The Influence of Ownership on Hospital Financial Performance Strategies

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Abstract

This paper analyzes the effects of hospital ownership on three specific strategies to improve financial performance. These strategies include (1) spending on advertising to increase revenues through increased market share and premium prices; (2) spending on accounting systems to cut costs, increase accounts receivable collections, or increase legitimacy with stakeholders and donors; and (3) improving efficiency through professional administration. We analyze California hospital expenditures on advertising, accounting, and administration for the period 1998 to 2000 to determine differences in these strategies across ownership type. We also examine the relationships among these expenditures and revenues and excess income margins. We find differences in strategies by ownership, i.e., for-profit hospitals emphasize advertising whereas government hospitals emphasize accounting. We also find that expenditures on advertising, accounting, and administration are positively related to margins for some hospitals.
1. Introduction

Researchers in economics, accounting, and management have extensively studied the effects of ownership type on firm behavior and performance (for example, Duggan 2000, Deneffe and Masson 2002), especially the convergence and divergence in the behavior of nonprofit and for-profit organizations. Glaeser (2001) suggests that behavior converges when commercialism increases in nonprofits as a response to declining rents and a rise in returns to commercialism. However, because of differences in managerial philosophy and style across nonprofit firms, there may be wide variance in the types of commercial behavior exhibited by these firms. Eldenburg et al. (2003) find that hospitals of different ownership types value different aspects of hospital performance. We contribute to this stream of research by analyzing the effects of hospital ownership on strategies pursued by hospitals to improve financial performance.

We examine three specific strategies that hospitals follow to improve their financial performance. First hospitals invest in advertising, and thereby increase their revenue via increased market share or premium prices. Second, they use elaborate accounting systems as a way to cut costs, increase accounts receivable collections, or increase their legitimacy with stakeholders and donors. Finally, hospitals improve their efficiency through professional administration.

We develop arguments about the emphasis that hospitals of different ownership place on these financial performance improvement strategies. For example, for-profit and non-profit hospitals are likely to provide incentives for managers to invest in advertising to increase market share. Furthermore, advertising is likely to yield significant gains in these hospitals by attracting profitable patients. Government and district hospitals on the
other hand, may focus on cost containment and maintaining their legitimacy with stakeholders and therefore invest in accounting resources but limit discretionary expenditures on advertising. These hospitals are closely monitored by the community and by taxpayers, and advertising is likely to be perceived as non-essential. Furthermore, these hospitals are often located in poorer areas and advertising could attract more indigent and uninsured patients. Although we examine the effects of these expenditures on hospital margins, we make no predictions about the success of these strategies.

We conduct our empirical analysis using hospitals located in the state of California during the period 1998 to 2000. We partition our sample into five different ownership types: for-profit, other nonprofit,\(^1\) church owned, government owned, and district hospitals. We perform T-tests of mean differences (by ownership type) in expenditures on advertising, accounting, and administration. We also use regression analysis to determine the effects of these expenditures on revenues and excess income margins (operating plus non-operating income divided by operating plus non-operating net revenues).

We find significant differences in expenditures per patient on advertising, accounting, and administration among ownership types. For-profit and other nonprofit hospitals spend significantly more than other hospitals on advertising. Government and district hospitals spend significantly less on advertising, but instead spend more on accounting. For-profits spend the most on administration, while church owned hospitals spend the least.

\(^1\) We use other nonprofit to refer to those nonprofit hospitals that are not owned by churches, districts, or governments.
To examine the efficacy of each of three strategies (advertising, accounting, and administration) in improving revenues and margins, we perform regression analysis using revenue per patient and excess income margin as dependent variables. We model each variable as a function of advertising, accounting, administrative expenditures per patient, and a set of control variables. When we analyze revenues, we find that other nonprofit hospitals appear to be most successful in generating revenues through expenditures on advertising, accounting, and administration. We speculate that in other nonprofit hospitals, increases in advertising expenditures increase revenues via increased market share and/or premium prices, increases in accounting expenditures increase revenue via better collections, and increases in administration expenses increase revenue through better management of product lines. We also find a significantly positive relation between excess income margins and advertising expenditures for these hospitals, suggesting a favorable cost-benefit tradeoff for investments in advertising.

In for-profit hospitals, expenditures on administration are associated with greater revenues. However, there is a negative association between excess income margins and expenditures on administration and accounting. This suggests that these expenditures increase costs to a greater extent than they increase revenues. Thus, for-profit hospitals appear to be ineffective in their use of accounting and administration resources to improve profitability. For church owned hospitals, advertising and administration are associated with both increased revenues and margins, suggesting that church hospitals efficiently use these resources. District hospitals also appear to use administration resources inefficiently: expenditures in administration are negatively associated with revenues and margins. In government hospitals, investments in advertising appear to
attract more uninsured patients because there is a negative relation between revenues and advertising expenditures. However, their investments in accounting are associated with greater profitability.

This research contributes to the management accounting and economics literature by examining the influence of ownership on strategic expenditures, particularly for accounting and administration. For example, Hill (2000) finds differences across ownership in the adoption rates of more sophisticated accounting systems, with nonprofit hospitals adopting new systems more frequently than government or for-profit hospitals.2 Brickley and Van Horn (2002) find that both CEO turnover and compensation are significantly related to financial performance (return on assets) in nonprofit hospitals. Lambert and Larcker (1995) find that hospitals more adversely affected by Medicare’s Prospective Payment System provided administrators more incentives to improve performance. Roomkin and Weisbrod (1999) find that top management in for-profit hospitals receives higher compensation that includes a larger portion of incentive based compensation than do top managers in nonprofits. Eldenburg and Krishnan (2003) find that district hospitals tend to pay CEOs less and exhibit poorer operating performance than a matched sample of nonprofit hospitals. We contribute to this literature by partitioning our hospital sample more finely on ownership type to examine differences in their strategies, and their effectiveness with these strategies.

