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ABSTRACT

This paper investigates three special tax provisions for not-for-profit (NFP) hospitals. First, they are exempt from capital taxes -- both income and property taxes. Second, they issue tax-exempt bonds so lenders do not pay income taxes on interest received. Third, donors deduct charitable contributions from their income tax bases. The rationale for these policies is that the NFP hospitals provide community benefits, the definition of which is often loosely-specified. The value of capital tax exemptions depends on the capital intensity of NFP hospitals, and for income taxes, the hospitals' profitability. For 1995, the aggregate value of the exemption from income taxes is $4.6 billion; the median hospital receives benefits of 1.8 percent of total assets. For the property tax exemption, we estimate an aggregate value of $1.7 billion. The value of the property tax exemption varies across hospitals depending on state and local tax policies and the hospital asset mix. Tax-exempt bonds and deductible contributions are concentrated among larger hospitals. Only 19.7 percent of NFP hospitals had outstanding tax-exempt debt in 1994. Almost half of existing bond debt could be replaced by using hospital endowments; we calculate an annual aggregate benefit of $354 million from using tax-exempt bonds. For charitable contributions, roughly four percent of hospitals receive 71 percent of the contributions. We estimate that the lost tax revenue from these contributions is $1.1 billion in 1994.

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The Tax Benefits of Not-for-Profit Hospitals

I. Introduction

Not-for-profit (NFP) hospitals in the United States receive several tax advantages relative to for-profit (FP) hospitals. The major tax advantages are exemption from Federal and state corporate income taxes, exemption from state and local property taxes, and access to tax-exempt bond financing. In addition, charitable contributions to NFP hospitals are tax deductible for the donor. The expansion of FP hospitals over the last fifteen years has led to increased scrutiny of why NFP hospitals receive a tax preference. Our objective is to quantify the importance of this array of tax breaks for NFP hospitals, assuming that the behavior of hospitals is otherwise static. We are interested in both the magnitude of these benefits and the heterogeneity of these benefits across hospitals.

The concern over whether NFP hospitals provide enough social benefits to justify their tax exemption has lead to research comparing the social benefits of NFP hospitals with the cost in terms of foregone tax revenue of the tax exemption. If, as managers of FP hospitals contend, the social benefits of NFP hospitals are less than this tax cost, then the tax exemptions seem difficult to justify. Clement, Smith and Wheeler (1994) present a methodology for measuring community benefits from not-for-profit hospitals and the size of the tax benefits of NFP status; they apply their methodology to a sample of NFP hospitals in California. They find considerable heterogeneity in the level of community benefits provided by NFP hospitals; depending on their recommended community benefit standard, between 20 and 80 percent of NFP hospitals have benefits exceeding their costs. As emphasized by Sloan (1997), the trade-off between the benefits and costs of NFP status should be evaluated relative to what would be provided by FP hospitals.

Sloan argues that the massive changes in the United States health care market have pushed NFP hospitals to become more similar to FP operations.

Rather than divide our attention between community benefits and tax benefits, we focus on the underlying determinants of the value of the tax benefits and estimate the magnitude and heterogeneity of each tax break throughout the U.S. The level of tax benefits will vary substantially across NFP hospitals. For the income tax, this variation will arise mainly from differences in profitability; capital intensity, state corporate tax rates, and the types of investment undertaken by the hospital (since effective tax rates vary across types of assets). The value of property tax exemption varies because hospitals differ in their use of capital and because property tax rates, assessment practices, and the definition of the property tax base (*e.g.*, the inclusion of different types of property) vary across locations.

While the property tax exemption applies across the whole spectrum of NFP hospitals and the income tax exemption is valuable for NFP hospitals with net income, the use of tax-exempt bonds and charitable contributions are concentrated in a subset of hospitals. The value of the access to tax-exempt bonds depends on how much tax-exempt debt a hospital has in its capital structure. While NFP hospitals benefit from the lower interest rate on tax-exempt debt relative to using taxable debt, FP hospitals might have a lower after-tax cost of borrowing since they can deduct their interest payments from their corporate income tax base. Tax-exempt bonds can also create opportunities for tax arbitrage. Hospitals differ in their reliance on charitable contributions depending on the mission of the hospital. The value of the tax benefit from the charitable contribution accrues directly to the donor and depends on the donor's marginal tax rate; however, this tax deduction can create an additional incentive for giving by changing the "price" of a

donation.

The paper proceeds as follows. Section II reviews some of the justifications for special tax policies towards NFP hospitals. Section III compares some basic characteristics of NFP and FP hospitals in terms of size and outputs. Section IV discusses and imputes the value of capital tax exemptions. In section V, we examine NFP hospitals' use of tax-exempt bond financing. Section VI discusses the tax benefits of tax-deductible charitable contributions. Section VII links our results to dynamic considerations and the ultimate incidence of who benefits from the tax treatment of NFP hospitals. Section VIII concludes with suggestions for further research.

II. Justifications for Tax Policy towards Not-For-Profit Hospitals

This section briefly reviews the arguments used to justify tax exemptions for NFP hospitals. These justifications fall in three categories: historical, administrative, and theoretical.

II.A. Historical Perspective on the NFP Hospital Tax Exemption

Not-for-profit organizations have been exempt from the U.S. federal income tax since its inception early in the twentieth century.[1] At the time, NFP organizations accounted for a small portion of the economy and engaged mainly in charitable activities. In general, hospitals were organized as not-for-profit, affiliated with either religious groups or philanthropic foundations, and served families that could not afford to pay the doctor to visit their home. These NFP hospitals provided public benefits, financed most of their investment through charitable gifts, and

[1] See Hansmann (1981) for a review of the rationales on exempting NFP organizations from taxation and Sanders (1995) for a specific application to NFP hospitals.

did not generate substantial "income" that would be subject to tax. Thus, historically, NFP hospitals received tax preferences because they provided public services and earned little profit.

As noted by Marmor, Schlesinger and Smithey (1987), drastic changes in medical technology and financing changed the role of hospitals in society. Technological advances transformed hospitals from places for the poor to seek comfort to places for the sick, regardless of income, to get well. The growth in private health insurance and government funding of health care of the poor and elderly made it viable to finance investment with revenues from patients. Hence the purely historical arguments for the tax exemptions have grown less relevant.

II.B. Administrative Perspective on the NFP Hospital Tax Exemption

In addition to the historical reasons for the tax exemption, administrative, or legal, issues also arise for taxing NFP organizations. For the income tax, NFP organizations present challenges for measuring income. As discussed by Bittker and Rahdert (1976), donations received by NFP hospitals could be designated either as taxable revenue (the donor has "purchased" a good) or as nontaxable gifts received; likewise, the charity provided to individuals could be classified as a deductible business expense or a nondeductible gift. Hansmann (1981) argues that these measurement problems are overstated for "commercial" NFPs -- organizations, such as hospitals, that rely heavily on revenues from goods and services, rather than donations.

Attributing the "income" of a NFP organization to "owners" also creates administrative problems. For many NFPs, income is small; however, for commercial NFPs (rather than donative NFPs), income is the business equivalent of "retained earnings." Even though retained earnings cannot be distributed, they measure the capital income generated by the NFP. If a religious or

charitable organization is the "owner" of the income, one could argue that the income should face a zero marginal tax rate. However, since the corporate level tax is an entity-level tax, the counter argument is that the NFP should pay the entity-level tax but the tax-exempt owner should not pay taxes on distributions. These administrative concerns are much smaller for the property tax since ownership can be assigned to the NFP organization which could be held liable for the tax payment.

To qualify for the income tax exemption, organizations face two tests: organizational and operational. The organizational test, also called the nondistribution constraint, requires that the NFP "own" itself; revenues in excess of expenses must be reinvested in the hospital's mission. The NFP cannot have shareholders who receive the residual claims on the firm's income and cannot operate for the private inurement of interested parties. This restriction implies that the NFP hospital cannot transfer the profits to physicians or directors through excessive compensation. The operational test requires the NFP hospital to have an exclusively charitable purpose. If a NFP hospital engages in profit-making activities unrelated to its primary mission, it faces an unrelated business income tax that is equivalent to the income tax that would have been paid on the earnings from these activities. The requirement of being exclusively charitable has raised both federal and state policy concerns regarding what constitutes charitable activity.[2]

II.C. Theoretical Arguments for the NFP Hospital Tax Exemption

Economic theory suggests that governments may want special tax treatment (either a

[2] See Frank and Salkever (1994) for a brief description of some of the recent policy challenges to NFP hospitals.

subsidy or lower tax rate) for activities when a competitive market would fail to produce an efficient outcome. Market failures can arise from private agents underproviding public goods (i.e., goods that are non-rival in consumption) or goods that generate positive externalities. Hospital activities that may create positive externalities include research and development, community education, medical education (to the degree health care professionals do not capture these benefits through returns to human capital), and disease control. Since FP firms only enter markets with non-negative expected economic profits, they may underproduce hospital outputs that are not profitable. If the social benefits of these outputs exceed their private returns, then a subsidy to encourage the provision of these outputs may be justified. While society might want to encourage goods with positive externalities, subsidies tied to the provision of these goods (when feasible) would be more effective at encouraging the desired behaviors than would income or property tax exemptions.

Another potential market failure that NFP hospitals may help solve is related to information problems in health care markets.[3] The NFP organizational form may reduce these information problems relative to FP firms. If NFP hospitals face other organizational disadvantages, such as lack of access to equity capital markets, then the tax exemptions may increase economic efficiency by encouraging the NFP form despite its other disadvantages. Hansmann (1981) argues that offsetting the nonprofit's capital constraint is a more appealing argument for the tax exemption than administrative reasons or encouraging the provision of community benefits. However, using a general equilibrium model, Goodspeed and Kenyon

[3] Frank and Salkever (1994) review models in which NFP status creates trust with customers. Arrow (1963) and Pauly (1978) are seminal articles.

(1993) conclude that the tax exemption is a second-best method to counter the capital constraint.

In addition to efficiency grounds, equity arguments are also made to support the NFP hospital tax exemption. The argument for redistributing resources through health care, rather than by directly transferring money to poor people, is that health care is a "merit" good. As with many of the efficiency arguments, this justification runs afoul of being inferior to more targeted policies. For example, Medicaid targets resources for the care of the poor much more directly than a property or income tax exemption.

