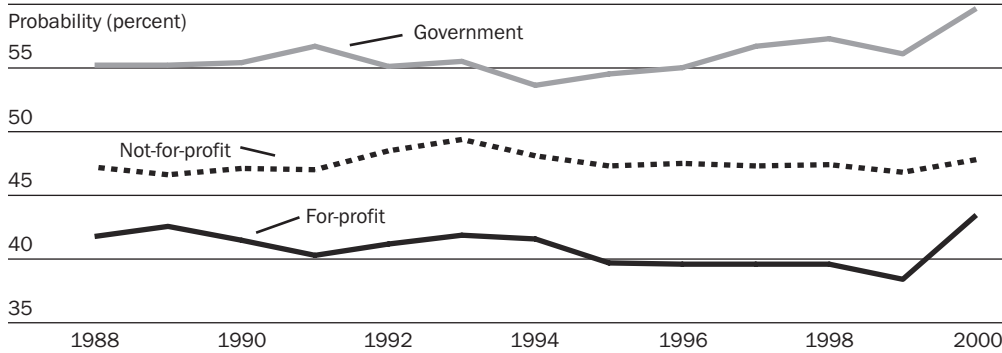
Unlike open-heart surgery, for-profits are less likely than nonprofits, which in turn are less likely than government hospitals, to offer psychiatric emergency care (Exhibit 3). On average from 1988 to 2000, controlling for other characteristics, 41 percent of for-profit hospitals offered psychiatric emergency services, compared with 48 percent of nonprofit and 56 percent of government hospitals. Again, the magnitude of these differences is large: For-profits are 15.0 percentage points less likely than government hospitals and 8.4 percentage points less likely than nonprofit hospitals ($p < .01$) to offer psychiatric emergency care. Among the smallest hospitals, the nonprofit versus for-profit difference was insignificant, as was the difference between nonprofit and non-VA government hospitals.

Not only did the probability of offering home health care vary by ownership, but the relative differences among types varied over time. The probability of offering home health services when the service was profitable increased for all three hospital types. However, among for-profits, growth of home health care when profitable and decline when unprofitable were particularly dramatic (Exhibit 4). From 1988 to 1996, the probability of a for-

profit hospital's offering home health services more than tripled (17.5 percent to 60.9 percent), controlling for hospital and market characteristics. During the same period, the probability of offering home health care only grew slightly more than ten percentage points (40.9 percent to 51.7 percent) for nonprofit and fourteen percentage points (38.1 percent to 51.9 percent) for government hospitals. From 1997 to 2000, as home health care became relatively unprofitable with the implementation of the BBA of 1997, the probability of offering it fell a striking 37.5 percentage points among for-profit, 7.7 percentage points among nonprofit, and 1.5 percentage points among government hospitals.

■ **Other services.** Tests of more than thirty other services yielded similar results (Exhibit 5). While for-profit hospitals were only somewhat more likely than nonprofits to offer relatively profitable services, both for-profit and nonprofit hospitals were considerably more likely than government hospitals to offer relatively profitable services. For-profits were less likely than nonprofits, which in turn were less likely than government hospitals, to offer relatively unprofitable services. For-profit hospitals were more responsive than the other types were to rapid changes in service

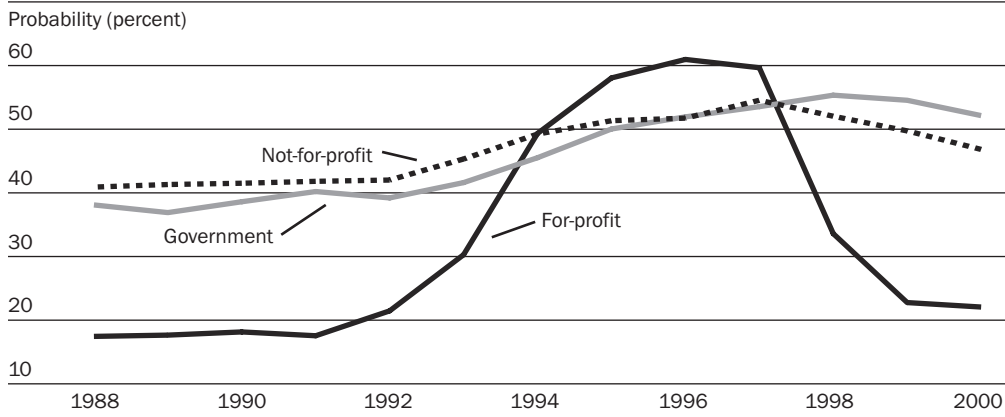
EXHIBIT 3
Hospitals' Probability Of Offering Psychiatric Emergency Services, By Ownership Type, 1988-2000



SOURCE: Author's analysis of data from American Hospital Association Annual Surveys, 1988-2000.

