A Comparative Analysis of Revenue and Cost-Management Strategies of Not-for-Profit and For-Profit Hospitals

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Summary

Not-for-profit (NFP) and for-profit (FP) hospitals were compared on several performance indicators including revenues, costs, productivity/efficiency, and profitability. The indicators were adjusted, where appropriate, for outpatient activity and a case-mix index for all patients. FP hospitals had higher profit margins as well as higher gross and net revenues per case-mix adjusted admission. On the other hand, NFP hospitals had lower total cost per case-mix adjusted admission even after subtracting taxes from FP hospital costs. There were no significant differences between the two groups on efficiency and productivity indicators—paid hours per case-mix adjusted admissions, occupancy levels, and case-mix adjusted ALOS. The higher profits of FP hospitals were attributed to revenue management rather than cost and efficiency management.

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This paper compares the economic performance and related strategies of not-for-profit (NFP) and for-profit (FP) hospitals in Virginia ten years after the introduction of the Medicare Prospective Pricing System (PPS) and in the midst of marketplace changes caused by the penetration of managed care. Several studies have compared the two types of hospitals prior to the implementation of PPS. These studies clearly demonstrate that FP hospitals were then more profitable than NFP hospitals, and that their higher profits were due mostly to differences in revenues rather than to differences in the cost of care. These findings are consistent with the incentive structure of the cost- or charge-based reimbursement systems of the time.

In the 1990s, however, hospitals have much greater incentive to contain the costs of producing services. The incentive is due to changes in reimbursement systems as well as the advent of managed care programs that control both utilization of services and prices. In such an environment, one would expect hospitals to be moving toward cost management rather than revenue management strategies. Recently, Cleverley (1992) compared the profiles of successful (most profitable) and unsuccessful (least profitable) hospitals in a sample of 1,000 hospitals using 1988 Medicare cost report data. He found that cost control was the most important factor influencing financial performance. However, he did not analyze the data by ownership classification. Therefore, we do not know whether FP hospitals have adopted more cost-reduction strategies than the NFP hospitals have. If FP hospitals are still more profitable than NFP hospitals, they may have been more effective than NFP hospitals in adopting cost reduction strategies.

This paper evaluates economic performance of for-profit and NFP hospitals and investigates whether any differences that exist are due to revenue enhancement strategies or to cost-management strategies. The research is conducted using 1993 data from the Virginia Health Services Cost Review Council. (There are several advantages in using Virginia data for this type of study that are described in the data section of the research methodology.)

The results of this study have implications for executives of healthcare corporations as well as for policymakers in the government. Executives of healthcare corporations must shift their strategies from revenue enhancement to cost management in this era of managed care and price sensitivity in the market. Those who are able to provide high quality of care more efficiently are likely to increase their marketshare as well as their profits.

Ownership may be a significant factor affecting the extent to which providers are successful in adapting to the paradigm shift from revenue to cost management. It is possible that the past success of FP hospitals in revenue enhancement during the era of cost/charge-based reimbursement could impede their success in the future. Alternatively, pressure from investors to produce profits may make them more effective in making the paradigm shift than NFP hospitals.

The results also have implications for policymakers and legislators who are questioning the tax-exempt status of NFP hospitals in several states. Among the results of this study are differences in some of the benefits, measured by charity care and charge differences, provided to communities by NFP and FP hospitals.

Previous Research

Most systematic empirical research on differences in the financial performance of for-profit and not-for-profit acute care hospitals has used data from the 1970s and early 1980s when reimbursement was based primarily on retrospective costs or on charges. This empirical work has consistently shown that FP hospitals were more profitable than NFP hospitals during this time, and that greater profitability was achieved through revenue rather than cost management strategies.

The predominance of revenue management is demonstrated by higher charges per day or per admission, higher ancillary charges, or higher markups by FP hospitals (Lewin and Associates 1976; Lewin and Associates 1981; Watt et al. 1986; Coelen 1986). Also contributing to their higher average revenue per output unit was a difference in the payer mix of the patients.

NFP hospitals were more likely than FP hospitals to provide care to less well insured patients during the 1970s and early 1980s. Analyses conducted by Renn et al. (1985) show that FP hospitals had more charge-based admissions as a percentage of total admissions than NFP hospitals did. Haddock, Arrington, and Skelton (1989) found that FP hospitals averaged higher percentages of Medicare admissions and lower percentages of Medicaid admissions, and that they consistently averaged higher percentages of private payer days. Finally, FP hospitals typically provided less charity care than did NFP hospitals (Gray 1986).

In contrast, FP hospitals did not manage costs better than NFP hospitals did. FP hospitals had either similar costs per day and per admission (Lewin and Associates 1976; Renn et al. 1985; Watt et al. 1986; Friedman and Shortell 1988), or had higher costs than in NFP hospitals (Lewin and Associates 1981; Pattison and Katz 1983; Pattison 1986; and Arrington and Haddock 1990).

