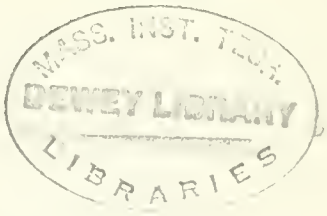

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ALFRED P. SLOAN SCHOOL OF MANAGEMENT

A LOOK AT THE MYTHS AND HALF-TRUTHS ABOUT PROFIT AND NON-PROFIT HOSPITAL PERFORMANCE

by

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November 1983

Working Paper 1511-83

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I. INTRODUCTION

Does the profit motive result in a hospital* that is more efficient and better managed? One with lower health care costs and no compromise in the quality of care? If so, then should more hospitals be encouraged to become for-profit (FP) hospitals by regulatory incentives, congressional inducements, or through other means? What if all hospitals became proprietary hospitals? Would we have a more efficient, lower cost health system? Answers to these questions are important, not only because of the widespread concern about rising hospital costs, but also because FP hospitals are accounting for an increasing share of the hospital beds and admissions in the United States.

Plan of the Paper

This paper reviews the literature and summarizes the currest state of knowledge about for profit vs. non-profit hospital performance. It then extends the literature through a survey of for-profit and non-profit hospital operating techniques to draw conclusions about operating efficiency. The balance of this section further motivates the need to better understand whether and how the profit motive affects hospital performance.

Section 2 describes and reviews the results of studies that compared quality, operating costs, fees charged for services between NP and FP hospitals and operating efficiency. These studies share common methodological weaknesses. In addition, they also point out several gaps in the research that need to be filled in in order to understand better relative performance of hospitals. One of the gaps is the lack of research into the operating techniques and operating efficiency of these hospitals.

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*Throughout this paper, the term "hospital" refers to short-term, general hospitals.

We begin to fill the gaps by analyzing a survey of hospital operating techniques used in FP and NP hospitals.

Section 3 describes the results of this survey of operating techniques. Section 4 summarizes the research findings to date and suggests directions and methodologies for further research which should be pursued to obtain a more definitive understanding of whether various hospital groups are likely to provide lower cost, more efficient health care and how they achieve these results.

Evolution and Expectation About For Profit Hospital Behavior

At first glance, private non-profit (NP) hospitals appear to be more popular than FP hospitals; however, over the past ten years, the number of FP beds have been growing rapidly (see table 1). Of the 6,933 United States hospitals operating in 1981, only 729, or 10.5%, were FP hospitals, while government hospitals accounted for 2,844, or 41%, and private NP hospitals accounted for 3,356, or 48.4%. Although Table 1 shows a small decline in the number of FP hospitals since 1960, it also indicates an increase of 64% in FP bed capacity during the decade ending in 1980 -- an increase that far exceeds that for NP hospitals (17%) during the same period. FP admissions also increased by 58.8%, over that decade, compared with only a 23% increase for NP hospitals.

The issue of FP hospital growth and its impact on health care costs is more acute from a regional view of United States' hospitals admissions. Table 3 indicates that FP hospitals have located in the Southern and Pacific states to a much greater extent than the Northern, Eastern, and Mountain states.

In 1983, the FP hospitals in Florida, Texas and California accounted for over 34%, 30% and 29% of the short-term, acute care hospitals in the United States, while other states had no FP's. Thus, FP hospitals are not uniformly distributed throughout the United States. According to Frost and Sullivan [16, pp. 77] hospital owners - the doctor entrepreneurs -- were originally attracted to these regions because of "... lack of competition from established medical facilities, the absence of regulations by local governments and the need for health care for a rapidly growing population." The uneven distribution of FP's is a policy concern especially with the advent of the chain hospitals.

What was once a "cottage-industry" has rapidly become a highly concentrated industry in which several chains are engaged in a frenzy of mergers and hospital acquisitions. Nearly three quarters of the FP beds are owned by three chains: Hospital Corporation of America (HCA), American Medical International (AMI), and Humana, whereas only ten percent of the NP beds are owned by the three largest NP chains. Since 1968, the number of chains and the beds they control have dramatically increased such that by 1980, 245 FP and NP chains controlled 300,000 or approximately 30% of the nation's hospital beds (Starr [37] p, 430). Chain hospital growth is generally believed to be due to potential economic advantages of centralized planning, marketing, budgeting, financial management, hiring, shared purchasing, and sharing other services such as labs, computers, and diagnostic equipment.

The financial performance of FP chain hospitals has been favorably assessed by security analysts who have classified several of the FP hospital chains as highly recommended investments (see for example, Sondomir [32], and Frost and Sullivan [16]). Table 4 suggests that FP revenues have grown

at a rate of over 20% per annum since 1974. Furthermore, FP chain hospitals achieved their profit and return on investment performance level while subject to income and property taxes and without the ability to attract tax free gifts for operations, capital, and endowment, or the ability to obtain low interest tax exempt debt, benefits which are available to NP hospitals. To understand the tax advantage, Table 5 reveals the before tax and after tax profit margins for the five largest FP chains. National Medical Enterprises is a dramatic example of the effect of income and property taxes upon profits -- its pre-tax margin is 13.8% while its after tax margin is 4%. Thus, a non-profit ownership status holds tax-advantages, but are these policies in the public interest? Many critics would disagree. Clark [9] in a very elaborate, well-research paper argues that current policy that does not tax NP hospitals is based more on good intentions than facts. He believes that NP hospitals should lose their favored no-tax status with respect to their patient care income and general contributions because it encourages inefficiency.

On the other hand, the idea of profiting from illness appears to rub Americans the wrong way. Some doctors and hospitals believe that introducing price competition via profit seeking institutions will attenuate the strides that the hospital industry has made in increasing the access to and improving the quality of health care. This opinion is stronger in some corners than others.

For example, the New England regional bias against FP's was illustrated in Massachusetts during the summer of 1983. Negotiations by the Massachusetts General Hospital for the sale of a non-profit psychiatric center to the Hospital Corporation of America evoked both a flurry of strong criticisms against the FP hospital chains coming into Massachusetts, as well

as some support for the idea. The issues that were raised about FP's in this instance were not new, and in this instance, they helped prevent this acquisition. Some of the negative beliefs about FP's embedded in many of these discussions include:

- FP's threaten the notion of health care as a community responsibility since policy decisions will be made in a remote corporate headquarters.
- FP's know how to turn a fast buck; hence, no services will be provided that are not profitable.
- NP's engage in price discrimination and cross-subsidization largely to provide health care at reasonable cost to the very sick and the indigent, a practice not found in FP's.
- Well-insured, wealthy patients will be siphoned off by FP's, forcing the NP's to take all of the uninsured and the poor, sometimes referred to as "cream skimming".
- Given the split in the patient population, two standards of care will result.

On the other hand, some of the positive beliefs about FP's include:

- FP's provide quality service in well-maintained surroundings
- There is no evidence that FP's place a higher value on return on equity than quality of care.
- FP's are more efficient largely due to better management practices.
- FP's adopt cost saving innovations more quickly.
- FP's provide care without the need for government subsidies through income, real estate and gift tax legislation.

How close are we toward answering these questions about the preferability of one hospital form over another? Our review of the more recent studies attempts to answer some of these questions. The study results indicate that FP's do not have lower costs per patient day, they set higher fees, they make greater use of good management techniques and their quality of care is undifferentable from the NP's. Nevertheless, research design and data availability problems render these kinds of conclusions as

tentative and ambiguous with the need for further work to understand relative performance of these hospital types.

