

ECONOMIC INCENTIVES IN THE HOSPICE CARE SETTING: A COMPARISON OF FOR-PROFIT AND NONPROFIT PROVIDERS

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ABSTRACT

The purpose of this paper is to examine the association of differences in economic incentives between for-profit (FP) and nonprofit (NP) hospice care providers with management performance, using financial and nonfinancial metrics. This research is based on the expectations of Agency theory and applies proxies of the quality of patient care while controlling for differences in cost-efficiency. Our findings indicate that FP hospice providers (1) selectively admit patients with longer life-prognoses and billable days and hence lower average costs per day, (2) employ a lower average cost/skill mix of workers, and (3) have higher CEO compensation and profit. The NP providers admit more patients with the less profitable life-prognoses attributes, have lower CEO compensation, and reinvest their net earnings under the non-distribution constraint. While the profit incentive may be needed to attract providers into this rapidly growing and underserved market, the NP providers return a lower cost per patient served from the taxpayer's perspective.

ECONOMIC INCENTIVES IN THE HOSPICE CARE SETTING: A COMPARISON OF FOR-PROFIT AND NONPROFIT PROVIDERS

Using the expectations of Agency theory as a basis, the purpose of this research is to analyze how the differences in economic incentives between for-profit (FP) and nonprofit (NP) hospice care providers affect management performance, as measured using financial and non-financial metrics. In addition, this research develops quality of patient care proxies which can be used by managers for comparative performance assessment and benchmarking in the hospice care industry.

The federal Medicare hospice benefit was established in 1983 to provide terminally ill beneficiaries with an alternative to conventional medical treatment. Hospice patients have accepted their terminal diagnosis and made the decision to no longer seek medical treatment of their illness. These patients receive pain management and comfort care from hospice providers. Hospice care in the United States has a substantial economic impact on the healthcare industry. In MedPAC's June 2008 Report to the Congress it was estimated that Medicare spending under the hospice benefit exceeded \$10 billion in fiscal year 2007 and is expected to more than double over the next 10 years. In 2007, an estimated 1.4 million patients received hospice care in the United States (NHPCO 2008). Almost 39% of the deaths that occurred in the United States in 2007 were deaths of hospice patients. There are more than 3,000 hospice programs in the United States. Between 2000 and 2007 the number of hospice providers grew from just over 2,300 to 3,200 which is about five percent per year. FP hospice providers made up almost all of that growth. The number of FP providers grew nearly 12% while there was virtually no growth in the number of NP providers.

Hospice care is often confused with hospital care. The patient care goals of a hospice and a hospital are polar opposites. The hospital seeks to treat illness and injury and prevent the patients from dying. Hospitals are generally paid on a per-patient case basis and attempt to contain costs by keeping the inpatient days of stay as few as possible. However, once a patient's condition has become terminal—defined as a medical prognosis of less than six-months to live—the hospice provider then seeks to manage pain and help keep the patient as comfortable as possible during their remaining days of life. Since treatment options have been exhausted, the hospice does not treat the patient's illness. The hospice has no control over the number of service days for a given patient, which is dependent solely on how long the patient lives. The hospice is paid on a flat per-diem rate basis, and the longer the patient lives, the lower the average cost per day will be for a given patient. In order to minimize their average daily costs, hospice providers thus have a financial incentive to admit patients who are early in the dying process—*i.e.*, before they are

very close to dying. For our research purposes, a person with one month or less to live is considered very close to dying. Patients cannot elect hospice care without orders from a medical doctor. The hospice provider bills for services every day whether or not a nurse or other provider visits the patient—who often reside at home. In the hospice setting a patient early in the dying process that is seen only twice a week is less costly per day on average than a patient who needs to be seen every day.

Fraud in hospice provider patient admission practices is also an important issue. There is anecdotal evidence that some FP providers selectively admit patients early in the dying process in order to keep them on billable hospice services as long as possible. One nursing blog stated plainly that hospice providers “market like crazy, bearing gifts for all the nurses” in order to recruit the patients early and in some situations where hospice care is unnecessary.¹ In one court case, criminal Medicare hospice fraud was proven and the provider had to repay \$25 million to Medicare as a negotiated settlement for improper patient admission practices.²

In House of Representatives bill 3200 (111th Congress, 2009), a section titled, Advance Care Planning Consultation, called for end of life counseling every five years. This end of life counseling, which was highly controversial in the news media, included hospice care in the proposed counseling. There has also been a call for Medicare to reform the hospice benefit payment system. One of the prominent suggestions has been to pay a higher per-diem rate in the first-few and last-few days of hospice care for a patient. Considering the debate on end of life counseling in the political news, along with healthcare being such a predominant topic with the current administration, our research provides empirical evidence that is useful for national policy makers. Our findings indicate that the current, fixed per diem payment rate system incentivizes selectivity in patient admission practices that may be more costly on average than the proposed U-shaped rate system.

Hospice providers consist of FP, NP, and governmental entities. The FP segment within Medicare-certified hospice providers has steadily grown since 1995 (NHPCO 2008). As the number of FP providers grows this may lead to more hospice providers becoming publicly traded companies. Within the group of hospice agencies that are FP there are only five (14% of total providers) that are or were publicly traded during the time frame of this study. While this limits our ability to research corporate governance factors, it does present a unique research opportunity. In accounting research, publicly traded firms are often the focus of study because of the readily available data. In our research, the highly detailed Medicare Cost Report data allows an opportunity to analyze entities that are not

¹ www.hospiceblog.org/2006/05/skilled-nursing-hospice-care.html.

² <http://fraudblawg.wordpress.com/2009/05/12/criminal-medicare-hospice-fraud/>.

publicly traded and in which data is not normally obtainable. Therefore in our study, we analyze non-publicly traded companies that are organized as either NP or FP.

Contributions

This paper contributes to the current accounting literature by examining the hospice provider market segment under an Agency theory expectations model. We use a nationwide sample, and analyze the economic incentives between FP and NP providers and their implications for federal Medicare payment policy.

This research is timely with consideration to the current focus on healthcare policy debate at the national level. Hospice is a large industry that is integral to the public policy debate because its main funding source is federal tax dollars. This research also proposes patient care quality proxies. There are no widely accepted quality measures for hospice providers (CMS 2008a; MedPac 2009). This research seeks to offer a beginning development of patient quality of care proxies.