There are two exceptions, however, to the empirical results that FP hospitals had higher charges and the same or higher costs during the 1970s and early 1980s. Vraciu (1981) found that revenue per day was lower in FP hospitals in Florida, Utah and Texas. Sloan and Vraciu (1983), in their study of 112 Florida hospitals, found that net operating funds per day were higher in FP hospitals, but that net operating expenses per day and admission were lower in FP hospitals.

Some differences in the components of total cost of FP and NFP hospitals during the 1970s and early 1980s have been identified. Renn et al. (1985), Lewin and Associates (1981), Watt et al. (1986), and Arrington and Haddock (1990) all found that FP hospitals had lower staffing levels than did NFP hospitals. However, Lewin and Associates (1981), Watt et al. (1986), and Pattison (1986) all showed that overhead or administrative costs were higher at FP than at NFP

hospitals. Finally, Renn et al. (1985) reported that capital costs as a percentage of patient care costs were higher in FP than NFP hospitals.

In summary, the majority of the empirical research concerning profitability, revenue, and cost differences between NFP and FP acute care hospitals has been conducted with data from the 1970s and early 1980s. The results are largely consistent and demonstrate that FP hospitals engaged in revenue management rather than cost management. As Friedman and Shortell (1988) note, however, under a reimbursement system dominated by cost-based reimbursement, such behavior would not be unexpected.

In recent years, during the post-PPS era, only Gapenski, Vogel, and Langland-Orban (1993), Chang and Tuckman (1988), and Friedman and Shortell (1988) have done similar analyses of FP and NFP hospitals.[1] Unfortunately, this research does not determine if the profit strategies employed by FP and NFP hospitals has changed from the pre-PPS era.

Chang and Tuckman (1988) reported that FP hospitals usually had higher profits but similar or higher costs per day than NFP hospitals did between 1982 and 1985. The FP hospitals, however, had higher gross and net revenues per day than the NFP hospitals.

Gapenski, Vogel, and Langland-Orban (1993) examined the profitability of 169 Florida FP and private NFP general, acute care hospitals in 1989. Their multivariate model included four categories of explanatory variables: organizational, managerial, patient mix and market factors. The researchers found no differences between FP and NFP hospitals with respect to pre-tax and post-tax operating margin or return on assets. However, the results must be interpreted with some caution because the authors have controlled for organizational and managerial variables that are generally manipulated by ownership. The choice of control variables in the multiple regression model creates multicollinearity among explanatory variables, which the authors acknowledge.

Finally, Friedman and Shortell (1988) compared the financial performance of FP and NFP acute care hospitals between 1983 and 1985, before and after the PPS was implemented. The 290 hospitals in their study were affiliated with multi-unit systems and were compared using multivariate regression models. In addition to FP ownership, explanatory variables included case mix, scope of services, supply and competition, and strategy variables. Friedman and Shortell found that there were no significant differences between FP and NFP hospitals in cost of care per admission. They also found that after PPS, operating margins for all types of hospitals increased with a somewhat greater increase for NFP system hospitals. The authors concluded that the investor-owned hospitals lost ground on profit because of their strategy of diversification into other businesses like insurance, pharmacies, and clinics. For-profit hospitals did not focus on cost reduction strategies; rather they continued on revenue enhancement strategies. This study, however, was conducted using data from only the two

years surrounding the implementation of PPS. Therefore, it is possible that the hospitals had not had sufficient time to switch from revenue enhancement to cost containment strategies.