SECTION 2 - Literature Review of For Profit vs. Non-Profit Hospital Performance

While numerous studies have addressed the relative performance of for profit and non-profit hospitals, only the more recent and the more rigorous studies are considered in this section. Four dimensions of performance are considered: (1) quality; (2) cost of hospital care; (3) fees charged for hospital services; and (4) operating efficiency.

Quality of Care

The overwhelming difficulty in attempting to define quality of hospital care is widely recognized and discussed in numerous essays and studies. (See for example, Bays [5], Ruchlin, et. al., [30], Clark [9], Steinwold and Neuhauser [38], Dumbaugh [14], and Donabedian [12]). One of the difficulties is that quality is a catchall that often includes mortality and morbidity, patient satisfaction, disease prevention, and overall health. As one author defines it, "quality is conceptually all those health related factors in the economic decision not included in cost and quantity." (Griffith [18], p. 68).

Previous studies (see Steinwold and Neuhauser [38]) have viewed the granting of a full accreditation by the JCAH as one measure of quality; albeit a measure that focuses on effort rather than on output. Table 6 reveals that when bed size is controlled for, no significant qualitative differences exist between FP and NP hospitals. For both ownership types it is clear that bed size makes the significant quality difference as measured by accreditation.

Several studies have used death rates or morbidity rates as a proxy for quality, and results have been inconclusive. Ruchlin [30] found that gross death rates unadjusted for case mix were higher in NP hospitals, though post operative death and infection rates and four other mortality rates were similar in profit and non-profit hospitals. A more recent study by Bays [4] did control for case mix, severity of illness and patient age, and found no significant differences in mortality rates between FP and NP hospitals.

Clark [9] found no clear differences in quality of care between non-profit and for profit hospitals. This conclusion is based, in part, on the Steinwold and Neuhauser [38] accreditation results described above as well as comparisons of: the incidence of malpractice claims; possession of high prestige technology; and the existence of suspect practices. Clark reports that these indicators do not suggest any real difference in quality of care between FP and NP hospitals.

A common belief is that the profit motive in hospitals competes with the objectives of maximizing quality of care. Nevertheless, NP's need to attract and maintain a partnership with physicians, a unique aspect of the hospital structure. The doctors, as agents for the entire patient population, exercise a great deal of purchasing power in their relations with hospitals. Unlike consumers, doctors do not exercise this purchasing power in order to lower hospital prices. Rather, doctors continually demand higher quality and greater access to beds. Thus, hospitals are motivated to provide care at a quality level which meets with their physicians' approval, or be in jeopardy of losing patients. To date, there is no evidence that for profit's are immune from the power and independence of physicians. Hence, suggestions that ownership type and corporate controls can keep the physicians in check appears to be unfounded.

Other motivations to assure high quality care may include managing the cost of malpractice claims and related insurance premiums as well as the cost-reimbursement environment.[1] To the extent that quality is dependent on the availability of modern equipment to provide state-of-the-art health care and reimbursement systems allow costs to pass through, FP's are actually in an advantageous position because they have greater access to capital markets than NP's. This greater acceses arrises from the FP's ability to finance operations with the sale of equity and corporate debt (see Frost and Sullivan [16]; and Riffer [29]).

We have found no other studies concluding that there are significant quality differences between the FP and NP hospitals. At this point in time, we concur with Clark [9] that no evidence exists to support the belief that FP's achieve their profit objectives through reductions in quality.

The Cost of Hospital Services

Clark [9] indicates that studies have almost universally concluded that despite lower occupancy rates, (see Table 2) FP's operate at lower costs. While per diem charges at for profit hospitals are higher, Clark notes that the average total cost per patient is lower because of uniformly shorter lengths of stay (see Table 1) and the hospital's possession of fewer cost generating resources, i.e., capital assets, and personnel.

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[1]In a cost-reimbursement environment, which hospitals have enjoyed for the last several years, hospitals are paid on an estimated or interim basis as services are rendered. At the end of each year, a cost report (based on special rules that allocate overhead to revenue producing departments) is filed with various third party insurers, and adjustments are made for any differences. Though some costs, such as those not directly related to patient care, are not reimbursable, capital purchases and those relating to quality of care are reimburseable. Thus, maintanance and improvement of quality has been supported by third party reimbursement.

Ruchlin, Pointer, and Cannidy [30] reported the findings of their study of 56 matched pairs of for profit chain, non-profit state and local, and non-profit voluntary hospitals. This was not a cost study. Rather, the purpose was to describe the characteristics of each ownership type. The authors found that the FP's reputation for being in a superior financial position was not supported. In fact both types of hospitals appeared to have similar solvency and liquidity ratios, and rates of return.

In 1974, Berry [7] reported his average cost study conducted on 6,000 short-term general hospitals for the years 1965-1967. The average cost (per day) functions included five independent variables: output (average daily census), quality (accreditation), product mix (scope of services), factor prices (wage rates and costs), and ownership type: non-profit government and voluntary, and proprietary hospitals. By comparing the three types of hospitals, the study found that FP hospitals have higher average costs than NP hospitals. In part, Berry believed this to be the result of proprietary hospitals shorter lengths of stay which would imply a lower total cost.[2]

Lewin, Derzon, and Margulies [25] (in a study published in 1982, subsequent to and in conflict with Clark's) found that for FP hospitals' operating costs were generally higher than NP hospitals in their sample of 53 matched pairs of FP and NP hospitals located in California, Texas and Florida.

Specifically, Lewin, et. al. [25], found that total patient care cost per day was 8% higher in FP's than in NP's while total cost per admission

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[2]In a later study, Bays [5] found that for profit chains displayed a lower total cost.

was only 4% higher in FP's, reflecting the somewhat shorter length of stay. In the Florida sample, however, greater length of stay at non-profit hospitals resulted in a cost per admission which is actually higher than for profit hospitals by 4%.

Further cost breakdowns in Lewin's study are also of interest as described below:

- Nursing salary cost per pay in FP hospitals is lower than NP hospitals by 11%.
- Administrative and general costs, including the home office costs are 45% higher in FP's than for NP's.
- Depreciation expense is 4% lower in for profit hospitals. While FP's have younger capital assets, this suggests that they also have fewer capital assets.
- Plant operating costs, housekeeping, laundry and linen are 15% lower in FP's than NP's.
- Ancillary service costs (Labs, Pharmacy, etc.) per day and per admission are higher in FP hospitals for all categories except laboratory where costs are 4% below NP hospitals.

One surprising conclusion is that the home office costs, which, among other things, include central purchasing and data processing, do not lead to lower overall costs or even equivalent savings at individual hospitals. This is of particular interest because it conflicts with management of HCA who claim that, "the company has simply taken advantage of economies of scale. At the most basic level, that means lower unit costs in purchasing. ... larger scale also makes it possible to hire specialists in site selection and construction, computerize billings and record keeping and institute such corporate office procedures as strict 'inventory controls'" [8]. While Lewin's study did not focus on HCA, this conflict highlights the ambiguity about whether the expansion of FP chains will result in higher or lower health care costs.

Another issue is whether the lower nursing costs in FP's reflect a less severe case mix or excessive personnel costs in the NP hospitals or whether this represnts some quality difference along the dimensions of nursing care, e.g., does it take longer on average for a nurse to respond to patient needs?

As with most studies that are considered in this paper, the Lewin study raises questions about whether case mix is adequately measured and considered. Lewin, et. al., attempted to obtain comparable pairs of hospitals by matching pairs of FP and NP hospitals based on size (average daily census), location, and services offered. Service mix represent the primary way they control for case mix. Again, it is a measure of how hospitals gear up; it is a measure of effort, not output. Considering that services are an imprecise measure of case mix and considering that NP's had lower average lengths of stay than the FP's, it is possible that the NP's in this sample treated a more complex case mix. If such case mix differences exist, it is possible that FP's were more costly on a case mix adjusted per admission basis than they appear in this study.