From a healthcare research perspective, we add to the stream of literature that analyzes hospitals’ advertising practices, and the effects of ownership on advertising and administration (for example Palmeri and Ewing 1993; Barro and Chu 2002). We also

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2 Hill’s measure of sophistication reflects survey responses about the ability of hospital cost accounting systems to identify costs at the procedure level and then aggregate and analyze cost information by DRG.
contribute to research that analyzes the roles of for-profits and non-profits in health care
(See Needleman 2001 for a summary of this literature.) Whereas prior healthcare
research partitions hospitals on for-profit, nonprofit, and government, there is little study
of behavioral differences based on ownership within nonprofit and government hospital
samples. Our results suggest that accounting and healthcare researchers need to consider
ownership differences in their research designs.

2. Theory and Research Questions

There are many strategies that hospitals pursue to improve their operating
performance. Some of these strategies are more committed or permanent in nature, e.g.
location decisions. Hospitals can choose to locate in more affluent neighborhoods and
reduce the proportion of uninsured patients (Norton and Staiger 1994, Wedig, Hassan,
and Sloan 1989). Hospitals pursue different types of investment strategies; they use
mergers and acquisitions as a strategy to obtain market power and increase prices
(Krishnan 2001), or alter their product-mix in favor of profitable patients (Krishnan,
Joshi, and Krishnan 2003). Hospitals also shift costs from one patient-type to another –
such as from less profitable patients to the more profitable patients (Eldenburg and
Kallapur 1996). Some hospitals change their ownership-type from non-profit to for-profit
and vice versa and implement significant changes to their operating strategy (Picone,
Chou, and Sloan 2002). Nonprofit hospitals have also been increasing their commercial
activities (Eldenburg, Khurana, and Pereira 2003) to improve margins. In this section,
we review three specific strategies that hospitals can pursue to increase revenues or
decrease costs, i.e., use advertising as a revenue enhancement tool, use accounting as a
revenue enhancement or cost reduction tool, and use professional administration to enhance efficiency.

2.1 Hospital revenue enhancement and cost containment strategies

Hospital strategies for revenue enhancement and cost containment have evolved over time, primarily in response to changes in the regulatory and institutional environment. Prior to 1983, hospitals were reimbursed based on cost for their Medicare patients. During this period, most other private insurance companies also paid for hospital services on the basis of cost. Prior research suggests that the cost-based reimbursement system did not encourage cost-conscious behavior, and that hospital competition was based on quality and the availability of a wide range of facilities and high-tech equipment. Empirical research in health-care suggests that hospitals over-invested in medical technology during this period to attract physicians who bought in the patients (Hughes and Luft 1991, Noether 1988, Robinson and Luft 1985, 1988, Zwanziger and Melnick 1988).

The changes in the Medicare reimbursement systems and the increased presence of managed care led to a more risky operating environment after 1983. Over 1,200 hospitals closed from 1980 to the late 1990s (Lee and Alexander 1999) as hospitals struggled to cope with these changes. In the mid to late 1980s, cost shifting allowed hospitals to increase payments from insurers that were still reimbursing based on cost. For example Eldenburg and Kallapur (1997) find that managers in Washington State hospitals shifted costs and patients from inpatient to outpatient when Medicare implemented the flat-fee reimbursement scheme for inpatients but retained cost-based
payment for outpatients. The industry also reduced the length of stay as a method to reduce costs in the short term (Sloan, Morrisey, and Valvona, 1988).

In the 1990s, hospitals focused on cost cutting and began downsizing and re-engineering efforts. Using a national sample of community hospitals Lee and Alexander (1999) examined operations from 1981 to 1994 and found that downsizing and leadership change were positively associated with closures. Downsizing occurred in 10 percent of their hospital sample (5,781 community hospitals) and CEO succession occurred in 19 percent of them.

2.1.1 Advertising by hospitals

One strategy that hospitals began pursuing after the mid-1980s was to increase revenues and market share through advertising. Whereas in other industries, advertising is routinely used as a strategy to increase revenues via increased volume, market share, or prices, advertising has a checkered history in the health-care industry. Until the 1980s, association such as the AMA frowned on advertising by medical organizations (Rizzo and Zeckhauser 1990). The AMA’s first code of ethics considered advertising to be a “highly reprehensible” practice. A survey by Folland (1987) suggests that many physicians believed that advertising was damaging to their reputations.

Physicians provide most of the services in hospitals. They have a professional value-system rooted in the Hippocratic oath that is based on providing the best quality of care and service. Meyer and Rowan (1977) consider hospitals as examples of organizations dominated by institutional factors. Hospitals were primarily established to improve access to healthcare for poor, indigent, elderly, and vulnerable populations (Scott et al., 2000). These historical institutional forces and underlying values influenced
hospitals’ organizational strategies and constrained adoption of aggressive advertising strategies.

However, increased financial pressures faced by hospitals in the late 1980s and 1990s forced them to find ways to increase revenues and improve performance. Prior research in health care suggests that the external regulatory change from cost-plus to fixed-price reimbursement changed the nature of U.S. market competition from quality-based to price-based (Dranove et al 1993; Gruber 1994; Meltzer, Chung, and Basu 2002; Zwanziger and Melnick 1988). During the 1990s, there was an increase in the presence of managed-care organizations that selectively contract with hospitals based on the hospital’s willingness to accept discounts and provide cost-effective care (Dranove, Simon, and White 1998). Hospitals needed to obtain greater volumes of managed care patients to survive. During this period, hospitals competed more directly for business through advertising campaigns (Palmeri and Ewing 1993). Hospital advertising quintupled in the 1980s, hitting $2.1 billion in 1991. Average spending among hospitals on advertising increased by 56% during the period 1995-1998, while average hospital operating expenditures increased by only 10% (Barro and Chu 2002).

2.1.2 Hospital Accounting

The changes in the regulatory environment from cost-plus to fixed-price reimbursement in 1983 also increased the demands on the accounting system. Prior to 1983, hospital accounting systems largely had the objective of providing a reasonably accurate view of the financial picture of the hospital as a whole, and typically provided no details about the costs associated with specific patients, procedures, or ailments (Narayanan 2000). In addition, Medicare and state regulatory agencies required
sophisticated cost reports, so hospitals relied on this information about costs. However, these costs were accumulated at the department level and then allocated from support departments to revenue generating departments. These allocations inaccurately reflect resource usage and so are not very useful. Furthermore, during the cost-plus regulatory environment setting prices for services or identifying the most profitable product-mix was not critical for hospital survival, reducing the demands on the accounting system. The costs of treating unprofitable patients could usually be shifted to other payors and hence it was not critical to invest in better billing and collection systems.

