

The Association between Economic Incentives, Accounting Performance Measures, and Hospital Closures

Abstract

The main purpose of this paper is to help policy makers enhance their decision effectiveness for provision of better quality, accessible healthcare services and reduction of misallocation of social resources. Due to the continuing cost containment pressures faced by the hospital industry, a number of recent studies have documented the increasing number of financially distressed hospitals. Without taking remedial actions to avert these pressures, the situation can get even worse in the future. Further, in addition to the mixed results provided by prior literature regarding relative performance of FP and NP hospitals, the existence and importance of agency theory in explaining the relation between economic incentives of FP and NP hospitals and the associated choices made by their managers also triggers our motives for this study. Therefore, this study is conducted to address the following three research questions: 1. the question of whether the differential economic incentives of FP and NP hospitals lead to their different financial or economic performance has been investigated, this study attempts to revisit the same issue from the context of financial distress and also their different probabilities of turning into closure, 2. what are the key factors associated with FP and NP hospitals' recovering from financial distress, and 3. whether the differing economic incentives of for-profit and nonprofit hospitals induce differential likelihood of managers to conduct earnings management actions (e.g. to change financial and nonfinancial performance measures) to help hospitals recover from financial distress or avoid from closure. The primary source of our data is Medicare cost reports. By obtaining a list of closed hospitals from DHHS as our treatment sample, matched with a control sample of open hospitals from Medicare database during the period of 1995 to 1999, a multinomial logistic regression is employed each year to conduct the analysis.

Key Words: Economic Incentive, Accounting Performance Measures, Hospital Financial Distress

I. Introduction

The results from prior literature regarding relative performance of FP and NP hospitals due to different ownership status is mixed. Some researchers provide evidence that ownership indeed plays an important role in the relative performance of FP and NP hospitals due to the implicitly differential economic incentives of managers (Roomkin et al. 1999, Becker and Potter 2002, Renn, S.C., et al. 1985, and Relman, A 1980). However, others provide evidence that managers of both FP and NP hospitals conduct earnings management actions through change of financial and nonfinancial measures to obtain a lower cost of capital, maintain capital market assess, and also increase their compensation levels (Pink and Leatt 1991, Brickley and Van Horn 2002, Eldenburg and Krishnan 2003). In other words, the natural belief that nonprofit hospitals will perform less efficiently and managers may not have incentives to improve their performance due to the differential goal of social responsiveness and the non-distribution constraint of payout of profit encounters a challenge. Such challenge is even strengthened by the findings of Forgione (1999) , Eldenburg and Krishnan (2003), and Wyatt-Johnson and Bennett (2004) in that nonprofit sector managers, similar to that of for-profit sector, have strong incentives to target on profitability performance.

Moreover, due to the inception of prospective payment systems (PPS), intensive competition, increasing growth in healthcare spending, general inflation, increases in real labor costs, the aging population, and technological advances, the hospital industry has faced enormous pressure and crisis, which can be evidenced by a number of recent studies documenting the increasing number of financially distressed hospitals (Bazzoli & Andes 1995, Prospective Payment Assessment Commission, 1991). Without taking remedial actions to avert these crisis, an even increasing number of financially distressed hospital can be foreseen in the near future. Although substantial research has examined causes of hospital closure (Lynn & Wertheim 1993, Gardiner et al., 1996, Bazzoli & Andes 1995, Williams et al., 1992), an accomplishment of the broader objective of reducing waste of social resource and increasing provision of adequate and high-quality care to the public will need not only a thorough investigation of the factors causing financially distressed hospitals to fail but also an examination of the factors leading financially distressed hospitals to recover.

In addition to the noted differing goals, the existence of agency theory helps to explain the relation between the economic incentives of for-profit and nonprofit hospitals and the associated choices made by their managers. With a model (Figure 1) developed by Forgione (1987) within the health care industry context, a better

understanding of the agency problem with nonprofit organizations can even be approached. Especially, Forgione (1987), in one application of his model, found a significant association between the for-profit/nonprofit economic incentives and real-valued financial and nonfinancial management performance measures observed during the first year of the Medicare Prospective Payment System, in both multi-hospital systems and independent hospitals. Moreover, both Robbins et al. (1993) and Eldenburg and Vines (2004) reported a relationship between profitability performance, managerial compensation plan, and managers' incentives to manage earnings.

With the above noted factors, this study is thus conducted mainly for addressing the following three research questions: 1. whether the differential economic incentives of FP and NP hospitals lead to their different financial or economic performance from the context of financial distress and also their different probability of turning into closure, 2. what are the key factors associated with FP and NP hospitals' recovering from financial distress, and 3. whether the differing economic incentives of for-profit and nonprofit hospitals induce differential likelihood of managers to conduct earnings management actions (e.g. to change financial and nonfinancial performance measures) to help hospitals recover from financial distress or avoid from closure. The overall purpose is to help policy makers enhance their decision effectiveness for provision of better quality, accessible healthcare services and reduction of misallocation of social resources.

The remainder of this proposal is organized as follows: section II provides a review of prior literature regarding economic incentives of FP and NP hospitals, current crisis faced by the hospital industry, the importance of agency theory in explaining the relation between economic incentives of FP and NP hospitals and the associated choices made by their managers, accounting performance measures, and definition of financial distress and section III describes our research design, including sample selection, model specification, variable selection and definition, data sources, and research method.