Thus far, we have described theoretical arguments in favor of the tax exemption of NFP hospitals. Many of these arguments offer only weak support for the tax exemption since it is not directly tied to particular behaviors or desired outcomes. Claims justifying the tax exemptions for NFP hospitals based on the services they provide require that NFP hospitals are more likely than FP hospitals to produce the desired outputs. We address whether the different organizational forms produce different outputs in the next section.

Policies that benefit one organizational form over another often spur criticisms of "unfair competition." Managers of FP hospitals claim that they are at a competitive disadvantage because the NFP hospitals are exempt from taxes. Presumably, these managers would support replacing the tax exemption with policies tied to specific behaviors but independent of organizational form. While such policies might be more effective from the government's perspective for the reasons discussed above, the issue of unfair competition is more complex than just noting that a policy favors one organizational form over another.

First, the coexistence of two organizational forms providing similar services (though possibly not identical services) suggests that the alternative organizational forms have competing

advantages and disadvantages.[4] While the NFP organizations may have tax and reputation advantages, the FP firms may have an edge in terms of access to equity capital or managerial efficiency (assuming the market for corporate control effectively disciplines FP managers). In addition, FP hospitals may take advantage of opportunities for "cream-skimming" either by specializing in high-profit activities or by catering to high-profit patients.[5] Thus, the mix of firms in the industry depends on the size of the tax advantage for NFP hospitals relative to these other differential costs and benefits of the two organizational forms. Second, Rose-Ackerman (1982) argues that the competition offered by NFP hospitals is "unfair" only if it is unanticipated and creates windfall losses for investors in the FP enterprises; FP firms should include anticipated competition from NFP firms in their investment decisions and, hence, anticipated competition does not unduly burden the FP firms (though it may shift the composition of investment within the industry).

III. Patterns in Location, Size, and Function of NFP and FP Hospitals

Given the justifications for the tax exemption of NFP hospitals and the potential for unfair competition, we present some basic facts about the size and characteristics of hospitals that are

[4] For a discussion of the merits of alternative organizational forms from an agency cost perspective, see Fama and Jensen (1983a and 1983b). Alternatively, the coexistence of the two organizational forms could be a disequilibrium phenomenon; however, despite the recent wave of conversions of NFP hospitals into FP hospitals, this explanation seems implausible given the persistence of the two forms.

[5] Myerson (1997) discusses the trend towards specialized hospitals "designed to conquer a profitable niche," such as heart hospitals and cancer centers. While he claims that FP hospitals are more aggressive in seeking these opportunities, both organizational forms are participating in the trend. In addition, these specialty hospitals have increased the competitive pressures on all hospitals providing a given service.

related to these hypotheses. Understanding differences in hospital characteristics is helpful for evaluating the tax benefits of NFP hospitals and for determining whether the organizational forms differ in their provision of community benefits. We focus on non-federal, general short-term hospitals in the 50 states and the District of Columbia using data from cost reports submitted to the Health Care Financing Administration (HCFA) for fiscal year 1995 by hospitals participating in Medicare.

Of these 4,996 short-term hospitals in the United States in 1995, 2963 (59 percent) are not-for-profit, 724 (15 percent) are for-profit, and 1309 (26 percent) are governmental. As the NFP sector contains some very large teaching hospitals, nearly 70 percent (660,150) beds are located in NFP hospitals. FP hospitals account for 12 percent (116,135) of beds, while the government hospitals account for the remaining 18 percent (169,680).

Regional Differences

The distribution of hospital types varies greatly by geographic region. In the Northeast, the NFP sector dominates. Connecticut, Maine, New Jersey, Rhode Island, and Vermont do not have any FP hospitals, and in Massachusetts, New York, and Pennsylvania, the percentage of beds in for-profit control is under 3 percent. The government sector is also small in the Northeast; the percentage of hospital beds in the government sector is less than 10 percent in every Northeastern state. In contrast to the Northeast, the percentage of hospital beds in the FP sector exceeds 30 percent in 7 states: Texas, Utah, Tennessee, Nevada, Florida, Delaware, and Louisiana. Nearly half (54,511) of all for-profit hospital beds are in just three states: Texas, Florida, and California.

Since hospital services are predominantly provided locally, the uneven geographic distribution of FP hospitals raises questions about how the different organizational forms interact. Obviously, in a market with no FP hospitals, the NFPs are insulated from competitive pressures induced by the potentially different objectives of FP hospitals.[6] At the other extreme, when FP hospitals have a large market share, they may be less able to exploit profit opportunities through segmenting the market since there are fewer NFP hospitals to serve the less profitable patients. In general, the competitive interactions between organizational forms may depend on the market penetration of FP hospitals. For example, the presence of a single FP hospital in a market might not influence the behavior of the dominant NFP hospitals but when FP firms have a large market share, the NFP hospitals respond by changing some behaviors. Since FP hospitals are unevenly distributed across locations, it is unlikely that a single, simple model will capture the interactions between FP and NFP hospitals in these different markets.

Differences in Size

In Table 1, we present the 25th percentile, the median, and the 75th percentile of the characteristics of the hospitals by control type. We summarize the data in this way to minimize the effect of what appear to be unrealistic values and to give an idea of the dispersion of the data as well as its central tendency. The first panel presents data on hospital size. At the 25th percentile, the NFP hospitals are smaller than the FP hospitals in terms of the total facility beds and the number of discharges, though the 25th percentile of the number of hospital employees is

[6] Unless regulatory barriers prevent entry by FP hospitals, the NFP hospitals may be influenced by the threat of entry by FP competition even where FP hospitals have zero market share.

greater for NFP hospitals. At the median and the 75th percentile of the distributions, the NFP hospitals are larger than the FP hospitals across all three dimensions. For example, the 75th percentile of the total facility beds is 50 percent larger for the NFP hospitals than for the FP hospitals, and the 75th percentile the total number of employees is 109 percent larger. Across all three size measures, government hospitals are the smallest of the three types. For each size variable, a Kruskal-Wallis test of equivalence of the distribution across hospital types is rejected at the 0.01 level.

In the middle panel of Table 1, we describe hospital size by financial measures. Across all points in the distribution, NFP hospitals have the greatest amount of both fixed and total assets, followed by FP and then government hospitals. NFP hospitals at the median and the 75th percentile generate more net patient revenue than their FP counterparts, though at the 25th percentile, net revenues of NFP hospitals lagged the FPs. Revenues of government hospitals are the lowest of the three types. Kruskal-Wallis tests for each of the variables presented in the middle panel rejected the null of equal distributions at the 0.01 level.

Characteristics and Complexity of Patients

The final panel of Table 1 presents measures of the kind and complexity of the patients treated in the three types of hospital. The first two rows of this panel present the percentage of patients insured by Medicaid and Medicare, respectively. If government insurance programs offer less generous reimbursement than private insurance, we would expect that profit maximizing firms might have an incentive to "cherry pick" or avoid the treatment of patients covered by this type of insurance. Though the advent of managed care has made Medicare patients relatively more

attractive to hospitals than they were in the past, this is less true for Medicaid patients, and it seems remarkable that the percentage of patients in the two types of private hospitals should be so similar. The final two rows of Table 1 give some indication of the complexity of cases served by each hospital type as measured by a case mix index (CMI) and the percentage of inpatient days that were in the intensive care unit.[7] By these indices the FP hospitals tend to treat slightly more difficult cases than NFP hospitals.[8]

Comparison of Services Provided

As a result of different organizational objectives, tax benefits, differences in regulatory constraints, or perhaps simply the historical evolution of the hospital market, hospitals of different organizational forms may differ in the kind and intensity of services that they provide. We examine differences by hospital type in the provision certain services, both those described in the literature as "community benefits" and those we classify as "specialized" services.

Community Benefits

As FP hospitals have grown in number, potential differences across hospital types in the willingness to provide uncompensated care has received much attention. The motivation for these concerns is clear: in the absence of harmful reputation effects, one would expect profit-maximizing firms to avoid treating uninsured patients, for whom receipt of payment is unlikely.

[7] Higher values of HCFA's CMI indicates a case load which is more expensive to treat.

[8] Alternatively, the difference in CMI may come from FP hospitals systematically recording more difficult diagnoses than NFP hospitals for similar patients. This recording difference would maximize reimbursements from third party payers.

Moreover, NFP firms are expected to provide a reasonable amount of uncompensated care in exchange for their tax-exempt status, though in most states the level of uncompensated care required to maintain NFP status is vaguely specified. Although is not possible to study these differences with the Medicare cost report data, which lack information on the provision of uncompensated care, two recent studies use data on California hospitals to address this question. Norton and Staiger (1994) find that though NFP hospitals provide more uncompensated care, the difference between NFP and FP firms disappears when accounting for the endogeneity of the choice of organization form. In other words, their results indicate that NFP and FP hospitals located in areas with similar characteristics would offer similar amounts of uncompensated care. Their study underlines the importance of treating the organization form as endogenous in order to make strong predictions related to the effects of the organizational form on hospital behavior. Young, Desai, and Lukas (1997) find that uncompensated care in hospitals that underwent a transition from FP to NFP did not decline relative to a control set of NFP hospitals, though, consistent with Norton and Staiger (1994), the hospitals that were acquired had a lower baseline level of uncompensated care.

Using the Medicare cost report data, we present evidence on the presence of three additional hospital services viewed as community benefits: an emergency department, a delivery room, and an hospital teaching program.[9] In our description of the differences in service provision below, we do not purport to provide estimates of a behavioral model that account for

[9] The sample from the cost reports was limited to hospitals that reported "reasonable" values for: total number of beds, number of employees, employees per bed, total discharges, return on fixed assets, fixed assets per discharge, return on total assets, net revenue per day, length of stay, inpatient share of revenue, and average wages.

the endogeneity of organization form. Rather, we seek to provide a basic description of the differences, how they might be partially accounted for by variables such as hospital size, and how this description is related to various hypotheses suggested by economic theory. We present statistics on these services in Table 2. The first three columns of the table show the proportion of hospitals of each organization form that provide the service or have the characteristic. In column 4, we present a Chi-square statistic for the null hypothesis of equality in the proportion across organizational forms. Finally, column 5 reports whether statistical differences between organizational forms were maintained in a linear probability model where the presence of the service or characteristic was modeled as a function of: a constant; four hospital size indicators; and indicators for teaching status, government status, for-profits status, church affiliation, and status as a sole-community hospital. We also included interactions of the two organizational form indicators with the four size indicators.