Framework for the Research

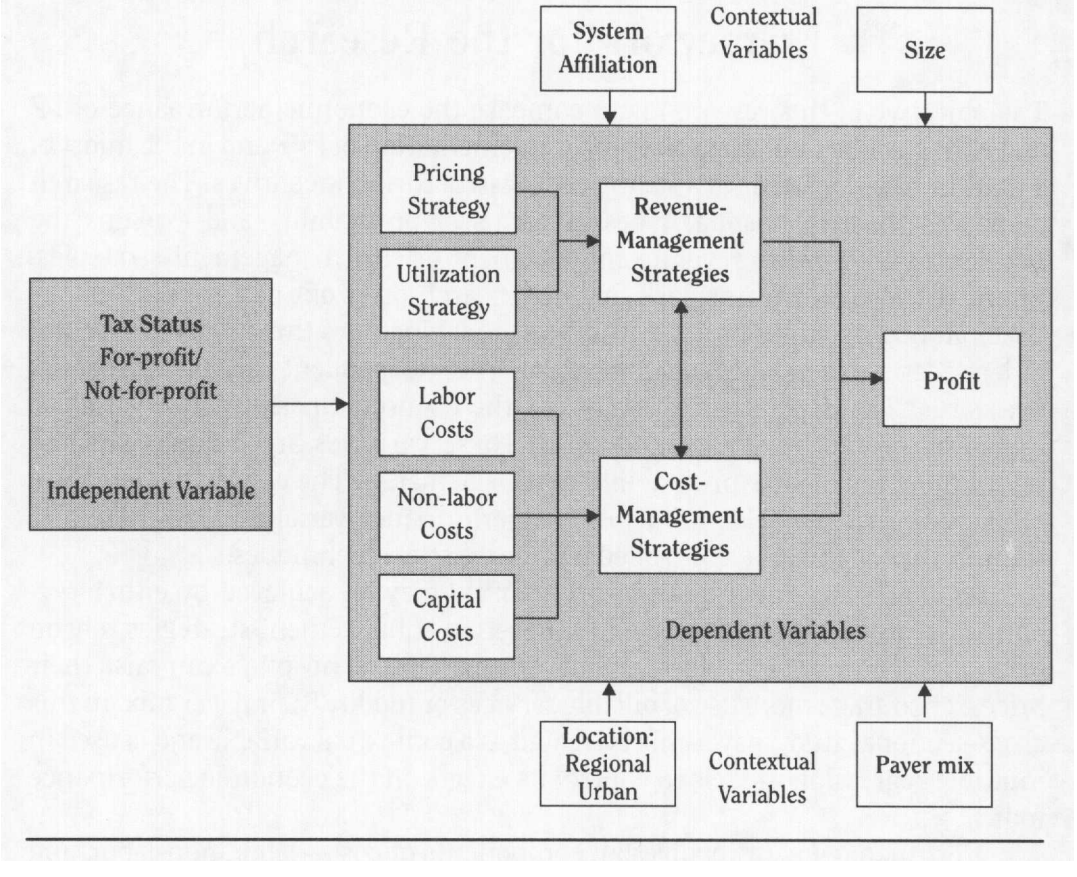
The objective of this research is to compare the economic performance of FP and NFP hospitals ten years after the implementation of PPS and in the midst of a market-based reform with strong cost restructuring incentives. The research compares the two hospital types in terms of profitability and explains the differences with either revenue enhancement or cost management strategies. Figure 1 provides a framework for the research on profit performance differences among hospitals by tax status. The model includes three sets of variables: independent, dependent, and contextual. The independent variable is hospital tax status. The dependent variables are the economic performance variables including profits, revenues, and costs. These variables are disaggregated to reveal more about how profitability may be achieved. The contextual variables are factors that may also influence the performance variables and, therefore, their influence must be controlled using statistical techniques.

As can be seen in Figure 1, profitability may be achieved by either revenue or cost-management strategies. Revenue enhancement strategies rely on pricing, utilization of services, and payer mix. That is, hospitals can raise their prices, encourage more use of billable services or modify their payer mix. In this cross-sectional study, payer mix is treated as a contextual variable and is used in multiple regression models to control its effects on the economic performance indicators.

Cost management involves all components of cost—labor, non-labor, and capital. Labor costs can be controlled by management of productivity, skill mix, wages, and benefits. Non-labor costs include supplies and drugs, utilities, the non-labor portion of contracts, and physician fees. These costs are controlled through management of purchasing contracts, utilization of services and supplies, inventory management, and physician contracts. Capital costs are defined as by Medicare. These costs are managed through capital investment planning and the method and timing of financing.

It should be noted that revenue management and cost-management strategies are not totally independent. For example, utilization management could be viewed as either a revenue-enhancement strategy or a cost-management strategy depending upon the goals and the approach to utilization management. It is a revenue-management strategy when the use of billable services is encouraged; on the other hand, it is a cost-management strategy when utilization of unnecessary services is discouraged under managed care and prospective payment systems.

Figure 1
Research Framework for the study of Performance by Tax-Status



When comparing the two groups of hospitals, it is important to identify and control the significant contextual variables that may also influence economic performance. For example, if more FP hospitals are urban than rural, then hospital location must be identified as a contextual variable and its effects be controlled by using statistical techniques like multivariate regression analysis.

This study includes four sets of contextual variables: size[2], location, system affiliation, and payer mix. These four variables were identified from previous research that compared FP and NFP hospitals (e.g., Gapenski, Vogel, and Langland-Orban 1993; Renn, et al. 1985; Levitz and Brooke 1985). The focus of this research is to compare FP and NFP hospitals rather than to study the effects of contextual variables on hospital performance. These, however, are included in our multiple regression models to control their effects from the effects of ownership.

Research Methodology

This section describes the study's research methods, including the data, variables, and analytical techniques.

Data

Data for this research are from the state-mandated 1993 annual submissions of data by hospitals to the Virginia Health Services Cost Review Council (VHSCRC). All short-term, acute care, medical/surgical, for-profit and NFP hospitals in Virginia are included. However, the two state university medical centers and city government hospitals have been excluded from the study. A total of 83 hospitals, 70 not-for-profit and 13 for-profit, are evaluated.