II. Literature Review

1. Economic Incentive

Due to the legal distinction between FP and NP hospitals of issues related to NP tax exemption, the ability to receive tax-deductible donations, prohibitions against the distribution of net profits or assets, and reasonable compensation limits, there exists current debate about differences in hospital performance due to ownership status. Although the results from prior literature regarding this issue is mixed, many researchers provide evidence that ownership indeed plays an important role in the relative performance of FP and NP hospitals due to the implicitly differential economic incentives. For example, Roomkin et al. (1999) examined monetary compensation and its composition between base salary and bonus, and the associated incentive structures in the U.S. hospital industry and find that for-profit hospitals utilize compensation mechanisms that, by involving larger contingent components, provide stronger incentives – greater rewards – as compared with nonprofit hospitals for performance that is more easily monitored. Moreover, their findings are consistent with a model in which nonprofit and for-profit organizations differ in their goals – for-profits usually aim at making profit and thus strive for motivating managers’ best performance while nonprofits, subject to a nondistribution constraint on the payout of profit to managers, may lack incentives for efficiency and thus may pursue goals of social responsibility and quiet life.

Becker and Potter (2002), based on stakeholder theory and Weber’s distinction between formal and substantive rationality, hypothesized that for-profit organizations manage stakeholders in ways that result in the organization being more efficient and less socially responsible than organizations that are not as profit oriented and their results confirmed the hypothesis they made. In other words, for-profit hospitals are managing stakeholder relationships in ways that increases the efficiency of these hospitals but decreases their social responsiveness. In addition, Renn, S.C., et al. (1985) and Relman, A (1980) also reported that the profit motive provides investor-owned hospitals with the incentive to operate more efficiently than voluntary not-for-profit hospitals.

However, given the above cited evidence, some other studies provide somewhat different findings. For example, Pink and Leatt (1991) found that hospital managers can increase their organization’s size, which is positively associated with their compensation level, through maintaining or improving capital market access. Forgione (1999) indicated that external monitoring provides nonprofit managers with strong incentives to have similar behavior as that of for-profit managers. Brickley and Van Horn (2002) identified significant associations between profitability and CEO

compensation and turnover in nonprofit hospitals. Eldenburg and Krishnan (2003), consistent with Brickley and Van Horn (2002), found a positive relationship between hospital profitability and CEO compensation. Wyatt-Johnson and Bennett (2004) also observed that about 90 percent of major medical center CEOs within nonprofit health systems are receiving some form of incentive compensation, which is similar to those of for-profit sector. Their observations not only support the findings of Forgione (1999) and Eldenburg and Krishnan (2003) in that nonprofit sector managers, similar to that of for-profit sector, have strong incentives to target on profitability performance, but also bring our speculation that both for-profit and nonprofit sector managers may have similar incentives to conduct earnings management actions due to the consideration of the impact of profitability on managerial compensation.

Although there exist mixed or inconclusive results from prior studies, the primary issue is that the profit incentive may be associated with significant real-valued performance differences among hospitals and may bring significant implications for the redistribution of quality healthcare and the economic performance of hospitals. Since the question of whether the differential economic incentives of FP and NP hospitals lead to their different financial or economic performance has been investigated, I am therefore interested in exploring the first research question – revisiting the same issue from the context of financial distress and also their different probability of turning into closure.

2. Current Crisis Faced by the Hospital Industry

A number of recent studies have documented the increasing number of U.S. hospitals experiencing financial distress (Bazzoli & Andes 1995, Prospective Payment Assessment Commission, 1991). In the findings of Bazzoli & Andes (1995), hospitals that were distressed in 1983-1985 experienced few of the organizational events and over 90 percent of the 340 distressed hospitals studied remained operational through 1990. Moreover, over 80 percent of surviving distressed hospitals that were unaffiliated with a system in 1985 continued to remain unaffiliated by 1990, and almost 75 percent of those that were affiliated in 1985 continued to be affiliated by 1990. Overall, their analysis strongly suggest that distressed hospitals have a remarkable resiliency that allows them to survive. Further, their additional finding that the number of rival hospitals increased in communities where distressed hospitals closed and declined in areas where distressed hospitals merged or survived even suggests that distressed hospitals may be able to survive by lowering the quality of services, and hereby lowering the cost of providing services, if patients have insufficient alternatives to which to turn. Since some of the financially distressed hospitals turn around successfully, while others fail and turn into closure finally. An

interesting question worth pursuing is - what factors cause financially distressed hospitals to fail or not fail. Although substantial research has examined causes of hospital closure (Lynn & Wertheim 1993, Gardiner et al., 1996, Bazzoli & Andes 1995, Williams et al., 1992), knowing which hospitals are most susceptible to closure may be of great use to administrators but insufficient for the broader objective of reducing waste of social resource and increasing provision of adequate and high-quality care to the public. An accomplishment of such objective will need not only a thorough investigation of the factors causing financially distressed hospitals to fail but also an examination of the factors leading financially distressed hospitals to recover. Therefore, I am interested in exploring the second research question – what are the key factors associated with FP and NP hospitals' recovering from financial distress.

To address my second research question, a better knowledge of the current crisis facing by the hospital industry is essential. According to a report by Department of Health and Human Services, Office of Inspector General (2003), which describes trends in urban and rural hospital closure from 1990-2000, including the extent, characteristics, reasons for, and impact of hospital closures, the main reasons for closure include competition, business-related decisions (relocations, consolidation, merger), low occupancy rate, lagging revenue, rising cost, Medicare & Medicaid reimbursements, mismanagement, old & damaged building. In their review, urban hospitals that closed have fewer beds, lower occupancy rates, and lower annual net income than urban hospitals nationally by average; however, Medicare and Medicaid utilization rates were slightly higher among hospitals that closed. Rural hospitals that closed have similar characteristics as those of urban hospitals that closed, while with slightly lower Medicare and Medicaid utilization rates compared to rural hospitals nationally.