The first row of Table 2 presents results on the presence of emergency room services by hospital type.[10] Uninsured patients are more likely to use emergency rooms for routine medical care than insured patients and the emergency department is a port of entry for hospital admission for more seriously-ill uninsured patients.[11] Therefore, it is possible that profit-seeking hospital firms would seek to avoid providing these services. In the first three columns of Table 2, we show the proportions of the three types of hospital with an emergency department. Consistent with our expectations, 93 percent of FP hospitals provide emergency services, compared to while

[10] As for each of the "service" variables, the emergency department variable is set to 1 if the hospital reported positive costs for the department.

[11] For example, Culhane and Hadley (1992) find that NFP psychiatric hospitals are more accessible through emergency services than their FP counterparts.

98 percent of NFP and 99 percent of government hospitals. The Chi-square statistic indicates that the proportions are statistically significant. Controlling for potential confounding factors in the regression model, small FP hospitals (those with less than 75 beds) are 18 percentage points (p-value of 0.0001) less likely to have an emergency room than their NFP counterparts, and FP hospitals with between 150 and 225 beds are 5.5 percentage points less likely to provide emergency services than their NFP counterparts. There are no statistically significant differences between FP and NFP hospitals with between 75 and 150 beds or between FP and NFP hospitals with more than 300 beds.

For reasons analogous to that for emergency rooms, profit-maximizing hospital firms might avoid the provision of newborn deliveries in order to avoid expending resources on births to uninsured or Medicaid-insured young mothers, especially since uninsured women are more likely to have low birth weight children that could require expensive neo-natal care.[12] In the second row of Table 2, we present some statistics for provision of hospital delivery rooms by hospital type. Sixty-three percent of FP hospitals provide delivery services, compared to 73 percent of government and 75 percent of NFP hospitals. In the regression analysis, statistically significant differences between FP and NFP firms are present for the two smallest size categories. Relative to similarly-sized NFP hospitals, FP hospitals with fewer than 75 beds are 28 percentage points less likely to have delivery services, and FP hospitals with between 75 and 150 beds are percentage points less likely to provide delivery services.

The future of hospital-based medical education programs in increasingly competitive

[12] Haas et al (1993) describes differences in birth outcomes between insured and uninsured women in Massachusetts.

hospital markets has been the subject of much discussion (see for example Reuter and Gaskin, 1997). Culhane and Hadley (1992) show that NFP psychiatric hospitals are more likely to be involved in professional training than FP psychiatric hospitals. The third row of Table 2 presents statistics for the presence of a teaching program in our sample of short-term general hospitals.[13] Twenty-nine percent of NFP hospitals have a teaching program, while only 12.7 percent of FP and 9.1 percent of government hospitals do. The regression analysis reveals that teaching status is very strongly related to size, and organizational form does not influence the probability of having a teaching program for hospitals with fewer than 150 beds. However, among the three largest categories, there were important (and statistically significant) differences between FP and NFP firms in the probability of having a teaching program. FP hospitals with between 150 and 224 beds were 16 percentage points less likely to have a teaching program. For hospitals with between 225 and 299 beds and hospitals with more than 300 beds, the differences were 29 and 36 percentage points, respectively.

Provision of Specialized Services

In rows 4 through 6 of Table 2, we present statistics on the presence of three specialized service units: an intensive care unit (ICU), a coronary care unit (CCU), and a radiation therapy unit (RTU). We find that FP hospitals, perhaps surprisingly, are the most likely to have an ICU (83 percent), followed by NFP (78 percent), and government hospitals (50 percent). The regressions indicate that the statistically significant differences across organizational forms are

[13] We classify hospitals as teaching hospitals if they indicated the presence of interns and residents on the Medicare cost report.

concentrated in the smallest two hospital size categories. For the CCUs, NFP hospitals lead, with 24.5 percent having a CCU, with the proportions being 13.2 percent and 10.8 percent in FP and government hospitals, respectively. However, having a CCU seems is strongly associated with size and teaching status, and in the regression analysis none of the indicators for organizational form or their interactions with the size indicators were statistically significant. The results for the RTUs are somewhat different, though the pattern of the raw proportions look similar to those of the CCUs, with 24.4 percent of NFPs, 10.5 percent of FPs, and 9.9 percent of government hospitals having RTU units. The regression reveals that the presence of a RTU is very strongly associated with size and teaching status. Once these are controlled for, there is no statistical difference between government and NFP hospitals. For the three smallest hospital size categories, there is no difference between FP and NFP hospitals, but there is a significant difference for the two highest categories. For example, a NFP hospital with more than 300 beds is 18 percentage points more likely, other things equal, to have a RTU than its FP counterpart.

These systematic differences in the outputs of FP and NFP hospitals may offer some justification for the tax exemptions for NFP hospitals if society values these differences and, for some reason, the FP organizational form underprovides these services. These differences in services may, in part, explain the differences in profitability that we document in the next section. However, the story of service differences across organization form is complicated by the significant amount of within-organization form variation. For example, as defined by Clement, Smith, and Wheeler (1994), 20 to 80 percent of NFP hospitals do not provide a level of community benefit equal to the government's tax expenditure on them, and Culhane and Hadley (1992) find in their discriminant analysis that, based on the services provided and clientele served

by their sample of psychiatric hospitals, some NFP psychiatric hospitals appear more like their FP counterparts than like the other NFP psychiatric hospitals.

IV. The Exemption from Capital Taxes

A major portion of the tax advantage of NFP hospitals comes from the exemption from factor taxes on capital -- the corporate income tax and the property tax. We begin this section by discussing general issues in analyzing factor taxes. We follow this general framework with imputations of the aggregate value of the exemption from income and property taxes and the heterogeneity in these benefits across hospitals.

IV.A. General Issues in Analyzing Factor Taxes

Since the property tax and income tax are taxes on capital, the importance of the exemption from these taxes depends on how much capital hospitals use. To get an idea of the importance of capital for hospitals, Table 3 compares the capital intensity of publicly-traded FP hospitals and other broad industry groups for 1995. The data are from COMPUSTAT, a database of corporate financial statements. While the publicly-traded firms may differ from their privately-held or NFP competitors, these data are useful for making interindustry comparisons. Furthermore, the eight publicly-traded firms with primary Standard Industrial Classification (SIC) code 8062 own the majority of for-profit hospitals.[14] The table reports two measures of capital

[14] According to the *Directory of Investor-Owned Hospitals, Hospital Management Companies, and Health Systems*, the eight publicly traded companies in the sample own 562 of the 740 (76.0 percent) non-specialty investor-owned hospitals which account for 101,879 of the 120,620 (84.5 percent) of the beds in these hospitals. For 1995, *Hospital Statistics* (from the American Hospital Association's annual survey) reports 752 for-profit community hospitals with a total of 106,000 beds.

intensity -- wages divided by the net book value of property, plant and equipment (PPE) as an approximation of ratio of labor-to-capital inputs and the net book value of PPE divided by sales revenue as an approximation of the capital-to-output ratio.

In terms of the labor-to-capital ratios, hospitals appear much more labor intensive than firms in non-service industries (a ratio of 0.72 for hospitals compared to 0.39 for manufacturing firms).[15] While these data indicate that hospitals are relatively labor intensive in terms of factor proportions of capital and labor, hospitals are in the middle of all firms in terms of asset-to-sales ratios. The manufacturing sector having both low wage-to-asset and low asset-to-sales ratios suggests that material inputs play a larger role in manufacturing than in service industries, such as hospitals. Overall, the data offer some evidence that hospitals are relatively labor intensive and, therefore, would benefit less from a capital tax exemption than would firms in other industries.

While the corporate income and property taxes are both factor taxes on capital, the differences in their administration leads to crucial differences in how important the tax exemption may be for NFP hospitals. The corporate income tax is levied on the flow of income generated by the firm's assets; in contrast, the property tax applies to the stock of assets owned by the firm. For a given rate of return, it is possible to construct a property tax that has the same revenue as a tax on capital income (assuming that the property tax applies to all of the capital generating the income). For example, for a 10 percent return to capital, a 30 percent capital income tax raises the same revenue as a 3 percent property tax.

Several details of the actual tax systems affect the equivalence between income and

[15] The wage data include hospital employees but not payments made directly from patients to doctors so they probable understate the relative labor intensity of health care services. For the manufacturing sector, a large fraction of the firms do not report the wage data.

property taxes. First, property taxes sometimes only apply to a subset of the firm's assets, such as land and structures. Second, for the corporate income tax, the returns that flow to bondholders do not face corporate taxation since interest expense is deductible. Third, since the income tax is an *ex post* capital tax, any returns generated as inframarginal returns (economic profit) or from good or bad luck are included in the tax base. Similarly, the income tax depends on the profitability of the management of the assets. If the firm chooses to deploy the assets in ways that are less profitable than it could otherwise use the assets, then it will pay less in income taxes for a given amount of assets; however, the property tax levy is not sensitive to these decisions. The same argument applies if management deploys the assets less efficiently. This difference in taxes is especially relevant if NFP hospitals provide less profitable services that have unmeasured (from the perspective of the tax base) social benefits.

Since the income tax uses an *ex post* measure of the return to capital, the tax liability depends on the profitability of the firm. The third column of Table 3 provides a simple comparison of the profitability of publicly-traded hospitals relative to other sectors. The 10.3 percent return on assets for publicly-traded hospitals in 1995 is similar to the return on assets in manufacturing (10.2 percent) and higher than the returns in the other sectors. For the period 1978 through 1995, hospitals had an average return on assets of 11.5 percent. These returns suggest that an exemption from a capital income tax could have substantial value for hospitals.

