CASH FLOW KINGS OF SMALL HOSPITALS: WHY ARE THEY WINNERS?

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ABSTRACT

This study evaluates the cash flow performance of hospitals that are at greater risk of closure, specifically small rural hospitals. The study finds that positive cash flow small hospitals own a greater number of beds and have fewer unoccupied beds. They also had lower operating costs, faster collection of receivables and higher turnover of inventory.

INTRODUCTION

Hospitals continue to face the pressures of a changing health care environment. Some of these changes evolve from the policies and procedures implemented by employers and the government to reduce health care costs and prevent unnecessary hospitalization. Other changes stem from the shifting of services to outpatient from inpatient, increasing competition and rising costs of medical technology.

Given the financial pressures of a changing health care environment, recent studies have focused on financial distress (Duffy and Freidman 1993; McCue 1991) and closure of hospitals (Lillie-Blanton et al. 1992; Willliams et al. 1992). These studies emphasized the effects of demographic/market factors (urban versus rural), payer mix (Medicare and Medicaid), and operational factors (capacity and utilization) on financial distress and closure. All of these studies found that financially at risk hospitals tend to be smaller facilities, typically under 100 beds.

Other studies have examined the performance of highly profitable hospitals in a competitive healthcare marketplace. Chang and Tuckman (1988) evaluated the profitability of not-for-profit hospitals in Tennessee. Vogel et al. (1993) profiled the determinants of highly profitable hospitals in Florida. Cleverley and Harvey (1992) studied the performance strategies of large, profitable, urban hospitals. All of these studies evaluated performance in terms of profitability. Further, the first two studies were state specific, while the latter study sampled hospital data from a single point in time.

This study differs from the previous works in two areas. First, the study follows the work of Kane (1991), using cash flow rather than reported profits as the measure of hospital performance. Second, rather than focusing on large urban hospitals, this study evaluates those hospitals at greater risk of closure, specifically small hospitals.

Overall, the aim of this study is to identify the population of financially sound small hospitals and examine the market, operational, and mission-related factors that affect their financial viability. The broader research questions proposed by this study attempt to investigate why these small hospitals are financially stronger than a comparison group of small hospitals. For example, are there certain regions of the country that have a strong community base to support these facilities? Do they have a strong competitive position? Do they serve a disproportionate share of government reimbursed patients? Does their ownership form create a greater motivation toward maximizing wealth? Do they offer more services and treat more complex cases? Do they generate a higher cash flow position as a result of lower costs or higher revenues? Finally, does this strong cash flow position stem from the effective management of receivables and inventory?

By attempting to answer these questions, the study could uncover the reasons for the success of these hospitals. In turn, small financially distressed hospitals could utilize this information to aid in the turnaround of their financial position. The findings of this study could also provide policy makers with a perspective on the impact of government payment systems on small hospitals.

THEORY AND MODEL SPECIFICATION

To value the worth of a hospital, one must estimate the future net operating cash flows generated by the hospital. The estimate of an organization's market value as an on-going concern is determined by discounting the expected net cash flows by its cost of capital over its economic life as shown below (Copeland and Weston 1988):

Equation (1)

$$\text{Value} = \sum_{t=1}^{n} \frac{NCFt}{(1+r)t}$$

where:

NCFt = expected net operating cash flows generated during a time period,
r = the firm's cost of capital,
t = the time period, and
n = the asset's expected life.

The net operating cash flows for each period equal the expected revenues, less the operating expenses, adjusted

for the working capital requirements of the organization. The importance of valuing operating cash flows is further supported by the real world application in valuing hospital acquisitions. Lutz (1994) points out that investor-owned chains value potential target acquisitions by measuring their earnings before interest, taxes and depreciation, which reflects their operating cash flow before working capital adjustments. As previously mentioned, researchers in health care finance, (Duffy and Freidman 1993; Kane 1991; McCue 1991) conclude that cash flow rather than reported operating margin is a more objective measure in assessing financial performance.

In this study, cash flow is defined as net income plus depreciation and interest expense adjusted for changes in net working capital. This cash flow measure approximates the difference between cash receipts and cash disbursements from operations; net income plus depreciation alone does not consider all of the operating cash flows of the organization. Net working capital adjustments include the changes in accounts receivable, inventory, accounts payable, and other related working capital accounts that affect cash flow and are not reflected on the income statement.