Moreover, based on the recent information released by AHA (American Hospital Association, 2002), American's hospitals, the foundation of our nation's health care system, are now facing lots of crisis, which include: 1. worker shortage of an estimated 168,000 positions waiting to be filled, among them three-quarters are for registered nurses, 2. rising demand and constrained capacity which is evidenced by overburdened emergency department and ambulance diversion, 3. confusing, contradictory and cumbersome regulations which force caregivers to spend more time on paperwork and less on patient care, 4. rapidly rising costs (including pharmaceutical costs and professional liability premiums) that is over 50 percent higher than service industries as a whole and, if not matched with increases in payment, will threaten the financial stability of hospitals, 5. growing number of uninsured people which threatens access to timely and appropriate care for more than

40 million Americans and strains the financial resources of the hospitals who care for these individuals especially as the unemployment rate climbs sharply after 2000, 6. decreased access to capital that's needed to meet growing demand, replace aging facilities, and update technology due to more bond downgrades than upgrades, 7. payment shortfalls from Medicare and Medicaid which make it even more difficult for hospitals to meet current challenges as half of hospitals lose money by serving Medicare patients, nearly three quarters lose money by serving Medicaid patients, one-third lose money overall, and moreover, 65 percent of hospitals are projected to lose money serving Medicare patients by 2005, and 8. such payment reductions even jeopardize the critical role of teaching hospitals in our health care system as they strive to maintain their academic missions.

Taken the above together, the challenges facing hospitals today include opportunities to improve quality and patient safety, continual advances in medicine, worker shortages, lack of staff and space to meet growing demand, the need to be prepared for mass casualty events, and an increasing burden of chronic disease in our population. In order to avert these crisis and to meet these challenges, what should the federal government do? Instead of continuing to cut resources, the federal government may have to take remedial actions by conducting critical investments to support information technology, advances in medicine, disaster readiness, workforce development, chronic care management, and rising demand for care. In addition to the federal government's efforts, an exploration of the second research question will undoubtedly contribute to lessening the magnitude of crisis.

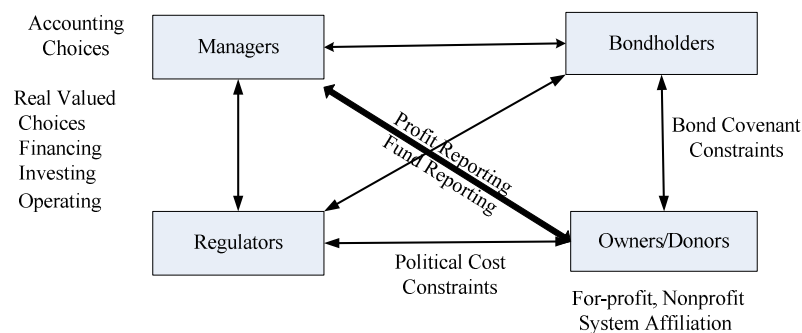
3. Agency Theory

In addition to the noted differing goals of for-profit and nonprofit hospitals, the existence of agency theory helps to explain the relation between the economic incentives of for-profit and nonprofit hospitals and the associated choices made by their managers. Based on a model (Figure 1) developed by Forgione (1987) within the health care industry context, a better understanding of the agency problem with nonprofit organizations can be approached. From Figure 1, it's evident that the equity investor has two choices in the health care market. The first choice is to buy stock in a for-profit organization to exchange for a typical return on equity; the second choice is to make a donation to a nonprofit organization, where the investor receives advantage of any tax effects, plus valued goodwill. Unlike for-profit organizations, where substantial profit sharing incentive systems help to align the economic interests of for-profit managers with those of the stockholders, nonprofit organizations are subject to the limitation of profit sharing. Despite this limitation, other forms of monitoring, such as donor-held seats on the board of directors, public scrutiny, U.S. Securities and

Exchange Commission (SEC) sanctions, do exist and provide nonprofit sector managers with strong incentives for behavior in line with objectives of equity donors. As Conrad (1984) argued, although the payoff to donated capital is in nonpecuniary terms, it's still real social cost and cannot be avoided; in other words, the two different types of returns produced by the for-profit and nonprofit organizational forms will provide equivalent value to the investor when the market is in equilibrium.

In addition to the profit sharing factors, both the political cost constraints and bond covenant relationships also exist in health care organizations as in commercial business domain and are useful in assessments of managerial incentives and choice behavior in health care organizations. Especially, as in one application of his model, Forgione (1987) found a significant association between the for-profit/nonprofit economic incentives and real-valued financial and nonfinancial management performance measures observed during the first year of the Medicare Prospective Payment System, in both multi-hospital systems and independent hospitals. Moreover, Robbins et al. (1993) found that the existence of management compensation plans in nonprofit hospitals is positively associated with income-increasing accounting choices. Eldenburg and Vines (2004) even reported that the linkages between profitability performance and managerial compensation create incentives for managers to manage earnings via the use of discretionary accruals. From the above discussion, I am therefore interested in exploring the third research question – whether the differing economic incentives of for-profit and nonprofit hospitals induce differential likelihood of managers to conduct earnings management actions (e.g. to change financial and nonfinancial performance measures) to help hospitals recover from financial distress or avoid from closure.