Further, evidence about relative cost is provided in two studies by Bays [4,5]. Bays [4, 1977] first finds systematic case mix differences among a set of 19 for profit hospitals and 22 non-profit hospitals in California. As a group, FP's had fewer older patients, lower average cost surgery, lower average length of stay, and lower proportion of Medicaid patients. This is relevant in that it supports the allegation that FP's practice cream skimming by selectively admitting patients and providing services that have low cost, high price, and/or high margin. This conclusion is flatly denied by the management of HCA, particularly in cases where their hospitals represents the only one in a geographic region [8].

Bays [5, 1979] then controls for case mix using an index of severity. With the hospital set in his 1977 study he evaluated cost defined as total cost per admission. He finds that, in general, FP's were no less costly than NP hospitals. However, Bays does find that FP chains are less costly than independent NP hospitals and independent FP hospitals, and have a similar case mix supporting HCA's claim [8]. Apparently, Bays locates management scale economies that appeared to be absent in the Lewin study. The aspect not considered by Bays is how FP chain hospitals compare with NP chains.

In this study, Bays also found some evidence of cream skimming. He reports that in 6 out of 19 admission categories, FP's differed significantly from NP's; however, these differences were due entirely to independent FP's. Bays found no case mix differences between FP's and chain FP's.[3]

In 1983, however, Sloan and Vraciu [36] found no significant differences in the proportion of Medicaid and Medicare days among FP and NP hospitals. In contrast to the Ruchlin finding, FP's displayed a slightly higher absolute percentage of Medicaid patient days. Note that this suggests a

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[3]Other authors have focused on the proportion of public third-party revenue to determine if FP's treat less complex cases. These are not as powerful as Bays case mix adjusted data; however, they may be viewed as prima facie evidence of cream skimming. For example, in 1973, Ruchlin, Painter and Connedy [30, studying a national sample of 56 hospitals, found that NP's, on the average, received 60% of third-party revenue from governmental sources; FP's, on the average, received 35% of third-party revenue from governmental sources. They suggest that the data on the disproportionate number of public third-party revenue supports the cream skimming proposition, i.e., that FP's treat less complex cases.

payor mix difference as distinguished from a treatment type of case mix difference.

In 1983, Coyne's study [11] of 177 hospitals separated FP hospitals, non-profit religious, county and voluntary hospitals into chain and independent categories. The purpose of the study was to examine performance differences using two measures of cost (cost per case and payroll expenses per day) and two measures of productivity (admissions per bed and FTE's per occupied bed) employing step wise multiple regression.

Coyne's study, which provides conclusions contrary to Bays, found that multi-hospital systems or chains incur higher costs per case than a set of FP and NP independent hospitals except for county owned hospital chains which had lower cost per admission. Coyne did not, however, compare FP chains with independent FP's nor did he compare NP chains with independent NP's. Nevertheless, these results raise questions about whether the profit motive leads to lower operating costs, regardless of whether the hospitals are part of a chain.

The Coyne study is significant in that it suggests enough heterogeneity in the ownership categories "for profit" and "non-profit" to obfuscate the cost differences. Coyne's study classified NP's into six sub-categories: county, religious and other non-profits grouped into chain and independent. The study indicates that for many performance variables, chain versus independent is an influential variable - thus comparing all types of non-profits with for profits chains (as, for example, the Lewin study and the Ruchlin study did) is problematic; the component variables within the category "non-profit" need to be specified.

In 1983, Patteson and Katz [27] reported their study of 280 California FP chain and independent hospitals, and NP voluntary and public hospitals.

They found that costs (total operating expenses) were higher in FP hospitals than NP hospitals. Total operating expenses per patient day were 6% higher for FP chains. However, due to shorter lengths of stay, FP chain expenses per admission were only 2% higher than NP hospitals. The authors conclude that costs were slightly higher in FP than NP hospitals, and that their growth has not been due to providing services at a lower cost.

Although the Patteson study use a larger sample than the Lewin matched sample study, they did not control for case mix. They did, however, select the hospitals based on a clustering technique which included a service mix complexity factor. Given the virtually identical NP vs. FP length of stay (6.0 days vs. 5.8 days), they argued that there was no reason to assume that FP's had more complex cases. One problem with the study, however, was that their categories did not control by type of non-profit hospital (chains vs. independent, and religious, governmental and other).

Patteson [27] reported that FP's held newer assets than NP's. Thus, the higher cost of FP's may be the result of higher depreciation expense in addition to higher interest costs and property taxes. This is an issue that demands more attention in future studies.

Sloan and Vraciu [36] studied 112 non-teaching hospitals under 400 beds in Florida. Part of the study focused upon the question of which type is more costly. Although they defined cost from the point of view of those people who pay the charges; to wit, insurance, governments and patients, we will talk about those findings in the section on charges. They also used operating expenses as a measure of cost. The study found that operating expenses per adjusted patient day were virtually identical for both types of hospitals, though FP chains were slightly lower than NP operating expenses per admission. The study also found that FP chains were less costly per day

and per admission than independent FP hosptials. Since the study focused on the small-to- medium-size hospital category (0-399 beds) in one state, there were not enough hospitals included to separate out component variables in the NP category.

The studies described above are representative of the ambiguities about which hospital type has lower costs. The results are ambiguous for two reasons. First, they rely upon definitions of cost that do not adjust for taxes, interest, and depreciation. Second, the data is not case mix adjusted. Hence, they are potentially comparing the costs of heterogeneous services. Another issue not adequately addressed is the occupancy rates. The FP chain hospitals that are publically traded often reflect average occupancy levels as low as 60%, which is far below that experienced by many NP's. This suggests that volume increases could lower the cost per day and per admission of FP's and suggest that their cost could be lower if adjusted for occupancy rates. In any case, the evidence does not support a conclusion that FP hospitals have lower costs.

Fees and Charges.

The fees hospitals charge and receive for services is the hospital element that is most directly reflected in common measures of the cost of health care. The mix of payor types impact the actual revenues earned. For example, private insurers and self-pay patients generally are charged the scheduled rate for services, while sevices to Medicare and Medicaid patients (and frequently Blue Cross) are reimbursed at rates which are generally below the standard fee set by the hospital. Hence, two hospitals providing the same type of service reimbursed by a different payor mix can have different revenue levels even when published fee schedules are the same.

One way the FP's are believed to achieve their strong financial performance records is through selectively attracting the higher paying type patients as was suggested in the case mix findings of Bays [5] discussed above. Other ways to achieve higher revenues is to locate hospitals in states where reimbursement rate regulation is less intensive. This is largely the cause for the concentrations of FP hospitals in a few regions of the United States and total absence of FP's in other regions.

Beyond the payor mix question is the issue of whether the for profit hospitals achieve their profit goals by actually charging higher rates than not for profits. Lewin, et. al., [25] found that for profit hospital charges were higher than non-profit hospitals charges by the following amounts: charges per inpatient day were 23% higher, charges per admission were 17% higher, payments by Medicare were 13% higher on a per patient basis and 8% higher on a per admission basis. Medicare reimbursements include an additional return on equity (ROE) allowance for FP hospitals over the fees paid to NP hospitals. When this ROE allowance is netted out of the above Medicare payments, the for profit hospitals still appear to have higher cost per day, but similar cost per admission. Lewin further states that the 23% higher charge per day in FP's actually reflects 8% higher routine charges and 36% higher ancillary charges per day. This is interpreted as a pricing strategy to keep the more visible room charges in for profit's closely in line with non-profit's. It was also noted that the markup of costs to establish charges (the published fees or services) was higher in FP's than NP's. Higher markups result in a higher net income for FP's of 3.7% of revenue, while the amount earned by NP hospitals exempt from taxes is only 1.3% of revenues. The Lewin study clearly suggests that the FP hospital derives its profits not from greater operating efficiency and lower

operating costs, but rather from the ability to earn greater margins on the services rendered. If this relationship was universally true and continued to be the case, then the expansion of the FP hospital sector would lead to higher health care costs.

