Hospital Ownership Conversions: Defining the Appropriate Public Oversight Role

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1.0. Introduction and Policy Context

The hospital industry attracts much public scrutiny, given its important role in providing personal health services, its size—about three percent of Gross Domestic Product, the importance of hospitals as employers in the communities they serve, and the high share of hospital revenue from public sources. During the last two decades, the industry has experienced a dramatic downsizing at the same time, and for the reason, that methods of paying for hospital care have changed. The market for hospital care in the year 2000 was much more competitive than it was in 1980.

Downsizing has taken various forms. First, there has been a reduction in the number of hospitals. In 1980, there were 5,830 "community" hospitals (non-federal short-term general hospitals located outside of institutions). By 1999, the latest year for which data are publicly available, the number had fallen to 4,956 (Fig. 1). The number of community hospitals peaked during the 1970s. Second, existing hospitals have reduced bed capacity from a peak of slightly over 1.0 million beds in 1983 to 830,000 beds in 1999 (Fig. 2). Third, hospitals have diversified, integrating both vertically and horizontally, and they have sought new ownership and management. As an extreme measure, many hospitals have closed.

Interestingly, for-profit (F) hospitals run counter to the national trend in the number and bed capacity (Figs. 1 and 2). The number of such hospitals has remained relatively constant in terms of numbers of hospitals and has risen in terms of number of beds under such hospital ownership. Although the number of private nonprofit hospitals (N) peaked in 1984 as did the number of beds, the subsequent decline in both has been small relative to the decline in number of public (G) hospitals and beds in such hospitals.

In fact, most of the decline in community hospital capacity has occurred in state and local government community hospitals. Thus, the trend has been to a privatized hospital system with some relative increase in the share of private hospitals under for-profit ownership. These changes reflect hospital closings, mergers, as well as ownership changes among existing hospitals.

This study focuses on hospital ownership changes and effects of such changes. Although government or private nonprofit ownership to for-profit ownership receive the most publicity, in fact, changes have occurred in all directions (Needleman et al. 1997).

Relatively more attention has been paid to conversions from G and N to F ownership for several reasons. There is a concern that hospitals that have a profit-seeking mission as an explicit motive are less likely to accept unprofitable cases for treatment, such as persons who lack health insurance or who are underinsured. Given the goal of maximizing profit, such hospitals may be more likely to exploit loopholes in the reimbursement rules; they may be more willing to reduce quality of care, especially quality attributes that are difficult for patients, and perhaps even their physicians, to monitor ("noncontractable quality," see e.g., Hart et al. 1997).

Allegations of adverse effects associated with ownership conversion are easily made. But obtaining rigorous empirical support for such allegations is a much more difficult matter. Any in-depth study of effects of ownership change on access to and quality of care and on business practices should account for the following factors.

First, hospitals do not change ownership in a vacuum. Hospitals that convert may have specific attributes that distinguish them from hospitals that do not convert. These

attributes may be a characteristic of the hospital and/or of the market in which the hospital operates.

Related to this first point, if a hospital did not change ownership in the particular way proposed, what was the alternative course of action? The hospital industry is a mature industry, in a sense more like steel than e-commerce. In an industry that is downsizing, there are rarely many attractive alternatives. Thus, even if the outcomes are worse than before, such outcomes could have been even worse if the choice to change ownership had not been made. The alternative to conversion may have been closure. Under such circumstances, all persons in the locality may have experienced a decrease in access to hospital care and loss of jobs to the community may have been far greater than occurred as a consequence of "efficiency measures" implemented by the acquirer. It is essential to ask the "what if" question, both in policy and in empirical analysis of effects of ownership changes.

Second, some of the observed changes reflect change in ownership per se rather than the effects of change in *type* of ownership. This is particularly true during the first few years following a conversion as hospitals adjust to new management and strategies.

A third point pertains to policy adoption based on empirical evidence of undesirable outcomes following specific types of hospital ownership conversions. If changes in mission and in behavior are observed, are there more direct and efficient policy instruments for assuring desirable behavior than simply blocking a certain type of conversion? For example, if fraud and abuse in hospital reporting of patient information for purposes of reimbursement is a widespread practice, a more direct approach would involve direct public oversight and enforcement rather than indirectly affecting such

behavior by influencing the mix of hospitals according to their propensities to engage in undesirable behaviors. As discussed below, some researchers have found that profit-seeking behavior is contagious. That is, when for-profit hospitals engage in certain kinds of behavior, their hospital competitors with different ownership forms may emulate it.

There is a rich empirical literature on relationship between hospital ownership and various performance measures (see e.g., Sloan 2000). In general, the literature reveals that private hospitals, whether they are for-profit or nonprofit, are more alike than different. The vast number of studies, however, have assessed effects of ownership type on hospital behavior rather than ownership conversions. The latter are potentially particular insightful because they hold location and characteristics that potentially influence behavior associated with location constant and examine changes that occurred post versus pre conversion. Norton and Staiger (1994) found differences in hospital behavior by ownership status, but the differences were attributable to where for-profit versus other types of hospitals decided to locate. For example, a profit-seeking hospital may decide to locate in a relatively affluent suburb, where well-insured persons are located rather than in an inner city, where people are much more likely to be uninsured or be enrolled in Medicaid (one of the less generous third party payers).

The dearth of studies on hospital ownership conversions reflects the difficulty of obtaining accurate data on conversion dates and conversion types. This problem has been remedied in the present study and in some studies reviewed below. After comparing ownership codes from two independent sources, the Annual Survey of Hospitals conducted by the American Hospital Association and Medicare Cost Reports, my students called hospitals for which the two sources were discrepant to determine whether

the conversion occurred, when it occurred, and ownership types before and after conversions. In total, about 300 telephone calls were made.

Compared to the number of quantitative studies, there have been very few qualitative studies of ownership and ownership conversions. Qualitative studies may be said to be "soft" but at the same time, they could reveal differences in and changes in decision making processes that otherwise can only be inferred very indirectly from outcome changes. By peering inside the "black box" of hospital decision making, especially decision making in the presence of major stress and organizational change, one can enhance our understanding of these changes. Such analysis also provides an important cross check on findings from the quantitative analysis.

Qualitative analysis is not done in large part because it is so difficult to do. Decision makers undergoing change and/or associated with choices that did not lead to a successful outcome are not likely to want to have their decisions and the sequelae of their decisions scrutinized. Also, there is no explicit hypothesis testing as in quantitative research. In the end, one gains an impression without the sharply defined results of a rejected null hypothesis.

In this chapter, I review and evaluate very recent research (mostly published in 2000 or subsequently) on the relationship between hospital ownership and behavior and present new empirical results on ownership conversions based on empirical analysis of hospital discharge data for the years 1988 through 1996, the Healthcare Cost and Utilization Project's (HCUP) Nationwide Inpatient Sample (NIS). HCUP is an intramural program of the U.S. Agency for Healthcare Research and Quality.

Using qualitative as well as quantitative evidence, the public policy questions addressed in this chapter are those posed above. Does ownership conversion, especially to the for-profit ownership form, lead to increased access to care barriers, diminished quality of care, and to profit-seeking billing practices designed to maximize reimbursement? Do acquirers of hospitals pay prices for the facilities that are commensurate with earning a fair rate of return on their investments? Or do acquirers pay too little for community assets in the form of hospitals? If there is evidence of market failure in this context, what are the appropriate public remedies?

Section 2 reviews empirical evidence on effects of ownership and ownership conversions on behavior. Section 3 presents new empirical evidence on effects of ownership conversions from G and N to F ownership and the reverse, from F to G or N. To the extent that hospital decision making becomes more profit-oriented when hospitals convert from G or N status, one should observe the opposite when hospitals convert from F to G or N status. Thus, by examining effects of conversions in both directions—toward and away from for-profit status, the empirical analysis makes it possible to distinguish effects of change of ownership type from effects of conversion per se. Section 4 further evaluates the findings and explores implications of the results for public policies as they relate to hospital ownership conversions.

2.0. New Empirical Evidence on Ownership Effects and on Hospital Conversions

2.1. Why Hospitals Convert. Using qualitative as well as quantitative methods, several recent studies have analyzed why hospitals change ownership status. The major determinants of ownership change are financial distress prior to the change, in large part due to a reduction in aggregate demand for hospital inpatient care and an increase in

competition among hospitals, necessitating implementation of new competitive strategies which were more difficult to introduce under the prior regime.

A study of five public hospitals that converted from public to nonprofit ownership gave two reasons for the changes: (1) a reluctance of public facilities to expand beyond their political jurisdiction and (2) governance and management restrictions that made it more difficult to compete with other hospitals (Legnini et al. 1999).

Burns et al. (2001) performed case studies of 16 hospitals that changed ownership between 1993 and 1996. Among the 16 hospitals were conversions from private nonprofit to for-profit, for-profit to nonprofit, public to for-profit, and public to nonprofit ownership. The case studies revealed two primary motivations for conversion irrespective of ownership type, even though the two both come down to money.

First, with one exception, the hospital reported current or anticipated financial stress as a motivation. By joining a chain or reducing managerial constraints in the case of public hospitals, the hospitals hoped to improve financial performance. A motivator for the hospitals converting from nonprofit to for-profit governance was access to equity capital. In one case, the hospital was not considered to be "strategic enough" to justify further investment by its nonprofit owner, but the hospital fit the strategy of a for-profit purchaser. In the case of for-profit to nonprofit conversions, the hospital had not met the former owners' required financial return. Reasons for the public to private conversions included poor hospital financial management under the previous ownership. In the extreme, the alternative for the hospital was closure.

Second, nearly all of the hospitals said that they were faced with an inability to compete for managed care contracts. By joining a larger, more dominant hospital in the

local market, the hospital was in a stronger position in dealing with managed care organizations.

A desire to change its mission only very rarely was a motive for an ownership conversion. Transitions to for-profit ownership were motivated by both "pull" and "push" factors. The former included an attractive financial offer. The latter included siphoning off of hospital cash flow by the former owner. Transitions from for-profit ownership to the other forms tended to be motivated by push factors, including failure to realize a required return.

In a review of conversion financing, Robinson (2000) reported that most conversions from private nonprofit to for-profit status are initiated by the nonprofit trustees and thus resemble friendly leveraged buyouts. At the same time, many nonprofit hospitals have created for-profit subsidiaries and continue to function as nonprofit organizations.

Conover et al. (2001) provide a recent study of determinants of hospital closings, mergers, and ownership changes. Between 1986 and 1996, the authors identified 472 hospitals involved in mergers, 658 hospitals that underwent ownership conversions, and 545 hospitals that closed during the period. On average, 2.3 percent of short-term community hospital beds were located in a facility that underwent at least one of these changes. In a given year, only 46 of the mergers involved a change in ownership type. In 1995-96, conversions from N to F status were the single most common type of ownership change. But in the other years, conversions from G to N ownership were the most common.

Multinomial logit analysis was used to determine characteristics of hospitals that merged, closed, or converted. The facility characteristics that significantly elevated any form of these changes in hospital status were high Medicaid share, low profitability, and low occupancy rate. Thus, overall, hospitals undergoing change were those in difficulty, not those who were high performers hoping to do even better. To better understand factors accounting for ownership conversions, changes to for-profit and from for-profit status were examined separately. Community factors that increased the probability of conversion to for-profit status were lower per capita income in the area, greater unemployment, and greater competitiveness among local hospitals, as measured by a Herfindahl Index of bed shares. The latter result implies that for-profits may be better positioned to compete as markets become more competitive—a result consistent with the stylized fact that the for-profit market share has grown in the last two decades.