Figure 1. Economic Relationships



Source: Adapted from Forgione (1987)

4. Accounting Performance Measures

Understanding all factors that influence a hospital's performance is important, especially when debating public policy on how to reform the U.S. healthcare system. As Johnson and Kaplan (1987), Kaplan and Atkinson (1989), Vollman (1990) and Eccles (1991) reported, performance measurement includes both financial and nonfinancial metrics. Since this study attempts to explore the relationship between economic incentives of hospitals with different ownership, accounting performance measures, and hospital closure, the identification of accounting performance measures will be approached through three aspects: key financial ratios of hospital closures from prior studies, different performance dimensions and related financial ratios, and nonfinancial measures.

(1) Key Financial Ratios of Hospital Closures from Prior Studies

In addition to increasing competition and growth of healthcare spending, the introduction of the Prospective Payment System (PPS) in 1983 has brought an increasing number of hospitals to close nationwide. With the increase of hospital closures, it's important for healthcare decision makers to find tools to identify troubled hospitals. As such, a number of researchers are thus motivated to conduct studies aimed at finding causes of hospital closures or key financial ratios to predict hospital failure.

Lynn and Wertheim (1993) conducted an analysis of twenty-one financial ratios sampled from open and closed hospitals from 1984 to 1987. Their results showed that the most predictive individual variables are the profitability ratio of net income to total revenues and the viability index ($\left[\frac{TR}{TE} \right] \times \left[\frac{TA}{TL} \right]$) for one year and two years prior to closure, respectively. However, when factoring ratios together, the multivariate model with the highest predictive accuracy is total liabilities / total assets (leverage) + total revenue / total expenses (capital efficiency) + total assets / bed days available (resource availability).

Bazzoli and Cleverly (1994) reviewed cases of 11 hospital bankruptcies that occurred in 1990 and 1991 and found that there exists similarities across the 11 bankrupt hospitals: low occupancy, poor payor mix, negative equity, aging physical plants, and very low current ratios.

Gardiner et al., (1996) investigated the ability of discriminant analysis to provide accurate predictions of hospital failure and their results showed that discriminant functions based on a small set of financial and nonfinancial variables provide the capability to predict hospital failure reliably for both not-for-profit and proprietary hospitals. The resulting discriminant model for the not-for-profit hospitals

include the predictor variables of cash flow to total debt (liquidity), equity financing (profitability), long-term debt per bed (leverage), FTEs per occupied bed (efficiency), county market share and hospital length of stay (nonfinancial). In addition, their analysis of proprietary hospitals resulted in a quadratic discriminant model consisting of seven predictor variables: average payment period (liquidity), profit per discharge (profitability), long-term debt to equity (leverage), capital expense per hospital bed and cost per discharge (efficiency), county market share and Medicaid length of stay (nonfinancial). Although there is an increasing percentage of U.S. population participating in some type of managed care program, Gardiner et al., (1996) anticipated that such emphasis on managed care should have little impact on the structural makeup of their prediction model although the individual variables from different category (financial health or nonfinancial measures) might change.

(2) Different performance dimensions and related financial ratios

According to Zeller et al., (1996), although a broad set of financial ratios are utilized to assess hospital performance by health care administrators, governing boards, and public policy groups, only a few ratios may be necessary for meaningful insight due to three reasons: first, users encounter a problem when deciding which subset of hospital ratios provide the greatest insight to financial analysis (Gombola and Ketz 1983a); second, there is an inherent redundancy built into financial ratios (Benishay 1971) and third, the grouping of financial ratios may or may not be reliable for users' application due to their special nature. Moreover, in their argument, financial ratio analysis of hospitals needs to be better understood for the following reasons: first, the sheer size of this specific industry makes proper financial assessment important to the nation's economy; second, because the hospital industry has different characteristics from that of other economic sectors, particularly with respect to ownership, its focus in financial analysis is different; third, hospitals' financing policies are very different from those of most other NFP charitable organizations where philanthropy or tax support is a sizable source of revenue (Cleverly 1993); fourth, the evolutionary change in economic environment from cost reimbursement to fixed prices has increased the level of financial risk in hospitals and has brought great interest to some related stakeholders in the interpretation of financial ratios (Glandon et al., 1987); fifth, industry-specific financial ratios have become available for hospital financial analysis in the past decade. The central focus of their argument is – industry-specific ratios are necessary for appropriate assessment of hospitals' performance, which is consistent with the articulation of Chu et al., (1991) in that hospital ratios provide information which is different from that provided from manufacturing and retail firms. Due to this, the following discussions

focus on identifying adequate financial characteristics and associated industry-specific ratios to better assess hospitals' performance.