However, as the operating environment became more risky in the 1990s, hospitals began to focus on improved billing and collection processes to decrease bad-debt costs and ensure reimbursement through accurate charges for services rendered (Jaklevic 2001, LaForge and Tureaud 2003). Reflecting the need for improving hospital fiscal services to obtain more detailed accounting information for pricing, product-mix, and collection strategies, salaries for directors of patient financial services increased almost 17 percent from 1999 to 2001 as hospitals sought to employ professional management for fiscal services (Jaklevic 2001). Investments in information systems increase accuracy and timeliness in billing by linking the clinical and financial functions (LaForge and Tureaud 2003). The aim of these expenditures is to minimize claim denials and ensure optimal payment for delivered services.

2.1.3 Hospital Administration

In a cost-plus environment, there is lower risk imposed on managers because inefficiencies can largely be shifted to insurers and other payers. Hence, hospital boards had less need to provide high-powered incentives to motivate management during the
cost-plus pre-1983 era. However, as the operating environment became more risky, the quality of management talent became more important. Lambert and Larcker (1995) used hospital compensation data from 1986 and found that hospitals most adversely affected by Medicare’s prospective payment system tended to use bonus-based compensation contracts to a greater extent than did other hospitals.\(^3\) Using 1992 compensation data, Roomkin and Weisbrod (1999) find larger bonuses (absolutely and relatively) for top management in for-profit hospitals. At lower management levels they find that base salaries are higher in nonprofits, but fewer differences in bonus patterns result in greater total compensation for nonprofits. When Brickley and Van Horn (2002) extend the sample period (from 1991 to 1995), they find that both CEO turnover and pay are strongly related to financial performance (return on assets) in nonprofit hospitals. They also find that the threat of turnover due to poor financial performance appears to be stronger in nonprofit hospitals than in for-profit hospitals. These findings suggest that hiring professional management and providing them with high-powered incentives is a route being explored by hospitals to improve hospital efficiency.

Accordingly, we argue that the changes in the operating environment faced by the hospital industry since the mid 1980s have increased the operating risk faced by hospitals and increased the need to adopt strategies to better manage operations, increasing revenues and decreasing costs. In the previous section, we identified three specific operating strategies that would help hospitals improve financial performance, i.e., advertising, accounting, and administration. In the following section we examine whether

\(^3\) Lambert and Larcker (1995) also found that hospitals were less likely to use bonuses when boards of directors and state regulatory bodies closely monitored their activities.
there are likely to be differences between hospitals of different ownership types in the type of operating strategy chosen.

2.2 The Effects of Ownership on Operating Strategy

2.2.1 Ownership and Hospital Objectives

The purpose of for-profit, investor-owned hospitals is to increase the value of invested capital (Yoder 1986). Prior research finds that for-profit hospitals tend to locate in more profitable areas (Norton and Staiger 1994), and are smaller than nonprofits (Roomkin and Weisbrod 1999). For-profit hospitals obtain fewer donations and are not tax-subsidized and so rely primarily on patient fees for funds.

Church hospitals are owned and governed by religious organizations. They were originally organized to provide services for church members, to restrict procedures that are contrary to religious beliefs, and to permit patients to follow the tenets of their religion for last rites and other ceremonies (Starr, 1982). These hospitals rely primarily on patient fees, but also receive donations.

Government hospitals in our sample are owned and governed by government agencies such as cities and counties. Their hospital boards tend to be appointed by local officials, and board meetings are open to the public. These hospitals rely on subsidies and grants for part of their operations, and perform more charity care than other hospitals (GAO 1990). Because these hospitals are tax-supported, government agencies are likely to monitor operations, and have the authority to increase or decrease funding through budgeting processes.

District hospitals are owned and governed by healthcare districts. These municipalities are responsible for hospital operations. Board members are elected and
board meetings are public. Healthcare districts have state-mandated authority to levy property taxes to support hospital operations, although tax support amounts to only about eight percent of their revenues (Eldenburg and Krishnan 2003). While these hospitals tend to be found in rural areas and are often smaller than other hospitals, there are a few large urban district hospitals in our sample.

The other nonprofit hospitals are privately owned and usually community hospitals or physician-group hospitals. Physician influence tends to be stronger in these hospitals. These hospitals rely primarily on patient fees but also receive donations.

2.1.2 Expenditure Predictions by Ownership Type

Barro and Chu (2002) analyze hospital advertising expenditures by ownership type. Prior to the 1990s, few nonprofit hospitals advertised. The authors theorize that nonprofit managers might not advertise because increased profits are not these hospitals’ core concerns, because advertising is not perceived as an honorable activity, or because these managers prefer to spend time on other activities. However, results from their empirical analysis suggest that non-profit hospitals increased spending in advertising between 1995 and 1998. In contrast, for-profit hospitals decreased spending during this period. In a study of California hospitals over the period 1991 to 1997, Town and Currim (2002) find no differences in advertising expenditures between for-profit and nonprofit hospitals. Therefore we expect that both for-profit and other nonprofit hospitals value investments in advertising. In these hospitals, advertising is likely to be viewed as an avenue to increase market share and perceived quality, providing these hospitals the ability to charge premium prices. For profits and nonprofits are also likely to have greater
returns to advertising as it is likely to be targeted at enhancing the hospital’s market share in profitable areas.

Duggan (2000) finds that local governments reduce their subsidies to publicly owned hospitals as other funds increase. Accordingly, government hospitals have fewer incentives to develop strategies such as advertising to increase revenues. Further, government hospitals are usually located in relatively poorer areas and offer services that are used to a greater extent by uninsured and indigent patients (Duggan 2002). In these hospitals, advertising is likely to attract unprofitable patients, who will not improve the hospital’s financial health. Hence, we expect government and district hospitals to spend less on advertising than other ownership types.