The same study examined changes in financial performance after conversion. This was done by forming a counterfactual group of nonconverting hospitals that were otherwise similar to the converters. Without a comparison group, it would have been impossible to know whether hospitals that converted were unique in experiencing financial distress or whether, in the years when hospitals converted, similar proportions of all hospitals were experiencing such distress.

Methodologically, a synthetic conversion date was assigned to the matched group of nonconverting hospitals. From the pool of hospitals that did not change ownership, hospitals were selected at random and randomly assigned a conversion date. The frequency distribution of conversion dates and types matched the actual series. Thus, if

conversions from G or N to F ownership status were particularly likely in 1989, for example, the matched sample mirrored this.

Relative to this comparison group, hospitals that converted experienced a decline in financial performance during the four years immediately preceding conversion. In this sense, converting hospitals were not typically successful businesses prior to conversion, and if not an ownership change, some other outcome, including closing was often inevitable.

2.2. What is Being Bought and Sold? The financial transaction involves a purchase or lease price, but much more. The transaction may be parsed into two elements, the price and provisions of the transaction other than price.[1] On price, the issue is whether or not acquirers pay a fair price for the facility, given discounted cash flows that are likely accrue from the transaction. In the vast majority of transactions in the general economy, the underlying assumption is that buyers and sellers are sufficiently informed to allow the market set the transaction price. In this context, there is a concern that sellers may not be sufficiently well informed and may obtain too little in return for relinquishing a major community asset.

On the nonprice dimensions, there is a concern that acquirers will be driven by profit considerations and provision of public goods by hospitals, such as provision of care to uninsured persons, public health programs, and education and research other than that sponsored by an outside public or private organization, will be reduced as a consequence.

Much of the evidence on these two questions comes from case studies of ownership conversions. To date, the literature has provided no clear answers to the price

[1] Of course, the two aspects are related. If there are many concessions on nonprice dimensions of the transaction, the price should reflect this.

question. As far as the nonprice question is concerned, the evidence is somewhat reassuring but preliminary.

The price question has been addressed by two recent empirical studies. Conover and Sloan (2001) assessed rates of return on a sample of hospital purchases starting in the early 1980s. Wide variations in rates of returns were observed with conversions to for-profit status exhibiting higher rates of return than other types of changes in hospital ownership. On average, rates of return were well above the cost of capital when hospitals converted to for-profit status, but somewhat closer to the cost of capital otherwise.

In an earlier study conducted by the authors, rates of return tended to be closer to the cost of capital, but that study was limited to ownership conversions that occurred in North and South Carolina and had a shorter post-conversion followup period, meaning that more of the measured return was based on projected rather than actual cash flows (Sloan et al. 2000). Methodologies used in the two studies were similar. A weakness of both studies is that it was only possible to make crude adjustments for nonprice concessions granted by buyers to sellers.

On the second question, it is necessary to glean bits of evidence from qualitative studies. Blumenthal and Weissman (2000) provided case studies of sales of three teaching hospitals to investor-owned hospital chains, focusing in particular on the effects of the sales on the organizations' medical education missions. In all three, there were no adverse effects.

The authors attributed lack of an effect to three factors. First, the for-profit purchasers considered preservation of some unprofitable activities a cost of doing business at these institutions. The contracts of sale stipulated that specific resources be

devoted to teaching, resource, and charity care. Second, private subsidization of medical education may not be that burdensome to the new owners, given external subsidies, such as for graduate medical education. Third, at the time the study was written, all three institutions were doing well financially. If faced with financial stress, their missions could change.

Cutler and Horwitz (2000) studied conversions of the Wesley Medical Center in Wichita, Kansas and HealthOne in Denver, Colorado. Both were large teaching facilities. The first was purchased by Hospital Corporation of America in 1985. Two foundations were funded with proceeds from the sale. In the HealthOne transaction, the hospital entered into a joint venture with Columbia/HCA in 1995. After the transaction, the new HealthOne organization concentrated on graduate medical education, paying faculty and residents and administering medical education at its facilities. Cutler and Horwitz found improvements in financial performance post conversion while maintaining the mission previous to ownership conversion. Improved financial performance came in part from the for-profits' skill at increasing public sector reimbursements, not solely from efficiency gains.

Outcomes following conversion are not uniformly favorable. Burns et al. (2000) described "the Allegheny System Debacle." This is a case study of the largest nonprofit health care involving the Allegheny Health, Education and Research Foundation, which consisted of a major teaching facility in Western Pennsylvania and several affiliate hospitals throughout the state. The authors attributed failure in part to failure of external oversight mechanisms, including lack of performance of the organization's board, accountants and auditors, bond-rating agencies, and state government. There was

ambiguity regarding the powers of the state attorney general, state politics, and jurisdictional issues with federal bankruptcy court. Pennsylvania law is ambiguous regarding the Attorney General's power over transactions with nonprofits.

The 16 case studies reported in Burns et al. (2001) revealed that in all but one conversion, the financial status of the hospital improved post conversion. There were funds from the sale or lease of the facility. New hospital owners invested in hospital plant and equipment, particularly in hospitals converting from private nonprofit to for-profit status, although in some cases, the investment post conversion was not as great as hospital management had anticipated. Improvements in margins were achieved by cutting staff,[2] improving purchasing practices, and consolidating services lines in a network approach.

Changes in decision making style depended in large part on whether the new organization was a multihospital system or a freestanding facility. In fact, the transition to being part of a larger system was on balance more important that was the specific change in ownership form. Those that became part of a chain lost some local autonomy in decision making. But there were differences in the strategic decision making process among chains and even in treatment of individual facilities within a particular chain. Overall, the organization's general mission remained in tact, as specified for example in the sales contract, while the methods for achieving its objectives changed.

Anderson et al. (2001) studied changes in internal decision making after conversion in ownership status at the same set of converting hospitals as in Burns et al.(2001), but they also included a comparison with 22 nonconverting hospitals matched

[2] This result is consistent with Thorpe et al.'s (2000) finding that margins increased after conversion to for-profit status, mainly because of expense reductions.

on location, ownership (prior to conversion), and bed size. They found that relative to nonconverted hospitals, converted hospitals had greater levels of physician and nurse participation in hospital decision making; in the converted group, these health professionals had greater influence over final choices made. These agents' interconnections and interactions may have intensified as the organizations tried to cope with the changes brought about by the conversion. Alternatively, granting more influence to professionals may have been a compromise struck to overcome professionals' resistance to change. The study assessed participation at three to six years following ownership conversion. Thus, the change in participation was not only transitory. However, increased participation by health professionals is logically more closely related to provision of care to individual patients than to policies affecting the community as a whole, such as provision of care to the uninsured.

2.3. Effects of Hospital Ownership Type Changes on Quality of Care. Two recent studies have assessed differences in quality of care by hospital ownership status. One is a comparison of differences in quality by ownership. The other explicitly examined the effect of change in ownership type on quality of care. Both studies relied on Medicare administrative records to gauge outcomes of care. At least to some extent, both studies account for methodological complexities of discerning effects of conversions discussed in the previous section. Both studies imply that conversion to for-profit status may lead to some reduction in quality of care, as measured by mortality rates at various times after discharge from the hospital.

McClellan and Staiger (2000) examined all Medicare hospital discharges for acute myocardial infarction for 1984-94 and for ischemic heart disease for 1984-91. The

outcome measures were death within 90 days of admission and cardiac complications leading to readmission. Many of the details are beyond the scope of this review. A purpose of that study was to develop a hospital-specific measure of quality with a high signal to noise ratio. However, the findings on hospital quality, measured in terms of patient survival, are highly pertinent here.

First, when county-level fixed effects were included, the estimated mortality difference between N and F hospitals fell by roughly half, implying that for-profit hospitals tend to locate in geographic areas where hospital quality is not as high in general. This may be in part because for-profits often acquire facilities that are not doing well financially. This still left some amount of lower quality attributable to being a for-profit hospital.

Second, in the three markets they considered in detail, for-profit hospitals did not have higher mortality rates. In one of these markets, a for-profit firm acquired a low-quality hospital, gauged in terms of mortality rates, and subsequently, quality at that hospital improved.

Overall, these results lend support to the conclusion that some of the results on quality differences reflect differential patterns by hospital ownership in where they locate their facilities rather than fundamental differences in hospital behavior. The authors concluded that "on average, the performance of not-for-profit hospitals in treating elderly patients with heart disease appears to be slightly better than that of for-profit hospitals, even after accounting for systematic differences in hospital size, teaching status, urbanization, and patient demographic characteristics. This average difference appears to be increasing over time. However, this small average difference masks an enormous

amount of variation in hospital quality within the for-profit and the private nonprofit categories. Our case-study results also suggest that for-profits may provide the impetus for quality improvements where, for various reasons, relatively poor quality of care is the norm." (p. 111).

In a comment on the McClellan-Staiger study, Wolfram (2000) stressed that survival to 90 days after the admission date represents only one dimension of quality. While no informed person would seek admission at a hospital with a markedly higher mortality rate, other attributes, such as time providers spend with patients, are also plausibly important. She also noted that McClellan and Staiger may not have adequately controlled for patient selection. For example, if more severely ill patients (in ways that the researcher cannot measure) seek care at private nonprofit hospitals, the true differential in quality between these institutions and for-profits will be higher than the difference the researchers measured.

There are several strategies for dealing with this issue, none of which are perfect. One is to include more explanatory variables, such as Wolfram's suggestion to include a binary variable for the presence of a trauma center.[3] If private nonprofits are more likely to have trauma centers, they may attract the most vulnerable heart attack victims.[4] Other approaches involve instrumental variables and difference-in-difference. None of the approaches is perfect. In the end, more progress is likely to be made by supplementing statistical approaches with case studies that identify changes in processes of care that occur in hospitals with different ownership form.

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[3] In some unpublished work, colleagues and I followed the suggestion to include a binary for trauma center in analysis of survival following inpatient stays. The variable typically did not affect outcomes. One might argue that a trauma center is endogenous to ownership.

[4] Their technique includes the equivalent of hospital fixed effects.

Picone et al. (2000) also assessed health outcomes using Medicare data for the years 1984-95. They studied death at 30 days, 6 months, and 1 year. They also assessed Medicare payments in the form of three dependent variables: (1) total Medicare payments during the first 6 months after the initial hospital admission; (2) total Medicare payments for care rendered during the initial admission; and (3) the difference between the first and the second payment measures.

Two samples were used in the analysis. The first, the GN sample, consisted of all admissions to hospitals operated by governments or private nonprofit organizations (GN) sample. Of these hospitals, some converted to for-profit status during the observational period. The second sample consisted of hospitals that were F hospitals in the base period. Some of these became GN hospitals during the observational period. The covariates of primary interest were the GN→F and F→GN binary variables identifying admissions to hospitals that changed ownership in these directions and the variables identifying admissions during the post conversion period. Other covariates measured patient characteristics, hospital characteristics, market characteristics including Primary Sampling Unit fixed effects, and year fixed effects.