Most prior research on hospital financial performance has focused on profitability. For example, Forgione (1987) and Forgione et al. (1996) found that FP hospitals tend to be half the size of NP hospitals with lower case mix, shorter length of stay, higher cost per day, lower cost per case, and greater profitability. Sear (1992) examined the differences of profitability in a small sample of for-profit hospitals and non-profit hospitals in Florida from 1982 to 1988 and found that FP hospitals are more profitable than NP hospitals and the average length of stay and wages per adjusted patient day are important factors of hospital profitability differences. Vogel et al. (1993) examined the determinants of exceptionally high and exceptionally low profitability among Florida hospitals and concluded that debt load, labor intensity, and Medicare mix play important roles in exceptional profitability. Langland-Orban et al. (1996) used pretax operating margin (PTOM) and pretax return on assets (PROA) measures to compare the organizational and operational characteristics of 140 private Florida hospitals with sustained high profitability and sustained low profitability and found that the PTOM and PROA high-profit groups had a lower adjusted average length of stay and debt utilization, and a higher labor yield, occupancy rate, and percent with high hospital accreditation ratings, also, the PROA high-profit group had a higher case-mix index and Medicare mix; however, their results did not provide evidence that poor financial performance results from limitations in Medicare and Medicaid reimbursement, charity care burdens, structural characteristics, or from providing a higher quality of service. Younis et al. (2001) used return on assets to measure hospitals profitability for 1991 and 1995 and concluded that factors of increases in efficiency, adjustment to the PPS and the use of technology for billing, collection and record keeping all contribute to the improvement of hospital profitability. Younis et al. (2003) examined the issue of profitability using a large sample of hospitals in Florida for 1991 and 1995 and demonstrated that status conversions from NP to FP, occupancy rate and teaching affiliation are all important factors to explain hospital profitability. Younis and Forgione (2005) investigated hospital profitability by comparing total profit margin (TPM) and return on equity (ROE) as measures of profitability and found that TPM is a better measure of profitability than ROE, and profitability is mainly influenced by location, size, occupancy rate, volume of Medicare and Medicaid patients, and teaching status.

Due to the limited focus of prior literature on profitability, many subsequent studies have extended their investigation of issue of hospital profitability to a broader context. For example, in addition to profitability, both Cleverly (1986) and Foster (1986) has emphasized the importance of examining additional three financial

dimensions when assessing hospital financial condition: liquidity, capital structure, and asset efficiency. Levitz and Brooke (1985) investigated differences in the financial performance from five categories of financial ratio, cost, and productivity between system-affiliated and independent hospitals. The related financial ratios for each category are: 1. liquidity ratios: current ratio, acid test (quick), absolute liquidity, accounts receivable, uncollectible ratio, collection period, 2. capital structure ratios: equity financing, long-term debt to equity, long-term debt to fixed assets, cash flow to debt, 3. financial activity ratios: total asset turnover, fixed asset turnover, current asset turnover, 4. depreciation ratios: plant depreciation, average age, 5. profitability ratios: return on equity, return on total assets, profit margin from patient services, operating margin, net profit margin, total margin, markup, deductible ratio. Cost measures include cost per case, cost per day, pay per day, pay per admission and nurse pay per day. Productivity measures include number of full-time equivalents per average daily census, fixed assets per average daily census, total assets per admission, admissions per bed, full-time administrators per average daily census, case-mix-adjusted average length of stay.

Cleverly and Rohleder (1985) investigated the financial dimensions of 29 financial ratios collected by the Financial Analysis Service, a division of the Healthcare Financial Management Association, for the years 1978 to 1980 and found that the 29 ratios captured the following 10 characteristics of financial performance: 1. profitability, 2. short-term cash position, 3. capital structure, 4. liquidity, 5. age of plant, 6. debt coverage, 7. payment mix, 8. leverage, 9. current asset efficiency, and 10. fixed asset efficiency.

Renn et al., (1985) investigated differences among five types of hospitals, defined by ownership (investor-owned or not-for-profit), system affiliation (system-affiliated or freestanding), and government sponsorship on 24 measures of economic performance from five dimensions: 1. revenue & expense: total patient care revenue per adjusted admission, net patient care revenue per adjusted admission, total patient care expenses per adjusted admission, general and administrative costs per adjusted admission, and home office costs per adjusted admission, 2. markups & profitability: gross patient care markup ratio, deductions from revenue as a percentage of total gross revenue, nonoperating revenue as a percentage of total gross revenue, total markup ratio, return on total assets, return on equity or fund balance, 3. activity & productivity ratios: total assets turnover ratio, case flow, FTEs per adjusted daily census, occupancy rate, average length of stay, 4. capital structure: debt-to-asset ratio, capital costs, including Medicare return on equity, as a percentage of patient care costs, accounting average age of plant, total fixed assets per bed, and 5. case mix & payer mix: Medicare case-mix index, inpatient surgeries per 100 admissions, births

per 100 admissions, outpatient revenue as a percentage of total gross revenue, and charge-based admissions as a percentage of total admissions.

Watt et al., (1986) investigated whether significant differences exist between the economic performance of investor-owned chain and not-for-profit hospitals and examined the following indicators of economic performance: inpatient charges, costs of providing inpatient services, costs to payers, personnel and use of physical assets, charge-to-cost markups and profitability, and capital structure financial ratios.

Register et al., (1988) compared performance of FP and NP from two dimensions of productivity and cost functions and used total inpatient days to measure productivity.

Chu et al., (1991) provided evidence that the approach to financial ratio analysis used for retail and manufacturing firms is not the same for hospitals. In their findings, only three ratios of debt structure, working capital flow, and receivables intensiveness remained consistent within the hospital industry throughout the five years of their study; however, they suggested future researchers to extend the study periods beyond 1987 due to the inception of the prospective payment system in 1983.

McCue and Ozcan (1992) analyzed the determinants of hospital capital structure in a new market setting that are created by the financial pressures of prospective payment and the intense price competition among hospitals and found that hospital system affiliation, bed size, growth rate in revenues, operating risk, and asset structure affected both short- and long-term debt borrowing; in addition, their findings reconfirmed the belief that price competition and the limitations of diagnosis-related group payments are already affecting health care providers' ability to borrow, despite the fact that Medicare capital costs are reimbursed on a retrospective, cost-based basis (Pallarito 1990).