NOTES: Probit predicted probabilities include all nonrural, general medical and surgical hospitals in metropolitan statistical areas with more than one hospital. *P* values are based on the chi-square test of the differences between average predicted probabilities of offering services in 1988-2000 by hospital type. Not-for-profit versus for-profit, $p = .001$; not-for-profit versus government, $p < .001$; for-profit versus government, $p < .001$.

EXHIBIT 4 Hospitals' Probability Of Offering Home Health Services, By Ownership Type, 1988–2000



SOURCE: Author's analysis of data from American Hospital Association Annual Surveys, 1988–2000.

NOTES: Probit predicted probabilities include all nonrural, general medical and surgical hospitals in metropolitan statistical areas with more than one hospital. *P* values are based on the chi-square test of the differences between average predicted probabilities of offering services in 1988–2000 by hospital type. Not-for-profit versus for-profit, $p < .001$; not-for-profit versus government, $p = .071$; for-profit versus government, $p < .001$.

profitability (Exhibit 6). The average probability of a hospital type's offering a medical service from 1988 through 2000, controlling for other characteristics, is reported in Exhibit 7.

Discussion And Policy Implications

Medical service offerings vary markedly by ownership, likely because hospital types adopt or prioritize goals differently. Although all hospitals must earn sufficient profits to operate, the evidence here suggests that for-profits are more likely to respond to profitability than the other types are when making supply decisions. Since government hospitals are most likely to supply the unprofitable services that are disproportionately needed by poor and underinsured patients, the evidence also suggests that such hospitals are caregivers of last resort. Nonprofit hospitals are often the intermediate type in terms of balancing profit seeking and serving the poor through service choices.

Neither the profit-making versus charitable divide (for-profit versus nonprofit and government) nor the public versus private divide (government versus nonprofit and for-profit) fully predicts behavior. These results suggest that corporate form can be used as a regulatory tool when regulations are designed to ac-

count for the motivations and relative responsiveness to profitability of all three types. For example, ownership could be considered in designing reimbursement policies. In addition, if they hope to secure a full range of services, states' attorneys general should consider the mix of types in a market when overseeing hospital conversions.

A further implication is that the measure traditionally used to justify nonprofit tax exemptions—the provision of uncompensated care—is too limited. Recent calls to eliminate nonprofit subsidies, commonly founded on the claim that there are no important differences among corporate types, should be rejected.²² Differences in service mix matter to all patients, not only the uninsured and nonpaying patients.

Although this paper has not addressed health outcomes, it does raise the question of the relationship between service profitability and medical appropriateness. As discussed in the home health example above, for-profits' responsiveness to incentives is noteworthy for its magnitude and speed. However, we do not know whether the most medically appropriate mix of hospital services is the most profitable. Public payment rates are set through a com-