This research also contributes to the advancement of healthcare management practice by providing evidence of the differences in management performance between NP and FP hospice providers. It is important for managers to understand these entities are operated differently as they attempt to compete with each other within the same markets, and in a manner consistent with public policy constraints.

This paper is organized as follows. Section I discusses the related literature, variable definitions and hypotheses. Section II presents our sample, methodology and empirical results. Finally, Section III discusses the limitations, conclusions and future directions of this research.

LITERATURE

Hospice is a largely unexplored area in the accounting literature. Wallace (1987) provides an early discussion of some of the difficulties in adapting Agency theory to the NP and governmental sectors in general. She also addresses adapting Agency theory to the NP environment. Forgione (1999) then presents an adaptation of the Agency theory model to NP healthcare entities, and Steinberg (2008) provides a more recent and extensive theoretical development of the nuances of applying Agency theory to NP organizations. Following the work of Forgione, we apply the expectations of Agency theory to FP and NP hospice care providers.

Owners/Donors

Forgione (1999) discusses the economic agency relationships between managers, regulators, creditors and owners/donors. In FP hospice providers that are not publicly traded, the owners are simply the owners of the entity

and have a residual interest in the hospice's profits and net assets. Their economic objective is for the hospice to be profitable and increase the value of the owner's investment. NPs do not have owners *per se*. The analog to "owners" in the NP setting is the donors. Donors supply the equity capital and expect a return on their investment in the form of goodwill plus the present value of any related tax benefits attributable to their donation. They may be entitled to a seat on the Board of Directors. While their role is somewhat different from the Board of an FP entity (*i.e.*, not adversarial to management but rather helping in fundraising), they nonetheless seek to ensure that management invests the donated capital in the production of services which generate the desired goodwill. The goodwill gained may be in the form of name recognition associated with the community benefits provided, as well as indirect cash flow effects stemming from increased patronage of their other business interests. In an equilibrium market, the returns to the FP investor and to the NP donor will be equal, and the investor will be indifferent between buying a share of stock in an FP or making a donation to an NP (Conrad, 1984).

In the case of NP hospice providers, the Board of Directors, which may include the large donors or creditors, hires a manager to operate the entity. The manager is expected to have a priority interest in patient care, which is the objective of donors. We expect that because of the generally small size and closely held ownership among FP hospice care providers, the manager of the FP will often be the same person as the investor (*i.e.*, the proprietor, partner, or small corporation shareholder). The problem that is presented in Agency theory is that managers, owners, and creditors are each expected to pursue advancement of their own respective interests (Jensen and Meckling 1976).

Managers

With respect to profit sharing constraints, management compensation incentives differ between the NP and FP entities. While FP providers can pay profit based bonuses, under IRC §501(c)3 NP providers are generally not allowed to distribute profits as bonuses to top executives. In addition NPs are subject to reasonable compensation limits and there is no stock ownership or stock options. Paying excessive CEO compensation could be detrimental to patient quality of care if managers skimp on quality in order to enhance their own compensation. Medicare is interested in ensuring that the public's hospice benefit money is spent on high quality patient care services. Donors to the NPs want to know that their contributions are going toward direct patient care, rather than excessive administrative and fundraising costs or lavish executive perquisites.

Creditors

The creditor plays a very different role in NPs when compared to FPs. An FP creditor can exercise bond covenant constraints and can force an entity into involuntary bankruptcy through court proceedings. Creditors are not permitted to force an NP into involuntary bankruptcy. Also, there is no person who is personally legally liable for the debts of an NP. Thus, NPs are generally required to carry sufficient indemnity policy coverage, which imposes a form of substitute Agency cost on the NP. Typically, FP providers consist of smaller entities in which the creditors can hold the owner personally liable for the debts of the entity.

Regulators

The primary regulator that we address in this research is the federal Medicare program, which operates under the US Department of Health and Human Services (DHHS) and is subject to provider investigations conducted by the DHHS Office of Inspector General (OIG). As a regulator, Medicare is ostensibly concerned with protecting the public beneficiary's interests and can constrain or impose sanctions on the hospice's managers. Medicare and the OIG can impose criminal penalties, civil money penalties, and program expulsion penalties against both FP and NP entities for operating contrary to the public interest. It is also important to note that NPs must operate in compliance with the requirements for their tax-exempt status under the Internal Revenue Service (IRS) code and are subject to IRS audit. The IRS can revoke tax exempt status, impose reasonable compensation limits, and limit the level of unrelated business activity in which the NP can engage. All hospices are also subject to monitoring by state healthcare regulators, revenue departments and attorney's general. The State attorneys general monitor NPs to ensure they fulfill community benefit obligations as an NP incorporated in their state, and hold NP Board members accountable for carrying out their fiduciary responsibilities. These economic factors are identified as political cost constraints.

Management Performance

Managers have two classes of decisions they make—accounting choices and real-valued choices. The real-valued choices consist of financing, investing and operating decisions. The accounting choices determine how the results of the real-valued choices get reported to external constituents—owners/donors, creditors, regulators and other stakeholders. McCue and Thompson (2005) performed a descriptive analysis that compared the operating and financial performance of hospices owned by publicly traded companies to private, FP hospices, and to NP hospices, within small and large size categories based on patient days. Our study extends their work by examining the

economic incentives between FP and NP entities based on the expectations of Agency theory. We use a continuous variable for size, rather than a discrete variable as in McCue and Thompson, and we exclude the small number of publicly traded hospice providers for improved comparability.

Huskamp *et al.* (2008) use patient-level data to explore the variation in hospice costs across patients. They find that average cost per day decreases as the length of hospice stay increases. This implies that lower average cost can be achieved by selectively admitting only the longer life prognosis patients. They identify possible changes to the Medicare per diem payment system that could address this issue—one of which is higher per diem rates for the first and lasts days of hospice services. Huskamp *et al.* call for replicating their findings using a broader hospice data set before attempting to implement changes in the per diem system. Our study responds to that request for research.