The advantage of this approach is that it recognizes that hospitals that convert may systematically be of different quality—perhaps worse quality on average. Without accounting for this factor, the measured effect of the conversion, relying only on post conversion outcomes could be highly misleading. The analysis suggested that, holding many other factors constant, the for-profit hospitals on average acquired better hospitals in terms of survival following admission to these facilities. However, after conversion to for-profit ownership, quality, as measured by survival to various intervals after discharge

from the hospital fell somewhat.[5] When hospitals converted in the other direction, that is from for-profit to government or private nonprofit status, there were no significant changes in mortality even though there were substantial reductions in input use as occurred in conversions from government or private nonprofit to for-profit ownership.

2.4. Effects of Hospital Ownership Changes on Provision of Public Goods. A major policy concern is that ownership conversions, especially to the for-profit form, will result in decreased provision of public goods. Most frequently mentioned among such public goods is provision of care to the uninsured, sometimes cast in terms of provision of uncompensated care. The empirical evidence on this score is mixed. Comparing provision of uncompensated care across ownership types, one is struck by the similarity between shares of dollar amounts of uncompensated care relative to hospital revenue provided by N and F hospitals. Government hospital uncompensated shares, not surprisingly, tend to be higher than for N and F hospitals (Sloan 2000).

A recent study, which focuses on ownership conversions, calls the conclusion that the main distinction in provision of uncompensated care is between private and public hospitals into question. Using unpublished and confidential data on revenue from the American Hospital Association, Thorpe et al. (2000) studied effects of conversion from N to F status on hospital provision of uncompensated care. They measured uncompensated care as bad debt and charity care charges deflated by each hospital's cost-to-charge ratio for 1991-97. To account for variations in hospital capacity and inflation, they divided this amount by total expenses for the hospital. They included several explanatory variables in their analysis, most notably hospital fixed effects. They found little effect of conversion

[5] In a revision of this paper not yet completed, the authors found that the decrease in hospital quality following conversion to F status was transitory, that is, did not last longer than three years following

to for-profit status on Medicaid patient loads. However, uncompensated care fell after conversion from N to F status, falling from 5.3 percent to 4.7 percent of hospital revenue on average. The 0.6 percentage-point reduction in uncompensated care amounted to about $400,000 less being spent per converted hospital on uncompensated care. For public hospitals converting to for-profit status, the decrease was greater, from 5.2 to 2.7 percent or $800,000 per hospital. The authors expressed the amounts in terms of admissions lost even though they provided no indication whether the decrease occurred on the inpatient or outpatient sides of the hospital or in some combination thereof. Thorpe et al. concluded that "Of concern, however, is our findings that the provision of uncompensated care is reduced when hospitals convert to for-profit status. Of particular concern is the large reduction in uncompensated care observed among public to for-profit hospital conversions. Because the bulk of these conversions occurred among smaller, rural public hospitals, such conversions could limit access to hospital care among the uninsured." (p. 192). The implication is that conversions cause reductions in uncompensated care and that these reductions could not be accounted for by inward shifts in demand largely exogenous to the hospitals involved in conversions. The authors noted that their result for nonprofit to for-profit conversions had not been found in previous studies (see e.g., Desai et al. 2000). I shall return to this issue in the next section when I discuss my own empirical analysis of this issue.

Several recent studies have focused not on the effect of ownership change on provision of public goods and more generally on product mix, but more specifically on the effects of competition from for-profit hospitals on behavior of nonprofit and public

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conversion.

hospitals.[6] The Disproportionate Share (DSH) Program was implemented nationally to provide a greater financial incentive for hospitals to deliver care to the poor. Subject to this federal law, each state could design its own DSH Program.

Duggan (2000a, 2000b) studied the change in financial incentives created by California's variant of the DSH Program on the propensity of hospitals to treat Medicaid recipients. This DSH program provided an explicit financial incentive for hospitals to admit Medicaid patients. It increased revenues to hospitals for which low-income patients constituted more than 25 percent of their patients. Hospitals above this threshold experienced a revenue increase and those below this threshold had an incentive to increase their low-patient shares to this level.

In one the studies, Duggan found an appreciable difference in response between public and private hospitals, irrespective of whether they were N or F. The public hospitals faced a "soft budget" constraint. That is, as their revenues from DSH increased, their sponsors lowered their subsidies accordingly. By contrast, both N- and F-owned facilities could accumulate wealth from this new revenue source. He concluded that the greatest difference in response to the DSH incentive was between public and private rather than between N and F hospitals.

In the second study, Duggan found that DSH resulted in a shift of Medicaid patients from public to private hospitals. Furthermore, the magnitude of the shift was directly related to the market share of for-profit hospitals in the county. In particular, the Ns' response to the DSH incentive was greater when they faced more competition from the for-profit sector.

[6] A fuller discussion of the effects of hospital competition on quality of care is beyond the scope of this article. On this subject, see, e.g., Kessler and McClellan (2000).

The implication is that N hospitals behave more like profit-maximizers when faced with the market discipline of the for-profits. Various tests he performed rejected alternative explanations for his finding (e.g., quality of care in the public facilities). An examination of the effects of competition from Fs on the board composition of N hospitals revealed that N hospital boards had larger shares of physicians when they faced competition from the F hospitals. Duggan reported that F boards contained large numbers of physician members.[7] In this sense, N boards in F-influenced areas may put physicians on the boards as their mission becomes more profit-oriented. However, other interpretations seem at least as likely. For one, placing physicians on the board may be a competitive response by N hospitals to retain their medical staffs.

Silverman and Skinner (2001) assessed effects of hospital competition on mission, but from a different perspective. Since implementation of the Medicare Prospective Payment System (PPS), hospitals have known that the pattern of reporting of diagnoses and procedures can affect the Diagnosis-Related Group (DRG) assigned to the case and hence the amount of revenue received from Medicare. Upcoding involves rearranging reports of diagnoses and/or procedures with the result that the patient falls within a higher-priced DRG. Some upcoding may be perfectly legitimate. In some cases, it may improve accuracy of reporting. But given the financial incentive to upcode, there is a large gray area. More profit-oriented hospitals may be more willing to take advantage of the incentive to increase revenue from Medicare. Moreover, even for those hospitals that are not fully profit-oriented, pressures from competition may force them to act in this way. The authors limited their analysis to hospital admissions involving pneumonia and respiratory infections. Between 1989 and 1996, the number of the most expensive DRG

[7] This has been documented by others as well. See e.g., Eldenburg et al. (2001).

in this diagnosis family rose by 10 percentage points among stable N hospitals, 23 percent among stable F hospitals, but 37 percentage points among N hospitals that converted to F status.

Silverman and Skinner obtained two major findings. First, for-profit hospitals were more likely to upcode in this diagnostic category than most nonprofit and government hospitals, holding many other factors constant. Second, the authors found evidence that upcoding among N hospitals was much more likely when they faced greater competition from F hospitals. By contrast, upcoding behavior of the for-profits was not affected by the presence of nonprofits.[8] During the latter part of the 1990s, Medicare became more aggressive in monitoring hospital billing practices with the consequence that some hospitals made large payments to compensate for shortcomings in past billing practices.[9]

3.0. Evidence from a National Sample of Hospital Discharges

3.1. Objectives of the Analysis. To further assess the effect of hospital ownership conversions on quality, patient mix, especially willingness to treat publically insured and uninsured persons, and upcoding, I assessed hospital discharge data from the Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS). Results from this analysis are reported in this study for the first time.

This data set offers many advantages. There are a very large number of observations, and the data come from many states and are available for a number of

[8] This result is consistent with a view advanced by Lakdawalla and Philipson (1999). They argued that nonprofit behavior should not affect for-profit behavior since the latter, by virtue of lack of tax advantages and charitable endowments, are the marginal firm and hence influence market outcomes (price, quality, etc.).

[9] Medicare compliance, coding, self-referral, and joint ventures have become major issues to hospitals. See, for example, a newsletter for hospital administrators explicitly devoted to these issues: Eli Research, Hospital Compliance Alert.

years. The hospital, but of course, not a patient identifier is provided. The main disadvantage of the data is that no information is available on patients after they were discharged from the hospital. Also, there is no information on hospital outpatient care.

3.2. Data and Methods. The NIS is a compilation of data from state hospital discharge data collection systems made available through the U.S. Agency for Healthcare Research and Quality. I limited the analysis to hospital admissions occurring during the years 1998-96. Data from the following states were included for some or all of the observational period: Arizona; California; Colorado; Connecticut; Florida; Hawaii; Illinois; Iowa; Kansas; Maryland; Massachusetts; Missouri; New Jersey; New York; Oregon; Pennsylvania; South Carolina; Tennessee; Utah; Washington; and Wisconsin. Each year, the NIS provides discharge abstract data from about 5 to 7.1 hospital stays from over 900 hospitals per year. The NIS is designed to approximate a 20-percent sample of U.S. community hospitals. The NIS is not designed to be representative of community hospitals in terms of ownership. Of the states included in the NIS, California and Florida had the most admissions to for-profit hospitals by far. Tennessee has a high for-profit market share but is a much smaller state and was only included in the NIS for part of the observational period. Texas, another state with a high for-profit market share, was not included in the NIS.

Separate analyses persons were conducted on admissions by (1) persons over the age of 65 at admission—hereafter called the "Medicare sample" and (2) births and admissions of persons who were between the ages of one and 64 on the admission date—the non-Medicare sample (although a minority of persons in the under age 65 group also had Medicare as the primary payer). For the Medicare analysis, the sample was limited to

persons who were admitted for one of five primary diagnoses: stroke; hip fracture; coronary heart disease; congestive heart failure; and pneumonia. To facilitate analysis, the NIS 10 percent sample was used with one exception. In analysis of discharges of persons who were between the ages of one and 64 on the admission date, I used a 25 percent sample of NIS's 10 percent sample.

The Medicare and non-Medicare samples were each divided into two subsamples. The first consisted of admissions to hospitals that were under government or private nonprofit ownership prior to conversion and changed to for-profit ownership or remained under government or private nonprofit ownership during the observational period, 1988-96—the GN sample. The second included admissions to hospitals that were under for-profit ownership but converted to GN status during the observational period as well as those that remained for-profit—the F sample.

Four hypotheses about effects of ownership conversions from GN→F and F→GN status were tested. Conversions from F to GN ownership were hypothesized to have the opposite effect of conversions from GN to F. By employing a two-sided test, I was able to distinguish between effects of conversion and those attributable to a change in ownership. By combining G and N, I focused on changes in behavior to and from the for-profit ownership form rather than on the private versus public ownership distinction.

H1: Quality of care falls following conversion from GN to F ownership. This may occur because profit-seeking hospitals seek to achieve higher profitability by cutting hospital inputs, such as personnel.

H1a. Quality may be increased, but only when it is profitable to do this--that is, when higher quality results in an additional payment sufficient to cover the additional marginal cost of the higher quality level.

H2: Following conversion from GN to F status, when subject to a fixed payment per case, as under the Medicare Prospective Payment System, the hospital becomes more aggressive in reducing length of stay. Again, the motive for reducing stays is to increase profitability.

H2a. Increasing transfers to nursing homes post discharge is one manifestation of a strategy of reducing length of stay.