Pattison and Katz [27] in essence substantiated the findings of the Lewin study [26] by examining a much larger sample of 280 California hospitals, including for profit clains and independent, and non-profit voluntary and public hospitals. The study found that while routine services (room and board) were unprofitable for all hospital types, some ancillary services (pharmacy, central supply, etc.) were profitable, while others (radiology, emergency, etc.) were unprofitable for all types of owership. For the profitable services, the for-profit chain hospitals were more likely to earn higher profits per ancillery service unit. For the unprofitable services, the for-profit chain hospitals experienced smaller losses per service unit. Both chain and independent FP hospitals lost more per service unit in providing emergency services and routine services than the NP's. They conclude that the data suggests FP charges are higher than NP, and chain FP's engage in a more aggressive loss-leader price strategy than NP chains.

The study was also able to focus on ancillary use. The study found that for all profitable ancillary services, the utilization was higher among the FP chains than the NP hospitals. For the unprofitable ancillary services, the units of service were identical. They conclude that the higher utilization of ancillary services supports the idea that the profit motive "... may lead to different styles of medical practice..." [Pattison, p. 350], i.e., FP's exploit more profitable cases.

Sloan and Vraciu [36] argued that net operating funds could be viewed as an alternate measure of cost. Since they defined net operating funds as operating revenues (net of contractual adjustments and bad debt) minus income taxes, they have partially adjusted charges for income taxes.[4] The study found that NP's and FP's had no significant differences in net operating funds per admission, but FP's had a slightly higher net operating funds on a per diem basis. Chain FP's had lower net operating funds on both a per diem and per admission basis. Thus, this study contradicts the Lewin and Pattison studies and suggests that if appropriate adjustments are made to gross charges, FP's may be charging the same as NP's.

The evidence that FP hospitals charge higher fees for sevices can be disputed in the studies we have examined. Sloan and Vraciu's income tax-adjusted study suggests that the jury should still be out. Thus, suggestions that the profit motive leads hospitals to maximize reimbursement and prices rather than to sacrifice quality to minimize cost (though quite plausible) is a premature conclusion.

Operating Efficiency of Hospitals

Many studies report that FP hospitals adjust more rapidly than non-profits to changes in demand. In part this may be due to the fact that NP's traditionally receive federal subsidies and loans which have reduced their dependence on the market demand for services. Some authors suggest

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[4]It is worth mentioning that no adjustments were made for the NP's property tax exclusion and the FP Medicare return on equity reimbursement component, thus the data is still too heterogeneous to draw any firm conclusions.

that NP's tend to respond to increases in demand by rationing services. To wit, emergency cases go first, and elective surgeries queue up, whereas FP's are more tightly coupled to demand shifts. A 1976 study by Kushman and Nuckton [25] found that for-profits displayed greater responsiveness to demand in that the bed stock of NP hospitals was less elastic; in fact, in some regions they found that NP's bedstock displayed an inverse relation to demand. Thus, the study concluded that FP's demonstrate greater market efficiency.

Frost and Sullivan [16] suggest that "... Proprietary [FP] hospital chains pride themselves in having put in place elaborate staffing controls to allow instantaneous reaction to hospitalization demand variations caused by seasonal or other factors. The industry has a strong incentive to send patients home early since only the first three days of stay are profitable on the average, with profitability declining rapidly beyond that point." Table 2 reveals that FP's do have a lower average length of stay than NP's, but this may suggest less complex cases, and not greater relative efficiency.

Other studies evaluating hospital efficiency have looked to certain resource utilization ratios and the existence of management techniques such as bulk processing as indicators of efficiency. For example, Lewin, et. al. [26], note that full-time equivalents of personnel per patient is about 12% lower in FP's than NP's and that while FP salaries are higher than NP's, the salary per day is 4% lower in FP's than NP's. This suggests more efficient scheduling and job allocation in FP's, possibly resulting from better management techniques. Alternatively, in this study, this might be due to less severe case mix.

Lewin also notes that FP's have almost 18% lower net fixed assets per patient day than NP's, again suggesting more efficient use of assets. There

are two possible reasons for this finding. Some authors (notably Clark [9]) suggest that NP's purchase excess assets because the donated funds are more easily generated when they are destined for capital additions than for general operating purposes. Another reason is that use of centralized planning talent in FP hospital chains may explain lower cost to construct and design fixed asset additions.

In 1982, Wilson and Jadlow [41] conducted a study of the relative efficiency of proprietary and non-profit hospitals in one area of service - nuclear medicine. The study, which included 922 hospitals categorized as government, private NP and private FP, found that part (19% - 22%) of the variation in efficiency could be explained by ownership type. In fact, FP hospitals were likely to be more efficient than NP's, and government hospitals displayed the greatest inefficiency.

There are, however, several problems with the study. The number of proprietary hospitals in the sample is 41 out of the 922 hospitals. This is not representative of the proportion of proprietary hospitals. In addition, important categories of chain versus independent, religious versus voluntary were neglected. As recent studies are showing, these sub-categories are too important to neglect and they often change the results. (See Coyne, [11])

In Coyne's study of hospital systems, he finds that system hospitals (both FP and NP) achieve greater productivity levels in terms of admissions per bed, an indication of better resource management. He goes on to note that, "greater efficiency is achieved at higher cost." With respect to the use of human resources, Coyne notes that FP system hospitals are insignificantly different from the independent hospitals (FP and NP). Hence, they have not achieved greater productivity levels from sharing and coordinating staff.

Clark [9] (p. 1,460.) suggests that NP's are less efficient because their administrations are more likely to avoid unpleasant efficiency relevant tasks than the business managers in FP hospitals. He also suggests that (1) NP's are more likely to reach managerial decisions based on easily obtained, but inadequate, data to evaluate performance; (2) they are less willing to press bill collection resulting in higher bad debt costs; and, (3) they are less sensitive to supply prices in selecting inputs.

On the other hand, Sloan and Vracui [36], Starr [37] and others have reported on a transformation of the values within the non-profit hospital sector, from unmittigated philanthropy to a more balanced view of the hospital as a business. A front page story on a very large New Jersey NP hospital expounded on this very fact. [Reference?] The hospital, a 700 bed teaching institute was establishing a holding company to protect the tax exempt status while diversifying and verically integrating. The hospital would be split into separate corporations so ancillary services would now sell its intermediate products to the surgical part of the company using transfer prices instead of charge slips. An important research question is - will divisionalized organization structures be a more significant factor on performance than ownership type? That is, can corporate reorganization improve hospital performance regardless of the presence or obsence of a profit motive?

SUMMARY OF THE WEAKNESSES OF PREVIOUS STUDIES

Each of the studies we reviewed share common weaknesses. One problem with every study is the lack of randomness. Due to the difficulty of obtaining data and controlling for extraneous variables, most of the studies selected hospitals based on homogeniety. Categories of the matched FP and

NP hospitals are based on several variables such as size, location, services offered, and the like. The matching methodology is not a substitute for randomization. When more than two variables are being matched the number of data points gets reduced such that the sample is not representative.