While the comparisons of the publicly-traded FP hospitals with firms in other industries provides a useful benchmark for thinking about the magnitude of the tax break for hospitals relative to the tax liabilities in other industries, this sample of firms may not reflect the value to NFP hospitals. As discussed above, the organizational forms differ in their outputs. They may

also may differ in terms of their reliance on capital and their profitability. In terms of their reliance on capital, two, potentially offsetting, effects might lead to difference in input choices across organizational forms. First, the capital tax exemption may encourage NFP hospitals to choose more capital intensive production methods or specialize in more capital intensive outputs[16] Second, since NFP hospitals cannot issue public equity, they may use less capital than FP hospitals. To compare the two types of hospitals, we return to the Medicare cost report data.

Table 4 compares the capital intensity and profitability of different types of hospitals. We have five measures of capital intensity: (1) employees per bed; (2) wages to fixed assets; (3) fixed assets to net patient revenue; (4) fixed assets per discharge; and (5) allocated capital costs as a fraction of total allocated costs. While the nonparametric statistical tests reject the null hypothesis that the distributions of the capital intensity variables are drawn from a common distribution, there are no strong patterns in capital intensity across types of hospitals. The distributions of the capital intensities have considerable overlap indicating that high capital intensity is not associated with a particular organizational form. At the median of their distributions, NFP hospitals have more employees per bed (3.30 for NFP hospitals to 2.44 for FP hospitals), higher wages relative to fixed assets (0.92 to 0.74), and lower capital costs relative to total costs (0.09 to 0.107). These differences suggest that NFP hospitals are less capital intensive than the FP hospitals. However, in terms of fixed assets relative to net patient revenues or discharges, NFP hospitals appear slightly more capital intensive than FP hospitals.

[16] The idea of one organizational form specializing in a particular set of outputs depends on the coexistence of the two organizational forms within the same geographic market. For markets served only by NFP hospitals, one would expect that only the substitution of capital for labor for a given set of outputs would occur since without a FP competitor, changing outputs implies changing the overall set of services received by the community.

The second panel of the table compares the profitability of different types of hospitals. Our measures of profitability are: (1) net income; (2) return on assets (total income divided by total assets); (3) return on fixed assets (the difference between patient revenue and operating expenses divided by fixed assets); and (4) operating margins (net patient revenues less operating expenses divided by operating expenses). The government hospitals are clearly less profitable than the private hospitals. By all of the measures except net income, the NFP hospitals are less profitable than the FP hospitals. The median of the return on fixed asset distribution for NFP hospitals is zero compared to 10.4 percent for FP hospitals; the low return on assets suggests that the NFP hospitals might pay considerably less in income taxes than their FP counterparts. However, the different organizational forms are much more similar in terms of returns on total assets; one difference between the return on fixed assets and the return on total assets is the investment income earned on investments, an important source of income for NFP hospitals with large endowments.

The lower incomes of NFP hospitals are consistent with both the competing theories stated above. Consistent with the intent of the NFP tax exemption, the NFPs could be distributing some of their "income" in the form of community benefits, or services provided at a price below average cost. Alternatively, the lower incomes could come from administrative inefficiency or excessive payments to factors of production. The lower incomes of the NFP hospitals may also reflect random differences across firms and years. Our analysis of cost report data focuses on 1995 when FP hospitals happened to be more profitable than NFP hospitals. While this difference is common, in some years, the different organizational forms have similar

profitability (see Sloan, 1997).[17] Thus, our comparisons of NFP and FP hospitals are somewhat sensitive to the choice of year.

These univariate comparisons of capital intensity and profitability do not control for other hospital characteristics, such as size and teaching responsibilities, that are correlated with organizational form. To control for some of these factors, we regress our measures of capital intensity and profitability on the number of beds in the facility, and dummy variables for for-profit status, government ownership, church affiliation, rural location (sole community hospital status), and teaching (as proxied for by the presence of interns or residents). Table 5 presents the results from these descriptive regressions. In terms of capital intensity, a more clear picture emerges that FP are more capital intensive than NFP hospitals: on average, relative to NFP hospitals, the FP hospitals have 0.6 fewer employees per bed, 0.06 higher fixed-asset-to-revenue ratios, $838 more fixed-assets-per-discharge, and 0.023 higher capital costs as a fraction of total costs.[18] If, as suggested by the regressions, NFP hospitals are less capital intensive than FP hospitals, then the value of the NFP's exemption from capital taxes is less than the value of taxes paid by the FP hospitals. Furthermore, these regressions cast doubt on the hypothesis that the exemption from capital taxes leads the NFP hospitals to substitute capital for labor or specialize in more capital intensive forms of health care.

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[17] While Sloan's analysis of total margins shows that FP and NFP hospitals are similar in some years, Cleverly's (1992) comparison of the return on equity of hospital systems indicates that FP hospital chains typically outperform NFP hospitals.

[18] For the variables created from accounting measures of capital (either fixed assets or allocated capital costs), newer hospitals may have higher measured capital costs than older hospitals if depreciation allowances for accounting purposes are more generous than true economic depreciation. With accelerated depreciation, book values of capital will understate market values. If hospital age is correlated with organizational form, then these discrepancies could affect our results.

The regression results on profitability confirm the conclusions from Table 4 that FP hospitals are more profitable than NFP hospitals. Relative to the NFP hospitals, the FP hospitals have $1.3 million more in net income, a 5.4 percentage point higher return on assets, a 15 percentage point higher return on fixed assets, and a 7.9 percentage point higher operating margin. The results also indicate that larger hospitals are more profitable (both in terms of the level of income and the rate of return), government hospitals are less profitable than NFP hospitals, and teaching hospitals are less profitable than other hospitals (in terms of rates of return). Overall, these differences in profitability suggest that many NFP hospitals would not have large income tax liabilities since they are not profitable.

IV.B. The Value of the Exemption from Income Taxes

As a starting point for analyzing the importance of the income tax exemption for NFP hospitals, we examine the income tax liabilities of publicly-traded FP hospitals, the same sample we used in Table 3 to compare capital intensity across industries. Table 6 presents summary measures of the importance of income taxes over time for publicly-traded hospital and across industries for 1995. For 1995, publicly-traded hospitals reported $976 million in total income taxes.[19] Hospitals' tax liabilities have grown over time as the FP hospital sector has grown. Compared to earlier years, 1995 seems typical in terms of income taxes relative to assets, sales, and cost of goods sold. Relative to manufacturing firms, income taxes are a slightly higher

[19] These data are the income taxes reported for financial reporting purposes. They may differ from tax payments to the government due to differences in financial and tax accounting. For example, differences in the timing of depreciation allowances can affect the taxes reported in financial statements relative to actual payments.

fraction of hospital assets, sales and cost of goods sold.

Since NFP hospitals may differ in terms of capital intensity and profitability, applying the taxes paid by the FP hospitals may not be a good indicator of the taxes that the NFP hospitals would pay if the income tax exemption were repealed. To get a sense of the potential tax liabilities of the NFP hospitals, we impute income tax liabilities from the HCFA cost report data. As an approximation of Federal income taxes, we multiply each hospital's net income by 35 percent, the top corporate statutory marginal tax rate. For firms with negative net income, this imputation leads to a tax "refund." This refund can be used to offset income tax liability from either previous years (a carryback), future years (a carryforward), or other hospitals "owned" by the same taxable entity.[20] To calculate precise estimates of the value of the refunds associated with losses requires a complicated, dynamic program accounting for the probability of firms moving from positive to negative income in order to use their carryforwards. Our approach overstates the value of tax refunds to the extent that some NFP hospitals persistently have negative income. To incorporate state income tax rates, we include the top marginal state corporate income tax rate, adjusted for deductibility of state income taxes for Federal income tax purposes.[21]

Table 7 reports statistics on the imputed value of income taxes paid by NFP and FP

[20] The ability to offset losses against income of affiliated hospitals is obviously useful for the large FP hospital chains. However, most NFP hospitals are in relatively small groups. The repeal of the NFP income tax exemption would create incentives for NFP hospitals to consolidate in order to benefit from taxable losses generated by a single hospital.

[21] We use state corporate tax rates from *Significant Features of Fiscal Federalism.* Since the last version of *Significant Features of Fiscal Federalism* has data for 1993, we update this data with information from the Federation of Tax Administrators.

hospitals, and the relative values of income taxes to net patient revenue and total asset value. We include the FP hospitals as a comparison for the NFP hospitals; unfortunately, the cost report data do not include a variable for taxes paid. The imputations for the FP hospitals also allow us to compare our imputed tax liabilities with the reported tax liabilities of publicly-traded hospitals in Table 6. The eight hospital firms in Table 6 owned 562 hospitals and record $976 million in income taxes paid. For the 622 FP hospitals in our sample, we impute an aggregate income tax liability of $946 million which suggests that our simple imputation does a reasonable job of capturing income tax liabilities.

While the median dollar values of Federal income taxes are similar for the two types of firms ($514.5 for NFP hospitals compared to $583.3 for FP hospitals), much of this difference comes from differences in hospital size. In terms of income taxes relative to revenues or total assets, the median values for NFP hospitals are roughly two-thirds as large as the median values for FP hospitals. Since the NFP hospitals have lower (private) rates of return than the FP hospitals, they benefit less from the income tax exemption than would be expected by simply assuming that they would pay a similar share of net revenue or asset value in income taxes as the FP hospitals. Without the tax exemption, the median NFP hospital would pay income taxes of 1.9 percent of net patient revenues; in contrast, the median FP hospital pays income taxes of 2.5 percent of net patient revenues. If the repeal of the income tax exemption pushes the NFP hospitals to behave like the current FP hospitals, then the 2.5 percent represents the tax savings for NFP hospitals. The comparison of the value of the tax exemption with revenues suggests that the tax exemption provides considerable financial resources to undertake the NFPs' charitable mission. For the 2,801 NFP hospitals in our sample, the aggregate imputed income tax liability is

$4.6 billion with roughly $4.1 billion resulting from the Federal income tax exemption and the remaining $500 million from the state tax exemption.