VARIABLE DEFINITIONS:

Gapenski, Vogel and Langeland-Orban (GVL) (1993) studied the determinants of profit using a sample of FP and NP hospitals in the State of Florida. The authors looked at 22 profitability determinants. We consider variables from this study that are salient and potentially useful in the hospice setting. This also offers the opportunity to address some of the differences between typical hospital research and our hospice research. Our study examines Medicare hospice providers throughout the United States, thus extending the scope of the single state sample of Florida hospitals examined by GVL.

GVL partitions the profitability variables into three³ categories as follows:

1. Organizational variables
 - a. Teaching status
 - b. Hospital size
 - c. Ownership
 - d. System status
2. Managerial variables
 - a. Age of plant
 - b. Debt utilization
 - c. Service index
 - d. Labor intensity
 - e. Nonoperating revenue
3. Patient-mix variables
 - a. Medicaid mix
 - b. Subacute care mix
 - c. Uncompensated care mix
 - d. Medicare mix
 - e. Case-mix index

³ I have intentionally excluded the market variables from GVL. The market variables are beyond the scope of this current study.

- f. Average length of stay
- g. Outpatient mix
- h. Intensive care mix
- i. Managed care mix

There are no hospices that are deemed to be teaching or non-teaching, therefore we do not use the GVL teaching status variable. The system status variable is a dummy control variable that denotes if the hospital is independent or part of a multi-hospital system. Our entire sample is made up of freestanding hospice providers, making this variable unnecessary. The age of plant variable from GVL, which is an asset-based calculation is not informative in the hospice care environment because of the substantial lack of assets of a service provider. In a later section we develop hospice appropriate variables in place of the service index and labor intensity variable used by GVL. The Medicaid mix, subacute care mix, uncompensated care mix, Medicare mix, case-mix index, outpatient mix, intensive care mix and managed care mix variables from GVL are not applicable to the hospice care providers in our study. Medicare is the most prevalent payer of the hospice benefit. In 2007, 87% of patient care days were paid by Medicare. Private insurance made up 4.8%, Medicaid made up 4.5% and 3.7% was paid by other sources (NHPCO 2008). In this study, we only examine Medicare certified providers. The non-Medicare payers are too small a portion of hospice benefits to consider in our study. However, we will use a variation of the GVL mix measures, discussed below, that is more applicable to hospice providers.

From the remaining GVL list above, we use the following categories to reclassify the variables consistent with the constructs of Agency theory, *i.e.*, profit sharing, debt covenant and political cost constraints, as well as real-valued financing, investing and operating variables.

Ownership (CNTRL)

The organizational variables from GVL that apply to our study are ownership and size. The ownership variable used by GVL is a dummy variable coded 0 for an NP hospital and 1 for an FP hospital. We use this same scheme for hospice providers. In our research, ownership is the left-hand-side variable in our regression analysis.

Size (LNREV)

GVL uses number of beds staffed and available at the end of the year to measure the size of a hospital. Hospices do not have beds. Typically hospice care is provided in the homes of the patients with temporary inpatient arrangements made only when necessary. While total assets is a commonly used size measure in the accounting literature, hospices are service providers with relative few assets. The number of patients served is an important size measure when comparing NP and FP providers because hospices are paid each day for each patient they serve. We

anticipate that FP providers admit a select number of patients with the longer expected life prognoses to attain greater revenues per patient. We include PATS in our descriptive statistics, but it could not be used in our regression analysis due to multicollinearity issues. We therefore use the natural log of revenue as the size metric. The size variable controls for both size effects and is used as a broad proxy for exposure to political cost constraints. We expect LNREV to be negatively associated with CTRL, due to selective patient admissions. That is, we expect FPs to serve fewer patients but have higher total revenue per patient.

Debt Measure (DEBT)

The managerial variable from GVL that we use is debt utilization, as a proxy for debt covenant constraints. Debt utilization was calculated by GVL by dividing total debt by total assets. We use this same calculation. Since NP entities are generally more dependent on debt financing for their operations, we expect debt to be negatively associated with CTRL.

Days of Service (DOS)

The only variable that we use from the GVL patient-mix variables is average length of stay, which we consider as an operating variable, referred to in hospices as days of service (DOS). Hospice providers track DOS and it has been suggested that FPs seek to increase their DOS per patient through admission strategies. We expect our findings to support prior research that FP providers have longer average DOS per patient than NP providers. Huskamp *et al.* (2008) found that average costs per day decreased as the duration of the hospice stay increased. We expect the same finding, that average DOS will be positively associated with CTRL.

Hospice Provider Revenue

As with hospitals, there is no limit to the types of diagnoses for hospice patients. Once a patient is admitted, the patients' situation and needs dictate the type of care required. The hospice provider cannot choose what type of services will be required by the patient. A hospice patient near the end of life (one month or less to live) may require more visits from the hospice registered nursing staff and more after-hours care than a patient who has several months yet to live. The types of care that a hospice provides include continuous home care (CHC), routine home care (RHC), inpatient respite care (INPRES) and general inpatient care (GENINP). These four types of care are the revenue sources for the hospice provider. Since each of these types of care is billed to Medicare by the day, we use them as operating variables in our study.

Continuous Home Care Days (CHC)

CHC is care that lasts from 8 to 24 hours a day in the patient's home. Although providers are reimbursed a higher per diem rate for CHC, it is more costly to provide staff in the home for this length of time. Thus, CHC can be profitable or unprofitable depending on the provider's wage rates, actual service time used, travel costs and other cost structure factors. For this reason, we do not have a directional expectation for CHC.

Routine Home Care Days (RHC)

RHC is for patients who are seen at home on a regular basis, but not necessarily every day. This is the most common type of hospice service. Medicare pays a lower per diem rate, but pays for every day even if the patient is not seen on a given day. Because we expect FP hospices to have fewer total patients, we expect RHC to be negatively associated with CTRL. That is, FPs bill for longer periods of time, but for fewer patients than NPs.

Inpatients Respite Care Days (INPRES)

INPRES is when the hospice patient is admitted into a hospital in order to provide a break, or respite, for the family caregivers at home. This is costly to the hospice provider because even though it gets paid for INPRES days, it must also reimburse the hospital for the inpatient days used by the patient. Therefore we expect that FP providers will seek to maximize profit by avoiding instances of INPRES billing days, and INPRES will be negatively associated with CTRL.