Church owned hospitals’ objectives are likely to be somewhat different from either of the two groups discussed above. Less emphasis may be placed on operating margins because community service is a valued goal. Therefore managers of church hospitals may less aggressively invest in advertising compared to for-profit and other nonprofit hospitals, however, they may be more responsive to competition compared to managers in government hospitals. Hence, expenditures on advertising may be higher than in government hospitals, but lower than in for-profits and other nonprofits.

Because government hospitals rely on subsidies, it is difficult for Congress (or other agencies) to monitor operating margins. Additionally, because quality is invisible, it is also difficult to monitor. Therefore in government hospitals, average cost is usually monitored to a greater extent than revenues or profits (Lindsay 1976). Government hospitals tend to have more elaborate cost accounting systems (Geiger and Ittner 1996). By maintaining elaborate accounting systems, government hospitals create the impression
of control and rational resource use to external stakeholders (Geiger and Ittner 1996). Therefore we expect government and district hospitals to invest more heavily in accounting systems compared to other ownership types. As mentioned above, all hospitals have been increasing expenditures in their billing departments to reduce claims denials and to increase net revenues. Investing in the billing system is likely to be more important for non-government hospitals because they do not rely on subsidies of any sort.

When hospitals consider cost control, ownership type is likely to affect the weight placed on controlling administrative costs relative to operating costs. Glaeser (2001) presents a model where elite worker cooperatives arise in successful nonprofits. Within this framework, we would expect administrative costs in other nonprofits to be higher than any of the other hospital types, because there would be fewer constraints on management behavior. In for-profits, the tension between the expectations of shareholders for returns and managers for compensation could lead to lower administrative costs than in other nonprofit hospitals. However, if for-profit boards believe more strongly in the pay and performance relationship, administration is likely to be a larger percentage of operating expense for these hospitals. Roomkin and Weisbrod (1999) find that while CEO compensation is higher in for-profit hospitals, lower management compensation is lower. Accordingly we expect that expenditures on administration could be similar among for-profit and nonprofit hospitals.

If costs are closely monitored in government hospitals, we would expect administrative costs to be lower than in any other hospital type. Eldenburg and Krishnan (2003) find that average CEO compensation is significantly lower in district hospitals than in a matched sample of church-owned and other nonprofit hospitals. Therefore
administrative costs in district hospitals are likely to be lower, and probably similar to
government hospitals since monitoring incentives are similar. Church hospitals tend to
hire lay professionals as management, so we could expect their expenditures on
administration to be higher than government but lower than either for-profit or other
nonprofits.

To summarize, we examine three strategies that hospitals may follow: (1) enhance
revenues through advertising and accounting system investment, (2) maintain legitimacy
with stakeholders and attempt to control cost through elaborate accounting systems, and
(3) improve efficiency through professional administration. We examine these as a
function of ownership type and make the following predictions:

1. Advertising Expenditures: (for-profit hospitals, other nonprofit hospitals) >
(church hospitals) > (government hospitals, district hospitals)

2. Accounting Expenditures: (government hospitals, district hospitals) > (church
hospitals) > (for-profit hospitals, other nonprofit hospitals)

3. Administrative Expenditures: (for-profit hospitals) > (other nonprofit hospitals) >
(church hospitals) > (government hospitals, district hospitals)

Further, we analyze the effects of these strategies on revenues, and excess income
margins, although we make no predictions about the potential success of any one
strategy. Figure 1 summarizes our conceptual model and empirical analysis strategy.

3. Sample and Descriptive Statistics

States establish a wide variety of regulations that govern hospital operations so
our sample is limited to hospitals in California. We examine acute care hospitals for the
period 1998 through 2000, a total of three fiscal years. Our data source is the hospital
financial data from the California Office of Statewide Health Planning and Development (OSHPD).

Some hospitals include skilled nursing facilities (nursing home care) and these were eliminated because their treatment patterns, reimbursement systems, and operating strategies differ from those of acute care facilities. Skilled nursing facilities focus on residential care rather than medical treatment. We identified these hospitals by examining their lengths of stay and eliminated any hospital with lengths of stay greater than 60 days.

Table 1 presents descriptive statistics for our sample hospitals. Notice that for-profit hospitals spend the most on advertising ($131.62 per patient) and government hospitals spend the least ($36.17 per patient). However, government hospitals spend the most on accounting ($778.72 per patient), and church-owned hospitals spend the least ($347.86 per patient). For-profit hospitals spend the most on administration ($988.01 per patient) and district hospitals spend the least ($536.46). Figure 2 summarizes the expenditures on advertising (Panel A), accounting (Panel B), and administration (Panel C).

4. Research Method

To examine differences in expenditures per patient for advertising, accounting, and administration by hospitals of different ownership types, we first perform t-tests. Then we use regression analysis to determine the effects of these expenditures on revenues and excess income margins. We estimate the following model using each of these two dependent variables:
**Dependent Variable of Interest** = \( \alpha + \beta_1(\text{Expenditures on Advertising per Patient}) + \beta_2(\text{Expenditures on Accounting per Patient}) + \beta_3(\text{Expenditures on Administration per Patient}) + \beta_4(\text{Net Assets per Patient}) + \beta_5(\text{Proportion of Medicare Patients}) + \beta_6(\text{Proportion of Medi-Cal Patients}) + \beta_7(\text{Average Length of Stay}) + \beta_8(\text{Staffed Beds}) + \beta_9(\text{Occupancy Rate}) + \epsilon_i \)

### 4.1 Dependent Variables

We use net revenue per patient and excess income margin as the primary dependent variables. Revenues per patient are measured as annual net operating revenues divided by number of patients discharged. This variable captures the efficacy of hospitals’ efforts to increase market share or charge premium prices via advertising. Excess income margin is measured as the sum of operating and non-operating income divided by the sum of operating and non-operating revenues. This variable captures the success of both revenue enhancement and cost-reduction strategies. Excess income margin also conveys information about the cost versus benefit tradeoffs of investing in each of these three strategies. For example, advertising may enhance revenue, however if the cost of advertising is higher than the revenue generated, a hospital’s margins would not improve.