A second problem with matching is that it often does not result in enough data to allow the inclusion of significant attribute variables into the research design. More frequently than not, studies have not disaggregated important components of the category non-profit such as - chain vs. independent, and religious, governmental and other voluntary. Most studies, like Lewin, have compared FP chains with NP independents. Only the Coyne study compared NP (religious, governmental and other) chains to FP chains. As Coyne's study informs us, these attributes can affect results and quite surprisingly (recall that county hospitals chains were lowest cost and FP chains were the highest cost).

Another problem related to the heterogenity of the comparative data is that most studies have focused on ownership, but have not considerd other structural attributes that might affect performance. Currently, there are four legal arrangements: corporate, holding company, overlapping institutional board membership, and the consortium. Further studies should build these variables into the research design.

A third problem with previous studies has been the definition and measurement of certain variables. Cost studies have varied in how costs are defined. As mentioned above, some studies looked at total hospital expenses, some have used average costs, and some have imputed physician

costs. Each of these studies has relied upon different sources of information ranging from mediocre cost reports to AHA surveys to information gathered via questionnaires. Fully loaded costs in these surveys include overhead costs allocated to patient care departments via a step down cost allocation procedure which is often subjective and may be incomparable across hospitals.

A fourth problem related to the definition of certain variables is the lack of price level and inflation adjusted data. Pattison's study found that FP hospitals held newer assets than non-profits. If expenses are higher due to higher depreciation, interest and taxes, adjusting for these differences might change the results.

Perhaps the most fundamental problem we found is that no study (save Bay's) used case mix adjusted data. The problem associated with not using case mix data is that there is too much heterogeniety in the output when patient days or admissions are used. If we do not know the proportion of vaginal delivery versus caesarian section, we can not make valid comparisons of cost per birth. In one sense, this is not a criticism of the past studies because case mix data has been non-existent throughout most of the 1970's. Most studies did not ignore case mix, they used proxy measures based on length of stay, facilities, the number of physician specialists present and the like. The recent passage of the Tax Equity and Fiscal Responsibility Act will make more explicit case mix data available, at least for Medicare patients, by 1984. Thus, future studies will be able to more directly consider case mix.

Are the NP hospital managers really using less sophisticated techniques that give rise to less efficient hospitals? There are strong allegations in Clark, and others, but these conclusions are based primarily on examining

operating ratios which are not directly adjusted for case mix, or the impact of inflation on reported costs. These studies also do not investigate the specific management technologies that give rise to different efficiencies between NP and FP hospitals. We begin to close this gap in the following study of hospital management techniques.

SECTION THREE - Survey of Hospitals Usage Of "Good Management Techniques"

To better understand the relative efficiency of FP vs. NP hospitals, we compare the degree to which a set of good management techniques are present among these hospitals. This approach differs from most of the hospital studies. Rather than ask how hospitals perform based on some overall performance measure, we consider a set of techniques which, if present, will tend to result in better performance (lower costs), and vice versa. The advantage to this approach is that the case mix output measurement problem common to most studies using performance measures is not present since all techniques are believed to be beneficial regardless of the output mix. This approach is also insulated from problems of adjusting cost for price level, inflation, and tax and interest related subsidies. The key weaknesses are that there is no ability to evaluate the degree and quality of implimentation of the good management techniques nor can we determine if there are techniques which compensate for the absence of these techniques. No attempt is made to measure any compensating techniques that management may use in lieu of these techniques or qualitative differences that arise when a technique used in hospital A is more efficacious than when it is used in hospital B. In addition, the way the data was gathered limits our ability to associate these tecniques with other performance criterion such as financial and operation ratios. Finally, we too cannot separate chains

and independent, religious and voluntary teachning and non-teaching. These are problems that can be avoided if replications of this study are conducted.

The data was collected by the General Accounting Office (GAO) in 1978. The survey included all acute care hospitals in 13 states and a stratified sample of hospitals including proportional representation of NP's and FP's in the remaining 37 states. The 37 state sample is the only portion of the study in which ownership status is known and is, therefore, the focus of this analysis. The GAO's objective was to understand the extent to which hospitals in general could improve operating efficiency and reduce costs by adopting better management techniques and they report the result for the universe of responses in [39]. We re-analyzed this data to evaluate the extent to which for profits and non-profits differ in their use of these techniques. The response rate was as follows:

HOSPITAL TYPE	SAMPLE SIZE	NUMBER OF VIABLE QUESTIONNAIRS RETURNED	RESPONSE RATE	# OF HOSP. IN U.S.	% OF ALL U.S. HOSPITALS INCLUDE IN THE SURVEY
Government	451	386	85.6%	1,780	21.6%
Private	808	626	77.5%	3,339	18.7%
Non-Private					
For Profit	206	147	71.4%	732	20.2%
	1,465	1,159	79.1%	5,851	19.8%

We considered sending a new questionnaire asking similar questions raised by the GAO to all hospitals and rejected this, for now, because of several reasons. First, the sample size of 1,159 hospitals represents

almost 20% of all U.S. hospitals and that even if the results could not be generalized through statistical inference to apply to all U.S. hospitals, it would certainly result in strong hypothesis to be tested in future studies. Second, the response rate for the GAO was likely to be much greater than our response rate, since the GAO has the ability to demand such information if it is not voluntarily provided and if the GAO chooses to exercises its leverage. Hence, cooperation on the part of these hospitals is not completely voluntary as it would be in an independent questionnaire. Third, we feel that this sample size already substantially exceeds existing studies of the FP vs. NP hospitals and this evidence would, consequently, be at least as definitive as other evidence available to date.

Development of the Questionnaire:

The GAO "identified from a literature review and discussions with hospital managers and consultants, the types of management techniques, which if properly implemented, could help restrain rising hospital costs" [39]. This questionnaire was sent to 67 recognized health care authorities to obtain their opinion on the potential for containing hospital costs through the use of selected management techniques. Thirty-three of these experts or 49.3% replied and this response was used as the basis for finalizing the questionnaire sent to hospitals.

The management technique identified as aiding cost containment in hospitals are described below:

- Shared services and equipment programs are believed to (1) reduce duplication of services and facilities, (2) contain operating costs resulting from economies of scale, and (3) reduce capital expenditures. Common examples of the benefits of sharing are quantity discounts available for group purchasing, economies of scale resulting from a common controlled laundry-service, and reduced hardware and software develoment costs of centralized

computer services. In a hospital setting, these benefits also extend to areas such as common blood banks and laboratory testing facilities.

- Conservation techniques can control the usage of energy. This might include adding appropriate building insulation, lowering hot water temperature, etc.

- Preadmission patient testing can reduce length of stay. Maximizing the amount of testing done on an outpatient basis for those patients where appropriate, like non-emergency surgery cases, may reduce the length of stay by one or more days.

- Development of generic drug purchasing guidelines and drug formularies can contain pharmacy costs by controlling and specifying the drugs to be purchased. Use of generic, rather than brand name, drugs results in lower drug costs. Providing drug formularies which list the approved drugs to be kept in stock can lead to reduced inventory costs resulting from elimination of duplicate stocks of similar substitutable drugs.

- Admissions scheduling programs reduce the variation in hospital occupancy rates and better coordinate hospital staff and other resources with the number of patients being treated. This requires an ability to predict daily patient volume and an ability to control admittance of non-emergency patients.

- Nurse staffing systems allow managers to determine nurse staffing requirements by shift based on the patient census and the needs of the patients. The ability to avoid excess nurse staffing is considered important because of the large percent of hospital costs attributable to this input (50% in 1977 [39], p. 39).