We impute the potential income tax liability by applying the tax rate to total net income which is the sum of operating income and investment income. Unlike FP hospitals, some NFP hospitals have substantial endowments invested in financial assets. Thus the NFP hospital is a combination of an operating business with a hospital and a portfolio of financial assets. In aggregate, the exemption from income taxes on investment income accounts for $1.4 billion of the total value of the exemption from income taxes, which is 30 percent of the total value of the income tax exemption. The value of the tax exemption on investment income is concentrated among hospitals with large endowments. For a NFP hospital with zero (or negative) operating income but an endowment yielding investment income, the income tax exemption only has value because the hospital is a tax-exempt investor in financial assets.

IV.C. The Value of Exemption from Property Taxes

Based on data provided by hospitals for the fiscal year 1992, HCFA undertook a special project to analyze property tax payments by FP hospitals. HCFA's data indicates that the average amount paid in property taxes by FP hospitals in 1992 was 1.6 percent of fixed assets. We use this rate as our first estimate of the average property tax rate that would apply to NFP hospitals in the absence of the tax exemption. We apply this rate to the fixed assets of NFP hospitals in the 1995 cost report data, and report summary statistics on the value of the tax exemption in Table 8. The median hospital-level exemption is $295,139, the median exemption per bed is $1,769, the median exemption per discharge is $62, and the median exemption as a percentage of total

revenues is 0.7 percent.

There are several potential problems with the above calculations as estimates of the size of property tax exemption. The most obvious is that FP firms and NFP firms may systematically locate in areas with different tax rates, so that the rate of 1.6 percent, developed from a set of FP hospitals, may not be an appropriate rate to apply to NFP hospitals. In particular, FP firms may locate in areas where property taxes are low. In addition, the uniform rate does not provide information on the heterogeneity in the tax rates and in the value of the exemption. For this reason, we expand our analysis to individual states.

Since there is no nationwide database providing the effective commercial property tax rates for each municipality, we set out to build our own by contacting the treasury departments in a large number of states. Three states -- New Jersey, Ohio, and Wisconsin -- provided *effective* tax rates for each municipality in the state.[22] Since FP profit hospitals represented a negligible part of the market in these three states in 1995, we cannot adequately address the question of whether property tax rates "faced" by FP and NFP firms are systematically different. However, our data from these states will give us some idea of the intra-state heterogeneity in the value of the tax exemption.

Our three states differ in the classification of fixed assets that are taxed. In Ohio, real property (land and buildings) is taxed at a different rate than business personal property (moveable equipment, etc.), and in New Jersey only real property is taxed. Since the Medicare

[22]The Office of Revenue and Tax Analysis of the Michigan Department of Revenue has recently published a set of imputations of the value of the tax exemption for NFP hospitals in Michigan (Michigan Department of Treasury, 1997). They reported that property taxes represented 45.2% of Michigan's $390.2 million in tax expenditures for not-for-profit hospitals in 1996.

cost report data do not provide separate variables for real and business personal property, we use the information on capital cost of buildings and fixtures and moveable equipment to determine the percentage of fixed assets in each of the two property categories. In each state, the property rate shows a fair amount of variation. Combining data from the Medicare cost reports and property tax rate data on the municipalities in which the hospitals reside, we calculate what the property tax bill of the NFP hospitals would have been had they not been exempt from taxation.

Results from the property tax imputations for NFP hospitals are given in Table 8. We report the 25th percentile, the median, and the 75th percentiles for five measures of the property tax burden. The tax rate for the median hospital in each of the three states is higher than the national average for FP hospitals. For New Jersey, the difference is slight (1.62 percent versus 1.6 percent), but in Wisconsin, the median is 2.8 percent, 75 percent higher than the FP national average. In addition to the interstate heterogeneity, tax rates vary considerably within states. For example, in Wisconsin the 25th percentile tax rate is 2.37 percent, while the 75th percentile tax rate is 3.28 percent, an increase of 40 percent. Property tax levels move through a larger range, since this is largely a function of hospital size. Indeed, the Michigan Department of Treasury (1997) calculates that the ten largest of the 172 NFP hospitals in Michigan account for over 40 percent of Michigan property tax expenditures. Columns 3, 4 and 5 present the imputed property taxes in ways that account for hospital size. In column 3, we can see that, at the median, property taxes per bed ranged from $1,848 in Ohio, which is just slight above the median for the country as a whole ($1,769), to $2,945 in Wisconsin. Column 4 shows that the median imputed property tax per discharge ranged from $57 in New Jersey to $126 in Wisconsin, which is more than double the US median of $62. In column 5 we see that, as a percentage of revenues, the median

property tax ranged from a 0.6 percent in New Jersey to 1.4 percent in Wisconsin.

At the bottom of Table 8, we calculate the total property tax expenditure for general short-term NFP hospitals in the three states. The tax expenditure ranges from $64 million in New Jersey to $118 million in Ohio. Since we do know how well the property tax rates that "apply" to NFP hospitals in these three states represent those of NFP hospitals faced around the country, we use the average FP hospital property tax rate developed from the HCFA study to develop a nationwide estimate of the value of the property tax exemption. By this measure, the total property tax expenditure in the United States for fiscal year 1995 was $1.7 billion. As a proportion of capital tax exemptions given to NFP hospitals by state and local government, this property tax bill is three times the size of the $500 million we calculated as the value of the exemption from state corporate income taxes. The much higher federal corporate income taxes result in a high value of the federal corporate income tax exemption ($4.1 billion), even at the relatively low level of profitability of NFP hospitals. Thus, the value of the property tax exemption represents only 27% of the total 6.3 billion dollars of capital tax exemptions at all levels of government.

The relative size of the different types of assets also affects the value of the property tax and income tax exemptions. The income tax exemption excludes income generated both by assets employed in the provision of medical care and investment assets, but the property tax only applies to fixed assets (or a subset of fixed assets). From Table 1 we can see that, at the median, non-fixed assets represent the majority of the assets of NFP hospitals. Since property taxes are based only on fixed assets, the value of the property tax exemption, at the median, applies to less than half of all hospital assets.

IV.D. The Combined Value of Capital Tax Exemptions

How large is the value of the capital tax exemption relative to government budgets and other tax expenditures directed to the health care sector? If the tax exemption were abolished, how large would the revenue gain be relative to, say, the health care needs of the uninsured? In 1994, aggregate property taxes paid in the U.S. were $197 billion and aggregate corporate income taxes were $169 billion (*Statistical Abstract of the United States 1997*, Table No. 478). Thus, with our assumption of no behavioral changes by the NFP hospitals, the $6.3 billion capital tax exemptions ($1.7 billion in property tax exemptions and $4.6 billion in income tax exemptions) extended to NFP hospitals represent about 1.7 percent of property and corporate income taxes paid.[23] Compared to other tax expenditures in the health care sector, the capital tax exemption for NFP hospitals is much smaller than the $60.6 billion tax expenditure on the exclusion of employer contributions for medical insurance, but larger than the $3.7 billion for deductibility of medical expenses and the $2.2 billion for deductibility of charitable contributions to the health care sector (*Statistical Abstract of the United States 1995*, Table No. 523).

In 1995, approximately 41 million people in the United States lacked health insurance. Hence, the value of the capital tax exemption to NFP hospitals represents $154 for each uninsured person. In 1995, per capita hospitalization expenses totaled $1,283.[24] Assuming that the uninsured have hospitalization costs similar to the national average and that hospital output and

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[23]As we discuss below, our calculations are based on the assumption of static reaction of hospitals to the capital taxes. It is possible that the NFP hospitals could obtain profitability levels similar to NF hospital in an environment where they are taxed.

[24]Data on the number of uninsured and per capita hospitalization expenses comes from the *Statistical Abstract of the United States 1997*.

prices are not sensitive to tax policy, then the extra tax revenue generated by taxing NFP hospitals could fund 12% of a program to extend hospitalization insurance to the uninsured.

V. Access to Tax-exempt Bond Markets

The ability to borrow using tax-exempt bonds is another potential tax-related advantage for NFP hospitals. In this section, we address two issues related to the value of the access to tax-exempt bond markets. First, we document the importance of tax-exempt bonds for NFP hospitals. Second, we discuss how potential policy reforms would affect NFP hospitals' value of issuing tax-exempt bonds.

Table 9 reports data on the issuance of long-term nonrefunding tax-exempt bonds by type of issuer for 1988 to 1992: government, NFP hospitals, and other tax-exempt private activity. These data are unpublished Internal Revenue Service tabulations.[25] The data exclude refunding issues which are associated with refinancing of existing debt. Thus these data should reflect borrowing for new investment. For 1992, the $10.3 billion in NFP hospital bonds accounted for 7.8 percent of the total tax-exempt bonds issued. The average bond issue was for $29.3 million. While other segments of the tax-exempt bond market grew by 49 percent between 1988 and 1992, the value of NFP issues grew by 124 percent. To put this $10.3 billion in perspective, it is useful to compare the proceeds of the bonds with the size of fixed assets of NFP hospitals. For a sample of 2,838 NFP hospitals with cost report data in both 1994 and 1995 and no change in ownership status, total fixed assets in 1995 are $102 billion with a median value of $18.5 million.

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[25] We thank Marvin Schwartz of the Statistics of Income and Bruce Davie of the Treasury Department for assistance with the data.

Furthermore, the aggregate change in fixed assets (i.e., a measure of net investment) for these hospitals is $4.2 billion. Thus the aggregate bond issuance of $10.3 billion is large relative to the stock and flow of fixed assets of NFP hospitals.

While Table 9 reports on the flow of new bond issues, the stock of outstanding debt depends both on new issues and the repayment of previous bonds. For information on the stock of outstanding bonds, we present data collected by the IRS from the balance sheets of tax-exempt organizations.[26] For 1994 (the most recent year with available data), NFP hospitals had $46.1 billion of outstanding tax-exempt debt. By comparison, these hospitals reported aggregate fixed assets of $191 billion and total assets of $281 billion. Thus tax-exempt bonds are an important source of financing for NFP hospitals.