**EXHIBIT 5
Comparison Of Services Offered At Study Hospitals, By Ownership, 1988–2000**

Relatively profitable services	F > N	F > G	N > G
Angioplasty (1989–2000)	Y***	Y***	Y***
Birthing room ^a	N*	N	Y
Cardiac catheterization lab	Y***	Y***	Y***
Computed tomography (CT) scanner	N	Y	Y*
Diagnostic radioisotope facility	N*	Y***	Y***
Extracorporeal shock-wave lithotripter	Y***	Y***	Y***
Fitness center	N**	N	Y**
Magnetic resonance imaging (MRI)	Y	Y***	Y***
Neonatal intensive care (>0 beds) ^a	Y***	Y***	N***
Open-heart surgery	Y***	Y***	Y***
Orthopedic surgery (1989–1993)	N	Y***	Y***
Pediatric intensive care (>1 beds) ^a	Y***	Y***	N***
Positron emission tomography (1990–2000)	Y	Y*	Y
Single photon emission CT (1990–2000)	N**	Y	Y***
Sports medicine	=	Y***	Y***
Ultrasound	N***	N	Y
Women’s center ^a	Y***	Y***	Y*
Relatively unprofitable services			
AIDS (outpatient) (1988–1993)	N	N***	N***
AIDS services (1994–2000)	N***	N***	N***
AIDS unit (1988–1993)	Y**	N	N***
Alcohol/drug inpatient (>1 beds)	Y***	Y*	N***
Alcohol/drug outpatient	N***	N***	N***
Burn treatment (>0 beds)	Y	N*	N***
Child/adolescent psychiatric (>0 beds) ^a	N	N*	N
Emergency room	N**	Y	Y***
Emergency room ^a	N*	=	Y
HIV test (1988–1991)	N	N*	N*
Obstetrics (>2 beds) ^a	N	N	N
Obstetrics (≥100 births) ^a	N***	N**	N
Psychiatric inpatient (1989–2000, >1 beds)	Y**	N***	N***
Psychiatric emergency services	N***	N***	N***
Psychiatric emergency services ^a	N***	N***	N
Trauma center	N**	N	Y
Trauma center ^a	N**	N***	N***

SOURCE: Author’s analysis of data from American Hospital Association Annual Surveys, 1988–2000.

NOTES : F is for-profit. N is not-for-profit. G is government. Equal sign denotes that the difference of predicted probability of offering service between firms is less than .003. F > N means that, on average over the study period, for-profits were more likely than nonprofits to offer the specified services, with a difference of at least .003.

^aExcluding Veterans Affairs (VA) hospitals.

*p < .10 **p < .05 ***p < .01

plex and changing process based on, among other factors, the evolving judgment of rate setters, imperfect adjustments for hospital markets’ demographic and geographic charac-

teristics, and the political strength of interested parties. Private payment rates result from complex negotiations and relative bargaining power. We need more study on how

EXHIBIT 6
Comparison Of Probability Of Offering Services With Variable Profits, By Ownership Type, 1992–1996 And 1997–2000

Service	Profitable (1992–1996)			Unprofitable (1997–2000)		
	F	N	G	F	N	G
Home health	39.3	9.7	12.7	-37.6	-7.7	-1.5
Skilled nursing	28.1	15.4	4.9	2.8	4.7	9.7

SOURCE: Author's analysis of data from American Hospital Association Annual Surveys, 1988–2000.

NOTES: Includes all nonrural, general medical and surgical hospitals, in metropolitan statistical areas with more than one hospital. F is for-profit. N is not-for-profit. G is government. Values are the percentage-point changes in probability of offering service during the years indicated.

and, indeed, whether these processes produce incentives for hospitals to provide a medically appropriate service mix.

■ **Study limitations.** Despite the methodological strength of this work—particularly the focus on medical services rather than financial behavior and the breadth of services studied—it has limitations. First, as discussed above, the nonrespondents were disproportionately for-profit. The data are self-reported and not independently verified, although there is no reason to suspect that data reliability is correlated with ownership.

Second, despite the rigorous nature of the research used to determine profitability, a note of caution is necessary. Profitability is not an inherent attribute of medical services; rather, it depends on institution-specific factors such as management skills, case-mix, and local input costs. Further, even within a single hospital, costs and charges differ, discounts vary by individual payer, and allocation of joint costs blur the profitability picture. Despite these complications, however, one can reasonably compare the relative profitability of services defined as bluntly as they are in the AHA data.

WHETHER NONPROFIT organizations behave differently from other ownership types, particularly in the hospital industry, has raised considerable debate. In 2004 more than fifty lawsuits alleging that nonprofit hospitals have violated their charitable obligations were filed in federal district courts alone.²³ Con-

gress is considering an extensive overhaul of the nonprofit sector's regulatory regime to increase accountability.²⁴ Any discussion of the value of nonprofit hospital ownership must account for the significant differences in service offerings among hospital types and how those offerings vary according to profitability.

The author thanks Jia-Jia Ye for research assistance and Paula Payton for administrative assistance. She thanks Allan Brandt, Suzanne Cooper, David Cutler, Phoebe Ellsworth, Don Herzog, Nancy Keating, Mary Beth Landrum, Barbara McNeil, Martha Minow, Carl Morris, David Naylor, Joseph Newhouse, Edward Parson, Jonathan Skinner, Richard Zeckhauser, three anonymous referees, and participants in the November 2003 National Bureau of Economic Research (NBER) Health Care meetings for helpful comments. This study was supported by a grant from the National Institute on Aging to the NBER (Grant no. T32-AG00186); the Hauser Center for Nonprofit Organizations; the Harvard University doctoral program in health policy; and the University of Michigan Law School, John M. Olin Center for Law and Economics.