H3: To increase payment from Medicare, the hospital more frequently upcodes diagnoses following a conversion from GN to F status. This is an extension of Silverman and Skinner's (2001) research, but for a different set of diagnoses.

H4: Following conversion from GN to F ownership, the hospital becomes less likely to admit publicly-insured and uninsured patients. This analysis only used the non-Medicare sample and sought to replicate Thorpe et al.'s (2000) finding that conversion to for-profit ownership led to reductions in hospital provision of uncompensated care.

For the analysis of admissions of persons aged 65 and over, the dependent variables were: inpatient mortality; extended length of stay; length of stay; pneumonia complication; destination at discharge—home (omitted reference group); nursing home; other hospital; or death; and upcoding of diagnoses. Extended length of stay was defined as a stay two standard deviations above the mean stay for the primary diagnosis and the year in which the admission occurred.

The pneumonia complication was taken from the list of secondary diagnoses provided on the hospital discharge abstract. In this analysis, elderly persons admitted with a primary diagnosis of pneumonia were excluded.

Upcoding was tested by two analyses. In the first, the dependent variable was one if the primary diagnosis was listed as a transient ischemic attack (TIA) and zero if the primary diagnosis was listed as a stroke. Medicare pays more for strokes than TIAs. There is some discretion in classifying patients between these two diagnoses. The second was the DRG weight assigned to the case, limiting the sample to the five primary diagnoses listed above.

A sample of births was analyzed to test H4 and H1a. The dependent variables were: patient did not have private insurance; patient stayed in hospital for less than two days; and patient had vaginal birth as opposed to a Cesarean Section—the underlying presumption being that C-Sections are more profitable on average than are vaginal births.

With the sample of births, the dependent variable was payment source other than private insurance versus private insurance. The other category included: Medicaid; Medicare or other government insurance (such as Veterans Administration, Champus); self-pay or no charge (suggesting no health insurance coverage); and private insurance (the omitted reference group). With the sample of persons with any diagnosis or principal procedure who were between the ages of one and 64 at the admission data, the dependent variables were each of the payer categories for public payers and self pay/no charge with privately insured individuals, the omitted reference group.

With exceptions noted below, four alternative specifications were employed. The methodology for the Medicare analysis is explained in detail here. Specifications for the

the non-Medicare were similar. Each successive specification added a set of explanatory variables, retaining the explanatory variables from the previous specification.

The first specification included explanatory variables identifying admissions after ownership conversion occurred, patient characteristics, market characteristics, and binary variables for year of admission. The patient characteristics were: age; race; gender; source of admission—emergency room, nursing home, other hospital versus home; binary variables for the five primary diagnoses; DRG weight; and the DxCG score. The DxCG is a case mix measure, which takes account of the patient's secondary diagnoses (see www.dxcg.com).

The market characteristics were: the Herfindahl Index based on bed shares; the fraction of the population enrolled in health maintenance organizations; population density (population per square mile); hospital beds per 1,000 population; and per capita income. For hospitals located in Standard Metropolitan Statistical Areas (SMSAs), the market area was assumed to be the SMSA. For hospitals located outside SMSAs, the market area was the county.

In the second specification, I added a conversion fixed effect binary variable. The conversion fixed effects identified admissions to hospitals involved in a conversion from G or N to F or F to G or N during the observational period. In the third specification, I added explanatory variables for hospital characteristics: bedsize; the number of resident physicians per bed, a measure of commitment to medical education; the hospital's operating margin, debt to asset ratio; and occupancy rate, all defined for the year in which the admission occurred. For hospitals with a negative operating margin, the operating margin was set equal to zero and an additional binary variable, "no profit," was set to

one. Likewise, if the debt-to-asset ratio exceeded one, the ratio was set to one and a binary variable was included to identify such cases. Although the hospital characteristics are possibly endogenous, it could also be argued that in their absence, that the ownership and ownership change variables represent other hospital characteristics, including financial distress, that are the true causal determinants of the dependent variables being studied. By considering alternative specifications, it is possible to gauge the sensitivity of findings to inclusion/exclusion of these explanatory variables.

Finally, the fourth specification added area fixed effects. These were binary variables for the SMSA in which the hospital was located and for nonSMSA hospitals, a binary variable measuring the hospital's state.

When the dependent variable was more than one mutually exclusive alternative, I used multinomial logit analysis and did not include the fourth specification. With area fixed effects, there were too many parameters to estimate.

3.3. Results: Medicare Analysis

3.3.1. Sample Characteristics. The main GN sample consisted of 419,000 hospital discharges from 1,215 hospitals (Table 1). Of these, over 16,000 hospital discharges were from 49 hospitals that changed from G or N to F ownership status. Slightly over 6,000 discharges were observed from 35 hospitals after the ownership conversion occurred. The main F sample consisted of 56,000 discharges from 165 hospitals. Among these, 32 hospitals experienced a conversion from F to N or G status during the observational period. Data were available from 20 F→GN hospitals after the conversion occurred.

As in the Picone et al. (2000) study, I constructed a counterfactual sample. This sample of hospital discharges were matched to the conversion sample with respect to

base ownership (GN or F). An artificial conversion year was randomly assigned to the admission. The frequency distribution of conversion years in the counterfactual sample matched the frequency distribution of actual conversions.

Given the large number of hospital discharges, there were many statistically significant differences between hospitals that did not convert and those that did convert as well as for the pre- versus post-conversion comparisons (Table 2). The differences, however, were often small. For the GN sample, these are the most noteworthy differences.

Hospitals converting from GN to F status increased the proportion of nonwhites that they admitted. Admissions through the emergency room fell as did receipt of patients from other hospitals. For converting hospitals, the mean DRG weight fell after conversion. A drop of 0.2 in the mean DRG weight for the five primary diagnoses is substantial. By contrast, in the counterfactual comparison group, the DRG weight rose in the "after" in contrast to the "before" group. The mean DxCG score rose from 2.1 to 2.2 before versus after conversion to F status. For the comparison group, the mean score rose from 2.0 to 2.2. Medicare payment is based on the DRG weight but not the DxCG score. This comparison suggests something less than a massive change in upcoding for purposes of obtaining higher Medicare payments post conversion to F ownership.

In the counterfactual group, mean bedsize remained about constant. However, among converting hospitals, mean bedsize fell by more than 50 percent after conversion. The number of residents per bed rose among converting hospitals, but this change is fully attributable to the reduction in beds. Operating margins in converting hospitals rose dramatically. Before conversion, the mean margin per discharge in converting hospitals

was 0.015. After conversion, the mean was 0.085. By contrast, in the counterfactual group, operating margins remained about constant. The debt-to-assets ratio fell for both converting and nonconverting hospitals, but much more for those hospitals that did not convert. The mean occupancy rate fell from 57 to 52 percent for converting hospitals in spite of the substantial reduction in bedsize. However, for nonconverting hospitals, mean occupancy decreased only decreased from 67 to 65 percent. Clearly, low occupancy rates were far more characteristics of hospitals converting from GN to F than among hospitals that did not convert.

For converting hospitals, the Herfindahl Index rose, suggesting a decline in competition. By contrast, for hospitals that did not convert, the Herfindahl Index was unchanged. Personal per capita income fell on average in the zip code areas in which the converting hospitals were located. But there was no change in income among nonconverting hospitals.

Many of the patterns were similar in the F sample. For example, the mean DRG weight declined slightly after conversion to GN status. By contrast, for hospitals in the counterfactual group, the mean DRG rose after the "conversion." The major difference was in the operating margin. Margins increased much more among nonconverting than among converting hospitals. As seen above, for GN hospitals, margins increased appreciably for hospitals converting to F ownership.

The mean inpatient mortality rate in the GN sample hospitalized in nonconverting hospitals was 8.1 percent (Table 3). For those hospitalized in converting hospitals, the mean mortality rate for 7.9 percent. Even with this large sample, this difference was not statistically significant at conventional levels. Although mortality fell from 8.2 before to

7.6 percent after conversion in converting hospitals, this difference was not statistically significant at conventional levels (p=0.19). In the counterfactual sample, the decline was appreciably larger, from 8.7 percent in the counterfactual "before" to 7.5 percent in the "after" (p<0.0001). The decrease reflects the secular decrease in inpatient mortality which apparently was not as favorable among hospitals that changed from GN to F ownership status.

The rate of pneumonia complications rose in hospitals converting from GN to F after conversion. The increase was from 3.8 to 5.0 percent (p=0.001). In the counterfactual sample, there was no change. Rates of extended stays declined much more in hospitals that were involved in ownership conversions than in those not involved in a conversion as did mean length of stay, implying that hospitals converting from GN to F made a substantial effort to reduce the very long lengths of stay. Mean length of stay declined in both converting and nonconverting hospitals, but more so in the former.

For the F sample, mortality rates declined by the same absolute amount for those hospitals that converted versus the counterfactual sample, but those that converted had a higher mortality rate in the before period. Pneumonia complication rates rose among those hospitals that remained for-profit but did not rise among those that converted from for-profit to either government or not-for-profit status. The rate of extended stays rose dramatically among hospitals in the converting group, but remained constant among those that did not convert, a very different pattern from hospitals in the GN sample.

Thus, overall, judging on the basis of mean values alone, a couple of negative features emerge in the GN→F case. The inpatient mortality experience was not as good among hospitals that converted from GN to F status. Furthermore, pneumonia

complication rates rose among those hospitals that converted from GN to F and among those for-profit hospitals that did not convert. Clearly length of stay was related to ownership with for-profit hospitals achieving lower lengths of stay overall.

3.3.2. Effects of Ownership Type Conversions on Inpatient Mortality, Pneumonia Complications, and Extended Length of Stay. The empirical analysis of ownership type conversion effects begins with effects on inpatient mortality, pneumonia complications during the stay occurring to patients admitted for stroke, hip fracture, coronary heart disease, and congestive heart failure (Table 4).

In the first specification in the GN sample, inpatient mortality fell after conversion to F ownership. The decline was 0.8 percent on average or about 10 percent relative to mean mortality. (The numbers in brackets are marginal effects—change in the probability of an outcome for change in binary or a unit change in explanatory variables for continuous variables).[10] However, in the remaining specifications, there was *no* change in inpatient mortality after conversion to F ownership. The results for the conversion fixed effect in Specifications 2-4 imply that hospitals that converted from G or N to F ownership tended to have lower mortality rates. That is, if anything, the new owners selected GN hospitals with relatively good mortality records.

In the F sample, the first specification implies a mortality increase after conversion to G or N status with an associated marginal effect of 0.012 (p=0.01). However, the after conversion parameter becomes statistically insignificant in the other, more complete specifications. In general, the results on the key parameters of interest—the binary variables for after conversion and the conversion fixed effect, are quite robust

[10] In Table 4, all explanatory variables shown are binaries.

to changes in equation specification. Thus, again, ownership conversion had no effect on inpatient mortality.

The proportion of patients with very long stays declined in the G and N to F case and rose for conversions in the opposite direction, supporting the descriptive results presented above in Table 3. Pneumonia complications rose after conversion among patients hospitals admitted to hospitals that converted to F ownership. The reverse occurred among patients admitted to hospitals that converted from F ownership. This conclusion holds for the full sample of Medicare patients in the four primary diagnosis categories (excluding those admitted with a primary diagnosis of pneumonia) and for a sample that excludes such patients who died during their stays.

