The Role of Profit Status under Imperfect Information:
Evidence from the Treatment Patterns of Elderly Medicare Beneficiaries
Hospitalized for Psychiatric Diagnoses

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Abstract Based on administrative data from all elderly Medicare beneficiaries admitted to general and psychiatric hospitals for a primary psychiatric disorder in 1990, we tested the hypotheses that beneficiaries treated in not-for-profit and for-profit facilities have different treatment patterns. Baseline estimates were derived from multiple regressions with hospital-level clustering corrections and sensitivity analyses were carried out using instrumental variables estimation. We found no evidence that not-for-profit facilities treated a sicker population or had higher costs or lower rehospitalization rates than for-profits. For-profits actually treated a higher proportion of medically indigent patients. Not-for-profits had a different treatment style (longer lengths of stay in conjunction with lower per diem costs) attributable to their other characteristics, such as greater involvement in medical education. Some evidence suggested that not-for-profit psychiatric hospitals actually have lower costs after adjusting for differences in their other hospital and market characteristics. These findings do not support either the concern that the growth in for-profits will lead to declining access and quality or the contention that not-for-profits are less efficient.

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INTRODUCTION

This study examines how profit status affects the treatment patterns of elderly Medicare beneficiaries admitted to private general and psychiatric hospitals for psychiatric care. Strongly competing views have been advanced on the role of for-profit providers in medicine (Eisenberg, 1984; Hasan, 1996; Meier, 1997; Nudelman and Andrews, 1996; Rafferty, 1984), with one side arguing that not-for-profits behave differently than for-profits and the other arguing that the differences are in tax status and financing, not the delivery of care. Advocates suggest that not-for-profit providers are less likely to inflate prices and more likely to offer high-quality care, offer unprofitable services, and provide care to indigent and high-cost patients; dissenters argue that not-for-profits are inefficient without providing more or better services.

Although the primary legal distinction between for-profit and not-for-profit entities is simply that the former can distribute earnings to individuals, while the latter must retain or spend their earnings, this distinction leads to other legal and organizational consequences, such as tax exemptions (Bloche, 1998). The tax-exempt status of not-for-profit hospitals has increasingly been subject to close scrutiny, legal tests and enforcement (Frank and Salkever, 1991; Frank and Salkever, 1994; Gray, 1993; Gray and McNerney, 1986; Hirth, 1997; Japsen, 1997; Josephson, 1997; Committee on Ways and Means, 1993; Reuters, 1997; Simon, 1987). Interest in whether profit status affects the behavior of health care providers has been further heightened in recent years by a wave of conversions from not-for-profit to for-profit, in part because of allegations that charitable assets were retained by the new for-profit organization rather than being used to compensate the public for the past value of the tax subsidies (DeFriese, 1996; Faulkner and Gray, 1996a). Despite the strong policy interest in the behavior of not-for-profit hospitals, empirical evidence is limited. The subsidization of not-for-profit hospitals through the tax system and their

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posited greater ability to merge (Faulkner and Gray, 1996b) suggest that society views them as important providers of social goods, such as charity care. Less is known, however, about whether profit status influences the hospital's costs and quality of care.

Quality of care, and hence the relationship between hospital profit status and quality, is an especially important concern for patients with psychiatric disorders. The classic economic theory of markets is predicated on the assumption that consumers make rational choices based on perfect information. If so, then market forces would prevent for-profits from offering suboptimal quality. Yet health care markets are more often characterized by asymmetric and imperfect information: providers typically know more than patients about the patient's condition, the possible courses of treatment for the condition and the quality of care being given. Even well-educated patients often do not have sufficient information to make rational choices regarding their health care.

The assumption of perfect consumer information is particularly difficult to justify when the patients involved have psychiatric disorders. Many suffer from cognitive and perceptual deficits that hinder their ability to compare the quality of competing health care providers and make rational market choices. Moreover, patients with psychiatric disorders are less likely to be married or have other close family ties, thus lacking support from family members who might act as their advocate in evaluating the quality of care received. Market failures due to imperfect information are therefore likely to be exacerbated among patients with psychiatric disorders, particularly among patients with severely disabling disorders such as schizophrenia, who are in the greatest need of services, yet most likely to have impaired judgment. As in other health care markets, the growing dominance of private, for-profit providers in the psychiatric sector has been controversial (Dorwart and Epstein, 1991; Dorwart and Schlesinger, 1988; Dorwart et al., 1991;

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Eisenberg, 1984; Levenson, 1982; Levenson, 1983; Schlesinger and Dorwart, 1984). Thus psychiatric patients are both important for policy and an ideal population with which to study the role of profit status under imperfect information.

The purpose of this study is to present new empirical evidence on the question of whether inpatient psychiatric treatment patterns differ by the profit status of the hospital. The analyses are based on data for all aged Medicare beneficiaries admitted to private general and psychiatric hospitals for a primary psychiatric diagnosis during 1990. We test the hypotheses that relative to beneficiaries treated in for-profit hospitals, those treated in not-for-profit facilities will have (1) worse casemix; (2) higher costs and lower profit margins; (3) higher rates of discharge to self-care; and (4) lower rehospitalization rates (as a proxy for the hospital's quality of care). To examine the behavior of for-profit and not-for-profit hospitals under reimbursement systems with differing financial incentives, we study two groups of psychiatric patients: those treated in general hospitals, which are reimbursed under the Prospective Payment System (PPS), and those treated in psychiatric hospitals, which are reimbursed under the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA).

BACKGROUND

History of hospital market Prior to 1870, virtually all hospitals in the United States were either public or private not-for-profit entities (Marmor, Schlesinger and Smithey, 1986; Reardon and Reardon, 1995). An increase in physician-owned and operated hospitals increased the proportion of for-profits in the hospital industry to 56% by 1910, but this proportion declined again, to 18% by 1946. Investor-owned hospitals, primarily those owned by outside investors, experienced some resurgence with the creation of Medicare and Medicaid in 1965, due to the

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generous reimbursement offered by these public insurance programs. Nonetheless, the majority

of facilities have remained not-for-profit. As of 1995, 60% of non-Federal general hospitals in

the United States were private not-for-profit, 14% were private for-profit, and the remaining 26%

were run by state and local government (American Hospital Association, 1996).

Historically, ownership structure in the psychiatric hospital sector had been quite

different than in the general hospital sector, with a much larger role played by state and local

government. However, privatization and the rise in for-profit health care providers have been

strong ongoing trends in the U.S. mental health services system over the past few decades, so

that psychiatric hospitals now look similar to general hospitals in terms of ownership. Between

1970 and 1992, all of the net growth in the number of psychiatric hospitals in the United States

occurred in the private sector, increasing the proportion of psychiatric hospitals run privately

from 33% to 64% (Center for Mental Health Services, Mandersheid and Sonnenschein, 1996).