These aggregate tabulations mask the heterogeneity in tax-exempt bond issuance among NFP hospitals. Only 19.7 percent of NFP hospitals have outstanding tax-exempt debt. Since issuing bonds has a fixed cost of underwriting, it is not surprising that the hospitals with outstanding tax-exempt bonds are much larger than the NFP hospitals without tax-exempt bonds; the hospitals with tax-exempt bonds have average fixed assets of $54.1 million compared to $14.6 million for those without tax-exempt debt. Conditional on having outstanding tax-exempt bonds, the median value of outstanding debt was $24.6 million. The median value of the ratio of outstanding tax-exempt debt to fixed assets was 0.769 which suggests these hospitals are either

[26] The data are from the public use files of Form 990 returns of tax exempt organizations for reporting year 1994. The data are a stratified random sample of NFP organizations with over sampling of large organizations. Since hospitals are larger than most NFP organizations, the sample has almost all major NFP hospitals. The data include weights for estimating population statistics. Unlike the HCFA data, we cannot separate the IRS data by type of hospital. Therefore, these data include long-term and specialty hospitals in addition to the general, short-term facilities that we discussed in previous sections.

highly-levered or have substantial other assets. In support of the later hypothesis, the median ratio of tax-exempt debt to total assets is only 0.336.

While these data indicated that tax-exempt bonds are an important source of financing for NFP hospitals, they do not give any information on the value of the tax "subsidy" from using tax-exempt bonds. Calculating the value of the subsidy depends on the alternative policy under consideration as well as how the NFP hospitals use the proceeds from borrowing. Under current tax law, investors are willing to lend to tax-exempt issuers at lower interest rates than they lend to issuers of taxable debt because they do not pay income taxes on interest from tax-exempt bonds. For example, the average current yield on 20-year maturity AAA-rate tax-exempt municipal bonds is 5.29 percent for 20-year maturities; in contrast, 20-year U.S.Treasury bonds yield 6.68 percent. Thus, expressed as a percent of the yield on the taxable bonds, the tax-exempt bonds have a subsidy of 21 percent for a 20-year yield.

Morrisey, Wedig, and Hassan (1996) propose using this comparison of taxable and tax-exempt yields for valuing the tax benefit from tax-exempt borrowing. They impute the value of tax-exempt bonds as the interest rate differential between taxable and tax-exempt bonds times the amount of debt outstanding. Assuming a yield spread of 1.5 percentage points (slightly higher than the spread between tax-exempt municipal debt and the relatively less risky U.S. Treasury bonds), this imputation implies that the $46.1 billion of outstanding NFP hospital tax-exempt debt creates an annual tax benefit of $691.5 million. This imputation approximates the value of issuing tax-exempt bonds in either of two situations. First, suppose the policy alternative is to maintain the exemption from income taxes for NFP hospitals but to repeal their access to tax-exempt borrowing and NFP hospitals do not respond by borrowing less. Second, if the proceeds from the

bonds are being invested in financial assets with higher rates of return than the tax-exempt bonds, then the yield spread captures the arbitrage profit from the investment strategy.

This imputation does not measure the value of issuing tax-exempt bonds if the proceeds are being used to increased fixed assets and the policy alternative is the repeal of both the access to tax-exempt bonds and the income tax exemption. Under this policy alternative, the NFP hospitals would face a higher interest rate but their interest payments would be deductible from the corporate tax base. With this more global change in the tax status of NFP hospitals, the hospitals would face an after-tax cost of borrowing of $(1 - t_c)i$ where t_c is the firm's marginal corporate tax rate and i is the nominal interest rate on taxable bonds. As an example, suppose a NFP hospital can borrow at 1 percentage point above the current AAA-rated tax-exempt bond yield for 20 years for a total interest rate of 6.29 percent; in contrast, a taxable hospital that can borrow at 1 percentage point above the 20-year U.S.Treasury bond rate of 6.68 percent and faces a 35 percent marginal corporate tax rate has an after-tax cost of borrowing of 4.99 percent. Thus, the NFP hospital faces a higher after-tax cost of borrowing than its FP competitor. A full analysis of this problem also depends on the investor-level tax rates and the degree to which these tax rates are capitalized into bond prices. For a general treatment of how tax-exempt bonds affect the cost of capital for NFP hospitals, see Wedig, Hassan, and Morrisey (1996).

An important determinant of the value of issuing tax-exempt bonds is how the hospital uses the proceeds. Legally, the hospitals must demonstrate that the funds will be used for new construction and that they do not have access to other funds.[27] Despite these legal requirements,

[27] The legal restrictions on the use of the proceeds from tax-exempt borrowing have grown more stringent over time.

many of the NFP hospitals with tax-exempt debt outstanding also have endowments. Since money is fungible, one could argue that to the extent the endowment could be used to pay off tax-exempt debt, these hospitals are engaging in tax arbitrage.

To get an upper bound on the amount of tax arbitrage undertaken by NFP hospitals, we use the IRS data on tax-exempt organizations to compare the size of outstanding bonds with endowments. The value of the hospital's endowment is the sum of investments in securities, real property (held for investment purposes), and other investments. For hospitals with endowments that exceed their tax-exempt debt outstanding, we measure the amount of possible tax arbitrage as the outstanding tax-exempt debt. These hospitals could retire their entire bond liability by reducing their endowment. Overall, 5.2 percent of NFP hospitals have tax-exempt bond liabilities that exceed their endowments. For hospitals with endowments that are less than their tax-exempt debt outstanding, we measure the amount of possible tax-arbitrage as their endowment. That is, these hospitals could only eliminate part of their bond liability by using their endowment.[28] 11.7 percent of NFP hospitals have endowments that are less than their tax-exempt bond liabilities and 2.8 percent of NFP hospitals have tax-exempt bond liabilities but report an endowment value of zero. This calculation indicates that $23.6 billion, or just over half of the aggregate tax-exempt bond liability, is potentially related to arbitrage rather than new construction. Valuing the tax benefit of the arbitrage with a yield spread of 1.5 percentage points suggests an annual tax benefit

[28] Our calculations assume that the hospitals do not need their endowments as a form of working capital or for precautionary saving. To the extent that hospitals need to keep some investments for these purposes, we are overstating the amount of tax arbitrage. Also, gifts to the endowments sometimes come with restrictions on the disposition of the assets. We ignore these restrictions since they are potentially endogenous to the tax planning process. That is, the NFP hospital can use these restrictions to justify engaging in financial arbitrage.

of $354 million. Since the yield spread depends on the tax rate of taxable investors, it increases with the level of the nominal interest rate. Thus, this tax advantage (either on the bonds associated with potential arbitrage or on all bonds, as in Wedig, Hassan, and Morrisey) increases when interest rates are high.

In summary, tax-exempt bonds are an important source of financing for NFP hospitals. However, if one takes as the policy alternative the repeal of both the exemption from income taxes and access to tax-exempt bond markets, it is unlikely that the overall tax exemption reduces the after-tax cost of borrowing for NFP hospitals. Nevertheless, our examination of hospital balance sheet data from the IRS suggests that tax arbitrage may also lead to some of the tax-exempt borrowing. To the extent that hospitals are getting around the complicated tax code restrictions on such activity, they benefit from profitable tax arbitrage. Our calculations suggest that these concerns are potentially relevant for approximately half of tax-exempt borrowing by NFP hospitals.

VI. Tax Benefits of Charitable Contributions

The final piece of the tax benefit puzzle is the ability of NFP hospitals to solicit tax deductible contributions. Since NFP hospitals are 501(c)(3) organizations for tax purposes, donors deduct their gifts from their income (and estate) tax bases (if they file income taxes as an "itemizer"). This deduction lowers the after-tax price of charitable giving.[29] These contributions provide financing that is unavailable to FP hospitals. As with the use of tax-exempt bonds, we are

[29] For analyses of how taxes affect incentives to give to charity, see Clotfelter (1985) and Randolph (1995).

interested in two questions. First, how important are charitable gifts as a source of financing? Second, how should we calculate the value of the tax exemption?

We have two sources of data on the importance of charitable contributions for NFP hospitals: (1) the cost report data include a variable on donations received; and (2) data from informational returns (Form 990) filed by NFP hospitals with the IRS. These different data sources lead to different conclusions regarding the importance of charitable contributions. The cost report data indicate that only 56 percent of NFP hospitals report receiving contributions. For 1995, aggregate contributions were $649 million (for our sample of 2,948 NFP hospitals) which amounted to 0.26 percent of total assets for all hospitals or 0.49 percent of the total assets of the hospitals that reported positive contributions. Conditional on receiving some contributions, the 25th percentile is only $11,831 in contributions, and the median is $60,878. However, conditional on positive contributions, the 95th percentile is $1.3 million indicating that at least 83 hospitals received more than $1.3 million in donations in 1995. Overall, the cost report data suggest that contributions are a minor source of funding, except for a small set of hospitals.

In contrast, in the IRS data for 1994, 77 percent of 501(c)(3) hospitals received public contributions (not including government grants) totaling $3.2 billion. These contributions are 1.15 percent of total assets and 2.72 percent of fixed assets. Hence, the tax data suggest that charitable contributions are a non-trivial source of funds for NFP hospitals. Of the hospitals receiving contributions, the 25th percentile of the contribution distribution is $16,260 and the conditional median contribution is $71,820. These conditional values are similar to the cost report data values, albeit more hospitals report positive contributions to the IRS. The most striking difference in the two datasets is among large recipients; among hospitals reporting

contributions to the IRS, the 95th percentile of the distribution of contributions is $2.82 million suggesting that 200 hospitals receive contributions of greater than this amount. This group of hospitals account for 3.85 percent of all hospitals but receive 71 percent of the charitable contributions. While the tax data include a broader set of hospitals which may explain part of the difference in aggregate contributions, this sample difference is unlikely to explain the difference in contributions relative to assets.

While the data sources disagree on the overall magnitude of charitable contributions, both sources indicate that charitable contributions are highly skewed towards a select group of hospitals. Auten, Clotfelter, and Schmalbeck (1997) provide further evidence on the importance of charitable contributions to hospitals. They report that of large individual charitable contributions of more than $5 million in 1996 (a total of $1.5 billion of gifts in all), 9.3 percent ($140 million) went to university-affiliated medical centers and 7.6 percent ($115 million) went to free-standing medical research institutions.[30]

In comparing charitable contributions with the fixed assets, we are implicitly assuming that contributions are used to finance capital expenditures. These comparisons, at least with the IRS data, suggest contributions are a modest, but important, source of financing. Alternatively, contributions could pay for services for less fortunate patients; however, contributions are quite small relative to overall patient revenues (less than 0.5 percent). The descriptions of the large

[30] Auten, Clotfelter, and Schmalbeck use data compiled by the electronic magazine, *Slate*. In contrast, the 1993 IRS data for all 501(c)(3) organizations reports that hospitals received 5.8 percent of total contributions and government grants (see Internal Revenue Service, 1997). These data do not include most religious organizations. Since Hodgkinson and Weitzman (1990, table 1.17, pp. 41-42) report that approximately two-thirds of household contributions go to religious organizations, hospitals total share in deductible contributions is substantially less than the 5.8 percent.

gifts suggest that most large donations are for capital expenditures or large investments rather than covering operating expenses.