Bazzoli and Andes (1995), based on a consideration of the emphasis by Cleverly (1986) and Foster (1986), have used the results from a 1991 AHA initiative to identify the set of financial indicators that best measures each of these four financial dimensions: 1. profitability: total margin, return on total assets; 2. liquidity: current ratio, days in accounts receivable; 3. capital structure: debt to capitalization, cash flow to total debt; and 4. asset efficiency: fixed asset turnover, average age of plant.

Zeller et al., (1996), by using audit financial data in a study of 2,189 not-for-profit hospitals for the period 1989-1992 and factor analysis, have defined six financial characteristics of performance and a concise set of critical financial ratios that can be used to measure the six characteristics of hospital performance: 1. profitability: return on assets, total margin, return on investment, operating margin, operating margin price level adjusted; 2. fixed-asset efficiency: fixed asset turnover,

price-level adjusted fixed asset turnover, total asset turnover; 3. capital structure: equity financing, fixed asset financing; 4. fixed-asset age: average age of plant, depreciation rate; 5. working capital efficiency: current asset turnover, current ratio, days cash on hand (short-term sources) and 6. liquidity: days cash on hand (all sources), replacement viability.

The Sourcebook 1999 presented 59 measures of hospital performance in seven areas, including capacity & utilization, patient and payer mix, capital structure, liquidity, revenue, expenses & profitability, productivity & efficiency and pricing strategy (Chu 1999).

Flex Monitoring Team (2005), using a specifically designed selecting process in an attempt to provide CAH (Critical Access Hospitals) administrators with a set of comparative financial indicators, found that the following six performance dimensions and their related indicators are selected as the most frequently used and most effective comparative financial indicators specifically for CAHs to improve their financial management: 1. profitability: total margin, cash flow margin, return on equity; 2. liquidity: current ratio, days cash on hand, net days revenue in accounts receivable 3. capital structure: equity financing, debt service coverage, long-term debt to capitalization; 4. revenue: outpatient revenues to total revenues, patient deductions, Medicare inpatient payer mix, Medicare outpatient payer mix, Medicare outpatient cost to charge, Medicare revenue per day; 5. cost: salaries to total expenses, average age of plant, FTEs per adjusted occupied bed; and 6. utilization: average daily census swing-SNF beds, average daily census acute beds.

(3) Nonfinancial Measures

Based on the above discussion, although industry-specific financial ratios have been developed and employed in hospital financial analysis, there is evidence that information in addition to financial accounting ratios might help the evaluation of financial performance of hospitals. For example, Cleverly and Nutt (1984) examined eight nonfinancial measures and find that the number of beginning beds (size), expense per patient day, and percentage of Medicaid revenue are significantly correlated with hospital bond ratings. Sherman (1986) posited that financial statements prepared according to present standards do not provide sufficient information for accurate comparative analysis of FPs and NPs and reports that the following supplemental disclosure is needed for financial statements for a relative performance comparison between FP and NP: 1. output mix data: output volume, case mix, and payer mix, 2. price level data, 3. disclosure of the impact of interest rates, research, teaching, fund accounting, and donated services on NP operations, 4. line of business disclosure: the reporting should at least segregate outpatient, teaching, and

research activities, 5. management discussion and analysis, 6. government-owned hospital reporting.

Walker (1993) found that financial variables fail to discriminate between profitable and unprofitable hospitals and thus do not provide a complete explanation of financial condition. Craycraft (1994) used bond rating as a proxy for financial performance in an attempt to examine whether nonfinancial data, specifically socioeconomic data, is relevant in assessing hospital financial performance and found that the model combining both the socioeconomic and financial variables is statistically better at explaining bond ratings rather than the financial model alone, implying that socioeconomic data do provide incremental information in measuring hospital performance. Lawrence and Kurtenbach (1995) found 10 nonfinancial measures to be significantly correlated with several measures of market risk. Also, Gardiner et al. (1996) found that two nonfinancial variables, county market share and length of stay, are significant in predicting failure in both not-for-profit and proprietary hospitals. Sengupta (1998) found that nonprofit hospitals might be able to mitigate their cost of external financing through more complete financial disclosure, particularly with regard to relevant, nonfinancial operating information. Due to the findings from prior studies, Watkins (2000) extended previous research by including nonfinancial information in his analysis and his results suggested that nonfinancial data captures aspects of hospital performance that financial data may not capture, is highly significant in explaining bond ratings (a proxy for one dimension of hospital performance – creditworthiness), and may contain informational value to aid management in making financial decisions. In his findings, only three distinct nonfinancial ratio groupings, which are best characterized as capturing measures of outputs, measures of efficiency, and measures of productivity, emerged consistently over his five-year (1990 – 1994) study period. Variables loading onto the first nonfinancial factor of measures of outputs include Case Mix Adjusted Admissions, Case Mix Adjusted Patient Days, and number of births. Variables loading onto the second nonfinancial factor of measures of efficiency include full-time equivalent employees to number of occupied beds, measuring staff efficiency, and occupancy rate, measuring a hospital's existing capacity utilization. Further, Case Mix Adjusted Admissions per Bed in service and Case Mix Adjusted Equivalent Admissions per Full-Time-Equivalents loaded consistently onto the third nonfinancial factor of measures of productivity. In addition to Watkins (2000), Ballou et al., (2003) investigated whether and how nonfinancial performance measures improve subsequent financial results and found that after EAMC (East Alabama Medical Center) began to focus more heavily on nonfinancial performance measures, the overall performance improved.