Simultaneously, the proportion of private psychiatric hospitals that is investor-owned grew from

48% in 1969 (Levenson, 1982) to 78% in 1990 (unpublished AHA data). Private for-profit

facilities are currently much more common in the psychiatric hospital sector than the general

hospital sector (49% vs. 13% in 1990) (Levenson, 1982).

Economic theories of profit status   Numerous explanations have been advanced for the

existence of not-for-profits (Frank and Salkever, 1994; Hansmann, 1987). For example, not-for-

profits may present an alternative to government in the production of public goods (James and

Rose-Ackerman, 1986; Weisbrod, 1988), or not-for-profit status may signal quality under

information asymmetry and "contract failure" (Arrow, 1963; Easley and O'Hara, 1983;

Hansmann, 1980; Hansmann, 1981). Perhaps because asymmetric information is most common

in markets for health care, almost half of all revenues from not-for-profit organizations occur in

the health sector (Frank and Salkever, 1994; Marmor, Schlesinger and Smithey, 1987). A number of theoretical models have been developed about the behavior of not-for-profit hospitals. The predictions arising from these models depend on what the hospital is hypothesized to maximize: bed size, budget, prestige, manager "perks", physician or employee income, income redistribution among patients, quality of care, or the ability of the managers to choose the service mix to meet their own ideals (Hansmann, 1987; Pauly and Redisch, 1973; Rose-Ackerman, 1987; Steinberg, 1986). In general, however, most models assume that not-for-profits derive part of their utility from patient wellbeing or quality of care, while for-profits strictly maximize profit. These models suggest that not-for-profit hospitals have stronger incentives than for-profits to admit indigent or high-cost patients, offer poorly remunerated services desired by the community, and provide high quality care, which in turn is hypothesized to lead to better patient outcomes after adjusting for differential case-mix.

Economic models also suggest that for-profit hospitals have stronger incentives for efficiency in production, leading to lower costs and higher profit margins under imperfect competition. On the other hand, debt is the primary source of capital for all private hospitals, even for not-for-profits, so pressure for efficiency in production still exists (Reardon and Reardon, 1995). The ability of not-for-profit hospitals to cross-subsidize unprofitable services also may be limited by increased competition (Marmor, Schlesinger and Smithey, 1986).

Nature of competition between for-profits and not-for-profits   These models suggest certain ways in which for-profits and not-for-profits may interact in the marketplace. If for-profits attempt to attract patients who are healthier, cost less to treat, and have better health insurance coverage, not-for-profit hospitals (with their hypothesized altruistic motives) will be left to treat the less financially desirable patients. Differing casemix may in turn influence

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equilibrium treatment patterns, i.e., if not-for-profit psychiatric hospitals admit more patients

with schizophrenia (one of the most disabling and costly psychiatric disorders), then they will

have higher costs and worse outcomes as a result.

Greater competition in the hospital market is likely to improve financial performance and

quality of care among all hospitals. Moreover, Hirth (Hirth, 1999; Hirth, 1997) shows that under

certain assumptions, for-profits will have greater incentive to provide high quality in markets

dominated by not-for-profits than those dominated by for-profits. Being a not-for-profit is

essentially a signal that the provider is of high quality, so patients with poor information about

the quality of inpatient care will choose to be treated at not-for-profit hospitals if they are

available, while informed patients will be indifferent. In markets with relatively more not-for-

profits, the uninformed patients are "siphoned off," leaving the for-profit providers with a

greater proportion of informed consumers. This in turn increases the quality of care that the for-

profits must provide. In addition, the behavior of not-for-profit providers may also depend on

the composition, in addition to the concentration, of the market. For example, being in

competition with for-profit providers may increase the incentives of the not-for-profit providers

for cost efficiency.

Medicare reimbursement methodology and differences by profit status The above

discussion assumes that reimbursement is not strictly cost-based, in which case neither for-profit

nor not-for-profit hospitals would have an incentive to "cream-skim" low-cost patients or skimp

on quality. The financial incentives facing hospitals treating psychiatric patients differ by the

type of facility. Psychiatric treatment in general hospital beds is reimbursed through the

Prospective Payment System (PPS). PPS reimbursement of psychiatric care provided in general

hospital beds is a fixed amount based on the patient's diagnosis-related group (DRG) and in most

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cases is completely independent of length of stay and the number of services provided. Care

provided in psychiatric hospitals (as well as PPS-exempt psychiatric units within general

hospitals) is reimbursed using the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA)

methodology, in which a "target amount" per admission is determined, based in part on

historical costs. Facilities with average costs above the target amounts bear the extra costs, while

facilities with average costs well below the target amounts operate under incentives similar to

cost-based reimbursement (Cromwell et al., 1992). Anecdotal evidence suggests that psychiatric

facilities may have artificially increased their costs during the initial years when TEFRA target

amounts were being set and then lowered them back down again, so that they are less constrained

than they otherwise would be. Furthermore, TEFRA facilities have the option to apply for

increases in the target amount if they can show evidence to justify higher rates, e.g. that patient

casemix is worsening over time. Thus while both systems offer incentives for cost containment,

reimbursement tends to be higher and more closely tied to actual costs under TEFRA than under

PPS. Therefore the behavior of for-profit and not-for-profit providers may diverge more in

general hospitals than in psychiatric hospitals, although caution must be exercised in making

direct comparisons, given the very different nature of the services provided and populations

treated in general vs. psychiatric hospitals.

LITERATURE REVIEW

Empirical studies of differences in hospital behavior by profit status have focused on

three major areas: costs, the provision of "social goods" (including charity care, unprofitable

services desired by the community, medical education, and unsponsored research) and quality.

Studies of psychiatric hospitals have additionally examined the casemix of the patient

populations served to determine whether there is evidence of differential "cream-skimming" of healthy patients and "dumping" of sick patients (Schlesinger et al., 1997). The evidence on the provision of social goods is the strongest, finding consistent evidence that not-for-profits are more likely to provide free care and unprofitable services. However, considerable uncertainty still exists surrounding cost, quality and casemix differentials by profit status. A limitation of a number of these studies is that they were based on data from a period in which cost-based reimbursement was more widely used, so may understate current differences in the behavior of for-profit and not-for-profit hospitals.