- Replace automatic use of a battery of routine admission tests with a requirement that physicians specify those tests required for each patient as a means to reduce laboratory testing costs. This is designed to eliminate excessive tests where they are superfluous with respect to the specific ailment to be treated.

- Use of competitive bidding procedures in purchasing materials, drugs, and equipment.

Prior Expectation

Chi-square tests of contingency were used in analysing the hospitals responses on whether or not the hospitals were employing "good management techniques. For each technique, the question we asked was whether the data provided sufficient evidence to indicate a statistically significant

difference between the proportion of NP hospitals employing a particular "good management" technique and the proportion of FP hospitals employing the same technique. The hypothesis might then be stated as: FP's will use these good management techniques more than NP's because they have incentives to maximize profits partly through reduced costs and because they have more professional managers able to understand, identify, and implement techniques to increase efficiency and reduce costs. The null hypothesis -- that there is no difference between FP and NP hospitals on the proportion of hospitals employing good management techniques -- was rejected employing a one-tailed statistical test (using the upper tail values of chi-square to locate the rejection region) at various levels of significance.

Table I.

THE PROPORTION OF HOSPITALS BY OWNERSHIP TYPE
REPORTING THE EXISTENCE OF A PARTICULAR MANAGEMENT TECHNIQUE

	PRIVATE NON-PROFIT	FOR-PROFIT
Number of responses	626	147
Percent of hospitals which are affiliated with other hospitals.	38.0%	54.8%
Usage of Good Management Techniques		
Preadmission testing on an outpatient basis for elective admissions.[a]	22.2%	34.7%
Standard series of tests rather than selective set of relevant tests are administered to entering patients.[d]	58.2%	56.6%
Prediction of daily patient census using estimating techniques.[c]	55.1%	62.8%
Great amount of control over non-emergency patient admissions.[d]	7.6%	3.5%
Little control over non-emergency patient admissions.[d]	43.0%	43.8%
Nurse staffing is based on the degree of illness and care needed.[d]	35.8%	34.3%
Attempt to conserve energy through energy saving devices.[d]	36.1%	32.8%
Use staff or committee to encourage energy conservation.[c]	66.8%	32.8%
Drug purchase (excluding emergency or single manufacturer) based on bids (all of most).[a]	63.3%	73.5%
Drug purchase by generic name (all/most).[d]	29.7%	23.6%
Hospital has drug formulary.[a]	89.9%	82.5%
Medical supply purchases based on bids from more than one supplier.[d]	67.5%	78.2%
Diagnostic equipment purchases based on bids of more than one supplier.[a]	88.3%	92.5%

a Significant at 99 percent
b Significant at 95 percent
c Significant at 90 percent
d Significant at less than 90 percent

Table II

THE NUMBER OF HOSPITALS IN THE SAMPLE THAT ARE PART OF A CHAIN OR MULTI-HOSPITAL ARRANGEMENT

	PRIVATE NON-PROFIT	FOR-PROFIT
No. of hospitals that had same affiliation	106	243

THE PROPORTION OF CHAIN HOSPITALS BY OWNERSHIP TYPE REPORTING A SHARED PURCHASING OR SHARED SERVICE ARRANGEMENT

	PRIVATE NON-PROFIT	FOR-PROFIT
Drug purchases.[a]	47.9%	67.1%
Medical supply purchases.[c]	57.8%	75.7%
Diagnostic equipment purchases.[a]	30.4%	66.7%
Food purchases.[a]	32.8%	50.0%
Laundry service.[d]	30.8%	35.9%
Laboratory service.[a]	26.9%	41.6%
Computer Services.[a]	46.6%	76.4%
Management Engineering Services.[a]	33.6%	64.4%
Radiology Services.[b]	22.6%	37.7%
Insurance purchasing.[a]	54.8%	82.7%

a Significant at 99 percent
b Significant at 95 percent
c Significant at 90 percent
d Significant at less than 90 percent

Table III

THE PROPORTION OF HOSPITALS REPORTING ON DEGREE OF CONTROL OVER CERTAIN DECISIONS.

	PRIVATE NON-PROFIT	FOR-PROFIT
Little decision making control over non-Emergency Room admissions.[d]	43.0	43.0
Decisions to purchase drugs made by attending physicians only.[a]	21.8	35.6
Decisions to purchase medical supplied made by attending physicians only.[d]	7.0	10.2
Decisions to purchase diagnostic and treatment equipment made by attending physician only.[d]	6.8	5.0

a Significant at 99 percent
b Significant at 95 percent
c Significant at 90 percent
d Significant at less than 90 percent

The results of the comparison of all the FP and NP hospital management responses are reported in Table 3.

Neither hospital type dominates all categories. The most apparent dominant result is in the use of shared services among hospitals affiliated with other hospitals. These results, reported in Table II show that FP's consistently make more frequent use of shared service arrangements than private NP's. This is consistent with the quote from the Chairman of HCA stating that they take advantage of economies of scale which allows the hiring of management specialists to handle MIS problems, the sharing of services, and the bulk purchasing. "It is certainly cheaper," he claimed, "to buy Band-Aids by the box-car than by the box." (Brown [8]).

According to Frost and Sullivan [16, p. 176], "The purchase power of a multi-hospital systems is something to be reckoned with by the suppliers of medical supplies, devices and equipment." Since proprietary chains, via contract, control many non-profit beds, an emormous amount of purchase power exists. Large and diversified suppliers, such as American Hospital Supply (AHS) are most able to deal with the chains and take advantage of large volumes. "Increased order volumes, in turn, help maximize its productivity and reduce its per product manufacturing costs." Consequently, the chains receive large discounts, and only the larger suppliers can afford to do business with chains since computerized ordering and discount systems are needed.

The potential benefits of shared services extend beyond economies of scale. They also include quality improvements which can arise from standardization of care and providing care through group arrangement; increased accessibility to sophisticated techniques not affordable by a single hospital, and market power arising from joint exercise of economic

and political power in purchasing and possibly even in preventing forms of competition from entering a market; on the other hand, shared services might create more bureaucracy and encourage cross-subsidization of inefficient facilities [15, pg. 98]. The FP's may be organized with more direct control over affiliates which may make coordination easier and more accessible than in the NP hospitals. Nevertheless, the results reflect that FP's are clearly able to benefit from such coordination more than the NP counterparts. The issue that remains is whether the head office management costs to coordinate these activities more than offsets the shared service benefits, as was suggested in the results of Lewin's study [26].

With respect to other management techniques addressed in this survey, the FP's appear to utilize these "good management" techniques with significantly greater frequency in preadmission testing, prediction of daily patient census, and purchasing of drugs, medical supplies, and medical equipment on a bid basis. These are both better planning techniques and cost reducing techniques. Private NP's are better managed with respect to reported use of drug formularies, purchase of drugs by generic name and use of staff and devices to conserve energy. The areas where NP's appear to be superior may, to some extent, be challenged.

The Lewin study [26, p. 56] found that on a per diem basis the cost of drugs sold (and cost of supplies sold) were dramatically higher for chain investor-owned hospitals than non-profits. They surmised that chain hospitals might be displaying a lower use of generic drug formularies, a conclusion supported in this study. Though plausible, the economies that FP's realize in purchasing by bids and in group arrangements may compensate for the benefits of purchasing drugs using generic names and establishing drug formularies.

Energy conservation can also be accomplished in the design of a building which may compensate for the lower use of devices and staff to manage energy costs. Some studies have suggested that FP's do have plants which may be designed to manage energy costs. Thus, the good management techiques more prevalent in NP's may not reflect important differences that affect operating efficiency and costs.