To conserve space and permit focus on the key parameter estimates and associated marginal effects, Table 4 does not include most of the parameter estimates in the model. Table 5 shows complete specifications from the GN sample for four dependent variables shown previously, but does not show area fixed effects. Virtually all of the parameter estimates on the patient variables are statistically significant at conventional levels and have plausible signs. The record for the hospital and market variables are somewhat more mixed. The measures of financial distress show no consistent effects on outcomes. For example, hospitals with an operating loss ("no profit") experienced higher rates of pneumonia complications and a higher mean length of stay, but there were no effects on either inpatient mortality or the rate of extended stays. Death rates were higher in larger hospitals, but lower in major teaching hospitals. The result for hospital size plausibly reflects casemix not otherwise measured. The coefficient on extended stay is positive and statistically significant at conventional levels.

Finally, to the extent that hospitals converting from GN to F status achieved lower lengths of stays after ownership conversion, was this achieved by increased rates of transfers to nursing homes or to other hospitals? To determine this, multinomial logit analysis of the place to which the person was discharged after leaving the hospital was conducted (Table 6). The four destinations were: home (reference group); death; nursing home; and other hospital. The analysis controlled, among other factors, for source of admission (nursing home, other hospital, emergency room, home) since patients were plausibly more likely to return to the place from which they came to hospital. But given the number of parameter estimates in a multinomial format, area fixed effects were not included. As in all of the other analysis, year binary variables were included. Results shown in the Table 6 are based on Specification 3.

In the GN sample, 8.1 percent of persons died in the hospital, 15.3 percent were transferred to a nursing home, 10.1 percent to another hospital, with the remaining two thirds (65.5 percent) returning home. The pattern of discharge destinations was similar for the F sample, with a slightly lower percentage of patients returning home and a somewhat higher percentage being transferred to other hospitals—possibly reflecting their smaller bedsize.

Holding other factors constant, the rate of discharges to other hospitals increased after conversion for GN to F hospitals (relative to discharge to home). The associated marginal effect of 0.039 is substantial relative to the sample mean transfer rate (about 40 percent of the sample mean). In view of the dramatic drop in bedsize among GN→F converting hospitals noted earlier, an increase in the transfer rate to other hospitals is not

surprising. In the F sample, discharges to nursing home increased after conversion, but the associated marginal effects were very small.

3.3.3. Upcoding of Diagnoses. For the measures studied, there is no evidence that ownership conversion from GN to F ownership status increased the rate of upcoding (Table 7). In the analysis of mean DRG weight of the five primary diagnoses included in the Medicare analysis, the DRG weight fell after conversion from GN to F. In this specification, many hospital characteristics, including bedsize, were held constant. Thus, the results for ownership conversion do not just reflect downsizing and loss of some sophisticated product lines. Of course, a decrease in the mean DRG may have reflected subtle changes in casemix. To the extent that this occurred, it more than obscures any change in upcoding for the five primary diagnoses included in this analysis that may have occurred. For coding of transient ischemic attack (TIA) versus stroke, there was an increase in the proportion of TIAs (significant at the 10 percent level) following conversion from GN to F status. By contrast, hospitals that converted from F to GN did have higher DRG weights after conversion. Similarly, the proportion of cases codes as stroke rather than TIA rose.

3.4. Results: Patients Under Age 65

3.4.1. Payer Mix after Ownership Conversion. As discussed in the previous section, there is widespread concern that ownership conversions work to the disadvantage of underserved populations. However, empirical evidence on actual effects has been mixed.

Table 8 presents key results of a multinomial analysis of anticipated source of payment. Since the payment categories are defined to the primary source of payment, they are mutually exclusive. For patients who were between the ages of one and 64 at the

admission date and were admitted to a facility in the GN sample, the probability of having Medicare or other government insurance, Medicaid, or being classified as a self-pay/no charge patient, *increased* after conversion to F status. G or N hospitals acquired by F owners tended to be those that had relatively low proportions of Medicaid and self-pay/no charge patients, or Medicare (disabled, End Stage Kidney Disease) patients. However, the tendency to eschew the poor and the disabled was not sustained after conversion.

For hospitals converting from F to GN ownership, the situation was more mixed. The proportion of self-pay/no charge patients fell after conversion to GN status.

For the sample of births, holding other factors constant, hospitals converting from GN to F were *more,* not less, likely to admit non-privately insured patients after the conversion occurred (Table 9). This finding is very robust to changes in equation specification. The conversion fixed effect is negative and the associated marginal effect is substantial. The implication is that for-profit organizations were more likely to acquire hospitals that were relatively oriented to privately insured patients, but after conversion, there was a major increase in non-privately insured patients. The marginal effect is 0.224. Since time fixed effects were included, the marginal effect for the after conversion dummy does not reflect a secular growth in persons not covered by private insurance. Patterns for conversions from F to GN status were quite similar to those from GN to F.

3.4.2. Changes in Stays: Birth Sample. There is a widespread concern that stays for labor/delivery have declined to unsafe levels. Such reductions are said to be motivated in part by largely a desire to increase profit. Some states have implemented laws to restrict the ability of health care providers to limit stays for labor and delivery to less than two

days. As seen in Table 9, the probability of a less than two-day stay declined after ownership conversion, both for hospitals that converted from GN to F status and those that converted in the opposite direction.

3.4.3. Changes in the Probability of Vaginal Births. The proportion of vaginal births declined after hospitals converted from government or not-for-profit to for-profit status (Table 9). For hospitals that converted from F to GN status, there was an increase in the probability of vaginal births, but this increase was not statistically significant at conventional levels.

4.0. Discussion, Conclusions, and Implications

The main question addressed by this chapter is whether or not the market for hospitals is "fundamentally broke." Based on my review of the literature prior to the year 2000 (Sloan 2000), the most recently-completed studies, many on ownership conversions rather than on ownership per se, and the new empirical findings presented here, the answer is "no." A few studies have reported undesirable outcomes, such as a reduction in uncompensated care following conversion to for-profit status. But the independent analysis presented here failed to confirm this finding, perhaps because my study was confined to inpatient care and the other study included inpatient and outpatient care (but did not indicate that the reductions were concentrated in outpatient care).

There is no systematic evidence of quality decline attributable to conversion in general or to particular types of conversions, such as to for-profit status in particular. On the whole, hospitals' missions appear to be preserved post conversion. In large part, constancy of mission has been safeguarded by contract provisions at the time the contract is executed. Although there is some empirical evidence that acquirers pay too little for the

facilities that they acquire, there is also some empirical evidence suggesting the opposite. The analysis presented in the previous section did not reveal systematic upcoding by hospitals that converted to for-profit ownership status. Thus, the upcoding for pneumonia and respiratory infections reported in an earlier study does not appear to generalize to other diagnoses.

This reassuring overall conclusion is not meant to imply that abuses do not occur and that patients are never disadvantaged by changes in ownership status. This study only finds that there is no overall evidence that socially undesirable outcomes systematically occur when hospitals convert from government or private nonprofit status or the reverse.

There is a clear role for public oversight. Success is not guaranteed—the Allegany System Debacle," described in point where effective public oversight was lacking is a case in point. Communities that place their hospital assets for sale do well to exercise due diligence. This may take the form of oversight by the state attorney general, the state certificate of need agency, as well as local publicly-elected officials. Practices, such as upcoding, should be monitored by hospital compliance programs.

Is there a chance that this study has failed to document important changes in quality of care and/or public goods provision associated with changes in hospital ownership status? There is always a possibility of this. The qualitative evidence presented here does not suggest bad effects; in fact, some aspects of the findings, such as increased health professional participation in hospital decision making, post conversion, are reassuring. In this study, only survival to hospital discharge was measured. There is some evidence of longer-term deleterious effects on survival when hospitals convert to for-profit ownership. However, rather than prevent such transactions from occurring,

communities might implement specific policies to prevent such outcomes, for example, by insisting on limits on reductions on hospital staff for a certain number of years after the transaction.

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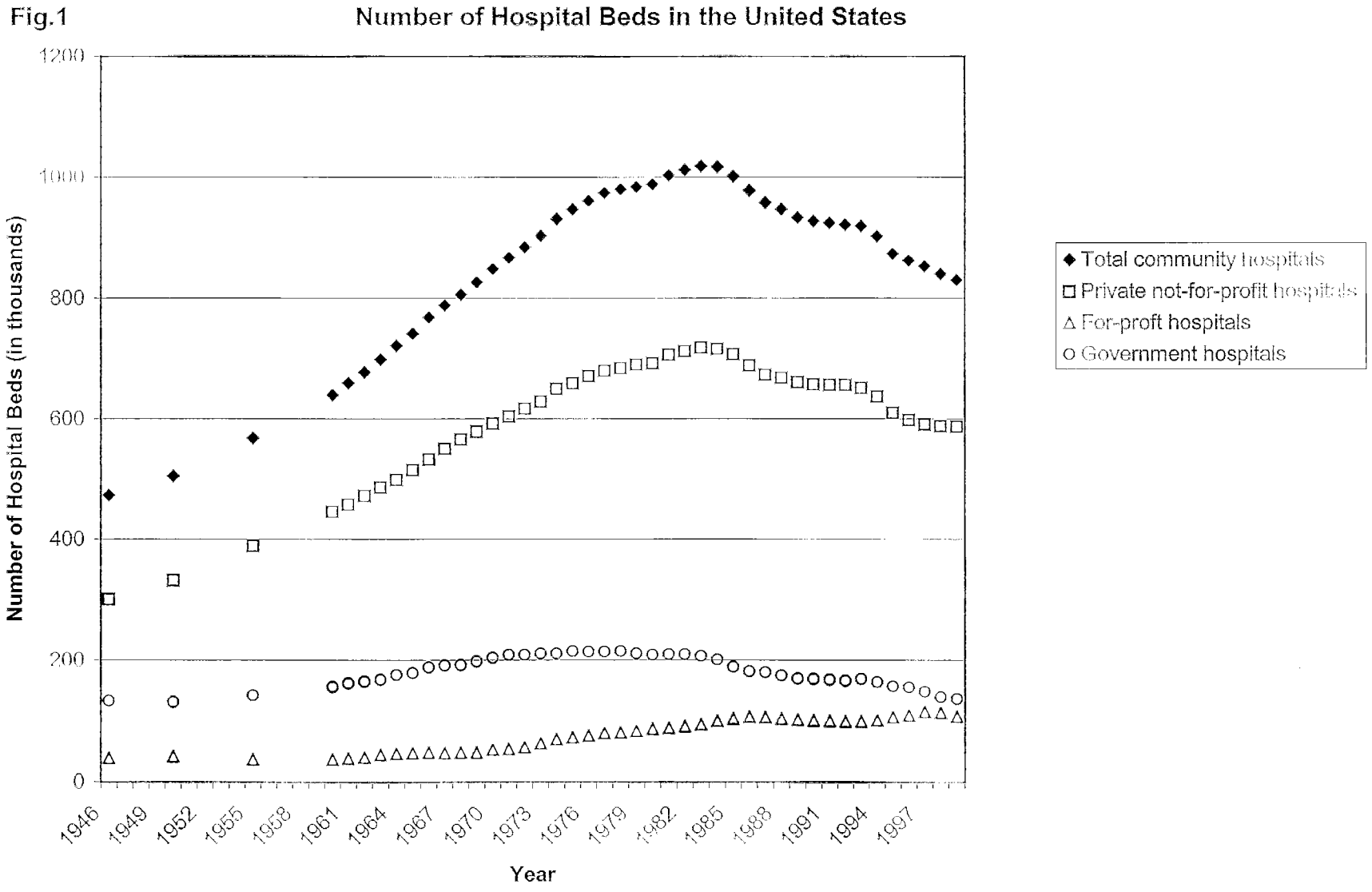
Frank Sloan's Hospital Figures

Fig.1



Source: American Hospital Association(1976, 1979, 2001). The data before 1979 are for nonfederal short-term general and other special hospitals, which includes community hospitals plus hospitals in institutions.