The previous literature review of hospital closure (Lillie-Blanton et al. 1992 and Williams et al. 1992) supports the factors affecting net cash flows. These can be divided into three groups: market factors that reflect the demand for hospital services; the hospital's mission and role within the community; and operating factors that affect the costs of producing hospital services.

Demand for health services, represented by the market factors, is an outgrowth of the needs and wealth of the community. The health needs of the community are measured by population size and growth. The financial capability of the community to purchase health insurance or pay for health services directly is measured by per capita income and the unemployment rate in the county. One would expect that strong cash flow hospitals serve communities that have the economic resources to pay for their services. Higher volume might also stem from an improved marketing system and alliances with high quality, prestigious hospitals. Census regions are included to control for the effects of regional differences in practice patterns, economic conditions and costs.

Hospital mission and community role is measured by ownership (government, for-profit, and non-profit) and system affiliation. One would expect for-profits to have a stronger incentive to maximize cash flow since they are controlled by stockholders or owners whose objective is to maximize wealth. Conversely, public hospitals may have been established to serve the uninsured and could depend on state and local governments to support periods of cash flow shortfalls. Hospitals affiliated with multi-hospital systems might achieve a positive cash flow advantage through economies of scale in administration, marketing and purchasing. One would expect positive cash flow small hospitals to be affiliated with multi-hospital systems.

Positive cash flow is also affected by operational factors, specifically the complexity of services (ICU index and Medicare case mix index), number of services, payer mix (proportion of Medicare and Medicaid payers), and capacity (bed size). Hospitals that provide an array of services may be able to attract a large patient base. In addition, hospitals that serve a small proportion of lower paying government patients and greater proportion of privately insured patients would also be expected to have a strong cash flow position. Lower input prices (wage index) would affect the cost of producing health care services and should also contribute to the revenue base of the facility. Occupancy rate reflects the ability to market services and measures operating capacity.

SAMPLE

The study employs data from four sources: (1) the Health Care Financing Administration (HCFA) Minimum Cost Data for fiscal years ending in 1989-1990 through 1992-1993; (2) the 1989 and 1992 Annual Survey of Hospitals conducted by the American Hospital Association (AHA); (3) the 1993 Area Resource File; and (4) the 1989 HCFA Provider of Services File.

Small hospitals were defined as facilities with less than 100 beds. The study first identified the population of small hospitals existing in the fiscal years ending in 1992 and 1993. The population included all acute-care, short-term hospitals listed in the Health Care Financing Administration Minimum Cost Data Tapes. The study identified 2,209 small hospitals from the HCFA tapes for fiscal periods ending from October 1, 1992 through September 30, 1993. As a point of comparison, the American Hospital Association Statistical Guide indicates that there are 2,364 small hospitals. Given the size of this sample relative to the population, one can surmise that there is limited sample selection bias.

The population was segmented into two groups. The first group included all small hospitals that had positive operating cash flows for the last four annual fiscal periods. The second group included all small hospitals that had negative operating cash flows for the same four fiscal periods. These hospitals had a bed size of less than 100 beds over the last four years. The final sample consists of 679 positive cash flow small hospitals and 96 negative cash flow small hospitals. Of the 679 positive cash flow small hospitals, the study found that 524 facilities were located in rural markets and 78 of the 96 negative cash flow small hospitals were located in rural markets.

METHODOLGY

In assessing the financial condition of the positive cash flow hospital group, the study also analyzed other endogenous measures related to the overall financial status of hospitals, such as net patient revenues per Medicare case mix adjusted discharge, operating expenses per Medicare case mix adjusted discharge, total discharges, Medicare case mix adjusted length of stay, days in accounts receivable and inventory turnover. A univariate t-test analysis is performed on not only these measures but all continuous measures by the rural and urban setting. A chi-square analysis is performed on the nominal measures.

The study employed logistic regression models to evaluate statistically whether exogenous market, mission and operating factors are associated with cash flow performance. The model uses a dichotomous dependent measure with one representing the positive cash flow small hospital group and zero representing the negative cash flow small hospital group.

RESULTS

From an univariate analysis standpoint, rural positive cash flow small hospitals, 56 percent are not-for-profit compared to seven percent for-profit. Of the rural negative cash flow small hospitals, 41 percent are not-for-profit verses eight percent for-profit.