**EXHIBIT 7
Hospitals' Predicted Probability Of Offering Various Services, By Hospital Ownership Type, 1988–2000**

Service	Probability (%)		
	Not-for-profit	Government	For-profit
AIDS (outpatient) (1988–1993)	8.1	26.2	6.9
AIDS services (1994–2000)	53.1	65.3	45.3
AIDS test (1988–1992)	63.0	66.3	62.3
AIDS unit (1988–1993)	3.3	7.5	5.5
Alcohol/drug inpatient (>1 beds)	27.7	34.0	37.4
Alcohol/drug outpatient	32.0	41.8	26.6
Angioplasty (1989–2000)	38.8	34.1	48.0
Birthing room ^a	73.4	71.5	70.3
Burn treatment (>0 beds)	3.7	7.5	4.6
Computed tomography (CT) scan	92.6	90.3	92.2
Cardiac catheterization lab	53.2	48.8	60.2
Child psychiatry (>0 beds) ^a	25.6	28.4	24.0
Diagnostic radioisotope facility	83.0	76.0	81.2
Extracorporeal shock-wave lithotripter	16.9	13.1	21.7
Emergency room	96.6	94.6	95.3
Emergency room ^a	96.6	95.6	95.5
Fitness	25.2	21.4	20.8
Home health	46.8	45.9	33.0
Home health (1988–1993)	42.1	39.1	20.5
Home health (1995–1997)	52.5	51.8	59.5
Home health (1998–2000)	49.5	53.9	26.2
Pediatric intensive care (>1 beds) ^a	18.6	25.3	31.1
Magnetic resonance imaging (MRI)	48.4	40.9	50.7
Neonatal intensive care (>0 beds)	33.1	33.3	45.4
Neonatal intensive care (>0 beds) ^a	33.1	38.8	45.4
Obstetrics bed (>2 beds)	75.6	64.9	73.4
Obstetrics bed (>2 beds) ^a	76.2	76.5	74.5
Obstetrics births (≥100 births)	74.3	63.0	69.4
Obstetrics births (≥100 births) ^a	74.8	75.6	70.5
Open-heart surgery	33.6	27.9	40.9
Orthopedic surgery (1989–1993)	93.9	88.4	92.6
Positron emission tomography scan (1990–2000)	5.6	5.2	7.2
Psychiatric inpatient (1989–2000, >1 beds)	46.6	58.5	51.1
Psychiatric emergency services	47.5	55.9	40.8
Psychiatric emergency services ^a	46.9	49.5	40.4
Skilled nursing (>2 beds)	35.0	37.7	35.0
Single photon emission CT (1990–2000)	46.4	40.9	41.8
Sports medicine	33.6	25.7	33.4
Trauma	25.7	23.9	21.8
Trauma ^a	25.5	30.7	21.7
Ultrasound	96.2	95.2	94.4
Women's center	46.7	49.0	52.0
Women's center ^a	46.5	42.9	51.8

SOURCE: Author's analysis of American Hospital Association Annual Survey data, 1988–2000.

NOTES: Probit predicted probabilities control for hospital, demographic, and geographic characteristics. Includes all general medical and surgical, nonrural hospitals in metropolitan statistical areas with more than one hospital.

^a Excluding Veterans Affairs (VA) hospitals.