Data from Virginia Health Services Cost Review Council provide several advantages for this type of study including: (1) the Virginia data contain case-mix information not only for Medicare patients, but for all patients; (2) the state ensures the data quality through a series of quality controls, including the use of an electronic form with an expert system to test for errors in data entry and a second review by the state's auditors; (3) NFP and FP hospitals in Virginia have very similar characteristics in terms of size, geographical distribution, and the percent of Medicare patients—see Table 1; and (4) limiting the study to a single state provides necessary control of the regulatory environment, an element that could influence the study results.

In Table 1, the definitions and the descriptive statistics for the contextual variables are presented for NFP and FP hospitals. Table 2 provides the definitions

Table 1
Definition and Descriptive Statistics for the Contextual Variables

Variable	Definition	NFP ($N = 70$)	FP ($N = 13$)	Z
Size	Licensed Beds (Mean)	217	231	−0.93
Regional Location				
	1 if Northern Virginia;	16%	15%	0.09
	0 Otherwise	84%	85%	
Rural/Urban Location				
	1 if rural;	41%	23%	1.22
	0 if urban	59%	77%	
System Affiliation				
	1 if Affiliated;	64%	77%	−0.91
	0 if Not Affiliated	36%	23%	
Payer mix	Medicaid	10.7%	7.5%	0.36
Percent adjusted patient	Medicare and other government	48.0%	47.3%	0.05
days (Mean)	Nongovernment	41.3%	45.2%	−0.26

Table 2
Operational Definition of Performance Indicators

	#	Indicator	Definition
Profits	1.	Operating margin	(Net revenues plus other operating revenues − Total operating expenses)/(Net revenue + Other operating revenues)
	2.	Return on assets (cash)	Cash flow from operations ÷ Total unrestricted assets
Revenues	3.	Gross revenue per admission	Total gross patient revenue ÷ Case-mix adjusted admissions[1]
	4.	Net revenue per admission	Total net patient revenue ÷ Case-mix adjusted admissions
	5.	Net revenue less taxes per admission	(Total net patient revenue − Total taxes) ÷ Case-mix adjusted admissions
Costs	6.	Total cost per admission	Total operating expenses ÷ Case-mix adjusted admissions
	7.	Total cost less taxes per admission	(Total operating expenses minus taxes paid) ÷ Case-mix adjusted admissions
	8.	Labor cost per admission	Total labor costs ÷ Case-mix adjusted admissions
	9.	Non-labor cost per admission	Total non-labor costs ÷ Case-mix adjusted admissions
	10.	Capital cost per admission	Total capital costs as defined by Medicare ÷ Case-mix adjusted admissions
Efficiency and Productivity	11.	FTE per occupied bed	(Total paid FTE) ÷ (Case-mix adjusted admissions* ALOS ÷ Days in fiscal year)
	12.	Paid hours per admission	(Total paid hours) ÷ Case-mix adjusted admissions
	13.	Licensed bed occupancy	(Total inpatient days) ÷ (Licensed beds* days in fiscal year)
	14.	Case-mix adjusted LOS	(Total patient days ÷ Total admissions) ÷ Case mix
Community Support Provided	15.	Community support provided (charity care + bad debts) per admission	[(Expenses required to provide charity care to people with incomes < 200% of the federal poverty level) +/− (payments to(from) the Indigent Care Trust Fund) + (bad debt expenses)] / Total expenses
	16.	Community support provided (charity care + bad debts + taxes) per admission	[(Expenses required to provide charity care to people with incomes < 200% of the federal poverty level) + (Bad debt expenses) +/− (Payments to the Indigent Care Trust Fund) + taxes paid] / Total expenses

[1]Case-mix adjusted admissions = [(Inpatient admissions) + (Inpatient admission equivalent of outpatient visits)]
*Hospital-wide case-mix index, or Case-mix adjusted admissions = [(Inpatient admissions) × (Inpatient + Outpatient gross revenues) / Inpatient gross revenues] × Hospital-wide case-mix index.

of performance indicators (dependent variables). For brevity, the measurement of the performance variables is discussed along with the results.

As can be seen from Table 1, the two groups of hospitals are not significantly different from one another in terms of size and other contextual variables. The significance of the size difference was tested using one-way analysis of variance.

The proportion distribution of hospitals along other contextual variables was tested using z-test for proportions. There were no significant differences between the two groups on any of the contextual variables at $p < .05$ ($Z > 1.69$). It should be noted that Virginia hospitals have lower than national average of Medicaid enrollees (7 percent vs. 11 percent) as well as HMO enrollees (8.4 percent vs. 19.5 percent).[3]

Analytic Methods

First, the two groups of hospitals are compared on individual performance indicators using Analysis of Variance (ANOVA). This provides us with the extent of the differences between the two groups of hospitals. To control the effects of contextual variables, a multivariate regression model is also evaluated for each performance indicator.

Results

The results are presented in Tables 3 and 4. Table 3 provides the results of a one-way analysis of variance comparing the for-profit and NFP hospital groups. Table 4 provides the results of multiple regression analysis, which controls for the contextual variables. Although not the major focus of this study, also included in these tables are two measures of community support.