General Inpatient Care Days (GENINP)

GENINP occurs when the hospice patient is admitted to a hospital for injury, acute or chronic symptom management or pain control that cannot be managed in the home environment. In this case the patient is treated by the hospital or nursing home staff. The hospice still receives the daily RHC payments but does not have to incur any costs, since the patient's hospital care is paid separately by Medicare. FPs will therefore seek to maximize profit by increasing GENINP days and we expect GENINP to be positively associated with CTRL.

Patient Quality of Care Proxies

In this paper we propose proxy variables to control for differences in patient quality of care. The Centers for Medicare and Medicaid Services (CMS) reported that it did not believe sufficient information was available to establish national quality benchmarks for hospice (CMS 2008a). The MedPAC 2009 report states that developing standardized empirical quality measures for hospice presents unique challenges. The set of structural hospice characteristics that is correlated with quality of care is not clear cut. Process and outcome measures are scarce.

Nonetheless, since managers can reduce short term costs by scrimping on the quality of patient care, it is important to attempt to control for quality differences in any comparative analysis.

Once a given patient is admitted to the hospice, it has no control over the number of service days—which depends solely on how long the patient lives. The patient’s situation and needs will also dictate the types of care required. The hospice provider cannot choose what type of services will be required by the patient. But the hospice manager can choose the mix of personnel assigned to meet the patient’s needs. The three main categories of patient care personnel in a hospice are nurses, social workers, and home health aids. Within those categories, there can also be skill and wage level differences for the personnel that make a difference in both the cost and quality of care provided.

For a given set of patient needs, if all providers are similarly efficient in terms of personnel mix and wage rates, then the percentages of cost devoted to each of the three personnel categories should be similar across providers. Any provider that has a lower proportion of cost devoted to, *e.g.* nursing care, and a higher offsetting proportion of cost devoted to, *e.g.* home-health aides, will of necessity be providing lower quality of care by virtue of the lower skill level of the workers. In this study, we include a variable to control for differences in efficiency across providers. We then compare the patient need attributes of the FP and NP hospice types, and observe, for similar patient needs, whether the personnel cost proportions differ significantly.

Nursing Salaries (NURSE)

Nursing salaries is the single largest cost category in a hospice. O’Neill *et al.* (2008) finds that FP hospice entities provide less registered nurse care as a percentage of total nursing care. That means FPs seek to maximize profit by substituting lower-cost, lower skill licensed vocational nurses in place of higher-cost, higher skill registered nurses. After controlling for efficiency, this can be interpreted as lower quality of patient care in FPs. Our NURSE variable is calculated as nursing salaries divided by (total expenses less CEO salary). We expect NURSE to be negatively associated with CTRL.

Social Worker Salaries (SW)

The SW variable is calculated as social worker salaries divided by (total expenses less CEO salary). Since social workers are relatively high cost personnel compared to home health aides, we expect FPs will seek to maximize profit by using less social workers, and SW will be negatively associated with CTRL.

Home-Health Aid Salaries (HHA)

The HHA variable is calculated as home-health aid salaries divided by (total expenses less CEO salary). Since home health aides are the lowest cost patient care personnel in a hospice we expect FPs will seek maximize profit by using more home health aides, and HHA will be positively associated with CTRL.

CEO Compensation (CEO)

In addition to the patient care proxies, we also examine CEO compensation, which is a proxy for the profit sharing constraint in Agency theory. The CEO variable is calculated by dividing CEO salary by (total expenses less CEO salary). Due to the reasonable compensation limitations and lack of profit sharing arrangements in NPs, we expect FP hospice executives will have higher compensation than NP executives, and CEO will be positively associated with CTRL.

Profit Measure (PROFIT)

Since small FP hospices may be proprietorships and allocate profits between CEO compensation and net income for tax planning purposes, we also calculate the variable PROFIT as (Net Income plus CEO compensation) divided by the number of patients. This variable measures the total profit earned per patient regardless of how it is attributed. Similar to CEO, we expect PROFIT to be positively associated with CTRL.

Return on Equity (ROE)

Return on equity is a common profitability measure used in the accounting literature. Valvona and Sloan (1988) used return on equity in their study. We will use the same calculation as Valvona and Sloan which is (total revenue – total expenses) / net fund balance. ROE is classified as a profit sharing variable in this study. Since ROE is a typical criterion used to evaluate FP managerial performance, we expect ROE to be positively associated with CTRL.

Efficiency Measure (INEFF)

Greater efficiency is a primary economic argument in support of FP organizational performance compared to NP organizations. FP organizations will tend to operate at a volume level where marginal revenue equals marginal cost and profit is maximized. On the other hand, because of the non-distribution constraint, NP organizations will tend to operate at the higher volume level where total revenue equals total cost (or even where total revenue is less than total cost, as a means of signaling a need for more resources) where patient service volume and hence the related goodwill production is maximized. This means NPs will generally have higher marginal cost than FPs. Cost-efficiency differences may also be coincident with quality of care differences. We therefore include this variable to

control for differences in efficiency between entities. We calculate INEFF as (total expenses less CEO salary) divided by total patient days. We expect our INEFF variable to be negatively associated with CTRL (lower value means more efficient).

Location Measure (URBAN)

Medicare pays hospice providers per diem rates that are adjusted for the provider's geographic location. Urban providers receive a higher per diem rate than the rural providers. We will use a dummy variable coded as 1 if the provider is classified as urban by Medicare and 0 if the provider is classified as rural. We use URBAN as a control variable in our regression analysis. FP providers frequently locate in urban areas because of the greater availability of patients and the higher payment rates. We thus expect URBAN to be positively associated with CTRL.

Accounting Choices

We use the Medicare Hospice Cost Reports as our primary data source, as discussed below. Medicare requires audited financial statements be filed with the cost report. The information filed in the cost report must be consistent with the audited financial statements. The cost report must also comply with Medicare reporting rules and is subject to Medicare audit and OIG investigation. This provides a certain amount of control for the accounting choices of management within all of the hospices we examine.