Only 30 percent of the positive cash flow small hospitals are system affiliated compared to the 70 percent free-standing. System affiliated hospitals represented 33 percent of the negative cash flow small hospitals. Fifty-nine percent of both the positive and negative cash flow small hospitals are located in the Central United States. Only four percent of positive cash flow facilities and three percent of negative cash flow small hospitals are in the Northeast region. Overall, it appears the proportional values for organizational characteristics and census regions are similar when comparing positive and negative cash flow small hospitals. The study also found that rural positive cash flow small hospitals were located in counties with large populations, low per capita income and high unemployment. They served a greater proportion of Medicaid payers, treated more complex cases and offered more services. They also had a greater number of beds and a higher occupancy rate than the negative cash flow group.

In terms of financial performance measures, the positive cash flow small hospitals had a higher turnover of their inventory and faster collection of their receivables. However, the negative cash flow small hospitals were able to increase the growth rate in their inventory ratio.

Surprisingly, revenues grew at a faster rate for the negative cash flow group than the positive cash flow group. In addition, net patient revenues per adjusted discharge was significantly higher for the negative cash flow group. However, operating expenses per adjusted discharge and its growth rate were significantly lower for the positive cash flow group. This finding shows that lower costs rather than higher revenues contributed to the operating success of positive cash flow small hospitals.

The volume of patients and patient length of stay also affected the financial performance of the positive cash flow small hospitals. Volume, which is measured by total discharges, was significantly higher for the positive cash flow small hospitals. Case mix adjusted length of stay was significantly lower for the positive cash flow small hospitals. It also appears that over time positive cash flow small hospitals were effective in maintaining average patient length of stay, while negative cash flow small hospitals experienced an increase in average patient length of stay.

Table 1 presents the beta coefficients and R-values for the rural logistic regression model. The "R" value or relative contribution of each measure to the model.

TABLE (1)
Logistic Regression Model

Independent variables	Beta coefficients	R-value	
Intercept	-7.03	0.000	
Market Share	-0.547	0.000	
Wage Index	2.443	0.000	
Population per thousand	-0.008	0.000	
Population growth	-2.449	-0.047	
Per capita income	0.001	0.000	
Unemployment rate	0.006	0.000	
Northeast	-0.482	0.000	
South	0.810	0.000	
West	1.013	0.072	**
For-profit	-0.712	0.077	**
Government	-0.977	0.027	
System affiliation	-0.969	0.115	*
Case mix	7.275	0.154	*
ICU index	-3.441	0.000	
Total services	0.037	0.000	
Bed	0.033	0.111	*
Occupancy rate	7.639	0.222	*
Medicare share	0.986	0.000	
Medicaid share	2.719	0.000	

** significant at the .05 level *significant at the .01 level

The occupancy rate variable had the highest contribution in the cash flow model with an R value of .222. The Medicare case mix measure had the second highest contribution (R

value equals .154) and system affiliation had the third highest contribution (R value equals .115). Of the remaining significant measures, for-profit ownership and then Western region had the greatest contributions. The overall pseudo-R^2 was .452, which indicates that a high proportion of the log likelihood could be explained by the model's independent variables. The log likelihood of the model was 331.45.

The positive coefficients for bed size and occupancy rate indicate that positive cash flow small hospitals are larger and have fewer unoccupied beds than negative cash flow small hospitals. Complexity of cases, measured by the Medicare case mix index, also has a positive coefficient, implying that hospitals with more complex cases have a greater positive cash flow. The negative coefficient for the system affiliation measure indicates negative cash flow small hospitals are more likely to be affiliated with a multi-hospital system. The negative coefficient for the for-profit ownership measure suggests that for-profit hospitals are more likely to be negative cash flow small hospitals relative to the omitted group of non-profit hospitals.

Finally, the coefficient for the Western region measure is positive. This finding indicates that relative to the Central United States, the Western region has a greater proportion of positive cash flow small hospitals.

DISCUSSION

The primary aim of this study was to profile the characteristics of small hospitals with consistent positive cash flows with respect to the extreme comparison case of small hospitals with consistent negative cash flows. Surprisingly, out of a sample of 2,209 small hospitals, 30 percent had positive cash flows for four consecutive years while four percent had negative cash flows for the same years. Therefore, it appears that only a minority of small hospitals are experiencing a certain degree of financial distress.