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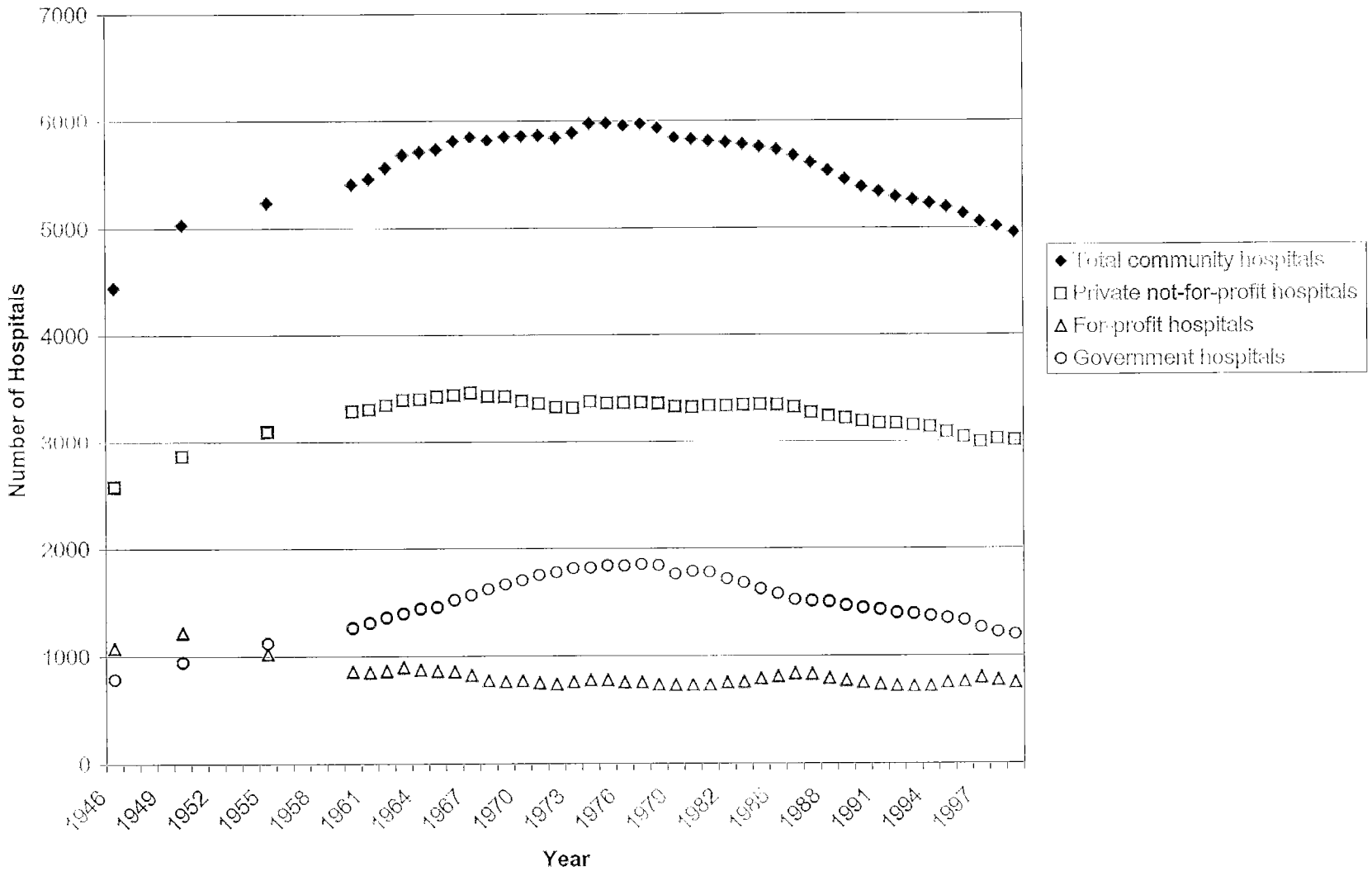
Fig.2

Number of Hospitals in the United States



Source: American Hospital Association(1976, 1979, 2001). The data before 1979 are for nonfederal short-term general and other special hospitals, which includes community hospitals plus hospitals in institutions.

DATE	Total community h	Nongovernment not-fc	Investor-owned (for-p	State and local gove	Total comn
1946	4444	2584	1076	785	473
1947					
1948					
1949					
1950	5031	2871	1218	942	505
1951					
1952					
1953					
1954					
1955	5237	3097	1020	1120	568
1956					
1957					
1958					
1959					
1960	5407	3291	856	1260	639
1961	5460	3305	848	1307	659
1962	5564	3346	860	1358	677
1963	5684	3394	896	1394	698
1964	5712	3402	870	1440	721
1965	5736	3426	857	1453	741
1966	5812	3440	852	1520	768
1967	5850	3461	821	1568	788
1968	5820	3430	769	1621	806
1969	5853	3428	759	1666	826
1970	5859	3386	769	1704	848
1971	5865	3363	750	1752	867
1972	5843	3326	738	1779	884
1973	5891	3320	757	1814	903
1974	5977	3381	775	1821	931
1975	5979	3364	775	1840	947
1976	5956	3368	752	1836	961
1977	5973	3371	751	1851	974
1978	5935	3360	732	1843	980
1979	5842	3330	727	1761	984
1980	5830	3322	730	1785	988
1981	5813	3340	729	1778	1003
1982	5801	3338	748	1715	1012
1983	5783	3347	757	1679	1018
1984	5759	3351	786	1622	1017
1985	5732	3349	805	1578	1001
1986	5678	3323	834	1521	978
1987	5611	3274	828	1509	958
1988	5533	3242	790	1501	947
1989	5455	3220	769	1466	933
1990	5384	3191	749	1444	927
1991	5342	3175	738	1429	924
1992	5292	3173	723	1396	921
1993	5261	3154	717	1390	919
1994	5229	3139	719	1371	902
1995	5194	3092	752	1350	873

1996	5134	3045	759	1330	862
1997	5057	3000	797	1260	853
1998	5015	3026	771	1218	840
1999	4956	3012	747	1197	830

Nongovern	Investor-ov	State and local government community beds
301	39	133
332	42	131
389	37	142
446	37	156
458	38	162
472	40	165
486	44	168
499	46	176
515	47	179
533	48	188
550	47	191
566	48	192
579	48	198
592	53	204
604	54	209
617	57	209
629	63	211
650	70	211
659	73	215
671	76	214
680	80	214
684	81	215
690	83	211
692	87	209
706	88	210
712	91	210
718	94	207
716	100	201
707	104	189
689	107	182
673	106	180
668	104	175
661	102	170
657	101	169
656	100	168
656	99	166
651	99	169
637	101	164
610	106	157

598	109	155
591	115	148
588	113	139
587	107	136

Frank Stearns - Tables

Table1. Medicare Analysis Samples*

Sample Screen	Patients	Hospitals
GN sample	418,831	1,215
GN-F subsample	16,354	49
GN-F after	6,050	35
F-sample	56,231	165
F-GN subsample	6,500	32
F-GN after	2,331	20

* Does not include observations drawn for analysis of coding of stroke versus transient ischemic attack (TIA)

Table 2. Mean Values of Explanatory Variables--Converting and Nonconverting Hospitals: Medicare Analysis

	Whole Sample			Counterfactual Sample			Conversion Sample		
	All Nconv	All Conv	P	Nconv-"Bef"	Nconv-"Af"	P	Conv-Bef	Conv-Af	P
				GN Sample					
Number of observations	402,477	16,354		216,277	186,371		10,304	6,050	
Patient									
Age	77.356	77.849	<.0001	77.250	77.479	<.001	77.616	78.245	<.001
White	0.886	0.817	<.001	0.893	0.880	<.001	0.879	0.746	<.001
Male	0.460	0.453	0.118	0.458	0.462	0.011	0.461	0.440	0.011
Admitted from ER	0.572	0.580	0.042	0.580	0.567	<.001	0.605	0.539	<.001
Admitted from NH	0.031	0.031	0.956	0.030	0.032	<.001	0.027	0.037	<.001
Admitted from other hosp.	0.053	0.062	<.001	0.047	0.059	<.001	0.041	0.018	<.001
Diagnosis of Alzheimer's	0.005	0.003	0.000	0.007	0.002	<.001	0.009	0.005	0.001
Diagnosis of other dementia	0.014	0.014	0.373	0.020	0.008	<.001	0.016	0.010	0.002
Diagnosis of hip fracture	0.088	0.088	0.863	0.088	0.089	0.075	0.090	0.084	0.167
Diagnosis of stroke	0.103	0.112	0.001	0.122	0.082	<.001	0.120	0.087	<.001
Diag of coronary hrt dis.	0.392	0.378	<.001	0.388	0.397	<.001	0.413	0.343	<.001
Diag of congestive hrt dis.	0.244	0.243	0.845	0.237	0.252	<.001	0.224	0.275	<.001
Diagnosis of pneumonia	0.172	0.182	0.001	0.164	0.180	<.001	0.153	0.232	<.001
DRG weight	1.558	1.493	<.001	1.512	1.610	<.001	1.567	1.387	<.001
DxCG score	2.136	2.149	0.333	2.043	2.245	<.001	2.099	2.235	<.001
Hospital									
Bedsize	337.657	237.869	<.001	337.425	337.919	0.524	302.866	127.584	<.001
Resident/beds	0.061	0.020	<.001	0.053	0.070	<.001	0.014	0.030	<.001
Operating margin	0.022	0.041	<.001	0.022	0.023	<.001	0.015	0.085	<.001
Debt-capital ratio	0.461	0.643	<.001	0.524	0.387	<.001	0.695	0.555	<.001
Occupancy rate (%)	66.274	55.002	<.001	67.110	65.303	<.001	56.879	51.803	<.001
Market									
Herfindahl index	0.230	0.204	<.001	0.235	0.225	<.001	0.177	0.252	<.001
HMO share	0.187	0.183	0.005	0.183	0.209	<.001	0.162	0.218	<.001
Pop. density ('000/sq m.)	0.844	0.684	<.001	0.824	0.867	<.001	0.670	0.709	<.001
Hospital beds/('000) pop.	0.390	0.378	<.001	0.400	0.377	<.001	0.387	0.363	<.001
Inc. in zip code area('000)	#REF!	#REF!	<.001	#REF!	#REF!	<.001	#REF!	#REF!	<.001
				F Sample					
Number of observations	49,731	8,500		29,218	20,513		4,169	2,331	
Patient									
Age	77.581	78.008	<.001	77.297	77.985	<.001	77.861	78.272	0.045
White	0.880	0.872	0.184	0.884	0.877	0.090	0.883	0.884	0.048
Male	0.468	0.440	<.001	0.470	0.466	0.337	0.451	0.421	0.020
Admitted from ER	0.654	0.635	0.003	0.654	0.654	0.881	0.614	0.573	<.001
Admitted from NH	0.022	0.020	0.268	0.021	0.023	0.281	0.021	0.018	0.317
Admitted from other hosp.	0.044	0.036	0.001	0.036	0.055	<.001	0.034	0.038	0.337
Diagnosis of Alzheimer's	0.014	0.004	0.466	0.007	0.002	<.001	0.006	0.000	<.001
Diagnosis of other dementia	0.036	0.010	0.424	0.016	0.004	<.001	0.013	0.004	<.001
Diagnosis of hip fracture	0.089	0.104	<.001	0.086	0.094	0.002	0.101	0.107	0.466
Diagnosis of stroke	0.106	0.110	0.016	0.121	0.070	<.001	0.120	0.092	0.001
Diag of coronary hrt dis.	0.393	0.331	<.001	0.393	0.385	0.004	0.342	0.310	0.007
Diag of congestive hrt dis.	0.249	0.256	0.219	0.253	0.268	<.001	0.243	0.279	0.002
Diagnosis of pneumonia	0.189	0.200	<.001	0.169	0.188	<.001	0.193	0.211	0.082
DRG weight	1.474	1.270	<.001	1.440	1.522	<.001	1.284	1.246	0.111
DxCG score	2.325	2.161	<.001	2.200	2.502	<.001	2.106	2.260	<.001
Hospital									
#REF!	27741.650	32848.850	<.0001	27621.330	28064.770	<.0001	32228.350	33958.600	<.0001
Bedsize	217.581	155.585	<.001	221.393	211.480	<.001	170.079	123.825	<.001
Resident/beds	0.002	0.002	0.004	0.001	0.003	<.001	0.002	0.004	<.001
Operating margin	0.030	0.039	<.001	0.034	0.102	<.001	0.037	0.041	0.059
Debt-capital ratio	0.521	0.659	<.001	0.507	0.599	<.001	0.721	0.548	<.001
Occupancy rate (%)	53.105	45.977	<.001	53.678	52.290	<.001	44.431	43.743	<.001
Market									
Herfindahl index	0.180	0.155	<.001	0.182	0.178	0.056	0.129	0.200	<.001
HMO share	0.155	0.141	<.001	0.124	0.199	<.001	0.116	0.187	<.001
Pop. density ('000/sq m.)	0.823	1.192	<.001	0.776	0.890	<.001	0.890	1.733	<.001
Hospital beds/('000) pop.	0.414	0.351	<.001	0.427	0.396	<.001	0.353	0.347	0.007