Table 3 shows that the two groups were significantly different from one another on the majority of indicators. The multivariate analysis also confirms the results of the analysis of variance. That is, even after controlling for system affiliation, regional and rural location, bed size and payer mix, tax status (ownership) is significantly related to the indicators. Next, the results in four categories—profits, revenues, costs, and efficiency/productivity—are examined in more depth. In addition, community support provided by the hospitals is also discussed.

Profits

Profits from operations, as measured by operating margin and cash return on assets (ROA), are significantly higher for FP hospitals than for NFP hospitals. The operating margins for NFP and FP hospitals in 1993 were 3.84 percent and 8.12 percent, respectively; the ROAs were 10.76 percent and 16.21 percent respectively.

Results from the multiple regression analyses also confirm that FP status is marginally significantly ($p < .10$) related to both the profit indicators. In addition to the tax status of the hospitals, rural location, size, and the percentage of nongovernment third-party days were associated with at least one of the profit indicators. The rural hospitals earned more profit than did urban hospitals; larger hospitals had higher margins than did smaller hospitals; and hospitals

Table 3
One-way ANOVA Comparing Not-for-Profit and For-Profit Hospitals on Performance Indicators

		Not-for-Profit ($N = 70$) Mean (sd)	For Profit ($N = 13$) Mean (sd)	Percent For-Profit vs. Not-for-Profit Difference	F-Value
Profits	1. Operating margin	.0384 (0.05)	0.0812 (0.07)	211%	6.96*
	2. Return on assets (cash)	0.1076 (0.06)	0.1621 (0.11)	50.65%	7.02**
Revenues	3. Gross revenue per admission[1]	$6686.43 (1,400.67)	$9766.62 (2,036.17)	46.07%	45.54*
	4. Net revenue per admission	$4317.9 (834.92)	$5672.98 (1,113.57)	31.38%	25.89**
	5. Net revenue less taxes per admission	$4316.21 (834.56)	$5328.75 (930.69)	23.44%	15.57**
Costs	6. Total cost per admission	$4220.85 (777.75)	$5249.19 (1,019.47)	24.36%	17.32*
	7. Total cost less taxes per admission	$4220.05 (777.73)	$4943.05 (906.09)	17.1%	8.99**
	8. Labor cost per admission	$2164.48 (445.72)	$2289.75 (498.72)	5.79%	.83
	9. Non-Labor cost per admission	$1387.69 (282.53)	$1805.92 (330.71)	30.14%	22.77**
	10. Capital cost per admission	$417.34 (162.66)	$592.93 (132.03)	42.07%	13.46**
Efficiency and Productivity	11. FTE per occupied bed	4.624 (1.00)	3.827 (0.58)	−17.24%	7.70**
	12. Paid hours per admission	136.401 (21.21)	129.233 (14.69)	−5.26%	1.35
	13. Licensed bed occupancy	0.46418 (0.13)	0.49262 (0.11)	2.84%	.54
	14. Case-mix adjusted LOS	5.099 (0.84)	5.527 (1.12)	8.39%	2.52
Community Support Provided	15. Community support provided (charity care + bad debts) per admission	$403.1 (169.7)	$326.7 (163.9)	−19.1%	3.73**
	16. Community support provided (charity care + bad debts + taxes) per admission	$404.8 (170.1)	$671.0 (241.9)	65.6%	28.36**

* $.05 < p \leq .1$
** $p \leq .0$
[1]All admissions are outpatient and case-mix adjusted with case-mix adjusted admissions = [(inpatient admission) × (inpatient + outpatient gross revenues) / inpatient gross revenues] × hospital-wide case-mix index.

with more nongovernment payer participation had higher operating margins than did those with greater government payer participation.

The two measures of profits reported here represent profits after federal income, state and local income, property, sales, and other taxes. Therefore,

the FP hospitals earned greater profits even after paying taxes than the NFP hospitals did.

The next obvious question is: Were higher profits earned through more efficient operations or by better revenue enhancement techniques such as pricing policies? The results presented below explore the answer to this question.

Revenues

In 1993, FP hospitals in Virginia earned 46 percent more in gross and 31 percent more in net revenues per case-mix adjusted admission than the NFP hospitals did (see Table 3). The net revenues were also influenced by all other factors in the multiple regression model (see Table 4). Hospitals that earned greater net revenue per admission included FP, system affiliated, urban, Northern Virginia and larger hospitals as well as those that had more nongovernment patients.

Pricing Strategy

The next question is whether the differences in revenue are due to pricing strategy or to the differences in the utilization of billable ancillary or outpatient services. An analysis of an additional data set collected by the VHSCRC regarding charges for specified inpatient and outpatient procedures addresses this question. For the standardized basket of procedures, the FP hospitals charged 24.8 percent more for outpatient procedures and 28 percent more for inpatient procedures. Both differences are statistically significant at $p < .05$. The number of ancillary procedures performed per admission was analyzed using the original VHSCRC database. There were no significant differences in the number of procedures performed per case-mix adjusted admission. This analysis shows that the FP hospitals have used a pricing strategy rather than utilization strategy to enhance revenues.