In addition to providing relevant information not depicted by traditional financial ratios, there are many other reasons to include nonfinancial information in my analysis. First, one possible explanation why prior studies of hospital performance have not been concerned with nonfinancial information is due to a lack of data availability. However, since the mid-1940s, the American Hospital Association (AHA) has collected utilization data as well as data on a variety of other aspects of health care annually (GASB Report, 1990). The data availability problem thus no longer exists for the subsequent studies. Second, certain resource providers for hospitals – for example, those that make charitable donations, taxpayers, financiers of debt and third party payers – are also interested in assessing various aspects of hospital performance (Lawrence and Kurtenbach 1995, GASB Report 1990). Third, the publication of a recent report by the AICPA Special Committee on Financial Reporting (AICPA 1994), also reflects a growing interest in nonfinancial measures among accountants (Ansari and Euske 1995). Moreover, the Government Accounting Standards Board (GASB) adopted and published Concepts Statement No. 2, Service Efforts and Accomplishments Reporting in 1995 (Harris, 1995) and believed that full accountability requires additional information beyond that traditionally supplied in external financial statements (GASB Report, 1990). Fourth, Several professional organizations have encouraged health care organizations, who raise capital in the tax-exempt revenue bond market, to report nonfinancial information. For example, an advisory committee of the National Association of State Auditors, Controllers and Treasurers (NASACT) has produced draft guidelines on the types of information that tax-exempt health care issuers should annually disclose to owners of their bonds (Pallarito, 1994). Additionally, in an attempt to strengthen voluntary disclosure, the Healthcare Financial Management Association’s (HFMA) Principles and Practices Board drafted a position statement which established guidelines that define the types of financial and nonfinancial data that health care providers should disclose (Pallarito, 1993). Finally, Mensah (1996) raised an important question concerning the adequacy of FASB information requirements for hospitals and other health care institutions in this “emerging highly competitive environment” – should hospitals and other health care organizations provide additional information beyond those required by the FASB?

An extensive review of the above studies confirms my belief that the nature and extent of nonfinancial information disclosure by hospitals is a relevant and timely policy issue for assessing financial performance. While such disclosure may be costly, I believe that such information should provide incremental value over and above the financial information that is already disclosed. Therefore, my analysis of the

relationship between economic incentives, accounting performance measures and hospital closure will take into consideration of the effects of nonfinancial measures.

5. Definition of Financial Distress

Due to this study's objective to address the above mentioned two research questions – what are the key factors associated with hospitals' recovering from financial distress and whether the differing economic incentives of for-profit and nonprofit hospitals induce differential likelihood of managers to conduct earnings management actions to help hospitals recover from financial distress or avoid from closure, a clear definition of financial distress is necessary for identifying samples of financially distressed hospitals. Moreover, given the different ownership status and accompanied different access to capital, two different definitions of financial distress are set for for-profit and not-for-profit hospitals, respectively.

(1) General Definition

Since the Balanced Budget Act of 1997 has dramatically changed the payment environment for institutional providers of non-acute health services from the traditional cost-based approaches to prospective payment, in a policy analysis brief by NORC Walsh Center for Rural Health Analysis on January of 2004, NORC (2004) utilized the definition of financially distressed hospitals as those with both a negative three-year average total margin and a negative cumulative two-year cash cushion and simulated the effects of the outpatient prospective payment system (OPPS) rules on the financial performance of rural hospitals in four states – Iowa, Texas, Washington, and West Virginia. Their findings suggested that the profitability and cash position of small, government-owned, and Medicare-dependent hospitals will be adversely impacted by outpatient PPS and also the number of financially distressed rural hospitals will increase significantly. Due to our somewhat similar objective of analyzing relative financial performance of FP and NP hospitals and the need to partition our samples into financially distressed and non-distressed to address our first and third research questions, we therefore adopt the same definition as that in the policy analysis brief by NORC as our means to identify the financially distressed hospitals for model 1.

(2) Not-for-profit Hospitals

Bazzoli and Andes (1995) identified a group of financially distressed hospitals and tracked them over time to identify the consequences of their financial distress. Since their steps to use hospitals that have BBB – rated bonds as an upper bound for identifying distress is somewhat consistent with one of our purposes to test the

relationship between hospital closure and bond rating revision, we therefore believe that adopting such ways to identify our financially distressed not-for-profit hospitals is able to provide a reasonable basis for our analysis. According to Bazzoli and Andes (1995), the way to identify financially distressed hospitals is a five-step procedure:

1. Since BBB – is the lowest S&P rating for “investment grade” bonds and implies that the issuer has serious financial problems that may result in bond default, the first step to establish thresholds for financial distress is to identify the group of hospitals with BBB – credit ratings on newly issued bonds from the Standard & Poor’s (S&P) rating agency.
2. To obtain median values for each of the eight financial indicators, including current ratio and days in account receivable (liquidity), total margin and return on total assets (profitability), debt to capitalization and cash flow to total debt (debt/capital structure), and fixed asset turnover and average age of plant (asset efficiency), for BBB – hospitals through Van Kampen Merritt Investment Advisory Corporation, which maintains a database of S&P ratings and the audited financial data used by S&P to derive these bond ratings.
3. To identify all community hospitals that were in operation from 1995 to 1999 and that had complete financial data for these years from Medicare database.
4. To compute the 1995-1999 average value for each of the eight financial indicators for each hospital to alleviate large year-to-year fluctuations that typically arise in hospital financial data.
5. To identify those community hospitals that had at least six of their eight financial indicators average value below the median values for the 1990 BBB – hospitals and define them as financially distressed. The rationale for requiring six values to be below the thresholds would provide assurance that financial performance of these hospitals is indeed poorer than that of BBB – hospitals.