Table 3. Mean Values of Dependent Variables--Converting and Nonconverting Hospitals: Medicare Analysis

	Whole Sample			Counterfactual Sample			Conversion Sample		
	Nconv	Conv	P	"Before"	"After"	P	Before	After	P
GN Sample									
Number of observations	402,477	16,354		216,106	186,371		10,304	6,050	
Mortality	0.081	0.079	0.375	0.087	0.075	<.0001	0.082	0.076	0.187
Extended stay	0.020	0.015	<.0001	0.019	0.020	0.001	0.017	0.012	0.009
Length of stay	8.124	7.982	0.089	8.650	7.511	<.0001	8.538	7.036	<.0001
Alive At Discharge									
Number of observations	368,827	15,053		196,805	172,022		9,463	5,590	
Extended stay	0.024	0.021	0.004	0.025	0.023	<.0001	0.025	0.014	<.0001
Non-Pneumonia Primary Diagnosis Patients									
Number of observations	333,401	13,378		180,531	152,870		8,731	4,647	
Pneumonia complications	0.042	0.042	0.847	0.042	0.042	0.081	0.038	0.050	0.001
Non-Pneumonia Primary Diagnosis Patients: Alive At Discharge									
Number of observations	307,866	12,438		165,727	142,139		8,089	4,349	
Pneumonia complications	0.034	0.034	0.808	0.034	0.035	0.075	0.030	0.043	0.001
F Sample									
Number of observations	49,731	6,500		29,218	20,513		4,169	2,331	
Mortality	0.075	0.083	0.028	0.080	0.068	<.0001	0.087	0.076	0.102
Extended stay	0.034	0.035	0.731	0.034	0.034	0.992	0.026	0.051	<.0001
Length of stay	7.018	7.372	0.258	7.489	6.848	<.0001	6.982	8.071	0.198
Alive At Discharge									
Number of observations	45,988	5,953		26,851	19,137		3,799	2,154	
Extended stay	0.037	0.034	0.156	0.038	0.036	0.134	0.026	0.047	<.0001
Non-Pneumonia Primary Diagnosis Patients									
Number of observations	41,313	5,201		24,542	16,771		3,363	1,838	
Pneumonia complications	0.037	0.044	0.011	0.035	0.040	0.008	0.045	0.044	0.829
Non-Pneumonia Primary Diagnosis Patients: Alive At Discharge									
Number of observations	38,530	4,808		22,770	15,760		3,092	1,716	
Pneumonia complications	0.030	0.035	0.064	0.028	0.034	0.001	0.034	0.038	0.485

Table 4. Effects of Ownership Conversions on Mortality, Pneumonia Complications and Extended Length of Stay: Medicare Analysis

	GN Sample					I Sample				
	Mortality	pneumonia complication		Extended Stay		mortality	pneumonia complication		extended stay	
		full sample	alive	full sample	alive		full sample	alive	full sample	alive
Specification 1										
After conversion	-0.155 ***	0.126 *	0.191 **	-0.521 ***	-0.4715214 ***	0.222 ***	0.148	0.145	0.342 **	0.244 *
	(0.054)	(0.075)	(0.092)	(0.141)	(0.132)	(0.090)	(0.138)	(0.151)	(0.135)	(0.140)
	[-0.008]	[0.003]	[0.005]	[-0.004]	[-0.005]	[0.012]	[0.003]	[0.003]	[0.007]	[0.006]
Specification 2										
After conversion	-0.014	0.260 ***	0.308 ***	-0.420 ***	-0.434 ***	0.061	-0.081	0.005	0.443 ***	0.423 **
	(0.066)	(0.095)	(0.106)	(0.163)	(0.148)	(0.108)	(0.164)	(0.184)	(0.168)	(0.173)
	[-0.001]	[0.007]	[0.008]	[-0.003]	[-0.005]	[0.003]	[-0.002]	[0.0001]	[0.010]	[0.011]
Fixed effect	-0.144 ***	-0.136 **	-0.120 *	-0.104	-0.039	0.171 ***	0.244 **	0.148	-0.109	-0.191 *
	(0.039)	(0.060)	(0.069)	(0.083)	-(0.039)	(0.063)	(0.097)	(0.113)	(0.111)	(0.113)
	[-0.007]	[-0.003]	[-0.002]	[-0.001]	[0.001]	[0.009]	[0.005]	[0.003]	-0.001	[-0.004]
Specification 3										
After conversion	-0.018	0.211 **	0.259 **	-0.329 **	-0.347 **	0.064	-0.077	0.047	0.440 ***	0.409 **
	(0.040)	(0.097)	(0.108)	(0.166)	(0.152)	(0.110)	(0.169)	(0.169)	(0.167)	(0.173)
	[-0.001]	[0.006]	[0.006]	[-0.003]	[-0.004]	[0.003]	[-0.002]	[0.0002]	[0.010]	[0.010]
Fixed effect	-0.126 ***	-0.163 ***	-0.175 **	-0.025	0.037	0.194 **	-0.113	-0.023	-0.029	-0.114
	(0.040)	(0.061)	(0.070)	(0.086)	(0.073)	(0.086)	(0.167)	(0.187)	(0.113)	(0.119)
	[-0.007]	[-0.004]	[-0.003]	[-0.0002]	[0.001]	[0.009]	[0.003]	[-0.0004]	[-0.001]	[-0.002]
Specification 4										
After conversion	0.029	0.196 *	0.264 **	-0.310 *	-0.337 **	-0.031	-0.115	0.079	0.533 ***	0.367 *
	(0.070)	(0.101)	(0.112)	(0.172)	(0.157)	(0.127)	(0.195)	(0.217)	(0.199)	(0.206)
	[0.002]	[0.005]	[0.006]	[-0.002]	[-0.003]	[-0.002]	[-0.002]	[0.001]	[0.012]	[0.009]
Fixed effect	-0.109 **	-0.096	-0.107	0.119	0.151 *	0.170 **	0.126	-0.070	0.041	-0.024
	(0.045)	(0.065)	(0.078)	(0.089)	(0.083)	(0.079)	(0.129)	(0.145)	(0.143)	(0.144)
	[-0.006]	[-0.002]	[-0.002]	[0.001]	[0.002]	[0.009]	[0.003]	[-0.001]	[0.007]	[-0.001]
N	417,850	346,765	320,292	412,773	383,864	56,199	46,514	43,338	56,217	51,941

Specification 1 includes patients' characteristics and market characteristics and year dummies
Specification 2 includes specification 1 +hospital conversion fixed effect (shown)
Specification 3 includes specification 2 + hospital characteristics
Specification 4 includes specification 3 + Area fixed effects
Standard errors in parenthesis and marginal effects in brackets.
Standard errors corrected for heteroscedasticity.
*** significant at 1% level (two-tail test)
** significant at 5% level (two-tail test)
* significant at 10% level (two-tail test)

Table 5. GN Sample--Mortality, Pneumonia Complication, Extended Stay and Length of Stay, Specification 4: Medicare A