The role of profit status in the general hospital sector A few studies of hospital financial performance have found that operating costs are lower among investor-owned hospitals (Lewin, Derzon and Margulies, 1981; Rundall and Lambert, 1984) and that among rural hospitals, for-profits are more efficient than not-for-profit hospitals (Ferrier and Valdmanis, 1996). However, the majority of studies suggest that investor-owned hospitals have similar or even higher daily expenses than not-for-profits, but shorter lengths of stay, leading to similar average expenses per patient (Becker and Sloan, 1985; Gray and McNerney, 1986; Institute of Medicine, 1986; Marmor, Schlesinger and Smithey, 1986; Pattison and Katz, 1983). Furthermore, a recent study found that total per capita Medicare spending was higher in markets dominated by for-profit hospitals and that spending grew more quickly in markets in which all hospitals converted to for-profit status than those in which all hospitals remained not-for-profit (Silverman, Skinner and Fisher, 1999). Evidence on profitability is mixed, with some studies suggesting that the markup over costs is higher in the for-profits (Pattison and Katz, 1983) and others finding insignificant differences (Becker and Sloan, 1985). Hoerger (Hoerger, 1991) finds greater variability in profits among not-for-profit hospitals than among for-profits, suggesting that the objective

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functions differ by profit status.

Strong evidence exists that there are significant, although in some cases small, differences in the provision of social goods by profit status; at the same time, considerable heterogeneity exists within proprietary hospitals (Frank and Salkever, 1994). For-profit hospitals are more likely than not-for-profits to avoid unprofitable patients, either by locating away from low-income areas, failing to provide services used disproportionately by the poorly insured, or screening admissions (Gray and McNerney, 1986; Institute of Medicine, 1986; Marmor, Schlesinger and Smithey, 1986; Norton and Staiger, 1994). Involvement in professional education and unsponsored research is also lower among for-profit hospitals (Gray and McNerney, 1986; Institute of Medicine, 1986).

The evidence on quality is weaker. Measurable differences in quality of care are small and not in consistent directions (Gray and McNerney, 1986; Institute of Medicine, 1986). Marmor, Schlesinger and Smithey (Marmor, Schlesinger and Smithey, 1986) concluded that quality of care is similar among for-profit and not-for-profit hospitals in which the delivery of services was controlled by physicians, but otherwise is lower in for-profits.

The role of profit status in psychiatric inpatient care   Several studies of the role of profit status have focused on the provision of psychiatric inpatient care. Similarly to the findings for general hospitals, among psychiatric hospitals, not-for-profits were more likely than for-profits to provide free care and poorly-remunerated services and to be involved with education and training activities (Culhane and Hadley, 1992; Dorwart et al., 1991; Lyles and Young, 1987; Olfson and Mechanic, 1996; Schlesinger and Dorwart, 1984). Inconsistent conclusions were reached regarding the clinical characteristics of the psychiatric patient populations served by not-for-profit vs. for-profits: Olfson and Mechanic (Olfson and Mechanic, 1996) found that among

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general hospitals, not-for-profits served a higher proportion of patients with schizophrenia (who tend to be the most severely ill), but other studies found that among psychiatric hospitals, not-for-profits treated patients who were similarly or even less impaired than the patients treated by for-profits (Dorwart et al., 1991; Schlesinger and Dorwart, 1984).

Among psychiatric hospitals, some evidence was found that not-for-profits provide higher quality care, proxied by staffing ratios (Dorwart et al., 1991; Schlesinger and Dorwart, 1984) and violations and complaints (Mark, 1996). Evidence on cost differentials among psychiatric hospitals is somewhat less consistent. The results of McCue and Clement (McCue and Clement, 1993) and McCue, Clement and Hoerger (McCue, Clement and Hoerger, 1993) suggest that average lengths of stay are longer in for-profit, yet that salary expenses (both per diem and per stay) are lower and profits are higher. In contrast, Schlesinger and Dorwart (Schlesinger and Dorwart, 1984) find similar costs per patient day among for-profits and not-for-profits. Mark (Mark, 1996) also finds no evidence that either adjusted or unadjusted average costs differ by profit status.

Contribution of the current study This study extends the existing literature in several ways. Our study focuses on elderly Medicare beneficiaries, which includes over 95% of all elderly. By studying elderly patients with psychiatric disorders, we focus on a market in which poor information and suboptimal quality of care are likely to be concerns. Medicare is an important payer of mental health care (for example, it is the source of about 20% of private psychiatric hospital revenues) and by focusing on a population with relatively uniform insurance coverage, differences in the care received across settings are less likely to be attributable to selection or differential treatment on the basis of insurance.

The past studies tended to rely on area- or hospital-level data, survey data with low

response rates and small cell sizes for certain subpopulations of interest, or data on a small number of providers from a single state. We use longitudinal, patient-level data, which allows us to better control for patient characteristics and to examine a set of outcomes complementary to those analyzed in previous work. Our database includes all hospitals in which patients were treated, so we are able to identify previous hospitalizations and follow patients after discharge, even if they are readmitted to hospitals other than the original provider. We also have zip codes for both the hospital and patient, so we can investigate the relationship of treatment patterns to area sociodemographic characteristics and supply-side factors. Finally, because our data are for the universe of Medicare patients hospitalized for psychiatric disorders during the study period, our results are nationally generalizable and our statistical power is high.

METHODS

Study population and data The study cohort was defined as all elderly Medicare beneficiaries who were admitted to a private general or psychiatric hospital with a primary psychiatric diagnosis (ICD-9-CM code in the range 290-319) during 1990. Analyses were performed separately for episodes occurring in general hospitals without PPS-exempt psychiatric units and episodes occurring in psychiatric hospitals. We excluded episodes occurring within general hospitals that have psychiatric units, because of the strong selection bias associated with the setting of care for patients (i.e. hospitals with psychiatric units choose whether to admit the patient to the unit or to a scatterbed, depending on whether reimbursement is expected to be higher under PPS or TEFRA). The cohort includes elderly persons who were originally eligible for Medicare on the basis of disability and those who are eligible on the basis of both age and end-stage renal disease. The unit of analysis was the hospital stay. Observations for

beneficiaries who had hospital stays in the year before the index admission were retained because their exclusion would have led to underrepresentation of the severely and chronically ill in the sample. Thus it was possible for a given patient to contribute more than one observation to the database.[1]

To ensure that we have complete data, we excluded the stays of beneficiaries (1) who had a primary payer other than Medicare, (2) who participated in group health plans or had discontinuous part A coverage for a reason other than death, either during the index stay or the followup period, (3) who resided or obtained their inpatient treatment outside the United States or who had missing or unusable geographic information, (4) who were treated in drug/alcohol facilities, (5) who were treated in facilities admitting fewer than two Medicare beneficiaries during the year, (6) whose total episode was composed of embedded hospital stays for which the dates of service use within each hospital could not be determined, and (7) who died in the hospital or less than 30 days after discharge. Jointly, all of these exclusions eliminated approximately 10% of hospitals and 10% of episodes for both general and psychiatric hospitals. 2.9% of general hospital episodes and 1.3% of psychiatric hospital episodes were excluded because of death; mortality rates were similar for for-profits and not-for-profits. The final numbers of hospital stays and unique numbers of beneficiaries and hospitals within each category were respectively 46,548, 42,420 and 2,349 for general hospital stays and 32,517, 26,694 and 418 for psychiatric hospital stays.