The two groups were not significantly different in terms of payer mix. FP hospitals earned 48 percent of revenues from nongovernment, third-party sources, compared to 45 percent for NFP hospitals. Nor did the two hospital types show differences in inpatient and outpatient revenue sources. FP hospitals received 75 percent of their revenue from inpatient and 25 percent from outpatient care, compared to 71 percent and 29 percent, respectively, for NFP hospitals. These differences are not statistically significant.

Net Revenue Less Taxes

An argument is generally made that the FP hospitals have to charge more because of their tax burden. To analyze the effects of tax burden, we analyzed differences between NFP and FP hospitals in net revenues less taxes per case-mix adjusted admission. The FP hospitals earned $5,328 after taxes per admission compared to $4,316 for the NFP hospitals, a difference of $1,012 per admission, or 23.5 percent more for FPs. This and the results from the regression analysis

Table 4
Multivariate Regression Analyses for Individual Performance Indicators (Standardized Beta Coefficient and p values)

				Tax Status		Location		Size	Payer mix
	Model	Dependent Variable	Model R^2	For-profit	System Affiliation	Northern Virginia	Rural	Licensed beds	Percent Non-government
Profits	1.	Operating margin	.231	.199 (.053)*	−.009 (.930)	−.050 (.687)	.312 (.017)**	.374 (.003)**	.357 (.005)**
	2.	Return on assets (cash)	.119	.195 (.075)*	.082 (.458)	−.081 (.541)	.250 (.073)*	.252 (.056)*	.153 (.256)
Revenue	3.	Gross revenue per admission	.450	.381 (.000)**	.202 (.024)**	.252 (.019)**	−.172 (.117)	.229 (.029)**	−.086 (.417)
	4.	Net revenue per admission	.580	.228 (.002)**	.135 (.071)*	.324 (.000)**	−.206 (.027)**	.270 (.002)**	.160 (.077)*
	5.	Net revenue less taxes per admission	.644	.282 (.000)**	.011 (.882)	−.130 (.066)*	−.338 (.000)**	.224 (.011)*	.318 (.000)**
Costs	6.	Total cost per admission	.593	.175 (.020)**	.137 (.073)*	.372 (.000)**	−.304 (.001)**	.206 (.022)**	.058 (.526)
	7.	Total cost less taxes per admission	.600	.129 (.081)*	.093 (.215)	.427 (.000)**	−.327 (.000)**	.212 (.014)**	.007 (.939)
	8.	Labor cost per admission	.567	.036 (.638)	−.020 (.746)	.462 (.000)**	−.256 (.009)**	.301 (.001)**	.020 (.827)
	9.	Non-labor cost per admission	.487	.140 (.094)*	.256 (.003)**	.249 (.016)**	−.262 (.015)**	.152 (.129)	.099 (.225)
	10.	Capital cost per admission	.269	.205 (.041)**	.062 (.543)	.193 (.114)	−.345 (.007)**	.035 (.765)	−.061 (.619)
Efficiency and Productivity	11.	FTE per occupied bed	.309	−3.374 (.001)**	.021 (.840)	−.085 (.481)	.006 (.95)	−.362 (.004)**	.42 (.000)**
	12.	Paid hours per admission	.151	.006 (.954)	−.226 (.042)**	.083 (.524)	−.198 (.147)	.223 (.084)*	−.177 (.183)
	13.	Licensed bed occupancy	.334	.196 (.041)**	−.073 (.453)	.153 (.188)	.276 (.023)**	.538 (.000)**	.247 (.037)**
	14.	Case-mix adjusted LOS	.353	.250 (.009)**	−.239 (.014)**	.250 (.031)**	.204 (.089)*	.198 (.079)*	−.529 (.000)**
Community Support	15.	Community support per admission	.227	−.203 (.063)*	.065 (.566)	.455 (.000)**	−.077 (.565)	.124 (.341)	−.299 (.023)**
	16.	Community support + taxes per admission	.371	.461 (.000)**	.115 (.263)	.186 (.112)	−.058 (.630)	.145 (.217)	.004 (.968)

* $.05 < p \leq .1$
** $p \leq .05$

clearly show that the FP hospitals brought in more net revenues per case-mix adjusted admission. The difference is most likely to be attributable to revenue-management strategies through higher pricing.

Costs

Hospital costs are analyzed using total cost, total cost less taxes, labor, non-labor, and capital costs. All cost indicators except for labor cost are significantly higher for FP than for NFP hospitals. As can be seen from Table 3, total cost per admission was 24 percent, total cost less taxes was 17 percent, non-labor cost was 30 percent, and capital cost was 42 percent higher in FP than in NFP hospitals. The differences are statistically significant.