HYPOTHESES

Our research hypotheses are as follows:

- H₁: *The number of patient days of stay will be negatively (positively) associated with FP (NP) form of entity.*
- H₂: *The quality of patient care proxies will be associated with form of entity.*
 - H_{2a}: *The proportion of Nursing salaries will be negatively (positively) associated with FP (NP) form of entity.*
 - H_{2b}: *The proportion of Social worker salaries will be negatively (positively) associated with FP (NP) form of entity.*
 - H_{2c}: *The proportion of Home-Health Aide salaries will be positively (negatively) associated with FP (NP) form of entity.*
- H₃: *The CEO compensation variables will be associated with form of entity.*
 - H_{3a}: *The proportion of CEO salary will be positively (negatively) associated with FP (NP) form of entity.*
 - H_{3b}: *The combined CEO salary and profit, per patient, will be positively (negatively) associated with FP (NP) form of entity.*

DATA

We use the Medicare Hospice Cost Report data set, which includes Medicare certified hospice providers that filed a cost report in the years 1999–2007. This data set is much more representative of hospice providers across the United States than has been used in prior research. Our initial data consisted of a total of 11,349 hospice-year observations. We deleted the publicly traded hospice providers from the sample, which eliminated 1,028 observations. We then deleted all of the governmental hospice providers, which eliminated another 283 observations. Another 2,780 observations were deleted due to missing or out of range values.

Our net sample is 7,258 observations of 1,809 hospice care providers for the years 1999 through 2007. Table 1 presents the number of rural and urban NP and FP providers. Descriptive statistics for the entire data set are presented in Table 2. Table 3, Panel A, presents the descriptive statistics for the FP entities and Panel B contains the descriptive statistics for the NP entities. Our net sample consists of 1,166 FP providers and 643 NP providers.

Please place Tables 1, 2, & 3 About Here

It is interesting to note that our sample proportions differ somewhat from the statistics reported by NHPCO (2008). Our sample consists of 64.5% FP entities and 35.5% NP entities, whereas NHPCO reported 47.1% FP and 48.6% NP providers in their 2008 report for the year 2007. It is important to note the reasons for the difference are most likely that NHPCOs report reflects its associate membership rather than all hospice care providers and our sample includes only Medicare certified hospice providers. Our data does support the MedPAC (2009) finding of an increasing percentage of FP providers over the time period of our study.

We included PATS, which is a measure of the number of patients served by the Hospice provider, in the descriptive statistics because it demonstrates the difference in number of patients served by the two types of entities. FP providers tend to serve fewer patients than NP: 305 vs. 655, respectively. This may indicate greater patient selectivity and is consistent with our H_1 . Importantly, the median proportions of patient care needs are nearly identical in all categories for FP and NP hospices, as presented in Table 4. This will lend greater reliability to our quality of care comparisons. It is notable that RHC makes up about 95% of the patient care needs in both types of entities.

Please place Table 4 About Here

Table 5 presents the correlation matrix for the variables used in our regression analysis. The Pearson correlation coefficients are reported above the diagonal and the Spearman correlations are reported below the diagonal. Only

RHC had a high positive correlation with LNREV (Pearson = 0.542, Spearman = 0.893) and with GENINP (Pearson = 0.661). The variance inflation factors (VIFs) are presented in Table 5, Panel Band indicate that multicollinearity is not an issue among our regression variables. The highest value is only 2.315, for RHC.

Please place Table 5 About Here

MODEL

Our logistic regression model is stated as follows:

$$\text{CNTRL} = \beta_1 \text{LNREV} + \beta_2 \text{DEBT} + \beta_3 \text{DOS} + \beta_4 \text{CHC} + \beta_5 \text{RHC} + \beta_6 \text{INPRES} + \beta_7 \text{GENINP} + \beta_8 \text{NURSE} + \beta_9 \text{SW} + \beta_{10} \text{HHA} + \beta_{11} \text{CEO} + \beta_{12} \text{PROFIT} + \beta_{13} \text{ROE} + \beta_{14} \text{INEFF} + \beta_{15} \text{URBAN} + \varepsilon$$

CNTRL	=	dummy variable coded as 0 if NP and 1 if FP
LNREV	=	log revenue
DEBT	=	total debt / total assets
DOS	=	average days of service: days of service / number of patients
CHC	=	continuous home care—number of days the patient is at home and receives 8–24 hours of predominantly nursing care
RHC	=	routine home care—number of days the patient is at home and not receiving CHC
INPRES	=	inpatient respite care—number of days the patient receives care in an inpatient facility for respite
GENINP	=	general inpatient care—number of days the patient receives care in an inpatient facility for injury, acute or chronic symptom management or pain control
NURSE	=	nursing salaries / (total expenses – CEO salary)
SW	=	social worker salaries / (total expenses – CEO salary)
HHA	=	home-health aide salaries / (total expenses – CEO salary)
CEO	=	CEO salary / (total expenses – CEO salary)
PROFIT	=	(CEO salary + Net Income) / number of patients
ROE	=	(total revenue – total expenses) / fund balance
INEFF	=	(total expenses – CEO salary) / total number of patient days
URBAN	=	dummy variable coded 0 for rural and 1 for urban

RESULTS

Our logistic regression results are presented in Table 6. The R^2 for the model is 28.8%. The effect of INEFF is in the predicted direction and just short significance at the 10% level ($p \# 0.111$). This suggests that FP hospice providers are more cost-efficient than NPs. As expected, after controlling for efficiency, our three patient quality of care proxies are all highly significant ($p \# 0.01$) and in the predicted direction. This supports our hypotheses H_{2a} , H_{2b} , and H_{2c} . This is consistent with the notion that FP entities substitute lower-skill and lower-cost home-health aides in place of registered nurses or social workers, thus lowering both cost and quality of care. This finding supports the finding of O'Neill *et al.* (2008), that FPs provide less registered nurse care.

Please place Table 6 About Here

As expected, both CEO and PROFIT are significant ($p \neq 0.01$) and in the predicted direction, indicating that CEO compensation is higher in FP entities. This finding is consistent with NP reasonable compensation limits and FP extraction of surplus from the entity. This supports our hypotheses H_{3a} and H_{3b}.