It is noteworthy that some of the techiques that could benefit hospital efficiency are used to a limited extent by both FP's and NP's. Specifically, they exert little control over nurse staffing. Nurse staffing based on illness and care-needs occur only in about one-third of these hospitals. Table III suggests that neither type of hospital has much control over elective admissions. The proporion reporting little or no control is 43 percent for both hosptial types. The decisions to purchase drugs are made by the attending physcians in 35.6 percent of FP vs. 21.8 percent of NP's.

These are examples of the institutional similarities between the two ownership types where neither has much success in managing the professional dominance of doctors and nurses.

The results of our study lead to acceptance of the hypothesis that FP's employ these good management techniques with greater frequency. Specifically, they appear to use management talent to take advantage of expedient standard business techniques to control costs rather than to seek innovation (albeit more challenging) ways of influencing doctors and nurses to alter their behavior to control resource utilization and health care costs.

4. CONCLUSION

This paper was intended to focus on some of the current beliefs about for-profit and non profit hospital performance. In order to carry out that task, we reviewed some of the major studies of the last ten years. In doing so we arrived at some preliminary conclusions.

We found no evidence that FP's place a higher value on profit than quality of care. We found no evidence that FP's were less expensive than NP's although these studies did not explicitly control for case mix or adjust for the difference in price levels, interest costs, donations, and taxes that these hospitals experienced.

We did find some evidence that FP's specialize in less complex cases, which is prima facie evidence of cream skimming - enough evidence for an indictment, but not a conviction. We also found evidence that FP's charge more, which, when coupled with the finding that FP's were not less expensive than NP's, lends credence of the speculation that FP's tend to maximize reimbursement rather than minimize costs. This result suggests that patient care in FP hospitals is more expensive and that the proliferation of FP's may result in yet higher health care costs regardless of the actual cost of operation. From a public policy standpoint, this raises the issue of whether these higher costs are more than offset by the property and income taxes generated by FP's and by the further reduced dependence of NP's on tax exempt financing and tax deductible gifts.

Less ambiguous results emerged around the issue of efficiency. By and large, most studies found that FP's were more efficient in their use of capital and personnel. In order to explore this finding in greater detail we examined if the ostensible greater efficiency of FP hospitals was the result of better management techniques.

The logic of most arguments that relate ownership to performance is that the profit motive results in a more efficient and effective operating systems which lead to lower costs and better performance. Thus, the presumption of superior operating techniques is a necessary condition to argue that ownership and performance have a relationship. If, on the other hand, both sets of institutions have similar operating techniques, the other extraneous factors (such as case mix, location, regulatory effect and the like) must be intervening.

Based on the analysis of the hospital survey, we found some evidence which supports the notion that FP's do employ a different set of managerial techniques with a different frequency than NP's. Where non-profit's display a greater tendency to purchase drugs generically, and to employ energy saving devices, FP's have a greater proclivity to install pre-admission testing, to predict the daily census, and to group purchase and to share a host of services. When we compared FP chains with NP chains, we found that many more of the FP chains were sharing professional and support services and group purchasing drugs, medical supplies, and clinical equipment than NP chains. We have no evidence, however, that these "good management" techniques result in lower case mix adjusted unit costs. We can only speculate from other information. The Lewin study found that FP chain plant operation and maintenance, housekeeping, laundry and linen costs were 15 percent lower than NP's. They acknowledge that that finding might suggest either a new and more efficient plant, or better management systems. Yet, there remain questions about whether added management overhead costs more than offset these cost savings. Further studies are needed to associate the existence of these kinds of technique with a particular aspect of performance.

One of the problems with all of the ralative efficiency studies is the use of a single ratio to measure productivity. When FTE's per occupied day or net fixed assets per daily census are the measures, how do we interpret them when one ratio is high and the other ratio is low? Furthermore, ratios are problematic when they purport to measure performance for hospitals because they match up a single input measure with a single output measure. Hospitals produce multiple products, and performance measures must be able to deal with multiple inputs and outputs. We believe that techniques that can explicity consider multiple outputs and inputs of hospitals such as Wilson and Judlow's linear programming technique, and data envelopment analysis (see Sherman [34]) are more useful in finding relative efficiency. Such tecniques not only find which hospitals are inefficient, but they can help to identify sources of inefficiency.

FP's VS NP's - A DECEPTIVE ISSUE?

A final weakness that we see on the major articles written on FP vs. NP hospitals takes us back to our threshold questions.

Does the profit motive result in a hospital that is more efficient and better managed? One with lower health care costs and without compromise in the quality of care?

We have neither a simple nor a precise answer to the question, but perhaps it is because we are not asking the right question. The profit motive per se may have little to do with performance in the health care industry.

Perhaps the pros and cons of the profit motive in health care cancel each other out. Perhaps by comparing for-profits with non-profit we are

confusing an abstraction with a concrete reality. If FP are, as the studies cited suggest, at least as costly as NP's, is this just a business man being as competitive as necessary? Do FP's essentially have reserves which can be drawn on to be more efficient, less costly if they need to be? Rather than focusing on the profit motive perhaps our attention may be more profoundly directed not toward a generic legal ownership type but toward the structure of the industry, the reimbursement system, the internal organization of hospitals, and specific structural features such as chain versus independent and simple corporate versus holding company models. It is a striking fact that no studies have focused on the relation between doctors and hospitals for the two ownership types. Yet many feel that the decision to admit a patient and the pattern of ancillary usage are where the performance battles are lost. Since there is no data available that suggests that for profit chains or for profit independent hospitals can counteract the power of the physicians, let alone control them any better than non-profit hospitals, we may be even further away from answering the threshold question than we realize.

Future Research Designs:

The ambiguities that remain in the literature strongly compel a recommendation that future studies should be undertaken only when the data and the analytic techniques can provide more conclusive results at least with respect to the study sample.

The following are the essential features that appear necessary to develop more insights into relative performance of hospitals.

The segregation of hospital types should acknowledge the chain/affiliate versus non-chain independent hospital. This has been shown to lead to

different useage of shared services and centralized management and technical expertise. Comparison of NP and FP chains as well as NP and FP independents are relevant. In addition, the comparison of chain with independent continues to be of interest because the question of whether the added central overhead costs exceed the cost saving benefits has not been resolved.

Segregation of NP hospitals by religious, community, and county types would be of interest primarily where issues of whether selective changes in legislation are of intertest. For example, if one were evaluating whether the property tax exemption should continue, there might be no reason to segregate community from religious hospitals. Except for such specialized questions, we feel that further segration of NP hospitals is not warranted.

Output Data on Case Mix - Data on Diagnosis Related Groups (DRG's) which will indicate bed days and admissions by type of patient diagnosis treated will become increasingly available, primarily as a result of state the federal legislation. Hence, this key weakness in most studies can largely be remedied. Some caution is, however, in order. First, the analytic techniques used may require that a single output measure be developed such as case mix adjusted bed days or admissions so that ratio such as cost per adjusted bed days may be developed for use in econometric regression type studies. The set of weights used will, therefore, be a key ingredient and to date only weights based on average rather than the efficient cost of each DRG are available, i.e, the efficient cost is not really known. Hence, this output measure will be biased but undoubtedly much more representative than prior estimates using service mix, length of stay and other surrogates. A second note of caution is that DRG's will be widely used because of their availability. Studies of hospital efficiency must recognize that DRG's are keyed to length of stay and not resource usage so that two patient types

that spend the same number of days in a hospital may make very different demands on the nursing staff and other hospital resources. Other more resource need sensitive case mix measures would be desirable where efficiency of resource usage is the primary focus.