NOTES

1. E.C. Norton and D. Staiger, "How Hospital Ownership Affects Access to Care for the Uninsured," *RAND Journal of Economics* 25, no. 1 (1994): 171-185.
2. F. Sloan, "Not-for-Profit Ownership and Hospital Behavior," in *Handbook of Health Economics*, vol. 1, ed. A.J. Culyer and J.P. Newhouse (Amsterdam: Elsevier Science B.V., 2000), 1141-1174. For evidence on differences in financial behavior, see E. M. Silverman, J.S. Skinner, and E.S. Fisher, "The Association between For-Profit Hospital Ownership and Increased Medicare Spending," *New England Journal of Medicine* 341, no. 6 (1999): 420-426; and R. Frank and D. Salkever, "Market Forces, Diversification of Activity, and the Mission of Not-for-Profit Hospitals," in *The Changing Hospital Industry: Comparing Not-for-Profit and For-Profit Institutions*, ed. D. Cutler (Chicago: University of Chicago Press, 2000), 195-215. See also R.G. Frank and D.S. Salkever, "Nonprofit Organization in the Health Sector," *Journal of Economic Perspectives* 8, no. 4 (1994): 129-144; M. Gaynor and D. Haas-Wilson, "Change, Consolidation, and Competition in Health Care Markets," *Journal of Economic Perspectives* 13, no. 1 (1999): 141-164; M.G. Duggan, "Hospital Ownership and Public Medical Spending," *Quarterly Journal of Economics* 115, no. 4 (2000): 1343-1373; F.A. Sloan, "Commercialism in Nonprofit Hospitals," *Journal of Policy Analysis and Management* 17, no. 2 (1998): 234-252; and G.J. Young, K. Desai, and C.V. Lucas, "Does the Sale of Nonprofit Hospitals Threaten Health Care for the Poor?" *Health Affairs* 16, no. 1 (1997): 137-141.
3. D.C. Naylor, "Your Money and/or Your Life?" *Canadian Medical Association Journal* 116, no. 11 (2002): 1416-1417.
4. F.A. Sloan et al., "Hospital Ownership and Cost and Quality of Care: Is There a Dime's Worth of Difference?" *Journal of Health Economics* 20, no. 1 (2001): 1-21; P.J. Devereaux et al., "A Systematic Review and Meta-Analysis of Studies Comparing Mortality Rates of Private For-Profit and Private Not-for-Profit Hospitals," *Canadian Medical Association Journal* 166, no. 11 (2002): 1399-1406; and M. McClellan and D. Staiger, "Comparing Hospital Quality at For-Profit and Not-for-Profit Hospitals," in *The Changing Hospital Industry*, 93-112.
5. Medicare Payment Advisory Commission, *Hospital Inpatient Services Payment System* (Washington: MedPAC, 13 July 2004).
6. A detailed research note on the relative profitability of all services in the study, including a complete list of sources, is available online at content.healthaffairs.org/cgi/content/full/24/3/790/DC1.
7. R. Winslow, "Missing a Beat: How a Breakthrough in Cardiac Broke Down for J&J," *Wall Street Journal*, 18 September 1998; H. Stout, "A Healthy Bottom Line," *Business Journal*, 11 May 2001; and M. Wagner, "Cardiac Administration Taking Off at Hospitals," *Modern Healthcare* (1 July 1991): 28.
8. D.M. Cutler, M. McClellan, and J.P. Newhouse, "How Does Managed Care Do It?" *RAND Journal of Economics* 31, no. 3 (2000): 526-548.
9. D.M. Cutler et al., "Pricing Heart Attack Treatments," in *Medical Care Output and Productivity*, ed. D.M. Cutler and E.R. Berndt (Chicago and London: University of Chicago Press, 2001), 305-362.
10. D.M. Cutler and R.S. Huckman, "Technological Development and Medical Productivity: The Diffusion of Angioplasty in New York State," *Journal of Health Economics* 22, no. 2 (2003): 187-217.
11. J. Cromwell, D.A. Dayhoff, and A.H. Thumaian, "Cost Savings and Physician Responses to Global Bundled Payments for Medicare Heart Bypass Surgery," *Health Care Financing Review* 19, no. 1 (1997): 41-57.
12. P.B. Ginsburg, "Are Focused Factories the Wave of the Future?" *Frontiers of Health Services Management* 16, no. 3 (2000): 41-46; K.J. Devers, L.R. Brewster, and P.B. Ginsburg, *Specialty Hospitals: Focused Factories or Cream Skimmers?* (Washington: Center for Studying Health System Change, April 2003); H. Meyer, "Focused Factories: Are You Ready for the Competition?" *Hospitals and Health Networks* 72, no. 7 (1998): 24-26, 28-30; M. Gallagher, "Bitter Medicine: Presbyterian Plans Painful for Doctor," *Albuquerque Journal*, 10 March 1998; R. Winslow, "Coronary Bypass: Fed-Up Cardiologists Invest in Own Hospital Just for Heart Disease—They'll Regain Autonomy, but Critics See a Grab for Most-Profitable Care—A Showdown in Albuquerque," *Wall Street Journal*, 22 June 1999; S. Dang, "Ground Broken for Heart Hospital," *Milwaukee Journal Sentinel*, 16 August 2002; and M. Romano, "The Week in Healthcare," *Modern Healthcare* (29 March 2004): 10-11.
13. Regarding ED costs, see, for example, Deloitte and Touche, *U.S. Hospitals and the Future of Health Care* (Boston: Deloitte and Touche, June 1990); W.M. Gentry and J.R. Penrod, "The Tax Benefits of Not-for-Profit Hospitals," in *The Changing Hospital Industry*, 285-324; and G.A. Melnick, C.A. Serrato, and J.M. Mann, "Prospective Payments to Hospitals: Should Emergency Admissions Have Higher Rates?" *Health Care Financing Review* 10, no. 3 (1989): 29-39. Regarding psychiatric care reimbursement, see A. Woodward et al., "The Drug Abuse Treatment Gap: Recent Estimates," *Health Care Financing Review* 18, no. 3 (1997): 5-17. Regarding populations attracted, see, for example, D.M. Dhossche and S.O. Ghani, "A Study on Recidivism in the Psychiatric Emer-