The negative significant coefficient on LNREV ($p \neq 0.01$) confirms that FPs do generate less total revenue than NP providers. Furthermore, the positive significant coefficient on the DOS ($p \neq 0.01$) variable also confirms that, as expected, FPs have longer average days of service per patient than the NP entities. Taken in combination, this supports the notion that FPs selectively admit a smaller number of patients and favor those with a longer life prognosis and more billable days. A hospice does not provide treatment of illness and cannot control the patients' remaining lifespan. The primary means of achieving longer average DOS is strategic selectivity in the patient recruitment and admission process. This is consistent with Lindrooth and Weisbrod (2007), who found that Medicare per diem payment rates encourage hospice providers to selectively admit patients with longer expected life prognosis. Our results support the idea that FPs "cherry pick" patients in order to maximize profitability. This evidence is relevant to Medicare, as national healthcare reforms focus in increasing coverage of more patients while lowering total cost per patient to the taxpayer. Medicare certified providers are required to provide care to all Medicare patients and not systematically avoid care to a patient based on health status.

ROE is not significant in our regression. This indicates that ROE does not meaningfully distinguish between FP and NP hospices. DEBT is significant but in an unexpected positive direction ($p \neq 0.01$). This indicates that FPs leverage their earnings more than the NPs. This could be due to lenders being hesitant to take a risk on NP entities since they cannot force involuntary bankruptcy and no individual is liable for the creditor claims.

RHC is significant and in the predicted direction ($p \neq 0.01$). This is consistent with the finding of negative LNREV (size) above. FP providers care for fewer, selectively admitted patients. CHC, INPRES and GENINP are all not significantly different between the FP and NP hospice providers. This is consistent with Table 4 above and confirms that the mix of patient service needs is substantially the same for both types of providers. This again supports the notion that, after controlling for efficiency differences, the use of lower-skill workers indicates lower quality of care in FP hospices.

As expected, the results for URBAN were significant and in the predicted direction ($p \neq 0.01$). This confirms that FP entities locate more frequently in urban areas than NPs. The finding for also supports the notion that FPs locate in areas where they have the opportunity to be more selective in accepting patients.

Table 7 used median raw data values to provide an illustration of how FPs serve fewer patients for longer days of service and earn higher profit.

Please place Table 7 About Here

LIMITATIONS

While most hospice entities are Medicare certified, about 7% of hospice providers are not certified. We limited our study to only Medicare certified providers for comparability purposes and data availability. Thus, our study may not generalize to the 7% non-certified hospice providers.

This study also considers only freestanding hospice providers. Thus our results may not generalize to home health agency-based, hospital-based, or skilled nursing facility-based hospice providers. Again, this limitation is due to the necessity that the data be available and comparable.

CONCLUSIONS

This paper contributes to the literature by providing additional information on the effects of financial incentives as identified by Agency theory within the population of hospice care providers. In addition the research provided proposed quality of patient care proxies for the hospice industry. Our findings indicate that FP hospice providers locate in highly populated urban areas where they selectively admit patients with longer life prognosis. After controlling for both patient health needs and cost-efficiency, the FP hospices use a significantly lower-skill mix of workers, suggesting lower quality of care. They more highly leverage earnings and extract the profits in the form of higher CEO salary and net income.

The NP providers tend to locate in less populated rural areas and serve more patients with shorter (and more costly) life prognoses. They use a significantly higher-skill mix of health workers, are less leveraged and have lower CEO compensation. With respect to informing national public policy debate on healthcare, our findings indicate that while the profit incentive attracts more providers into this growing and underserved market, their admission of fewer patients with greater revenue capacity, in combination with extraction of profit, also raises the average cost per patient for the taxpayers.

FUTURE DIRECTIONS

This research leaves many opportunities for future research. The methods by which FP providers are able to recruit and select patients with longer life prognosis is an important topic to research with respect to informing public policy reforms. Another avenue of future research is to examine the 7% of hospice providers that are not Medicare Certified facilities as well as the non-freestanding hospices, to determine if our results are generalizable across the different populations. The FP publically traded entities would be another group of providers to analyze compared to the sample in this paper, particularly with respect to how corporate governance issues affect managerial choices. Further refinement and tests of our efficiency and quality of patient care proxies is also important, and can be pursued as better data may become available.

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**TABLE 1:
BREAKDOWN OF URBAN VARIABLE**

<i>Variable</i>	<i>FP</i>	<i>%</i>	<i>NP</i>	<i>%</i>	<i>Total</i>	<i>%</i>
URBAN	906	77.7%	425	66.1%	1,331	73.6%
RURAL	260	22.3%	218	33.9%	478	26.4%
Total	1,166	100.0%	643	100.0%	1,809	100.0%

TABLE 2
DESCRIPTIVE STATISTICS FOR ENTIRE SAMPLE
(N = 7,258)

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>
PATS	473.0	772.0	1.0	248.0	13,259.0
LNREV	14.5	1.5	0.0	14.6	20.0
DEBT	38.8%	46.4%	0.0%	38.8%	19.4%
DOS	66.2	32.5	1.0	59.0	531.0
CHC	464.4	1,970.6	1.0	464.4	61,045.0
RHC	26,593.3	43,006.3	3.0	15,425.0	899,866.0
INPRES	83.9	277.6	1.0	72.0	11,339.0
GENINP	1,085.3	2,579.0	1.0	303.5	43,939.0
NURSE	18.5%	5.3%	0.0%	18.5%	64.0%
SW	4.2%	1.9%	0.0%	4.2%	58.3%
HHA	5.9%	2.8%	0.0%	5.9%	55.1%
CEO	6.9%	16.8%	0.0%	6.9%	12.5%
PROFIT	1,654.4	8,662.0	-48,148.0	1,654.4	527,313.7
ROE	118.4%	1,232.4%	-13,036.5%	31.8%	59,547.2%
INEFF	146.7	190.8	8.1	146.7	11,171.5

Note:

PATS number of patients, **LNREV** log revenue, **DEBT** total debt / total assets, **DOS** days of service / number of patients, **CHC** continuous home care—number of days the patient is at home and receives 8–24 hours of predominantly nursing care, **RHC** routine home care—number of days the patient is at home and not receiving CHC, **INPRES** inpatient respite care—number of days the patient receives care in an inpatient facility for respite, **GENINP** general inpatient care—number of days the patient receives care in an inpatient facility for injury, acute or chronic symptom management or pain control, **NURSE** nursing salaries / (total expenses – CEO salary), **SW** social worker salaries / (total expenses – CEO salary), **HHA** home-health aide salaries / (total expenses – CEO salary), **CEO** CEO salary / (total expenses – CEO salary), **PROFIT** (CEO salary + Net Income) / number of patients, **ROE** (total revenue – total expenses) / fund balance, **INEFF** (total expenses – CEO salary) / total number of patient days.