### 4.2 Independent Variables of Interest

Examination of the relationship between revenues, advertising, and margins is problematic because the causal relationship among these variables is not apparent. Expenditures on advertising are likely to increase revenues, and at the same time increases in revenues (and margins) may lead to increases in expenditures on advertising. To control for these interdependencies, we use a two-stage approach in our empirical
analysis as recommended by Greene (2000, p 682) and Kennedy (1998). To develop the instrumental variable, we first regress total advertising expenditures as a function of net revenues and a set of control variables. Then we use the fitted values from this regression as the independent variable (instrument) in the models estimating revenues and margins. This method minimizes the problems caused by the interdependencies between advertising expenditures and revenues (Greene 2000, Kennedy 1998).

Accounting expenditures per patient are measured by dividing total expenditures on accounting by the number of patients discharged, and administration expenditures are measured similarly.

4.3 Control variables

Prior health care literature indicates that hospital size influences hospital performance and behavior. Robinson and Phibbs (1989) and French (1996) find that larger hospitals have higher total costs. Mick and Wise (1996) find that larger hospitals have higher operating margins and Alexander and Lee (1996) find that larger hospitals are less likely to fail, and that higher market share allows them to set higher prices (Dranove, Shanley, and White, 1993). In addition, Pink and Leatt (1991) and Santerre and Thomas (1993) provide evidence that size affects management compensation in hospitals. Therefore we include two measures of hospital size: the average number of staffed beds and net assets. Staffed beds convey information about the capacity of the hospital while net assets contain information about the level of investment.

Hofler and Folland (1991) find differences in costs related to proportion of Medicare patients. In addition, Medicare patient proportions have been used in prior hospital efficiency studies, for example, Zuckerman, Hadlley, and Iezzoni (1994) and
Eldenburg and Krishnan (2003). Therefore we include Medicare patient days as a proportion of total patient days as a control variable.

In 1990, the state of California established a program that offered monetary incentives to hospitals providing a disproportionate share of care to the poor. Duggan (2000) finds that hospitals of different ownership types responded differently. For-profit and non-profit hospital increased their shares of profitable Medi-Cal patients, but continued to avoid unprofitable Medi-Cal patients, while government hospitals were unresponsive to the incentives. Prior research by Robinson and Phibbs, (1989) find evidence that hospitals with greater proportions of Medi-Cal patients have lower rates of cost inflation. Therefore the proportion of Medi-Cal patient days to the total patient days is used as a control.

We include LOS as a control variable because prior research indicates that it has a significant influence on the operating performance and behavior of hospitals (Lynk, 1995). Consistent with prior literature on hospital efficiency, we include occupancy rates in our analysis (Zuckerman, Hadlley, and Iezzoni 1994). Occupancy rate is defined as the number of patient days scaled by staffed beds times 365.

5. Results

5.1 Mean Difference T-tests

Table 2 presents the ordering of differences in average expenditure per patient for advertising, accounting, and administration. As predicted, for-profit and other nonprofit hospitals spend more on advertising than any other hospital type, while government hospitals spend the least. District hospitals spend more than government hospitals but less than for-profit, nonprofit, and church hospitals. This is likely to be driven by two factors. First, non-profit and for-profit hospitals have appointed boards and private meetings,
which imposes fewer constraints on the type of value-enhancing behaviors pursued by these boards and managers. Hence, for-profit and non-profit hospitals can more easily justify their advertising expenditures. However district hospitals have elected boards and public meetings. Board members and managers at these hospitals face greater pressures for cost containment, and therefore advertising costs may not be perceived as valuable.

Second, local governments often tend to reduce their subsidies to publicly owned hospitals as their revenues increase. Hence, government hospitals have fewer incentives to develop strategies such as advertising to increase revenues, and instead are more likely to pursue strategies that decrease costs. In addition, government and district hospitals are more likely to pursue strategies that create the impression of cost control (Geiger and Ittner 1996).

The results for differences in expenditures on accounting support the argument that government hospitals are more likely to pursue cost reduction or “impression management” strategies. Government and district hospital expenditures on accounting are significantly greater than the expenditures by for-profit, non-profit, and church hospitals. Thus, these hospitals use accounting systems either as a way to reduce costs, or to satisfy external constituents (Geiger and Ittner 1996).

For-profits spend the most on administration whereas church hospitals spend the least. For-profits are more likely to have fewer constraints on CEO and top-management compensation. Church hospitals likely use church representatives on their management teams. For example Carondelet Health System is a nationwide network of hospitals operated by the Sisters of St. Joseph of Carondelet, with health care services in Arizona, New York, Minnesota, Georgia, Idaho, Washington, California, Missouri, Kansas, and Wisconsin. In the past, the Sisters have frequently held management positions and their compensation reverts back to the religious order.4

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4 This information was provided by a Sister in charge of a Carondelet hospital in Tucson, Arizona.
5.2 Regression Analysis Results

Table 3 presents results with revenues per patient as dependent variable, partitioned by ownership. Advertising is significantly and positively related to revenues for non-profit and church hospitals. Thus, advertising by nonprofit and church hospitals pays off in the form of increased revenues, generated via increased market share and premium prices. Prior research (Barro and Chu, 2002, for example) indicates that increases in expenditures on advertising by nonprofit hospitals surpassed for-profit hospital spending during 1998. Nonprofit hospitals may be gaining market share at the expense of for-profit hospitals. This would partially explain the insignificant results for for-profit hospitals. It is also possible that non-profit hospitals have only started advertising in recent years and hence have increasing returns to advertising whereas the for-profit hospitals have advertised for a longer time and do not have increasing returns. Government hospitals experience a negative relation between advertising and revenues. Because these hospitals tend to be located in poorer areas, advertising attracts a greater number of indigent and underinsured patients.

For all hospital ownership types, accounting system expenditures are positively related to revenues, however these results approach statistical significance only for non-profit and district hospitals. Apparently accounting managers’ efforts to reduce denied claims is effective, especially for nonprofit and district hospitals. These hospitals are also likely to use their accounting systems to determine more profitable product-mixes and thereby increase their revenues.