- gency Room," *Annals of Clinical Psychiatry* 10, no. 2 (1998): 59–67; H. Shwed, "Teaching Emergency Room Psychiatry," *Hospital and Community Psychiatry* 31, no. 8 (1980): 558–562; and L. Tye, "Beth Israel to Keep Psychiatric Unit," *Boston Globe*, 2 February 2001.
14. *Duggan v. Bowen*, 691 F. Supp. 1487 (1988).
 15. J.P. Newhouse, *Pricing the Priceless: A Health Care Conundrum* (Cambridge, Mass.: MIT Press, 2002).
 16. J.P. Newhouse, "Medicare," in *American Economic Policy in the 1990s*, ed. J.A. Frankel and P.R. Orszag (Cambridge, Mass.: MIT Press, 2002), 899–955.
 17. K. Liu et al., *Medicare's Post-Acute Benefit: Background, Trends, and Issues to Be Faced* (Washington: Urban Institute, 1999).
 18. C. Helbing and E.S. Cornelius, "SNFs," *Health Care Financing Review* 14 Supp. (1992): 97–123; C. Helbing, J.A. Sangl, and H.A. Silverman, "Home Health Agency Benefits," *Health Care Financing Review* 14 Supp. (1992): 125–148; N.J. Scharmach, "Diversifying into Skilled Nursing Care: It Can Fill Beds, Manage Medicare Costs, and Meet a Need," *Modern Healthcare* (30 April 1990): 30; and L. Wagner, "Hospitals Seeing Benefit in Offering Long-Term Care," *Modern Healthcare* (24 March 1989): 40–42.
 19. C.R. Gresenz, J. Rogowski, and J.J. Escarce, "Updated Variable-Radius Measures of Hospital Competition," *Health Services Research* 39, no. 2 (2004): 417–430.
 20. J.E. Wennberg, "Understanding Geographic Variations in Health Care Delivery," *New England Journal of Medicine* 340, no. 1 (1999): 52–53.
 21. D.B. Rubin, "Estimating Causal Effects from Large Data Sets using Propensity Scores," *Annals of Internal Medicine* 127, no. 8, Part 2 (1997): 757–763; P.R. Rosenbaum and D.B. Rubin, "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika* 70, no. 1 (1983): 41–55; and P.R. Rosenbaum and D.B. Rubin, "Reducing Bias in Observational Studies using Subclassification on the Propensity Score," *Journal of the American Statistical Association* 79, no. 387 (1984): 516–524.
 22. For review of these arguments, see J.R. Horwitz, "Why We Need the Independent Sector: The Behavior, Law, and Ethics of Not-for-Profit Hospitals," *UCLA Law Review* 50, no. 6 (2003): 1345–1411.
 23. BNA's Health Law Reporter, *NonProfit Hospital Charity Care Litigation* 13, no. 43 (2004): 1555–1575.
 24. Senate Finance Committee, "Staff Discussion Draft," Senate Finance Committee Hearing—Charity Oversight and Reform: Keeping Bad Things from Happening to Good Charities (22 June 2004).