	Mortality		Pneumonia Complication		Extended Stay		Length of Stay	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Conversion								
GN_F after	-0.109	(0.045) **	-0.096	(0.068)	0.119	(0.098)	0.088	(0.099)
GN_F fixed effect	0.029	(0.070)	0.196	(0.101) *	-0.310	(0.172) *	-0.127	(0.124)
Patient								
Age	0.047	(0.001) ***	0.038	(0.001) ***	0.018	(0.002) ***	0.057	(0.003) ***
White	0.106	(0.027) ***	-0.018	(0.039)	-0.205	(0.049) ***	-0.325	(0.110) ***
Male	0.072	(0.013) ***	0.037	(0.019) ***	-0.170	(0.028) ***	-0.618	(0.043) ***
Admitted from ER	0.342	(0.016) ***	0.289	(0.024) ***	0.043	(0.032)	0.287	(0.057) ***
Admitted from NH	0.443	(0.034) ***	0.585	(0.051) ***	-0.389	(0.072)	-0.394	(0.124)
Admitted from other hosp.	0.285	(0.032) ***	0.147	(0.047) ***	0.542	(0.047) ***	2.132	(0.275) ***
Diagnosis of Alzheimer's	0.348	(0.052) ***	0.132	(0.081) **	0.017	(0.120)	-0.252	(0.313)
Diag. of other dementia	-0.137	(0.034) ***	0.134	(0.048) ***	0.274	(0.068) ***	0.461	(0.146) ***
Diagnosis of stroke	1.935	(0.031) ***	1.687	(0.034) ***	-0.145	(0.063) **	1.288	(0.144) ***
Diag of coronary hrt dis.	0.827	(0.030) ***	-0.423	(0.034) ***	-0.215	(0.049) ***	-3.822	(0.081) ***
Diag of congestive hrt dis.	1.315	(0.030) ***	0.913	(0.032) ***	0.052	(0.052)	-0.416	(0.098) ***
Diagnosis of pneumonia	1.412	(0.031) ***	---	---	0.241	(0.051) ***	0.119	(0.086)
DRG weight	0.136	(0.004) ***	0.063	(0.005) ***	0.337	(0.005) ***	1.743	(0.026) ***
DxCG score	0.424	(0.003) ***	0.533	(0.005) ***	0.401	(0.008) ***	1.285	(0.022) ***
Hospital								
Bedsize('000)	0.279	(0.038) **	-0.277	(0.060) ***	0.228	(0.067) ***	0.003	(0.137)
Residents/beds	-0.189	(0.058) ***	0.194	(0.075) ***	-0.056	(0.094)	-1.113	(0.152) ***
Operating margin	0.230	(0.139) **	0.141	(0.233)	-0.136	(0.312)	0.162	(0.387)
Debt-capital ratio	0.004	(0.040)	0.070	(0.059)	0.195	(0.089) **	0.201	(0.125)
Occupancy rate	0.112	(0.517) **	-0.108	(0.780)	0.494	(1.231) ***	1.360	(2.197) ***
No profit	0.012	(0.015)	0.116	(0.023) ***	-0.017	(0.033)	0.151	(0.055) ***
Debt-captial ratio >1	0.038	(0.041)	0.102	(0.061) *	0.058	(0.087)	0.106	(0.133)
Market								
Herfindahl Index	0.035	(0.038)	0.432	(0.064) ***	-0.220	(0.091) **	-0.108	(0.111)
HMO share	-0.025	(0.053)	0.078	(0.071)	0.175	(0.105)	0.020	(0.182)
Pop. density ('000/sq m.)	-0.014	(0.008)	0.004	(0.012)	0.012	(0.012)	0.177	(0.034) ***
Hospital beds/('000) pop.	-0.140	(0.064) **	-0.021	(0.097)	0.526	(0.150) ***	0.607	(0.150) ***
Inc. in zip code area(mil $)	0.038	(0.592)	2.140	(0.887)	-4.380	(1.170)	-16.700	(3.110)
Constant	-8.743	(0.132) ***	-8.216	(0.164) ***	-9.121	(0.342) ***	-0.735	(0.335) *
N	417,833		346,688		########		########	
R2	---		---		---		0.091	
Pseudo R2	0.140		0.171		0.248		---	

Year, area, and indicators of missing value binary variables not shown.

Standard errors in parenthesis

*** significant at 1% level (two-tail test)

** significant at 5% level (two-tail test)

* significant at 10% level (two-tail test)

Table 6. Multinomial Logit Analysis: Destination of Discharge: Medicare Analysis

GN Sample

	Death				Nursing Home				Other Hospital			
Frequency	8.12%				15.27%				10.12%			
After conversion	0.012	(0.068)	[0.002]		-0.086	(0.054)	[-0.010]		0.373	(0.061)	[0.039]	***
Conversion fixed effect	-0.228	(0.416)	[-0.010]	***	-0.181	(0.034)	[-0.011]	***	-0.505	(0.042)	[-0.035]	***
Pseudo R2	0.191											
N of observations	418,773											

F Sample

	Death				Nursing Home				Other Hospital			
Frequency	7.57%				14.77%				10.96%			
After conversion	0.095	(0.110)	[0.005]		0.153	(0.087)	[0.006]	***	-0.051	(0.089)	[-0.003]	
Conversion fixed effect	0.184	(0.068)	[0.010]	***	0.070	(0.056)	[0.013]		-0.012	(0.061)	[-0.007]	
Pseudo R2	0.191											
N of observations	56,217											

Based on specification 3
Omitted group is destination to home
Standard errors in parenthesis and marginal effects in brackets.
*** significant at 1% level (two-tail test)
** significant at 5% level (two-tail test)
* significant at 10% level (two-tail test)

Table 7. Up-coding of Diagnosis: Medicare Analysis

	TIA v. Stroke				DRG Weight			
	GN sample		F sample		GN sample		F sample	
Conversion								
GN_F after	0.183	(0.098) *	---	---	-0.173	(0.023) ***	---	---
GN_F fixed effect	-0.163	(0.058) ***	---	---	0.176	(0.016) ***	---	---
F_GN after	---	---	-0.505	(0.162) ***	---	---	0.102	(0.034) ***
F_GN fixed effect	---	---	0.316	(0.107) ***	---	---	-0.125	(0.023) ***
Patient								
Age	-0.003	(0.001) **	-0.011	(0.003) ***	-0.013	(0.000) ***	-0.008	(0.001) ***
White	0.142	(0.037) ***	-0.099	(0.099)	0.172	(0.011) ***	0.045	(0.021) **
Male	-0.197	(0.019) ***	-0.058	(0.051)	0.151	(0.005) ***	0.173	(0.011) ***
Admitted from ER	-0.188	(0.022) ***	-0.279	(0.059) ***	-0.331	(0.006) ***	-0.302	(0.014) ***
Admitted from NH	-0.624	(0.066) ***	-0.802	(0.197) ***	-0.347	(0.014) ***	-0.054	(0.038)
Admitted from other hosp.	-1.496	(0.080) ***	-1.220	(0.136) ***	0.871	(0.018) ***	0.501	(0.045) ***
Diagnosis of Alzheimer's	---	---	---	---	-0.091	(0.010) ***	-0.036	(0.032)
Diagnosis of other dementia	---	---	---	---	-0.114	(0.007) ***	-0.058	(0.021) ***
Diagnosis of stroke	---	---	---	---	-0.443	(0.007) ***	-0.505	(0.016) ***
Diag of coronary hrt dis.	---	---	---	---	-0.068	(0.006) ***	-0.369	(0.014) ***
Diag of congestive hrt dis.	---	---	---	---	-0.714	(0.005) ***	-0.741	(0.013) ***
Diagnosis of pneumonia	---	---	---	---	-0.617	(0.006) ***	-0.424	(0.016) ***
Hospital								
Bedsize('000)	-0.507	(0.055) ***	-0.381	(0.259)	0.824	(0.016) ***	1.009	(0.065) ***
Residents/beds	-0.410	(0.088) ***	-0.858	(1.436)	0.395	(0.026) ***	1.397	(0.586) **
Operating margin	-0.210	(0.203)	-0.597	(0.693)	-0.076	(0.048)	0.677	(0.088) ***
Debt-capital ratio	0.247	(0.053) ***	-0.165	(0.104)	-0.107	(0.014) ***	-0.175	(0.025) ***
Occupancy rate (%)	0.005	(0.001) ***	0.001	(0.012)	0.008	(0.000) ***	0.003	(0.000) ***
No profit	0.077	(0.021) ***	-0.110	(0.071)	-0.068	(0.006) ***	0.018	(0.015)
Debt-captial ratio larger than 1	0.005	(0.058)	0.157	(0.092) *	-0.184	(0.013) ***	0.085	(0.020) ***
Market								
Herfindahl index	-0.092	(0.041) **	-0.004	(0.125)	-0.080	(0.012) ***	-0.083	(0.033) **
HMO share	-0.226	(0.054) ***	0.038	(0.144)	0.175	(0.019) ***	-0.062	(0.045)
Pop. density ('000/sq m.)	0.441	(0.084) ***	0.848	(0.236) ***	0.078	(0.039) ***	-0.719	(0.125) ***
Hospital beds/('000) pop.	0.563	(0.065) ***	0.037	(0.194)	-0.072	(0.019) ***	-0.023	(0.041)
Income in zip code area (mil $)	3.240	(0.802)	-1.300	(2.842)	0.502	(0.231)	2.150	(0.667)
Constant	2.941	(0.133) ***	2.383	(0.042) ***	0.825	(0.340) *	-1.457	(0.125) ***
Number of observations	61,853		8,015		418,773		58,217	
R2	0.033		0.062		0.141		0.113	

Year, area, and indicators of missing value binary variables not shown. Based on Specification 4

Standard errors in parenthesis and marginal effects in brackets.

*** significant at 1% level (two-tail test)

** significant at 5% level (two-tail test)

* significant at 10% level (two-tail test)

Table 8. **Multinomial Logit Analysis: Payer Type of Patients Aged 1 to 64**[1]

GN Sample

	Medicare or other Gov. Ins.				Medicaid				Self-Pay or No Charge			
Frequency	7.94%				17.67%				19.27%			
After conversion	0.244	(0.052)	[0.008]	***	0.582	(0.057)	[0.067]	***	0.579	(0.081)	[0.033]	***
Conversion fixed effect	-0.066	(0.027)	[0.007]	**	-0.412	(0.034)	[-0.039]	***	-0.601	(0.051)	[-0.030]	***
Pseudo R2	0.105											
Number of Obs.	512,133											

F Sample

	Medicare or other Gov. Ins.				Medicaid				Self-Pay or No Charge			
Frequency	6.29%				12.90%				21.36%			
After conversion	0.068	(0.086)	[0.002]		0.454	(0.096)	[0.048]	***	-0.266	(0.121)	[-0.011]	**
Conversion fixed effect	-0.343	(0.059)	[-0.049]	***	-0.326	(0.077)	[-0.022]	***	0.210	(0.090)	[0.013]	**
Pseudo R2	0.103											
Number of Obs.	40,405											

[1]Based on specification 3
Sample: 25% of one of the subsample provided by HCUP data, excluding women giving birth
Omitted group is private insurance
Standard errors in parenthesis and marginal effects in brackets.
*** significant at 1% level (two-tail test)
** significant at 5% level (two-tail test)
* significant at 10% level (two-tail test)

Table 9. Logit Analysis of Probability of Payment Other Than Private Insurance for Labor/Delivery, Less Than 2 Day Stay, and Vaginal Birth[1]: Birth Sample

	GN Sample			F Sample		
Probability of Payment Other Than Private Insurance						
After conversion	0.916	(0.046)	[0.224] ***	0.884	(0.107)	[0.218] ***
Conversion fixed effect	-0.417	(0.026)	[-0.098] ***	-0.187	(0.083)	[-0.044] **
N of observations	558,268			32,527		
Pseudo R2	0.188			0.213		
Probability of Less Than 2-Day Stay						
After conversion	-0.391	(0.056)	[-0.025] ***	-0.206	(0.117)	[-0.017] *
Conversion fixed effect	-0.347	(0.028)	[-0.023] ***	-0.085	(0.092)	[-0.007]
N of observations	566,927			32,635		
Pseudo R2	0.015			0.024		
Probability of Vaginal Birth						
After conversion	-0.340	(0.049)	[-0.025] ***	0.123	(0.103)	[0.024]
Conversion fixed effect	0.252	(0.024)	[0.025] ***	0.299	(0.075)	[0.061] ***
N of observations	567,605			32,635		
Pseudo R2	0.293			0.315		

[1]Based on specification 3

Standard errors corrected for heteroscedasticity.

Standard errors in parenthesis and marginal effects in brackets.

*** significant at 1% level (two-tail test)

** significant at 5% level (two-tail test)

* significant at 10% level (two-tail test)