Cost data will always be subject to variations among different accounting and cost allocation systems. While studies have implicitly assumed that such problems are small enough to be just part of the large mass of noise in this type of research, this may become an issue of importance as the nature of hospitals, HMO's and free standing clinics continue to evolve.

A number of specific cost identification problems which require adjustment in future studies are as follows:

a. Inflation and specific price level adjustment - To the extent that asset purchase and leases are contracted for in different time periods, adjustments are needed to meaningfully compare hospital costs.

b. Lower interest rates associated with tax exempt bonds need to be considered in comparing FP and NP costs.

c. The property and income taxes that are waived for NP's also require adjustment in comparing costs.

d. While donations are a decreasing proportion of hospital capital, this still represents a source of funds for which no stockholder requires a return but which is effectively a government subsidy, i.e., hospitals would clearly receive fewer donations if they were not tax exempt gifts. In addition, this source of funding is unlikely to be evenly distributed among all NP hospitals. Consequently, the need to adjust for this "free" resource to understand the cost of FP and NP hospitals should be more explicitly considered in future studies.

e. When revenues are used instead of costs to focus on fees for health services, the mix of payors and the different proportioning of reimbursement from payors such as Medicare need to be considered.

Our final recommendation is that more research focus on the comparison of management and operating techniques to understand whether they differ with respect to their management of professional staff, capital additions,

patient scheduling, etc. This research would focus on the question of whether the quality of management and the operating costs differ among hospital types. Such findings would have important implications for normative prescriptions about how hospitals should be structured and managed.

APPENDIX

HOW THE EVIDENCE ON FOR PROFIT'S "STACKS UP"

Figure 1.

STUDIES THAT HAVE FOUND THAT FP QUALITY IS:

HIGHER	LOWER	SAME
	Ruchlin[1]	Stenwald & Neuhauser[2] Bays[3] Clark Pattison[4]

STUDIES HAVE FOUND THAT FP COSTS TO BE:

HIGHER	LOWER	SAME
Berry Lewis Pattison Coyne	Bays	Sloan & Vracio

1. Quality defined by Gross death rates
2. Quality defined by accredidatin
3. Quality defined by mortality and morbidity
4. Quality defined by services offered.

STUDIES THAT HAVE FOUND FP's TO BE

MORE EFFICIENT	LESS EFFICIENT
Lewin Coyne Wilson & Judlow	

STUDIES THAT HAVE FOUND FP CHARGES TO BE

HIGHER	LOWER	SAME
Lewin Pattison		

MAJOR STUDIES ON HOSPITAL PERFORMANCE 1973-1983

YEAR	AUTHOR	INDEPENDENT VARIABLES
1973	Ruchlin, et. alia. [30]	FP chain, NP voluntary, NP governmental
1974	Rafferty, et. alia. [28]	FP vs. NP voluntary
1974	Berry [7]	FP vs. NP voluntary and NP governmental
1976	Schweitzer, et. alia [33]	FP vs. NP
1977	Kushman [25]	FP vs. NP
1977	Bays [4]	Chain FP, Non-chain FP vs. NP
1979	Bays [5]	Chain FP, Non-chain FP vs. NP
1981	Lewin [26]	Chain profit, Independent non-profit
1982	Wilson, et. alia. [41]	Private NP, Private FP, Gov't NP, Independent Religious, NP Independent Voluntary, NP Independent
1982	Coyne [11]	NP chain Religious, NP Chain Voluntary, NP Chain Govt, FP Chain; FP Independent
1983	Pattison [27]	NP Voluntary, Public, Investor-Owned, Chain Investor-Owned Independent.
1983	Sloan, et. alia. [36]	FP Chain, FP Independent, NP Voluntary

Table 1

SELECTED STATISTICS* OF FOR-PROFIT (FP) AND NON GOVERNMENTAL NON PROFIT (NGNP) HOSPITALS IN THE UNITED STATES FROM 1960 to 1981

	NUMBER OF HOSPITALS		NUMBER OF BEDS (in 000)		PATIENT ADMISSIONS (In 000)		COST PER DAY		COST PER VISIT (ADMISSION)	
YEAR	FP	NGNP	FP	NGNP	FP	NGNP	FP	NGNP	FP	NGNP
1960	856	3,291	37	446	1,550	16,788	-	-	-	-
1970	769	3,386	53	592	2,031	20,948	60	75	486	615
1976	752	3,368	76	671	2,734	24,098	156	153	1,032	1,208
1980	730	3,339	87	693	3,165	25,576	257	246	1,677	1,900
1981	729	3,356	88	706	3,239	25,995	229	286	1,953	2,223
TOTALS (for all hospitals.	6,933		1,362		39,169					

*From American Hospital Association 1981 Annual Survey, Hospital Statistics.

Table 2

Average Length of Stay and Occupancy Rates for
Non Governmental Non Profit and For-Profit Hospitals*
For the Years 1960, 1970, 1976, 1980, and 1981

	AVERAGE LENGTH OF STAY		OCCUPANCY RATE	
YEAR	FOR	NON	FP	NGNP
1960	5.7	7.4	65.4	76.6
1970	6.8	8.2	72.2	80.1
1976	6.6	7.9	64.8	77.1
1980	6.5	7.7	65.2	78.2
1981	6.5	7.8	66.4	78.5

*From Hospital Statistics, 1982 edition.

Table 3

Location of For-Profit Hospitals in the United States

LOCATION	NO. OF FOR PROFITS	TOTAL NO. OF	PROPORTION OF FOR PROFITS TO TOTAL
Pacific	162	716	23%
West South Central	201	847	24%
South Atlantic	161	823	20%
East South Central	98	492	20%
New England	4	252	2%
East North Central	9	904	1%
West North Central	25	797	3%
Mid-Atlantic	39	615	6%
Mountain States	30	367	8%

Table 4

Revenue Growth of For-Profit, Investor Owned Hospitals

1973 - 1979*

YEAR	TOTAL IN BILLIONS	GROWTH %
1979	12.4	24.0
1978	10.0	28.2
1977	7.8	27.8
1976	6.1	27.0
1975	4.8	26.3
1974	3.8	5.5
1973	3.6	38.5
1972	2.6	

*From Frost and Sullivan, p. 72.

Table 5

1980 Profit Margins of Five Major Hospital Management Companies*

COMPANY	HOSPITAL OPERATIONS PRE-TAX MARGINS (%)	COMPANY OPERATIONS After tax (%)
AMI	9.8	4.9
Charter Medical	-	4.6
Hospital Corporation of America	9.1	5.7
Humana	8.5	4.6
National Medical Enterprises	13.8	4.0

*From Frost and Sullivan, p. 129.

Table 6

Number and Proportion of Non-Governmental Non-Profit and For-Profit Hospitals Accredited by the Joint Commission (JCAH) by Bed Size in 1981*

	FOR PROFITS			NON PROFITS		
BEDS	# HOSPITALS	# ACCREDITED	% ACCREDITED	# HOSPITALS	# ACCREDITED	% ACCREDITED
6-24	41	4	9.8	261	36	13.8
25-49	117	53	45.3	1,006	400	39.8
50-99	205	161	78.5	1,461	1,046	71.6
100-199	234	206	88.0	1,408	1,239	88.0
200-299	98	94	95.9	718	682	95.0
300-399	22	21	95.5	428	419	97.8
400-499	11	11	100.0	267	265	99.3
500 +	1	1	100.0	330	329	99.7

*From Hospital Statistics, 1982.

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