In estimating the value of the tax benefit of the deduction for charitable gifts, one needs to know the marginal tax rate of the donor. Given the information reported by Auten, Clotfelter, and Schmalbeck, it seems likely that most of the donations to NFP hospitals are from high income taxpayers with high marginal tax rates. A static measure of the revenue cost of these provisions would be the marginal tax rate times the amount of the contributions. For example, if the average combined Federal and state marginal income tax rate for donors is 35 percent,[31] then the $3.2 billion in charitable contributions reported in the IRS data imply a tax expenditure of $1.1 billion.[32] However, if tax rules singled-out NFP hospitals for a change in status, one would expect a large shift in where donors would give; also, one would expect universities and other medical centers to respond by setting up targeted foundations to serve specific needs, such as cancer research. Thus, it is difficult to imagine changing the tax policy towards charitable gifts for NFP hospitals without changing the tax treatment of all charitable organizations.

VII. Dynamic Considerations and the Incidence of the Tax Treatment of NFP Hospitals

The estimates in the previous sections provide evidence on the relative magnitude of the elements of the tax treatment of NFP hospitals. This information helps us understand the

[31] This calculation assumes all donors to hospitals itemize their deductions which may lead to an overstatement of the tax expenditure. However, we ignore estate tax considerations which could be quite important for wealthy donors.

[32] Our tax expenditure calculation is substantially less than the $2.1 billion reported for 1994 in the U.S. Federal budget (see *Statistical Abstract of the United States 1997*, Table No. 523). Our calculation focuses on hospitals and excludes health research organizations.

"statutory incidence" of the tax exemptions -- how much tax revenue does the government lose and which agents would write checks to the government under alternative tax regimes. If prices and quantities remain unchanged by tax policy, then the static estimates of statutory incidence would also be the economic incidence (the ultimate beneficiaries after accounting for price and quantity changes) of the policy. One complication created by analyzing NFP organizations is that even with this set of static assumptions, it is unclear who benefits when the NFP organization has a tax windfall. In the context of a for-profit corporation, the shareholders are the assumed beneficiaries of such a windfall. Since NFP hospitals do not have shareholders, then the windfall will be distributed somehow through the various constituencies of the NFP hospital. In theory, these tax savings should accrue to the community through such benefits as uncompensated care. However, as we discussed above, it is unclear how the community benefits differ across organizational forms. An alternative possibility is that other stakeholders, such as doctors or other employees, benefit from the tax advantages.

While assuming static behavior simplifies estimating the tax benefits, the economic incidence cannot be discerned by calculating hypothetical tax payments. Instead, the economic incidence depends critically on the behavioral responses of NFP hospitals. Starting from the framework of no behavioral response, one needs to know how tax policy changes would affect prices, outputs, and inputs in the market for hospital services. In terms of outputs, tax policy may affect many different dimensions. The tax exemptions may decrease the price of health care or increase the quantity of health care provided. If the tax benefits are shifted forwards onto consumers through lower prices, then it is less likely that the tax exemptions will generate

resources for NFP hospitals to spend on other community benefits.[33]

Traditional public finance models of incidence (see, Shoven and Whalley, 1992, for a survey) suggest that taxing one sector less heavily than another would lead to increased output in the lightly-taxed sector. However, these models assume profit-maximizing investors allocating capital across sectors. For NFP hospitals, these traditional incidence channels probably do not work well. Even if the tax exemptions increase the quantity of health care, it is unclear whether this increase benefits needy people. The behavioral responses could also include changes in the quality of care (without a corresponding change in price) or the types of outputs provided (particularly a shift towards outputs whose social returns exceed their private returns).

These changes in the output market shift tax benefits forward onto consumers. Other behavioral responses would shift the tax benefits backwards onto factors of production. The tax exemption could change the capital intensity of hospital production with the less heavily-taxed NFP hospitals opting for a more capital intensive production function; however, our evidence in section IV suggests that this effect is likely to be small. NFP hospitals could also respond by "distributing" the tax benefit in the form of higher wages or better working conditions. Better working conditions could include more workers per bed, as we document in Table 4. Consumers may benefit if the increase in the number of workers results in higher quality care (a form of shifting of tax benefits to the consumer if the price does not increase); however, workers may also benefit if they work less intensely for the same pay. Lastly, the NFP hospitals can engage in behaviors that skirt the restrictions on private inurement and private benefit by attempting to

[33] Some analysts have argued that lower prices are a form of community benefit (see Clement, Smith, and Wheeler, 1994). Of course, lowering prices (and the associated income) automatically dilutes the value of the exemption from income taxes.

distribute the tax benefits to insiders, such as managers or doctors. An example of such behavior is joint ventures between hospitals and physicians (for details on these joint ventures and the associated legislative concerns, see U.S. General Accounting Office, 1993).

One additional behavioral response also deserves mention: the organizational form of hospitals may depend on the value of the tax exemptions. Gulley and Santerre (1993) examine this hypothesis using panel data on market shares of NFP and FP hospitals in different states. Consistent with expectation, they find that higher state corporate income taxes and higher local property taxes increase the market share of NFP hospitals. To the extent that organizational form is more than a label for tax purposes, these tax-induced changes in organizational form affect the characteristics of care provided in different markets.

In addition to incidence, public finance economists are concerned with the excess burden associated with tax policy. The excess burden of the tax exemption depends on how the lost revenue is raised. The low tax rate on the production of health care through NFP organizations must be compensated for by raising tax rates on other goods. To estimate the excess burden associated with this change in tax rates requires knowing the demand and supply elasticities for various types of goods. Estimating the excess burden associated with the tax exemptions is complicated by the possibility that the exemptions encourage the provision of community benefits. If the tax exemption serves as a corrective tax that encourages the production of goods with positive externalities, the excess burden is less than would otherwise be calculated by examining the elasticities of supply and demand for different goods. Thus, as with the question of economic incidence, understanding the excess burden associated with the tax exemption requires a model of the behavioral responses and social benefits of NFP hospitals.

In summary, our calculations focus on the relatively straightforward measurement of the statutory incidence of the tax treatment of NFP hospitals. These estimates provide a useful starting point for framing the debate on tax policy towards NFP hospitals. However, they are a starting point, rather than an ending point, for understanding the economic implications of tax policy towards NFP hospitals.

VIII. Conclusion

In this paper, we explore the size and heterogeneity of the tax breaks granted to NFP hospitals. The tax breaks include exemption from income tax, exemption from property tax, use of tax-exempt bonds, and the tax-deductibility of contributions to the hospital. In terms of non-tax characteristics, NFP and FP hospitals are similar in many ways though there are some important differences across organizational forms. One striking difference between NFP and FP hospitals is their geographic location. Across states, FP hospitals' market share of beds ranges from zero to over 30 percent. The median NFP hospital is larger than the median FP hospital; however, the size distribution of NFP hospitals is quite disperse, including some very small hospitals as well as the large, urban teaching centers. Patient characteristics as measured by the proportion of Medicaid and Medicare patients and the HCFA case-mix index are remarkably similar for FP and NFP hospitals. Analysis of the provision of several hospital services viewed to be either community benefits or specialized shows significant differences between forms, though we find significant intra-form differences as well. The similarities across organizational forms suggest that the tax exemptions are not essential to the provision of health care; however, further research is needed to determine whether the incentive effects or distributional effects of the tax

exemptions justify their existence.

The value of the exemption from capital taxes depends on capital intensity and, for the income tax, profitability. Despite technological advances in medicine, hospitals remain more labor-intensive than non-service industries. Perhaps surprisingly, given the capital tax break, FP hospital are more capital intensive than their NFP counterparts. The FP hospitals are also more profitable than the NFP hospitals. For some NFP hospitals, investment income is a substantial portion of total income. Our estimates of the aggregate value of the capital tax exemptions for NFP hospitals are $4.6 billion from income taxes and $1.7 billion from property taxes.

The tax benefits of tax-exempt bond financing and charitable contributions are concentrated among a relatively small set of hospitals. Less than 20 percent of NFP hospitals have outstanding tax-exempt debt and charitable contributions are highly skewed towards an elite group of hospitals. Compared to FP hospitals that pay higher interest rates but deduct interest payments from taxable income, it is unclear how much of an advantage tax-exempt bonds provide NFP hospitals for building new facilities. If, however, the tax-exempt borrowing allows the NFP hospitals to maintain their endowments while expanding their facilities, then the NFP hospitals benefit from tax arbitrage. We find that almost half of outstanding tax-exempt debt of NFP hospitals could be offset by their endowments, leading to an arbitrage benefit of $354 million per year. For charitable contributions in 1994, we estimate that the $3.6 billion of donations lowered the donors' tax liabilities by about $1.1 billion.

As emphasized in section VII, our estimates do not include the behavioral responses caused by the tax exemptions. A full understanding of the impact of the tax exemptions requires estimates of how NFP and FP hospitals respond to tax incentives. An important behavioral

margin is the choice of organizational form which depends on tax benefits as well as the costs and benefits of non-tax characteristics of each form. The continuing trend of hospital conversions may offer one way to examine these issues using longitudinal data with changing organizational form.

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Table 1. Hospital Characteristics by type of hospital control.