The data sets used in the analyses are the 1989-1991 inpatient standard analytic (SAF) and denominator files; 1990 Medicare cost reports, exempt units file and Provider of Service

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[1] Sensitivity analyses accounting for beneficiary-level clustering had little impact on the estimated magnitude and significance of the not-for-profit effect, probably because cluster sizes were small (less than two observations per beneficiary on average).

(POS) file; the 1990 Census; and the 1990 American Hospital Association (AHA) file. Inpatient

claims from the standard analytic files were aggregated into separate hospital stays, identified

through either discharge prior to readmission, a change of DRG for patients remaining in the

same hospital, or a change of provider ID number for patients transferred to another facility.

Hospital stays were linked to (1) beneficiary characteristics from the 1990 denominator file, (2)

hospital characteristics from the cost reports, exempt units and POS files, (3) area population

characteristics from the 1990 Census, and (4) hospital affiliation with a health care system (e.g.

hospital chain) from the AHA file. Finally, hospital stays were linked together longitudinally to

determine prior and subsequent hospitalizations. Prior admissions and rehospitalizations were

based on all hospital stays for psychiatric conditions, including general hospital, psychiatric unit

and psychiatric hospital admissions.

Outcomes   The dependent variables examined in this study are the total and ancillary

costs associated with the hospital stay, length of stay, average costs per day, the "profit margin"

associated with the hospital stay (Medicare reimbursement minus constructed costs), whether the

beneficiary was discharged to self-care at home (vs. all other discharge destinations), and

whether the patient was rehospitalized within 30 days of discharge from the hospital.

Total costs represent overall resource use during the stay and were constructed by (1)

multiplying routine and special care days by the facility's routine and special care per diem costs,

(2) multiplying ancillary charges within each cost center by the facility's ratio of costs to charges

(RCC) in that center, and (3) aggregating across all categories of costs. The RCCs are derived

from the hospital cost reports and exempt units file and were unavailable for a small proportion

of the sample, so the cost analyses were limited to inpatient stays for which RCCs could be

obtained. To determine whether hospital costs result from duration vs. intensity of care, we also

examined ancillary costs, length of stay, and costs per day. Beneficiaries who were admitted and discharged on the same day were defined to have a length of stay of one day, since it was not possible to determine the times of admission and discharge. Hospitals may achieve shorter lengths of stay by transferring patients to other facilities or releasing them to formal home care services, thereby shifting part of the costs of care. We therefore examine the probability the beneficiary was discharged to self care at home, vs. all other destinations (including transfer to another facility and discharge to home care). To test hypotheses regarding profit margins, Medicare reimbursement minus constructed costs was also analyzed.

Cost comparisons are not meaningful unless the output is comparable. Although we do not have quality or clinical outcome measures, we analyze a proxy that is frequently used in analyses of psychiatric inpatient care, 30-day rehospitalization rates, to determine whether cost differentials are likely to have resulted from differences in the output being produced. Short community tenure may reflect the quality of care provided during the index hospitalization (Ashton et al., 1997) or the failure of the hospital to provide adequate post-discharge followup. (High-quality care for psychiatric inpatients has been argued to include appropriate referrals for followup care and post-discharge monitoring by the hospital and is associated with hospital profit and ownership status (Dorwart et al., 1991).) Due to the variation in the diagnosis and coding of psychiatric conditions, we include rehospitalizations for any primary psychiatric diagnosis, regardless of whether it is the same as for the index hospital stay.

Regressors Two specifications of the model are estimated. Both control for the profit status of the hospital in which the beneficiary was treated and the characteristics of the beneficiary (sociodemographic, insurance and clinical characteristics). The second specification also controls for market and hospital characteristics. By estimating both specifications, we gain

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information about the degree to which unadjusted differences between for-profits and not-for-profits are attributable to differential patient selection vs. organizational characteristics of the hospital. Moreover, hospital and market characteristics are arguably under the influence of the hospital and may themselves be affected by, or simultaneously determined with, the hospital's profit status. For example, a hospital's profit status may influence its choices regarding which market to locate in, whether to engage in medical education, how large to grow, and so on. Part of the reason for expecting a "not-for-profit effect" is that not-for-profits are thought to be more willing to provide social goods, including educational activities. If other hospital characteristics mediate the not-for-profit effect and are not just confounders, then the effect of profit status in the first specification can be interpreted as the "total" effect of being a not-for-profit. Comparing the effect of profit status from the first and second specifications thus provides information about the degree to which the total effect of being a not-for-profit is mediated through observable hospital characteristics.

Sociodemographic characteristics include age, sex, race (black, other and unknown vs. white), whether the beneficiary resides in an urban area, and the average income of household heads of the same age who reside in the beneficiary's zip code of residence. The zip code income measure was constructed from categorical data and serves as a proxy for the beneficiary's own income. Insurance characteristics include whether the beneficiary is currently Medicare-eligible on the basis of end-stage renal disease (in addition to age), was originally eligible on the basis of disability, and had any state buy-in coverage during the year of the index hospital admission. Beneficiaries eligible for state buy-in frequently have Medicaid coverage and generally have low income and assets (e.g. Qualified Medicare Beneficiaries), so this variable serves as an imperfect proxy for both supplemental insurance and socioeconomic status.

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Clinical characteristics are based on the ICD-9-CM diagnoses coded for the hospital stay and include the patient's primary diagnosis, psychiatric comorbidities, source of admission and prior hospitalizations. All primary 5-digit diagnosis codes in the range 290.**-319.** were aggregated into the following categories: schizophrenia; bipolar disorder; other psychotic disorders; major depression; dysthymia; other depressive disorders; anxiety disorders; adjustment disorders; dementia; organic disorders other than dementia; substance disorders; personality disorders; and all other psychiatric disorders or conditions. Schizophrenia was chosen as the omitted category for the regression analyses because on average, it is one of the most severe and chronic types of psychiatric disorders.

Secondary diagnoses in the range 290-319 were first classified in a similar fashion and then further aggregated into the following groups of disorders: psychotic, affective, personality, substance-related, and all other psychiatric comorbidities. Secondary diagnoses outside of this range were classified into the following groups of medical comorbidities: cardiovascular, nervous system, endocrine, gastrointestinal, genitourinary, hematology, pulmonary, musculoskeletal, and other medical condition. As additional proxies for severity, we also control for the source of admission to the hospital (transfer from another facility; admission upon recommendation of the facility's emergency room physician; admission at the direction of the courts or a law enforcement agency; vs. referral from a physician, clinic or HMO) and whether the beneficiary was hospitalized for any primary or secondary psychiatric diagnosis during the previous year (controlling separately for whether the beneficiary had incomplete claims data for the year prior to the stay).