Expenditures on administration are positively related to revenues within for-profit, nonprofit and church hospitals. We find no relationship between administration
expenses and net revenues for government hospitals, and a negative association for district hospitals. This is consistent with Duggan (2000), who suggests that administrators in government hospitals are not interested in increasing their revenues because subsidies are reduced as revenues increase. Eldenburg and Krishnan provide evidence suggesting that district hospitals cut administrative costs rather than operating costs. It is likely these hospitals reduce administrative costs as margins fall, even though revenues may be increasing.

Many insurance plans reimburse on a per-diem basis and hence for all hospital types, greater length of stay increases revenues. Within for-profit, district, and government hospitals there is a positive and significant relation between revenues and assets. We find a negative relation for non-profit and church hospitals. Larger hospitals could be investing in technology that shifts patients from inpatient to outpatient, or greatly reduces hospital stays, such as cardiology advances that replace surgeries with angioplasty and coronary stents. This type of technology may reduce revenues, but increase product-line profitability.

The results for Medicare and Medi-Cal suggest that for-profit and other nonprofit hospitals are treating more complex patients with higher reimbursement rates. Duggan (2000) finds these hospitals tend to target the most profitable Medi-Cal patients, so they are likely to do the same for Medicare patients. Outpatient proportion is positively related to revenues for hospitals owned by churches, districts, and the government. These hospitals are admitting more insured outpatients who are either more complex outpatients, or later admitted as inpatients. For-profit hospitals may be admitting uninsured patients, and patients with less complex cases as outpatients and hence
revenues decrease as the proportion of outpatients increase in these hospitals. District hospitals experience decreasing revenues with increasing occupancy rates. This suggests that Medicare and other patients reimbursed on DRG or other flat-fee payments could be staying longer, that is, there are some inefficiencies in their care for these hospitals, and these hospitals likely attract under- and uninsured patients.

Table 4 presents the results for all hospitals using the same model but estimated with excess income margin as the dependent variable. These margins reflect operating income, donations, grants, tax subsidization, and income from commercial activities. Expenditures on advertising increase excess income margins in non-profit and church owned hospitals. Recall that these hospitals also experienced increases in revenues through advertising. These findings suggest that advertising strategies appear to pay off for other non-profit and church hospitals.

Expenditures on accounting increase margins for government hospitals suggesting that these hospitals are successfully leveraging their accounting systems to cut costs. Because costs are monitored externally by elected boards managers are more likely to emphasize accounting systems, especially when margins are negative, which is consistent with Cotton (1976).

Expenditures on administration are positively related to margins in church hospitals, but negatively related to margins in for-profit, non-profit, and district hospitals. Church hospitals may be replacing lay people with professional administrators who are more adept at managing operations. Perhaps the latter hospitals increased administrative expenditures in an attempt to improve margins, but the costs outweighed the benefits.
Our results for Medicare and Medi-Cal patients are consistent with Duggan’s (2000) findings that nonprofit hospitals skim off the most profitable patients, leaving those less profitable for government hospitals. Length of stay is associated with higher margins in for-profit and non-profit hospitals suggesting that each additional day that a patient stays is profitable for these hospitals.

6. Conclusions

In this study we find that hospitals of different ownership types appear to employ different strategies to improve financial results. They also experience varying degrees of success with these strategies. We analyze expenditures on advertising, accounting, and administration to determine differences among different hospital ownership types. Further, we examine the influence of these expenditures on revenues and excess income margins.

We find that for-profit and other nonprofit hospitals spend more on advertising than other hospitals, while government hospitals spend the least. These advertising expenditures appear to increase both revenues and margins in other nonprofit and church hospitals. However, in government hospitals, revenues decrease as advertising expenditures increase.

Government and district hospital expenditures on accounting are significantly greater than the expenditures by all other hospitals. Accounting expenditures are positively related to revenues in other nonprofit and district hospitals, but do not affect their margins. Although there is no relation between accounting expenditures and revenues in for-profit and church hospitals, we find a negative relation for their margins.
Only government hospitals experience increased excess income margins with increased accounting expenditures.

For PROFITS spend the most on administration, and these expenditures are positively related to revenues, but negatively related to margins. Similar to for-profits, nonprofit administration expenditures are positively related to revenues, but negatively related to margins. Although church hospitals spend the least on administration, their expenditures are positively related to both revenues and margins. In contrast, in district hospitals both revenues and margins are negatively related to administration expenditures.

These results indicate that hospitals of different ownership types behave differently when choosing operating strategies. The degree to which they succeed in using these strategies also differs. These results provide insights for hospital administrators and for researchers in accounting and health care. Our results also suggest that empirical researchers will benefit by more finely partitioning hospital ownership type, while examining hospital behavior.

While we explore differences in strategies across ownership types, we limit our analysis to hospitals. There are several other industries that have a variety of ownership types, such as universities, school systems, social service, and government agencies. Future research analyzing differences in strategies and outcomes for these organizations will increase our understanding of factors that influence their financial performance.
References