In contrast to theory, the ownership type of positive cash flow small hospitals was not the wealth maximizing for-profit hospital but the perceived community oriented, non-profit hospital. This outcome reconfirms the closure study of Lillie-Blanton et al. (1992) who found non-profit hospitals to be at a lower risk of closure. When positive cash flow small hospitals are compared to the negative cash flow small hospital group, positive cash flow facilities in rural settings were less likely to affiliate with a multi-hospital system. Evidently, this strong cash flow position has sustained the independence of these small, rural, positive cash flow small hospitals.

This analysis found that operationally managers of positive cash flow small hospitals are cash flow winners for several reasons. First, they, are able to control the operating costs of their hospitals. Second, they are effective in managing patient length of stay. Lower length of stay may be an outgrowth of an effective working relationship with a medical staff committed to cost effective practice patterns. Third, managers of positive cash flow small hospitals are also proficient in turning their receivables into cash and utilizing their inventory effectively given the higher volume of patients. Fourth, managers of positive cash flow hospitals are effective in marketing their services as reflected by their higher occupancy rate when compared to other small hospitals. It is important to emphasize that occupancy rate is not only a critical measure in the cash flow performance of small hospitals, but it is also a critical measure in evaluating hospital creditworthiness and closure. Carpenter (1992) and McCue, Renn and Pillari (1990) found that higher occupancy contributes to a lower cost of debt and higher bond ratings. These studies conclude that bond investors evaluate occupancy rate as a significant barometer of future cash flows. In terms of hospital closure, this study supports Lillie-Blanton et al. (1992) finding that hospitals with high occupancy are at a lower risk of closure.

Rural market conditions have no positive effect on cash flow. Surprisingly, small hospitals with positive cash flows in rural settings are located in less densely populated areas. This outcome differs from Williams et al. (1992) hospital closure study. They found that hospitals with declining populations are more likely to be at risk. To overcome this shortcoming, small hospitals in rural markets appear to depend on the management of their internal operations and their size to generate a consistent positive cash flow position.

The findings of this study present some differences from other studies (Chang and Tuckman 1988; Cleverley and Harvey 1992; Vogel et al. 1993; Duffy and Friedman 1993) that examined reported profits rather than cash flows. However, a caveat behind this comparison is that these studies sampled hospitals of different bed sizes and not just small facilities. Vogel et al. (1992), who evaluated Florida hospitals, Cleverley and Harvey (1992), who evaluated large urban hospitals, and Chang and Tuckman (1988), who evaluated the profitability of Tennessee non-profit hospitals, found that Medicare payer mix reduces profitability. The multivariate analysis of this study found that neither Medicare nor Medicaid payer mix affected cash flows. However, this study did find that positive cash flow small hospitals had lower patient length of stay. This outcome coincides with the Vogel et al. (1992) and Cleverley and Harvey (1992) studies that found a negative relationship between length of stay and profitability. The Duffy and Freidman (1993) study evaluated hospitals in terms of reported operating profit margin and found no significant differences between the change in average length of stay between the positive and negative reported operating margin groups. In contrast, this study showed an

increase in average length of stay for small hospitals within the negative cash flow group.

The study highlights several policy issues about small hospitals. The first policy issue is that in a changing health care market small hospitals can survive. The evidence implies that higher occupancy rate coupled with effective management of receivables, operating costs and inventory are the critical factors that enable small hospitals to generate a positive cash flow position over a four year period. The second policy issue is that the proportion of governments payers treated by small hospitals had no affect on the cash flow state of these hospitals. The third policy issue is that small rural hospitals with positive cash flows had a higher Medicare case mix index when compared to the extreme comparison group of small hospitals. This finding supports the excessive payment views of William's et al. (1992) and Lillie-Blanton et al. (1992). Williams et al. (1992) concluded that there may be an over payments by Medicare to small hospitals with high case mix and a greater number of intensive care services. Furthermore, Lillie-Blanton et al. (1992) also claim that higher Medicare case mix index hospitals may generate higher reported profits through greater demand because case complexity is associated with diversity of hospital services. Although when measuring case complexity by the ICU index the analysis of urban small hospitals suggests that positive cash flow group treated fewer complex cases.

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