Hospital characteristics[2] include medical school affiliation, the presence of a residency

program, hospital or unit bed size, and chain affiliation. Market characteristics include the average weekly wages of health care workers in the state,[3] market concentration, and the percentage of the market that is for-profit. Chain affiliation, market concentration, and the percentage of the market that is for-profit are also interacted with profit status.

While no perfect definition of hospital markets exists for constructing the measures of market concentration, we use an approach similar to that of (Zwanziger and Melnick, 1988). Hirschman-Herfindahl indices (Herfindahl, 1950; Hirschman, 1945) are constructed for each zip code, based on the hospitals treating Medicare beneficiaries with psychiatric disorders in the zip code. The concentration of the market in which any given hospital operates is measured as a weighted average of the indices for all of the zip codes in which that hospital is a provider. The weights are the proportions of beneficiaries living in the zip code who are treated by that hospital. Higher values for this index indicate that the hospital operates in a more concentrated and hence presumably less competitive market.

Estimation We first present descriptive data by the type and profit status of the facility in which the beneficiary was treated – hospital-level data for hospital characteristics and episode-level data for patient characteristics and outcomes. Proportions are given for categorical variables and means and standard deviations for continuous variables. By comparing the characteristics of the patient populations treated in each type of facility, we can get a sense of whether differential selection of patients into not-for-profit vs. for-profit hospitals is likely to confound the comparison of costs and outcomes. Statistical tests based on sampling theory are

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[2] Results were similar when controlling separately for region of the country.

[3] We also tried using hospital-specific hourly wage rates from the Medicare cost reports, but this measure of input prices was not very useful, due to high rates of missing data.

unnecessary, since the analyses are based on data for the entire universe of Medicare beneficiaries. We therefore focus on whether the differences are large enough to be of clinical or policy significance, rather than on their statistical significance.

We then derive single-equation regression estimates of the effect of hospital profit status on the outcome measures, controlling for the independent variables in the two specifications described above. Clustering corrections are used to account for correlated observations within hospitals. The tables give the "predictive margins", i.e. the difference in the expected value of the outcome when the not-for-profit indicator is changed from 0 to 1, all other regressors are held constant at their original values, and the interactions between profit status and other regressors are changed appropriately. The approximate standard errors and p-values associated with these margins are derived from first-order Taylor series expansions. The probabilities of discharge to self-care at home and rehospitalization within 30 days were estimated with logistic regression. Total profits, costs, conditional ancillary costs[4], costs per day and length of stay were estimated with linear regressions; for all but the profit measure, a log transformation of the dependent variable was used to take skewness in the distribution into account. For models involving log transformations of the dependent variable, parameter estimates were retransformed to derive effects on dollars on the untransformed scale using a "smearing" algorithm (Duan, 1983), with separate "smear" factors calculated for episodes occurring in not-for-profit vs. for-profit hospitals (Manning, 1998).

We also examine the sensitivity of these results to selection bias by using a two-stage instrumental variables (IV) approach. Valid comparisons of the outcome measures across for-

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[4] Two-part models for unconditional ancillary costs were not estimated because of the low proportion of patients with zero ancillary costs (0.9% and 3.7% for general and psychiatric hospital episodes respectively)

profit and not-for-profit hospitals depend on the ability to adjust for differential case-mix and severity of illness of the patients. In the absence of perfect clinical controls, hospitals that accept the sickest patients will appear to have heavier resource use. There is no consensus in the past literature on whether not-for-profits treat sicker or healthier patients than for-profit hospitals; nonetheless, if unmeasured patient severity is correlated with profit status among our study cohort, our comparisons will be biased using single-equation estimation.

The same is true for differential selection based on other unobservable patient characteristics, such as private supplemental insurance or social support (e.g., marital status and other family involvement in the care of the patient). For example, Medigap policies may encourage greater utilization of health services by eliminating patient cost-sharing requirements, leading to higher rehospitalization rates, while informal caregivers may act as a substitute for formal services, leading to lower rehospitalization rates. If for-profits and not-for-profits differentially admit patients with supplemental insurance and strong social support, single-equation estimation may lead to biased effects of profit status.

The instruments used in the IV analysis are the distances to the nearest for-profit and not-for-profit facilities and their squared terms[5]. These measures are highly significant predictors of the profit status of the treating hospital even when controlling for other hospital and market as well as patient characteristics. However, the instruments may not perfectly meet all of the other assumptions required for consistency[6] of the IV estimator (Angrist, Imbens and Rubin, 1996).

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[5] Use of differential distance measures yielded similar results.

[6] Instrumental variables procedures do not necessarily yield consistent parameter estimates in cases in which the outcome is nonlinear, so we also used linear probability regressions to compare the single-equation and IV estimates, with similar results.

These assumptions might fail if beneficiaries move to be closer to the hospital in which they are being treated (i.e. distance is itself endogenous), or if some people prefer to be treated in hospitals far away from their homes, due to the fear of being stigmatized as a psychiatric patient (i.e., monotonicity fails). Thus the IV estimates should be treated as suggestive rather than conclusive. Nonetheless, if monotonicity generally holds and relative distance is more highly correlated with hospital profit status than with the outcome measures, then the IV estimates should be more consistent than the single-equation estimates.

Analysis of the zip code data suggested that minimum distances are probably exogenous. About the same proportion of beneficiaries moved further away from the treating hospital as those moving closer after controlling for threshold effects, i.e. that beneficiaries who live in the same zip code as the treating hospital cannot move closer. (Before controlling for threshold effects, beneficiaries were actually more likely to move away from the hospital in which they are treated.) Average distances moved were similar for the groups who moved closer and further to the hospital. Monotonicity also seemed to be a reasonable assumption. Only about 8% of the stays occurred in a hospital that was more than 20 miles further away than the closest private hospital of the same specialty type. This proportion does not seem inconsistent with monotonicity, since the beneficiary's zip code is from the denominator file and does not always correspond to the beneficiary's place of residence at the time of hospitalization (e.g. due to mid-year moves or "snowbirds"). Also, some people may travel to be treated in hospitals that provide greater quality or are closer to family members.

RESULTS

<u>Descriptive data on facility characteristics by hospital profit status</u> As expected, other

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facility characteristics were strongly correlated with profit status (Table 1). Not-for-profits were much more likely to be affiliated with medical schools and to have a residency program. For-profits were much more likely to be part of a health care system and operated in markets with greater for-profit penetration. Among general hospitals only, not-for-profits were slightly larger on average and operated in slightly less concentrated markets.