### Table 1

**Descriptive Statistics for 1998-2000**

<table>
<thead>
<tr>
<th>Variable</th>
<th>For-Profit Hospitals (n=487)</th>
<th>Other Nonprofit Hospitals (n=570)</th>
<th>Church Hospitals (n=128)</th>
<th>District Hospitals (n=136)</th>
<th>Government Hospitals (n=84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Revenue Per Patient ($)</td>
<td>9,809 (7,765)</td>
<td>10,728 (6,562)</td>
<td>9,095 (2089)</td>
<td>10,282 (4,321)</td>
<td>11,790 (9,578)</td>
</tr>
<tr>
<td>Total Operating Cost Per Patient ($)</td>
<td>10,184 (10,184)</td>
<td>11,719 (9,427)</td>
<td>9,298 (2,121)</td>
<td>11,128 (5,298)</td>
<td>11,448 (8,429)</td>
</tr>
<tr>
<td>Expenditures on Advertising Per Patient ($)</td>
<td>131.62 (195.84)</td>
<td>112.92 (220.35)</td>
<td>75.83 (56.74)</td>
<td>62.18 (51.24)</td>
<td>36.17 (32.91)</td>
</tr>
<tr>
<td>% of Hospitals Reporting Advertising Expenses</td>
<td>74.45%</td>
<td>72.85%</td>
<td>82.57%</td>
<td>64.71%</td>
<td>32.98%</td>
</tr>
<tr>
<td>Expenditures on Accounting Per Patient ($)</td>
<td>551.21 (452.46)</td>
<td>500.50 (912.93)</td>
<td>347.86 (131.43)</td>
<td>665.87 (472.90)</td>
<td>778.72 (610.75)</td>
</tr>
<tr>
<td>Expenditures on Administration Per Patient ($)</td>
<td>988.01 (1,322)</td>
<td>694.05 (1,099.05)</td>
<td>610.11 (256.86)</td>
<td>536.46 (568.73)</td>
<td>881.59 (1,063)</td>
</tr>
<tr>
<td>Net Assets ($ million)</td>
<td>14.62 (21.27)</td>
<td>45.49 (57.78)</td>
<td>44.13 (42.93)</td>
<td>19.73 (26.41)</td>
<td>49.61 (81.94)</td>
</tr>
<tr>
<td>Percentage of Medicare Patients</td>
<td>38.64 (20.78)</td>
<td>30.02 (16.74)</td>
<td>36.45 (11.02)</td>
<td>38.96 (13.09)</td>
<td>16.77 (10.98)</td>
</tr>
<tr>
<td>Percentage of Medi-Cal Patients</td>
<td>19.61 (18.28)</td>
<td>14.81 (13.28)</td>
<td>19.80 (11.59)</td>
<td>21.16 (11.21)</td>
<td>44.27 (11.11)</td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>8.52 (7.35)</td>
<td>6.32 (5.19)</td>
<td>5.58 (1.69)</td>
<td>10.16 (8.80)</td>
<td>7.67 (5.36)</td>
</tr>
<tr>
<td>Staffed Beds</td>
<td>107 (86)</td>
<td>191 (143)</td>
<td>207 (133)</td>
<td>105.48 (99.02)</td>
<td>146 (164)</td>
</tr>
<tr>
<td>Occupancy Rate (%)</td>
<td>55.59 (26.74)</td>
<td>60.39 (21.88)</td>
<td>65.56 (16.61)</td>
<td>63.44 (24.73)</td>
<td>73.84 (19.53)</td>
</tr>
</tbody>
</table>
Table 2

*T*-Tests of Differences in Spending

| Expenditures on Advertising per Patient: (For-Profit, Other Nonprofit) > Church > District > Government |
| Expenditures on Accounting per Patient: (Government, District) > (For-Profit, Other Nonprofit) > Church |
| Expenditures on Administration per Patient: (For-Profit) > (Other Nonprofit,) > (Government) > (District) > (Church) |
**Table 3**

Determinants of Net Revenue per Patient

Adjusted Net Revenue Per Patient = $\alpha + \beta_1(\text{Expenditures on Advertising per Patient}) + \beta_2(\text{Expenditures on Accounting per Patient}) + \beta_3(\text{Expenditures on Administration per Patient}) + \beta_4(\text{Net Assets per Patient}) + \beta_5(\text{Proportion of Medicare Patients}) + \beta_6(\text{Proportion of Medi-Cal Patients}) + \beta_7(\text{Average Length of Stay}) + \beta_8(\text{Staffed Beds}) + \beta_9(\text{Occupancy Rate}) + \varepsilon_i$

<table>
<thead>
<tr>
<th>Predictor</th>
<th>For-Profit</th>
<th>Non-profit</th>
<th>Church-owned</th>
<th>District</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising</td>
<td>0.003</td>
<td>0.005</td>
<td>0.003</td>
<td>0.003</td>
<td>-0.023</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td>(7.25)**</td>
<td>(7.79)***</td>
<td>(0.98)</td>
<td>(-8.18)***</td>
</tr>
<tr>
<td>Accounting</td>
<td>0.68</td>
<td>7.72</td>
<td>0.64</td>
<td>4.76</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td>(1.48)</td>
<td>(7.03)***</td>
<td>(0.81)</td>
<td>(3.73)***</td>
<td>(1.46)</td>
</tr>
<tr>
<td>Administration</td>
<td>0.90</td>
<td>3.48</td>
<td>4.06</td>
<td>-1.64</td>
<td>1.65</td>
</tr>
<tr>
<td></td>
<td>(3.03)***</td>
<td>(10.42)***</td>
<td>(8.05)***</td>
<td>(-2.06)**</td>
<td>(0.48)</td>
</tr>
<tr>
<td>Assets</td>
<td>6.65E-5</td>
<td>-1.61E-5</td>
<td>-3.45E-5</td>
<td>5.87E-5</td>
<td>1.33E-5</td>
</tr>
<tr>
<td></td>
<td>(3.81)***</td>
<td>(-1.97)*</td>
<td>(-4.51)***</td>
<td>(2.44)***</td>
<td>(4.50)***</td>
</tr>
<tr>
<td>Medicare</td>
<td>9,067.90</td>
<td>5927.13</td>
<td>4,898.06</td>
<td>-2,085.17</td>
<td>2,449.45</td>
</tr>
<tr>
<td></td>
<td>(6.46)***</td>
<td>(5.14)***</td>
<td>(3.65)***</td>
<td>(-0.54)</td>
<td>(0.46)</td>
</tr>
<tr>
<td>Medi-Cal</td>
<td>1,878.39</td>
<td>5,545.01</td>
<td>-4,705.08</td>
<td>-11,757</td>
<td>29,682</td>
</tr>
<tr>
<td></td>
<td>(1.91)*</td>
<td>(4.09)***</td>
<td>(-3.87)***</td>
<td>(-3.14)***</td>
<td>(4.24)***</td>
</tr>
<tr>
<td>Outpatient</td>
<td>-10,355</td>
<td>3,103.94</td>
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<td>8,793</td>
<td>12,660</td>
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<td>(1.17)</td>
<td>(2.06)**</td>
<td>(2.16)**</td>
<td>(2.05)*</td>
</tr>
<tr>
<td>Avg. LOS</td>
<td>359.09</td>
<td>124.59</td>
<td>125.73</td>
<td>276.47</td>
<td>510.60</td>
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<td>(6.29)***</td>
<td>(42.22)***</td>
<td>(18.48)***</td>
<td>(13.47)***</td>
<td>(4.08)***</td>
</tr>
<tr>
<td>Staffed Beds</td>
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<td>-8.51</td>
<td>-20.19</td>
<td>53.84</td>
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<tr>
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<td>(-4.14)***</td>
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<td>(13.06)***</td>
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<td>Occ. Rate</td>
<td>653.76</td>
<td>422.08</td>
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<tr>
<td></td>
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<td>(0.54)</td>
<td>(2.78)***</td>
<td>(-4.33)***</td>
<td>(4.60)***</td>
</tr>
<tr>
<td>Intercept</td>
<td>-134.77</td>
<td>2,291.48</td>
<td>3,871.60</td>
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</tr>
<tr>
<td>Adjusted R²</td>
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<td>0.91</td>
<td>0.95</td>
<td>0.97</td>
<td>0.96</td>
</tr>
<tr>
<td>N</td>
<td>304</td>
<td>415</td>
<td>108</td>
<td>97</td>
<td>30</td>
</tr>
</tbody>
</table>