TABLE 3
DESCRIPTIVE STATISTICS FOR FP AND NP SAMPLES

PANEL A: FP SAMPLE (N = 3,781)

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>
PATS	305.0	384.0	1.0	181.0	3,842.0
LNREV	14.3	1.5	0.0	14.4	18.2
DEBT	47.6%	59.8%	0.0%	38.8%	19.4%
DOS	76.4	35.8	3.0	71.0	531.0
CHC	451.6	1,978.6	1.0	288.0	48,657.0
RHC	21,114.9	25,903.7	3.0	13,735.0	360,538.0
INPRES	76.0	301.1	1.0	83.0	11,339.0
GENINP	788.5	1,806.0	1.0	260.0	43,939.0
NURSE	17.9%	5.6%	0.0%	18.5%	64.0%
SW	4.1%	2.1%	0.0%	4.2%	58.3%
HHA	6.3%	3.1%	0.0%	5.9%	55.1%
CEO	8.5%	22.8%	0.0%	6.9%	12.5%
PROFIT	1,909.4	8,014.3	-48,148.0	1,654.4	288,422.7
ROE	153.9%	1,374.9%	-13,036.4%	74.4%	49,904.8%
INEFF	139.0	119.5	8.1	146.7	4,682.7

PANEL B: NP SAMPLE (N = 3,477)

<i>Variable</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>
PATS	655.0	1,009.9	2.0	333.0	13,259.0
LNREV	14.7	1.4	0.0	14.7	20.0
DEBT	29.3%	21.1%	0.0%	28.9%	260.7%
DOS	55.2	24.1	1.0	51.0	404.0
CHC	478.2	1,962.1	1.0	464.3	61,045.0
RHC	32,550.7	55,349.1	4.0	17,636.0	899,866.0
INPRES	92.4	249.3	1.0	65.0	10,363.0
GENINP	1,408.0	3,184.2	1.0	340.0	34,008.0
NURSE	19.1%	4.9%	0.0%	18.5%	44.8%
SW	4.2%	1.7%	0.0%	4.2%	16.3%
HHA	5.3%	2.4%	0.0%	5.9%	25.1%
CEO	5.2%	4.7%	0.0%	4.8%	79.3%
PROFIT	1,377.1	9,310.3	-9784.6	1,287.0	527,313.7
ROE	79.9%	1,054.7%	-5,284.4%	15.1%	59,547.2%
INEFF	155.0	245.6	23.4	146.7	11,171.5

Note:

FP for-profit, **NP** nonprofit, **PATS** number of patients, **LNREV** log revenue, **DEBT** total debt / total assets, **DOS** days of service / number of patients, **CHC** continuous home care—number of days the patient is at home and receives 8–24 hours of predominantly nursing care, **RHC** routine home care—number of days the patient is at home and not receiving CHC, **INPRES** inpatient respite care—number of days the patient receives care in an inpatient facility for respite, **GENINP** general inpatient care—number of days the patient receives care in an inpatient facility for injury or acute chronic symptom management or pain control, **NURSE** nursing salaries / (total expenses – CEO salary), **SW** social worker salaries / (total expenses – CEO salary), **HHA** home-health aide salaries / (total expenses – CEO salary), **CEO** CEO salary / (total expenses – CEO salary), **PROFIT** (CEO salary + Net Income) / number of patients, **ROE** (total revenue – total expenses) / fund balance, **INEFF** (total expenses – CEO salary) / total number of patient days.

TABLE 4
MEDIAN PATIENT CARE NEEDS

<i>Care Type</i>	<i>FP</i>	<i>%</i>	<i>NP</i>	<i>%</i>
CHC Days	288	2.0%	464	2.5%
RHC Days	13,735	95.6%	17,636	95.3%
INPRES P Days	83	0.6%	65	0.4%
GENINP Days	260	1.8%	340	1.8%
Total	14,366	100.0%	18,505	100.0%

ABLE 5
CORRELATION AND VIF TABLES

PANEL A: CORRELATIONS FOR REGRESSION VARIABLES (SPEARMAN \ PEARSON)

	<i>CNTRL</i>	<i>LNREV</i>	<i>DEBT</i>	<i>DOS</i>	<i>CHC</i>	<i>RHC</i>	<i>INPRES</i>	<i>GENINP</i>	<i>NURSE</i>	<i>SW</i>	<i>HHA</i>	<i>CEO</i>	<i>PROFIT</i>	<i>ROE</i>	<i>EFF</i>	<i>URBAN</i>
<i>CNTRL</i>		-.159	.197	.327	-.007	-.133	-.030	-.120	-.111	-.042	.180	.100	.031	.030	-.042	.145
<i>LNREV</i>	-.160		-.076	.052	.056	.542	.103	.332	-.013	-.068	.005	-.126	.056	.021	.006	.227
<i>DEBT</i>	.296	-.013		.097	-.005	-.016	-.006	-.009	-.026	-.021	.024	.030	-.008	.088	.012	.032
<i>DOS</i>	.363	.055	.124		.035	.031	.001	-.050	-.104	-.041	.190	.040	.034	.044	-.113	-.048
<i>CHC</i>	-.036	-.047	-.038	-.063		.125	.099	.114	-.019	-.007	.005	.010	-.000	.033	-.009	.036
<i>RHC</i>	-.140	.893	-.035	.155	-.060		.199	.661	.009	-.043	-.019	-.077	-.019	-.011	-.019	.192
<i>INPRES</i>	-.043	.145	.009	.009	.103	.165		.150	.013	-.014	.027	-.014	-.005	.012	-.001	.054
<i>GENINP</i>	-.083	.253	.023	-.090	.110	.242	.281		.022	-.069	-.019	-.045	-.016	-.009	.011	.128
<i>NURSE</i>	-.120	.014	-.065	-.129	-.017	.020	.029	.009		.186	.057	.027	.022	-.006	-.090	-.020
<i>SW</i>	-.060	-.064	-.041	-.076	-.019	-.059	-.046	-.086	.223		-.019	.309	-.010	-.007	-.076	-.000
<i>HHA</i>	.227	.010	.061	.243	-.033	.008	.007	-.014	.074	.044		.053	.030	.020	-.088	-.003
<i>CEO</i>	.266	-.417	.088	.126	.026	-.413	-.051	-.120	.065	.119	.209		.020	.022	-.036	-.020
<i>PROFIT</i>	.239	.033	.016	.330	.013	-.024	-.001	-.029	-.064	-.010	.219	.333		.022	.463	.029
<i>ROE</i>	.218	.060	.199	.180	-.023	.022	.020	.024	-.029	-.006	.102	.103	.347		-.013	-.005
<i>EFF</i>	-.154	.126	.049	-.301	-.004	-.010	.007	.103	-.096	-.058	-.201	-.120	-.114	-.064		-.007
<i>URBAN</i>	.145	.288	.108	-.033	.033	.284	.075	.112	-.018	.003	.034	-.096	-.010	.061	.071	