Descriptive data on patient characteristics by hospital profit status Although there were a number of differences in the sociodemographic characteristics of the populations treated, most were not large enough to be of policy interest (Table 2). Distance was strongly correlated with the choice of treating hospital. On average, beneficiaries treated in a for-profit hospital lived closer to for-profit hospitals than to not-for-profit hospitals, while those treated in a not-for-profit lived closer to not-for-profits. Patients treated in not-for-profits were less likely to have state buy-in coverage and were more likely to be female and to live in higher-income and urban areas. Consistent with past literature showing that not-for-profit hospitals are more likely to offer emergency room services and the hypothesis that for-profit hospitals may "dump" undesirable patients onto the not-for-profits, a lower proportion of the patients treated by the not-for-profits were admitted through referrals, while higher proportions were admitted through the ER or transfers from other facilities.

Casemix differences were modest. For-profits treated a lower proportion of patients with major depressive disorder (among general hospitals), a lower proportion of patients with dementia (among psychiatric hospitals), and a higher proportion of patients with substance disorders (among both general and psychiatric hospitals). Otherwise the populations looked quite similar in terms of primary diagnosis, psychiatric and medical comorbidities and prior hospitalizations. While this evidence suggests that selection bias may be less of a problem for

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our analysis, it is still possible that severity differs within diagnostic groupings.

Descriptive data on patient outcomes by hospital profit status   Before controlling for covariates, average lengths of stay were several days longer for beneficiaries treated in not-for-profit hospitals of both types (Table 3). Total costs were slightly higher among not-for-profits, while costs per day were lower. Among psychiatric hospitals, the unadjusted probability of receiving ancillary services and ancillary costs conditional on use were lower. Among general hospitals, not-for-profits had lower profit margins than for-profits; among psychiatric hospitals, the converse was true.

Differences in rates of discharge to self-care by profit status varied by hospital type in a manner that did not support the initial hypotheses. Among general hospitals, where the financial incentive for cost-shifting is stronger because of PPS, the for-profits had higher rates of discharging patients to self-care. In contrast, among psychiatric hospitals, for-profits had lower rates of discharge to home. Among both types of hospitals, for-profits had higher 30-day rehospitalization rates, but differences were modest.

Specification controlling for patient characteristics only   Looking first at the general hospitals (columns 2 and 3, Table 4), the pattern among not-for-profits of longer lengths of stay in conjunction with lower per diem costs and lower rates of discharge to self-care remained after adjusting for the characteristics of the patient populations. Although there was also some evidence that not-for-profits may have higher total costs, the difference was modest and sensitive to the use of instrumental variables methods. Among psychiatric hospitals, a similar pattern emerged (columns 4 and 5, Table 4). Lengths of stay were longer and costs per day lower even after adjusting for patient casemix. In the case of psychiatric hospitals, there was also strong evidence that conditional ancillary costs were lower among the not-for-profits, which is

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consistent with the finding of lower costs per day. However, no significant differences in rates of

discharge to self-care remained after adjusting for patient characteristics. While there was some

suggestion that profit margins were actually higher among the not-for-profit psychiatric

hospitals, this result was again sensitive to the use of instrumental variables.

Specification controlling for patient, market and hospital characteristics Relatively little

evidence of a "direct" effect of being a not-for-profit on treatment patterns and rehospitalization

rates was found (Table 5). The results suggested that the higher resource use of not-for-profits in

Tables 3 and 4 could be attributed to the large differences in their other organizational and

market characteristics, e.g., greater involvement in medical education. After adjusting for these

characteristics, the only significant difference remaining for general hospitals was again the

lower rates of discharge to self-care at home among the not-for-profits (columns 2 and 3, Table

5). Among psychiatric hospitals, not-for-profits actually had lower total costs, ancillary costs

and lengths of stay. Although these effects were no longer statistically significant after

instrumenting, for the most part this was due to inflation of the standard errors; the direction of

the effects remained the same and for total costs and length of stay, the magnitude actually

increased.

DISCUSSION

This study tested the hypothesis that patients treated in private not-for-profit and for-

profit hospitals have different treatment patterns. More specifically, we had hypothesized that

because not-for-profit hospitals are likely to have additional, non-pecuniary goals such as the

welfare of patients or employees, they would be less likely to "cream-skim" more profitable

(e.g. sicker and less wealthy) patients, less cost-efficient and have lower profit margins than for-

profits, yet also provide higher quality care (leading to lower rehospitalization rates) and be less likely to cost-shift onto other providers (proxied by discharge destination). Because these hypotheses were based on the assumption that patients have imperfect information about the quality of their care, we tested them using a patient population among which information failures are likely to be particularly prevalent: elderly Medicare beneficiaries admitted for a primary psychiatric diagnosis.

Despite the varying strength of the cost containment incentives faced by general and psychiatric hospitals, most of the findings were consistent across hospital types. The patient populations served by for-profit vs. not-for-profit hospitals differed fairly little, so not much evidence was found to support the hypothesis that for-profit hospitals engage in differential patient selection on the basis of observable characteristics. Interestingly, for-profit hospitals treated poorer patients on average (proxied by state buy-in coverage and zip code income). No evidence was found to support the hypothesis that not-for-profits are less efficient or have lower profit margins. After adjusting for differences in patient characteristics, not-for-profit and for-profit hospitals had similar average total costs of care. Not-for-profits did seem to have a different treatment style, combining longer lengths of stay with lower per diem costs and (in the case of psychiatric hospitals) lower ancillary costs. This combination of findings could result from a market equilibrium in which for-profits and not-for-profits ended up treating different kinds of patients, i.e., the for-profits focus on the short stayers and the not-for-profits care for the long stayers. Such selection could result from unmeasured factors, such as greater family support among the short stayers. However, findings were similar with the IV analysis, which in theory should eliminate all biases resulting from correlation of profit status with the error term, including omitted-variable bias.

Furthermore, when taking into account other organizational differences likely to increase costs among not-for-profits, such as their greater participation in medical education, some evidence suggested that among psychiatric hospitals, not-for-profits actually had lower total costs, ancillary costs and lengths of stay. Thus the less intensive treatment style of not-for-profits appears to be the result of the strong association between profit status and other organizational characteristics favoring this treatment style, rather than patient characteristics. Comparing the specification that controlled only for patient characteristics with the specification that controlled for additional hospital characteristics suggests that not-for-profits are placed at a strong cost disadvantage as a result of factors such as their greater likelihood to participate in medical education. Whether such findings can be used to argue for preferential treatment of not-for-profits depends on whether these attributes are being subsidized through other means. Thus, for example, a system that gave tax breaks to not-for-profits while separately subsidizing medical education might be rewarding not-for-profit providers twice for the provision of a single social good.