	25th percentile			Median			75th percentile			
	NFP	FP	Gov	NFP	FP	Gov	NFP	FP	Gov	k-w test
Total Facility Beds	81.0	86.5	42.0	170	138	70	310	205	141	*
Total Discharges	1,682	1,839	496	4,975	3,609	1,233	10,791	6,463	3,301	*
Length of Stay	4.53	4.32	4.32	5.51	5.11	5.46	7.05	6.06	10.81	*
# of employees	206	177	84	520	330	161	1,134	543	391	*
Total Assets (10^6)	11.34	9.43	3.37	40.7	22.4	8.04	107.30	47.34	24.93	*
Fixed Assets (10^6)	5.09	4.19	1.38	18.2	13.0	3.59	44.92	27.92	11.77	*
Net Patient Rev (10^6)	12.03	13.30	3.75	37.2	28.4	8.04	89.40	51.17	23.66	*
Inpat % tot rev	53.4	58.1	47.7	62.4	66.9	56.6	71.3	74.9	66.4	*
Medicaid % days	5.47	4.74	4.90	10.5	10.9	11.7	18.9	19.9	24.7	*
Medicare % days	36.5	39.9	20.9	51.8	52.4	49.9	61.9	65.5	64.2	*
Case mix index	1.15	1.19	1.00	1.28	1.33	1.09	1.44	1.47	1.24	*
% ICU days	2.34	3.99	0	4.94	5.85	1.88	7.27	7.65	6.14	*

Tabulation based on a sample of 4,996 general short-term hospitals from HCFA's public use file of Medicare Cost Reports, fiscal year 1995. The * indicates that the Kruskal-Wallis test of equivalent distribution of the variable across the three hospital types was rejected at the 0.01 level.

Table 2. Presence of Hospital Services/Characteristics by Organizational Form

	Percent with Service				
	NFP	FP	Gov	Chi-Square	Regression Results
Emergency Room	97.8	93.2	99.0	0.001	[1]
Delivery Room	74.7	62.7	72.8	0.001	[1]
Teaching Program	29.2	12.7	9.1	0.001	[1]
ICU	79.6	87.3	52.8	0.001	[1]
CCU	24.5	13.2	10.8	0.001	[2]
Radiation Therapy Unit	24.4	10.5	9.9	0.001	[1]

Based on the sample from Medicare cost reports for fiscal year 1995. Columns 1, 2, and 3 show percentages for each service by hospital type, and column (4) gives the Chi-square for the test of equality of the proportions across organizational forms. Column (5) indicates where there were differences across organization forms in a linear probability model where the provision of the service is modeled as a function of: a constant; four hospital size indicators; and indicators for teaching status, government status, for-profits status, church affiliation, and status as a sole-community hospital. The two organizational form indicators were interacted with the four size indicators.

[1] Significant differences across organizational forms for some hospital sizes. See text.

[2] No significant differences across organizational forms for any hospital size.

Table 3: Hospital Capital Intensity and Profitability Relative to Other Industries, 1995

Industry	Wages to Net PPE	Net PPE to Sales	Return on Assets
Natural Resources	0.292	0.864	6.8%
Manufacturing	0.391	0.360	10.2%
Transportation & Utilities	0.313	1.157	8.4%
Sales	0.402	0.182	8.7%
Services	2.022	0.412	9.1%
Hospitals	0.724	0.608	10.3%

Source: Authors' calculations from Standard & Poor's COMPUSTAT database. The values are industry averages weighted by the size of the denominator (i.e., the sum of all firms' values for the numerator divided by the sum of all firms' values for the denominator). Net PPE is the net book value of property, plant, and equipment. The labor expense measure is missing for many firms.

Table 4: Capital Intensity and Profitability by Type of Hospital Control.

	25th percentile			Median			75th percentile			
	NFP	FP	Gov	NFP	FP	Gov	NFP	FP	Gov	k-w test
Employees per bed	2.42	1.87	1.66	3.30	2.44	2.44	4.16	3.09	3.50	*
Wages to fixed assets	0.68	0.50	0.76	0.92	0.74	1.08	1.29	1.29	1.63	*
Fixed assets to net patient revenue	0.35	0.28	0.30	0.47	0.45	0.42	0.61	0.65	0.59	*
Fixed assets per discharge	2,623	1,913	2,028	3,852	3,522	3,204	5,444	5,721	5,030	*
Capital costs over total costs	0.070	0.083	0.053	0.090	0.107	0.070	0.113	0.133	0.091	*
Net Income (000)	137	-54.5	-24.6	1,333	1,343	299	5,201	5,717	1,187	*
Return on assets(%)	1.1	-0.6	-0.5	4.4	6.9	4.2	7.9	19.3	4.9	*
Return on fixed assets (%)	-9.3	-4.6	-31.5	0.0	10.4	-7.0	8.3	34.4	4.9	*
Operating margin (%)	-4.2	-2.7	-12.0	-0.0	5.2	-3.3	4.1	16.8	2.4	*

Tabulation based on a sample of 4,996 general short-term hospitals from HCFA's public use file of Medicare Cost Reports, fiscal year 1995. The * indicates that the Kruskal-Wallis test of equivalent distribution of the variable across the three hospital types was rejected at the 0.01 level.

Table 5: Capital Intensity and Profitability Regressions

	Explanatory Variable						
	Constant	Beds (000)	For-Profit	Government	Church	Rural	Teaching
Employees per bed	2.93*	0.702*	-0.59*	-0.33*	-0.0061	-0.13**	1.31*
Wages to fixed assets	1.27*	-0.42*	-0.087	-0.040	-0.13**	0.16*	-0.11**
Fixed assets to net patient revenue	0.52*	0.0024	0.060**	0.034	0.026	-0.049	0.039
Fixed assets per discharge	4155*	726**	837*	-50.9	159	84.0	1170*
Capital costs over total costs	0.087*	0.015*	0.023*	-0.011*	0.0056*	-0.0035**	0.0070*
Net Income (000)	14.6	13.5*	1,366*	-275	1,302*	-110	2,823*
Return on assets (%)	3.1*	3.6*	5.4*	-0.016	0.63	1.8*	-0.81**
Return on fixed assets (%)	-3.2*	10.0*	15.0*	-7.9*	1.8	1.5	-3.9*
Operating margin (%)	-0.75**	4.0*	7.9*	-3.3*	1.1**	0.33	-1.9*

The sample includes 4,555 general short-term hospitals from HCFA's public use file of Medicare Cost Reports, fiscal year 1995. Relative to the sample in tables 1, 2 and 4, we eliminated observations with implausible values. The * and ** indicate that the coefficients are statistically different from zero at the 99 percent and 95 percent confidence levels, respectively.

Table 6: Summary Measures of the Importance of Income Taxes for Publicly Traded Hospitals

Year	Number of Firms	Income taxes (total)	Income taxes to book value of assets	Income taxes to sales	Income taxes to cost of goods sold
1980	11	$196 m.	4.2%	4.8%	6.1%
1985	17	$620 m.	3.3%	4.4%	5.6%
1990	17	$391 m.	1.6%	1.8%	2.2%
1994	12	$926 m.	2.9%	3.9%	4.8%
1995	8	$976 m.	3.0%	3.8%	4.6%
Cross-Industry Comparison for 1995:					
Manufacturing	3218	$162,162 m.	2.9%	3.0%	4.3%
Services	1143	$9,826 m.	2.7%	3.3%	5.5%

Source: Authors' calculations from Standard & Poor's COMPUSTAT database supplemented with Tenet Healthcare's 1996 Annual Report. The ratios reflect total industry income taxes to industry book value, sales and cost of goods sold.

Table 7: Imputed Income Taxes by Type of Hospital Control.

	25th percentile		Median		75th percentile	
	NFP	FP	NFP	FP	NFP	FP
Federal income tax (000)	68.7	-3.5	514.5	583.3	1,861.6	2,135.4
Fed. income tax to net patient revenue	0.47	-0.038	1.7	2.2	3.1	5.1
Federal income tax to total assets	0.46	-0.017	1.5	2.5	2.7	6.4
Total income tax (000)	79.2	-3.8	579.8	642.5	2,110.8	2,329.9
Total income tax to net patient revenue	0.54	-0.044	1.9	2.5	3.5	5.6
Total income tax to total assets	0.52	-0.017	1.8	2.7	3.1	7.1

The ratios of taxes to revenue and assets are expressed as percentages. We eliminated observations for which the return on assets or the return on fixed assets was either greater than one in absolute value. Data are from HCFA's public use file of Medicare Cost Reports, fiscal year 1995.

Table 8. Imputed Property Taxes for NFP Hospitals in Total and for 3 States

	% tax rate on fixed assets	property tax level	property tax per bed	property tax per discharge	property tax % net revenue
25th percentile					
NJ	1.36	358,704	1,525	44	0.5
Ohio	1.46	151,988	1,157	52	0.6
Wisconsin	2.37	125,990	1,299	97	1.1
US*	1.60	82,357	922	42	0.6
Median					
NJ	1.62	649,414	1,876	57	0.6
Ohio	1.70	429,901	1,848	67	0.8
Wisconsin	2.81	277,397	2,945	126	1.4
US*	1.60	295,139	1,769	62	0.7
75th percentile					
NJ	1.82	1,016,505	2,830	73	0.9
Ohio	1.91	819,896	2,835	89	1.0
Wisconsin	3.28	773,765	5,035	168	1.9
US*	1.60	721,766	2,827	87	1.0

Total Imputed Property taxes, NFP hospitals	
NJ	$64.34 million
Ohio	$117.86 million
Wisconsin	$83.66 million
US	$1.705 billion

Tabulations compiled from Medicare Cost Reports report on fixed assets and state tabulations on property tax rates.

* US property taxes are based on a rate of 1.6%, the percentage of fixed assets paid in property taxes by hospitals paying property taxes 1992.

Table 9: Long-Term Tax-Exempt Bond Issuance, By Type of Issuer

	Total		Government Bonds		NFP Hospitals		Other Private Activity	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Year								
1988	11,217	86.9	9,245	53.5	208	4.6	1,764	28.8
1989	12,024	94.8	9,284	61.9	250	6.3	2,490	26.6
1990	12,646	106.8	10,317	70.6	265	6.6	2,064	29.6
1991	12,827	122.1	10,458	86.3	369	11.1	2,000	24.7
1992	11,877	132.9	9,937	975	352	10.3	1,588	25.1

Source: The data are from unpublished tabulations from the Statistics of Income, Internal Revenue Service. Dollar values are in billions of current dollars. The bonds are nonrefunding bonds.