PANEL B: VIFs FOR REGRESSION VARIABLES

<i>Variable</i>	<i>VIF</i>	<i>Variable</i>	<i>VIF</i>	<i>Variable</i>	<i>VIF</i>
<i>LNREV</i>	1.497	<i>INPRES</i>	1.050	<i>CEO</i>	1.130
<i>DEBT</i>	1.030	<i>GENINP</i>	1.810	<i>PROFIT</i>	1.311
<i>DOS</i>	1.106	<i>NURSE</i>	1.070	<i>ROE</i>	1.013
<i>CHC</i>	1.027	<i>SW</i>	1.158	<i>EFF</i>	1.340
<i>RHC</i>	2.315	<i>HHA</i>	1.055	<i>URBAN</i>	1.073

VIF variance inflation factor, **CNTRL** dummy variable coded as 0 if NP and 1 if FP, **LNREV** log revenue, **DEBT** total debt / total assets, **DOS** days of service / number of patients, **CHC** continuous home care—number of days the patient is at home and receives 8–24 hours of predominantly nursing care, **RHC** routine home care—number of days the patient is at home and not receiving CHC, **INPRES** inpatient respite care—number of days the patient receives care in an inpatient facility for respite, **GENINP** general inpatient care—number of days the patient receives care in an inpatient facility for injury, acute or chronic symptom management or pain control, **NURSE** nursing salaries / (total expenses – CEO Salary), **SW** social worker salaries / (total expenses – CEO Salary), **HHA** home-health aide salaries / (total expenses – CEO Salary), **CEO** CEO salary / (total expenses – CEO salary), **PROFIT** (CEO salary + Net Income) / number of patients, **ROE** (total revenue – total expenses) / fund balance, **INEFF** (total expenses – CEO salary) / total number of patient days, **URBAN** dummy variable coded 0 for rural and 1 for urban.

TABLE 6
LOGISTIC REGRESSION RESULTS

$$\text{CNTRL} = \beta_1 \text{LNREV} + \beta_2 \text{DEBT} + \beta_3 \text{DOS} + \beta_4 \text{CHC} + \beta_5 \text{RHC} + \beta_6 \text{INPRES P} + \beta_7 \text{GENINP} + \beta_8 \text{NURSE} + \beta_9 \text{SW} + \beta_{10} \text{HHA} + \beta_{11} \text{CEO} + \beta_{12} \text{PROFIT} + \beta_{13} \text{ROE} + \beta_{14} \text{INEFF} + \beta_{15} \text{URBAN} + \varepsilon$$

$R^2 = 28.8\%$
 $N = 7,258$

<i>Variable</i>	<i>Expectation</i>	<i>Coeff.</i>	<i>Std. Error</i>	<i>Pr. > χ^2</i>
Intercept		- 0.250	0.452	0.580
LNREV	-	- 0.217*	0.030	# 0.000
DEBT	-	2.448*	0.125	# 0.000
DOS	+	0.029*	0.001	# 0.000
CHC	?	- 0.000	0.000	0.585
RHC	-	- 0.000*	0.000	# 0.000
INPRES P	-	- 0.000	0.000	0.664
GENINP	+	- 0.000	0.000	0.497
NURSE	-	- 3.663*	0.589	# 0.000
SW	-	- 5.198*	1.664	0.002
HHA	+	10.212*	1.220	# 0.000
CEO	+	6.696*	0.695	# 0.000
PROFIT	+	0.000*	0.000	0.004
ROE	+	- 0.004	0.003	0.169
INEFF	-	- 0.000	0.000	0.111
URBAN	+	1.190*	0.069	# 0.000

CNTRL dummy variable coded as 0 if NP and 1 if FP, LNREV log revenue, DEBT total debt / total assets, DOS days of service / number of patients, CHC continuous home care—number of days the patient is at home and receives 8–24 hours of predominantly nursing care, RHC routine home care—number of days the patient is at home and not receiving CHC, INPRES P inpatient respite care—number of days the patient receives care in an inpatient facility for respite, GENINP general inpatient care—number of days the patient receives care in an inpatient facility for injury, acute or chronic symptom management or pain control, NURSE nursing salaries / (total expenses – CEO Salary), SW social worker salaries / (total expenses – CEO Salary), HHA home-health aide salaries / (total expenses – CEO Salary), CEO CEO salary / (total expenses – CEO salary), PROFIT (CEO salary + Net Income) / number of patients, ROE (total revenue – total expenses) / fund balance, INEFF (total expenses – CEO salary) / total number of patient days, URBAN dummy variable coded 0 for rural and 1 for urban.

TABLE 7
COMPARISON OF MEDIAN FP AND NP
REVENUE AND COST STRUCTURES

<i>Variable</i>	<i>FP</i>	<i>NP</i>	<i>FP / NP</i>
Number of Patients	181	333	54.4%
Average DOS per Patient	71	51	139.2%
Total Revenues	1,804,669	2,460,202	73.4%
Total Expenses	1,520,403	2,406,218	63.2%
Net Income	284,266	53,984	526.6%
Revenue per Patient	9,971	7,388	135.0%
CEO Comp. + NI, per Patient	1,277	586	217.9%