If quality or patient outcomes vary, then cost comparisons are not meaningful, because efficiency is defined with regard to a fixed product, and differing quality or clinical outcomes imply that the output is not the same across providers. However, the proxy that could be examined in this study, 30-day rehospitalization rates, did not differ significantly by the profit status of the hospital. Thus the finding of similar or lower costs per inpatient episode contradicts the hypothesis that not-for-profit hospitals are less likely to use resources in an efficient manner.

To the extent that some of our psychiatric hospitals may have been new entrants and for-profit hospitals have a stronger incentive to inflate costs during initial years of operation in order to increase their TEFRA target amounts, the cost differences between for-profits and not-for-

profits may be biased downward. However, it seems unlikely that enough of the psychiatric hospitals were new entrants to bias the comparison by very much, and evidence of greater cost-efficiency among for-profits was not much stronger for general hospitals, which did not face these perverse incentives.

One striking result was the consistently lower rate of discharge to home among not-for-profit general hospitals compared with for-profit general hospitals. Discharge to other forms of care may reflect a cost-effective way to treat patients along a continuum, by substituting community care or less specialized inpatient care for expensive acute hospital care. However, it may also simply reflect cost-shifting onto other providers. This finding is particularly interesting because under PPS, general hospitals have a strong incentive to discharge patients early. This finding contradicts the hypothesis that faced with such incentives, hospitals with a profit motive will be more likely to try to discharge patients early by getting them into other forms of care.

In terms of policy implications, our findings can be interpreted in several ways. Even among a patient population for which imperfect information is likely to be a major concern, i.e. those hospitalized for psychiatric disorders, the differences between for-profits and not-for-profits in their provision of care were not that large. Although the frequently-heard argument about the inefficiency of not-for-profits did not hold up, neither did the hypotheses that not-for-profits are more likely to treat a sicker or poorer patient population, or provide higher quality of care, leading to better patient outcomes. Observable casemix differences were small, and patients treated in not-for-profits were actually less likely to be medically indigent and to live in low-income areas. Differences between the patient populations in rehospitalization rates were negligible. These findings may allay some of the concern about declines in access and quality resulting from the growth in for-profit psychiatric hospitals.

The major policy debate over not-for-profits has revolved around the issue of whether their unique contributions to society merit their subsidization through the tax system. In the current study, we did not find any evidence of differences by hospital profit status in patient treatment patterns after discharge that might reflect the quality of inpatient care received. We looked only at 30-day rehospitalization rates, which are limited as a measure of clinical outcome (Lyons et al., 1997). Utilization-based measures are not ideal ways to measure quality and are only imperfectly related to clinical outcomes. Nonetheless, they are commonly employed as proxies for quality of inpatient care in provider profiling. The only feasible way to regularly assess quality of care among large patient populations may be administrative databases. These are limited in terms of quality and outcome measures, particularly for patients with psychiatric disorders, for whom mortality rates are not particularly informative. Future research based on more comprehensive quality and outcome measures should examine whether quality can be used as an argument for the tax subsidization of not-for-profits.

Our study purposefully examines only persons with relatively homogeneous insurance coverage, so our data do not speak to the question of whether not-for-profits provide social goods, e.g. charity care. Yet there are more direct ways to subsidize the provision of care to uninsured populations or medical education than tax breaks for not-for-profit providers. In fact, tax subsidies seem best suited for encouraging the provision of "goods" that are difficult to quantify, such as quality. For this reason, if future investigation of quality and patient outcomes do not find evidence that not-for-profit hospitals provide better quality of care than for-profits, policymakers should consider tying the pecuniary advantages of not-for-profit hospitals directly to their provision of social goods, rather than to their profit status per se.

Table 1. Hospital characteristics by hospital type and profit status

	General Hospitals		Psychiatric Hospitals	
	For-Profit (N=498)	Not-For-Profit (N=1,851)	For-Profit (N=94)	Not-for-Profit (N=324)
Medical school affiliation	11%	23%	12%	28%
Residency program	4%	16%	6%	22%
Affiliated with health care system				
Yes	54%	34%	40%	19%
No	18%	53%	20%	46%
Unknown	28%	13%	40%	35%
Number of hospital beds	138 (92)	158 (133)	92 (42)	95 (79)
Weekly health care worker wages	440 (50)	441 (52)	444 (50)	447 (46)
Herfindahl index	.25 (.11)	.31 (.14)	.25 (.08)	.25 (.09)
Percent of market that is NFP	.48 (.18)	.15 (.16)	.42 (.16)	.15 (.13)

Table 2. Patient characteristics by hospital type and profit status

	General Hospital Episodes		Psychiatric Hospital Episodes	
	For-Profit (N=6,868)	**Not-For-Profit (N=39,680)**	**For-Profit (N=23,049)**	**Not-for-Profit (N=9,468)**
Miles to closest FP general hospital	9 (17)	36 (41)	-	-
Miles to closest NFP general hospital	13 (15)	5 (9)	-	-
Miles to closest FP psychiatric unit	-	-	-	-
Miles to closest NFP psychiatric unit	-	-	-	-
Miles to closest FP psychiatric hospital	-	-	17 (24)	28 (32)
Miles to closest NFP psychiatric hospital	-	-	85 (121)	17 (28)
Female	58%	62%	65%	67%
Race				
White	88%	89%	89%	91%
Black	8%	7%	7%	5%
Other	1%	1%	1%	1%
Don't know	3%	3%	3%	3%
Age group				
65 to 74	48%	45%	58%	55%
75 to 84	37%	39%	32%	35%
85 and over	15%	16%	9%	10%
Originally eligible through disability	12%	12%	15%	13%
Currently ESRD-eligible	1%	1%	<1%	<1%
Has state buy-in coverage	19%	15%	16%	11%
Average family income in zip code	$23,184 ($9,233)	$23,707 ($9,459)	$26,202 ($10,615)	$26,826 ($10,846)
Urban residence	76%	76%	83%	85%

Table 2 (cont'd)