*p<0.10, **p<0.05, ***p<0.01
Table 4  
Determinants of Excess Income Margin  
*Excess Income Margin = α + β₁(Expenditures on Advertising Per Patient) + β₂(Expenditures on Accounting Per Patient) + β₃(Expenditures on Administration Per Patient) + β₄(Net Assets Per Patient) + β₅(Proportion of Medicare Patients) + β₆(Proportion of Medi-Cal Patients) + β₇(Average Length of Stay) + β₈(Staffed Beds) + β₉(Occupancy Rate) + εᵢ*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>For-Profit</th>
<th>Non-profit</th>
<th>Church-owned</th>
<th>District</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising</td>
<td>6.56E-8</td>
<td>1.377E-7</td>
<td>8.31E-8</td>
<td>1.72E-7</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(4.57)***</td>
<td>(2.65)***</td>
<td>(1.59)</td>
<td>(-0.20)</td>
</tr>
<tr>
<td>Accounting</td>
<td>-2.89E-4</td>
<td>-3.43E-7</td>
<td>-1.68E-4</td>
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</tr>
<tr>
<td></td>
<td>(-3.44)***</td>
<td>(-0.03)</td>
<td>(-2.81)***</td>
<td>(1.07)</td>
<td>(1.79)*</td>
</tr>
<tr>
<td>Administration</td>
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<td>7.98E-5</td>
<td>-5.91E-5</td>
<td>-1.81E-4</td>
</tr>
<tr>
<td></td>
<td>(-3.30)***</td>
<td>(-2.09)**</td>
<td>(2.11)**</td>
<td>(2.18)**</td>
<td>(-0.89)</td>
</tr>
<tr>
<td>Assets</td>
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<td>-1.44E-9</td>
<td>-7.98E-10</td>
<td>-7.01E-11</td>
</tr>
<tr>
<td></td>
<td>(0.93)</td>
<td>(-3.15)***</td>
<td>(-2.51)***</td>
<td>(-0.97)</td>
<td>(-0.40)</td>
</tr>
<tr>
<td>Medicare</td>
<td>-0.10</td>
<td>0.16</td>
<td>0.05</td>
<td>0.18</td>
<td>-0.51</td>
</tr>
<tr>
<td></td>
<td>(-0.04)</td>
<td>(3.22)***</td>
<td>(0.55)</td>
<td>(1.43)</td>
<td>(-1.62)</td>
</tr>
<tr>
<td>Medi-Cal</td>
<td>0.051</td>
<td>0.28</td>
<td>-0.02</td>
<td>0.04</td>
<td>0.19</td>
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<td>(4.77)***</td>
<td>(-0.21)</td>
<td>(0.35)</td>
<td>(0.46)</td>
</tr>
<tr>
<td>Outpatient</td>
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<td>-0.29</td>
<td>-0.25</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>(-1.08)</td>
<td>(0.03)</td>
<td>(-1.43)</td>
<td>(-1.83)*</td>
<td>(0.80)</td>
</tr>
<tr>
<td>Avg. LOS</td>
<td>0.02</td>
<td>3.89E-4</td>
<td>9.49E-5</td>
<td>-0.001</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(1.79)*</td>
<td>(3.08)***</td>
<td>(0.19)</td>
<td>(-1.47)</td>
<td>(0.81)</td>
</tr>
<tr>
<td>Staffed Beds</td>
<td>4.79E-5</td>
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<td>1.70E-4</td>
<td>2.55E-4</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.47)</td>
<td>(-0.89)</td>
<td>(-1.10)</td>
<td>(0.94)</td>
<td>(6.45)***</td>
</tr>
<tr>
<td>Occ. Rate</td>
<td>0.24</td>
<td>-0.003</td>
<td>0.18</td>
<td>0.13</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>(1.55)</td>
<td>(-0.10)</td>
<td>(2.96)***</td>
<td>(3.31)***</td>
<td>(2.39)***</td>
</tr>
<tr>
<td>Interext</td>
<td>-0.25</td>
<td>-0.12</td>
<td>-0.05</td>
<td>-0.14</td>
<td>-0.04</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.25</td>
<td>0.17</td>
<td>0.16</td>
<td>0.28</td>
<td>0.78</td>
</tr>
<tr>
<td>N</td>
<td>304</td>
<td>415</td>
<td>108</td>
<td>97</td>
<td>30</td>
</tr>
</tbody>
</table>

*p<0.10, **p<0.05, ***p<0.01
Figure 1: Theoretical Model

Ownership Type:
- For-Profit
- Other Nonprofit
- Church
- Government
- District

* Expenditures on Advertising
* Expenditures on Administration
* Expenditures on Accounting
* Revenue and Market Share
* Operating Income
* Excess Income Margins
* Operating Cost
* Operating Margins
* Expenditures on Advertising

37