The total costs per case-mix adjusted admission for FP and NFP hospitals were, respectively, $5,249 and $4,221—a difference of $1,028 per admission. The total costs less taxes for the two groups were $4,943 and $4,220 respectively—a difference of $723 per admission. That is, only about 30 percent of the higher cost for FP hospitals can be explained by taxes.

Next, total cost is broken into labor, non-labor, and capital cost components. After analyzing NFP and FP differences in these three components, they are further broken into sub-components to gain more insight into the cost structures of the FP and NFP hospitals.

Labor Costs

The labor costs per case-mix adjusted admission were higher for the FP than the NFP group—$2,289 vs. $2,164. It is interesting to note that for the FP hospitals, the labor cost was 5.8 percent higher while the paid hours per admission were 5.3 percent lower. This can be explained by salary and benefit costs per FTE. FP hospitals paid $2,397 more per FTE ($29,531 vs. $27,134 for NFP), or 8.8 percent, in salary and $1,852 per FTE more ($7,035 vs. $5,183), or 35.7 percent, in benefits than NFP hospitals.

From the above data, it is not possible to draw a definitive conclusion that the FP hospitals paid higher wages for comparable job categories. Part of the difference in salary cost can be explained by the skill-mix differences in nursing services. FP hospitals used more registered nurses as a percent of the total workforce—26.9 percent vs. 22.7 percent—which is statistically significant at $p < .05$. Without a wage and salary survey, it is not possible to draw any conclusions about the differences in wage structure for comparable job classifications.

The VHSCRC data base also allows us to separate the cost of contracted labor from the total labor cost. Contracted labor includes agency nurses and the labor portion of all contracted services like housekeeping, dietary, and pharmacy. For-profit and NFP hospitals spent about $36 and $51 per admission, respectively, on contracted labor; the difference is not statistically significant.

Non-Labor Costs

The non-labor cost was about $1,806 and $1,388 per admission, respectively, for FP and NFP hospitals. Non-labor cost includes the cost of drugs, physician contracted amounts, the non-labor portion of contracted services, home office expenses, supplies, and other non-labor expenses. For-profit and NFP hospitals were not different from one another on drug cost ($181 vs. $153) and physician fees ($99 vs. $135) per admission; however, there were significant differences in the non-labor portion of home office expense ($110 for FPs vs. $51 for NFPs), the non-labor portion of contracted services ($181 vs. $101), and supply and other expenses ($1,232 vs. $946) per admission.

Capital Costs

FP hospitals also had a 42 percent higher capital cost per admission—$593 vs. $417 for NFP hospitals. Some of the difference can be explained by the higher investment in plant and capital by the FP hospitals, as reflected by the lower average age of plant. The average age of plant is defined as accumulated depreciation divided by the annual depreciation expense. The average ages of plants for FP and NFP were 5.08 and 8.21 years, respectively, a statistically significant difference ($p < .0002$).

The results of the regression models of the cost variables are shown in Table 4. As with the ANOVA results, total, total less taxes, non-labor, and capital costs were significantly different between NFP and FP hospitals. As expected, total costs per admission are significantly higher in Northern Virginia, urban, and larger hospitals. The regional difference basically represents the cost of living or wage difference, and, therefore, does not affect the capital cost. All cost indicators are significantly lower in rural hospitals than in urban hospitals. Larger hospitals have higher total costs as well as higher labor costs per admission; however, the size does not affect the cost of capital and the non-labor operating expenses. The payer mix does not affect the cost structure. System affiliation also does not affect the labor cost or the capital cost, but it is associated with higher non-labor costs, which include cost of the home office, information systems, and the like.

Efficiency and Productivity

There were mixed results for efficiency and productivity. FP hospitals used 17 percent fewer FTEs per occupied bed (3.827 vs. 4.624), a statistically significant result ($p < .05$), and used 5 percent fewer paid hours per admission (129.3 vs. 136.4), which is not statistically significant. Thus, on a daily basis the FP hospitals were more productive; however, due to their 8.4 percent longer average length of stay, labor productivity per admission was not significantly different between the two groups. Under PPS, however, paid hours per case-mix adjusted admission is a better indicator of overall labor productivity.

The licensed bed occupancy level and case-mix adjusted length of stay during 1993 are not statistically different. In contrast, staffed bed occupancy, which is not shown in the tables, was significantly higher for FP hospitals—65.3 percent vs. 58.7 percent ($p < 0.1$). FP hospitals staff fewer beds and keep occupancy levels high for improved utilization of staff.

More statistically significant differences between the NFP and FP hospitals are evident after controlling for the contextual variables in the regression model. FP hospitals had significantly higher average occupancy and length of stay. In addition, the efficiency advantage of FPs in FTEs per occupied bed diminishes.