Source of admission				
Referral	66%	56%	80%	72%
Transfer from another facility	2%	4%	4%	7%
Emergency room	30%	38%	3%	7%
Criminal justice system	<1%	<1%	1%	1%
Don't know	2%	2%	12%	12%
Primary psychiatric diagnosis				
Schizophrenia	2%	3%	6%	6%
Other psychotic disorder	9%	10%	6%	4%
Bipolar disorder	2%	4%	9%	9%
Major depressive disorder	11%	16%	43%	43%
Dysthymia	2%	2%	2%	1%
Other depressive disorder	2%	2%	3%	2%
Anxiety disorder	4%	4%	2%	2%
Dementia	17%	18%	8%	12%
Other organic	17%	15%	7%	8%
Substance-related disorder	27%	20%	12%	9%
Adjustment disorder	1%	2%	2%	3%
Personality disorder	<1%	<1%	<1%	<1%
Other psychiatric disorder	7%	5%	1%	1%
Psychiatric comorbidities				
Psychotic disorder	3%	4%	1%	1%
Affective disorder	5%	5%	3%	2%
Organic disorder	7%	7%	4%	4%
Substance disorder	12%	10%	5%	4%
Personality disorder	1%	2%	4%	3%
Other psychiatric	8%	8%	5%	5%
Prior psychiatric hospitalization	17%	19%	39%	39%

Table 2 (cont'd)

Medical comorbidities				
Cardiovascular	52%	50%	7%	7%
Nervous system	21%	22%	3%	3%
Endocrine	15%	17%	3%	3%
Gastrointestinal	13%	13%	2%	2%
Genitourinary	18%	15%	1%	1%
Hematology	3%	3%	<1%	<1%
Pulmonary	19%	16%	2%	2%
Musculoskeletal	10%	11%	2%	2%
Other medical condition	28%	28%	3%	3%

Table 3.   Patient outcomes by type and profit status of facility

	General Hospital Episodes		Psychiatric Hospital Episodes	
	For-Profit (N=6,868)	**Not-For-Profit (N=39,680)**	**For-Profit (N=23,049)**	**Not-for-Profit (N=9,468)**
Total costs	$3,928 (SD=$3,687)	$4,604 (SD=$5,326)	$9,360 (SD=$7,883)	$9,462 (SD=$7,622)
Had any ancillary costs	99.3%	99.0%	98.8%	90.1%
Conditional ancillary costs	$1,108 (SD=$1,295)	$1,200 (SD=$2,119)	$2,480 (SD=$3,447)	$1,394 (SD=$1,676)
Costs per day	$476 (SD=$1,294)	$409 (SD=$241)	$462 (SD=$187)	$398 (SD=$123)
Length of stay	9.1 days (SD=7.9)	11.8 days (SD=13.3)	20.0 days (SD=14.0)	23.5 days (SD=17.5)
Total profits	-$1,501 (SD=$3,489)	-$1,950 (SD=$4,709)	-$3,609 (SD=$5,024)	-$1,364 (SD=$6,495)
Discharged to self care at home	66%	63%	80%	85%
Rehospitalized within 30 days	10.9%	10.3%	15.8%	14.1%

Table 4.   Effect of being a not-for-profit hospital on outcome measures, controlling for patient characteristics only

	General Hospital Episodes		Psychiatric Hospital Episodes	
	Single-Equation	**IV Estimation**	**Single-Equation**	**IV Estimation**
Total costs	Δ= $424	Δ= -$88	Δ= $10	Δ= $225
	(SE=$91) (p≤.001)	(SE=$166) (p=.594)	(SE=$606) (p=.987)	(SE=$466) (p=.629)
Conditional ancillary costs	Δ= $61	Δ= -$159	Δ= -$1,049	Δ= -$999
	(SE=$28) (p=.032)	(SE=$57) (p=.006)	(SE=$165) (p≤.001)	(SE=$109) (p≤.001)
Costs per day	Δ= -$66	Δ= -$78	Δ= -$66	Δ= -$63
	(SE=$7) (p≤.001)	(SE=$8) (p≤.001)	(SE=$16) (p≤.001)	(SE=$5) (p≤.001)
Length of stay	Δ= 2.16 (SE=.181) (p≤.001)	Δ= 1.51	Δ=3.41	Δ= 4.50
		(SE=.341) (p≤.001)	(SE=.93) (p≤.001)	(SE=.92) (p≤.001)
Total profits	Δ= -$49	Δ= $352	Δ= $1,788	Δ= -$181
	(SE=$91) (p=.590)	(SE=$168) (p=.036)	(SE=$366) (p≤.001)	(SE=$280) (p=.519)
Discharged to self care at home	Δ= -.032	Δ= -.147	Δ= .022	Δ= .002
	(SE=.010) (p≤.001)	(SE=.018) (p≤.001)	(SE=.025) (p=.377)	(SE=.023) (p=.935)
Rehospitalized within 30 days	Δ= -.012	Δ= -.000	Δ= -.014	Δ= .002
	(SE=.006) (p=.042)	(SE=.011) (p=.997)	(SE=.008) (p=.090)	(SE=.015) (p=.915)

Note: Regressions use hospital-level clustering corrections and control for a constant and the patient characteristics shown in Table 2.

Table 5.   Effect of being a not-for-profit hospital on outcome measures, controlling for patient and other hospital characteristics

	General Hospital Episodes		Psychiatric Hospital Episodes	
	Single-Equation	**IV Estimation**	**Single-Equation**	**IV Estimation**
Total costs	Δ= -$235 (SE=$188) (p=.211)	Δ= $1,855 (SE=$2,505) (p=.459)	Δ= -$2,787 (SE=$712) (p≤.001)	Δ= -$3,498 (SE=$4,084) (p=.392)
Conditional ancillary costs	Δ= -$10 (SE=$54) (p=.853)	Δ= $331 (SE=$751) (p=.659)	Δ= -$1100 (SE=$200) (p≤.001)	Δ= -$331 (SE=$1,299) (p=.799)
Costs per day	Δ= -$29 (SE=$12) (p=.016)	Δ= $63 (SE=$96) (p=.512)	Δ= -$58 (SE=$33) (p=.078)	Δ=$58 (SE=$58) (p=.322)
Length of stay	Δ= -0.27 (SE=0.39) (p=.492)	Δ= 4.26 (SE=6.03) (p=.480)	Δ= -3.75 (SE=.78) (p≤.001)	Δ=-4.21 (SE=8.06) (p=.602)
Total profits	Δ= $228 (SE=$156) (p=.143)	Δ= $2,378 (SE=$3,792) (p=.531)	Δ= $1,082 (SE=$721) (p=.134)	Δ= $4,337 (SE=$4,124) (p=.293)
Discharged to self care at home	Δ= -.068 (SE=.017) (p≤.001)	Δ= -.398 (SE=.061) (p≤.001)	Δ= -.017 (SE=.048) (p=.725)	Δ= .272 (SE=.105) (p=.009)
Rehospitalized within 30 days	Δ= .005 (SE=.010) (p=.638)	Δ= .153 (SE=.104) (p=.142)	Δ= -.024 (SE=.012) (p=.037)	Δ= -.236 (SE=.095) (p=.013)

Note: Regressions use hospital-level clustering corrections and control for a constant, the hospital and market characteristics in Table 1, and the patient characteristics shown in Table 2.

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