Community Support Provided

No study of the differences between NFP and FP hospitals would be complete without a discussion of their differences in contributions to the community. Scholars, policymakers and practitioners have debated the appropriate definition and measurement of the community contribution of acute care hospitals (Kovner 1994; Clement, Smith, and Wheeler 1994; Buczko 1994). A complete discussion of this debate is beyond the scope of this paper. Therefore, the two groups of hospitals were compared on two commonly used measures of the community support they provide. First, community support is estimated as the amount of uncompensated care (charity care + bad debts) adjusted for the amount paid to or received from Virginia's indigent trust fund. Second, since an argument can be made that the FP hospitals pay taxes in lieu of charity care, we also computed the community support with taxes.

The not-for-profit hospitals provided more community support, $403 vs. $326 per adjusted admission, or 9.3 percent vs. 5.7 percent of net revenue. The two means are statistically different at $p = 0.056$. When taxes are included in the calculations, the FP hospitals provided more community care than the NFP hospitals did, $405 vs. $671 per adjusted admission, or 9.4 percent vs. 13.1 percent of net revenues, which is statistically different at $p < .05$. These results are consistent in both the ANOVA and regression analyses. As was noted earlier, NFP hospitals also benefitted their communities by charging significantly less for services.

Discussion

The results of this study of the differences between acute care NFP and FP hospitals operating in Virginia in 1993 are strikingly similar to the results from similar studies conducted during the 1970s and early 1980s. We find that the relative edge in profits of FP over NFP hospitals is still due to higher revenues per adjusted admission rather than to more efficient cost management, even though the reimbursement system has significantly changed over the years.

How have the FP hospitals managed to maintain their revenue advantage? Since we did not find the two groups of hospitals to be significantly different from one another on outpatient revenues as a percent of total revenue, the relative advantage clearly is from the inpatient revenues. Since the two groups are reimbursed exactly the same amounts for case-mix adjusted Medicare patients, and the two have about the same proportion of Medicare patients, the difference in revenues is most likely be due to revenues from commercial insurers and private payers. It is very likely that, in this world of incremental changes, the relative advantages of the past for the FP hospitals are still embedded in new contracts with insurance and managed care companies. This is especially likely to have occurred because managed care penetration was low in many, but not all, parts of Virginia during 1993.

It is generally argued that the FP healthcare corporations operate more efficiently because they have greater financial incentive to be efficient and productive. This research does not support that proposition. The results here show that the FP hospitals are more profitable, but not more cost-efficient and productive, than the NFP hospitals. Even after deducting the tax expenses, FP hospitals had higher cost per case-mix adjusted admission.

Why are the FP hospitals not more efficient, considering the intrinsic financial incentive structure of the investor-owned hospitals? The answer to this question lies in a complex set of factors. First, revenues are easier to manage than cost through the centralized administrative structures of multi-unit FP corporations. The corporate structure has attempted to manage cost through control systems like flexible budgeting, productivity monitoring and control, and utilization management systems. Such systems have become common among all types of hospitals and have outlived their limited effectiveness. In the future, the cost structure cannot be changed significantly without reengineering the fundamental production and delivery systems. Changing production and delivery systems is difficult and would require working with clinical professionals including physicians, nurses, therapists, and technicians.

Second, the psyche and the culture of hospital management were developed over the three decades of a cost-based reimbursement system that is counter-productive to the efficient management of costs. The management psyche of the first line and middle managers has not yet changed in any fundamental way. The clinical managers still see a conflict between the goals of cost containment and giving high-quality care. Until the clinical managers are retrained and given new tools by which they can accomplish the goals of cost containment and of quality improvement simultaneously, little gain will occur in the cost structure.

It must be recognized that the path of cost management is a complex one that will require new management thinking, new skills and attitudes, new management structures and decision support systems, empowerment of managers, process reengineering and continuous quality improvement, new production,

distribution and communication systems, and new incentive structures that reward efficient management of cost and quality. To date, neither the FP nor the NFP hospitals have shown any superior performance in managing cost; they are equally ineffective.

Notes

1. ProPAC (1995) presents descriptive data showing higher profitability among FP hospitals for the 1984 through 1993 fiscal years, but does not provide any further analysis.

2. The economies of scale studies have not produced consistent results. For example, Cowing and Holtmann (1983) estimated a short-run cost function for 138 hospitals and found evidence of economies of scale. On the other hand, Grannemann, Brown, and Pauly (1986) suggested the opposite, even after controlling for the case mix of patients, although they admit that the Medicare case-mix index does not adequately account for the severity of patient condition. Recently, researchers have noted that in the study of economies of scale, one must control for the case mix of patients as well as the mix and scope of services provided by hospitals (Friedman and Shortell 1988). Shukla (1992), in a study of labor productivity, found a significant economy of scale in nurse-staffing levels, when the case mix and the scope of services were controlled.

3. The profile of enrollment is provided in "Reforming the Health Care System: State Profiles 1995" by McCloskey, Woolwich, and Holahan (1995).

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