Due to our objective of addressing the second research question, we thus adopt the same definition for model 1 to identify the financially distressed hospitals for model 2, and the definition especially fit for not-for-profit hospital to identify the financially distressed hospitals for model 3.

III. Research Design

1. Sample Selection

We obtain a list of closed hospitals, 78 for rural and 168 for urban, from Department of Health and Human Services, Office of Inspector General for the period 1996 to 2000. In their definition, a closed hospital is a facility that stopped providing general, short-term, acute inpatient care during 1996-2000 and a hospital is not considered closed if it met one of the following conditions: 1. merged with, or was sold to, another hospital but the physical plant continued to provide inpatient acute care, or 2. converted to critical access status for rural hospital, or 3. both closed and reopened during the same calendar year and at the same physical location. Moreover, we obtain cost report data accounting for the most recent full fiscal year prior to closure from HCFA Annual Medicare Hospital Cost Reports (hereafter Medicare database), 1995 to 1999; in other words, closed hospitals for which one year of financial data prior to the year of closure was not reported in the HCFA are not included in the treatment sample.

In order to make a comparison between closed and open hospitals, a control sample of around 200 open hospitals is selected randomly from Medicare database each year if the hospitals were operated from 1995 to 1999 and met the following two criteria: 1. they had to remain open throughout the study period; and 2. their Medicare cost reports for the year they were selected had to be available. Further, due to our objective of addressing the first and third research question, we pool the treatment and matched control sample and partition the whole sample into three groups, financially not-distressed, financially distressed and failed, and financially distressed and recovered hospitals based on our above noted general definition for financial distress to test our first model estimation; and due to our objective of addressing the second research question, we first split the whole sample into two groups - for-profit and not-for-profit, and then each group is further partitioned into three subsets of financially not-distressed, financially distressed and failed, and financially distressed and recovered hospitals based on our general definition of financial distress and specific definition of financial distress for not-for-profit hospital, respectively. All hospitals classified as for-profit are used for our second model estimation, and those classified as not-for-profit are used for our third model estimation.

2. Variable Selection

Based on a review of prior studies regarding key financial ratios and predictors of hospital closures, we thus utilize equity financing, cash flow to total debt,

long-term debt per bed, FTEs per occupied bed, length of stay as our control variables for model 1. Further, due to our purpose to identify possibly different key factors associated with hospitals recovering from financial distress between FP and NP, average payment period (liquidity), profit per discharge (profitability), long-term debt to equity (leverage), capital expense per hospital bed and cost per discharge (efficiency), and Medicaid length of stay (nonfinancial) are utilized as control variables for model 2, while cash flow to total debt (liquidity), equity financing (profitability), long-term debt per bed (leverage), FTEs per occupied bed (efficiency), and hospital length of stay (nonfinancial) are utilized as control variables for model 3.

Further, due to the evidence from prior studies that nonfinancial information do contain information content and capture aspects of hospital performance that financial data may not capture, our test variables include both financial ratios and nonfinancial measures. Based on an extensive review of prior studies regarding hospital performance, a summary of inclusive financial characteristics and their associated variables are provided as follows: 1. profitability: total profit margin, return on total assets, return on equity, 2. liquidity: current ratio, acid test, accounts receivable, uncollectible ratio, collection period, days in accounts receivable, days cash on hand, net days revenue in accounts receivable, working capital flow, 3. capital structure: equity financing, long-term debt to equity, long-term debt to fixed assets, long-term debt to capitalization, cash flow to debt, debt-to-asset ratio, capital costs, average age of plant, total fixed assets per bed, hospital system affiliation, bed size, growth rate in revenues, operating risk, asset structure, fixed asset financing, debt service coverage, plant depreciation, 4. cost: cost per case, cost per day, pay per day, pay per admission, nurse pay per day, salaries to total expenses, FTEs per adjusted occupied bed, 5. productivity: number of full-time equivalents per average daily census, fixed assets per average daily census, total assets per admission, admissions per bed, full-time administrators per average daily census, case-mix-adjusted average length of stay, occupancy rate, average length of stay, total inpatient days, 6. payment mix: Medicare inpatient payer mix, Medicare outpatient payer mix, Medicare outpatient cost to charge, Medicare revenue per day, 7. case mix & payer mix: Medicare case-mix index, inpatient surgeries per 100 admissions, births per 100 admissions, outpatient revenue as a percentage of total gross revenue, and charge-based admissions as a percentage of total admissions, 8. fixed asset efficiency: price-level adjusted fixed asset turnover, total asset turnover, current asset turnover, depreciation rate, 9. revenue & expense: total patient care revenue per adjusted admission, net patient care revenue per adjusted admission, total patient care expenses per adjusted admission, general and administrative costs per adjusted admission, and home office costs per adjusted admission, outpatient revenues to total revenues, patient deductions, 10. capacity &

utilization: average daily census swing-SNF beds, average daily census acute beds.

After taking into consideration of our specific research purpose, the current crisis faced by the hospital industry, and our judgment of data availability and feasibility, six performance dimensions and the associated variables for each dimension are selected as our test variables for financial ratio for all three models: 1. profitability: total profit margin, 2. liquidity: net days revenue in accounts receivable, 3. capital structure: age of physical plant, 4. productivity: total assets per admission, 5. revenue & expense: outpatient revenue as a percentage of total gross revenue, and 6. fixed asset efficiency: fixed asset turnover.

The same considerations as financial ratios are taken for determination of inclusion of nonfinancial measures, 1. productivity: occupancy rate, 2. case and payor mix: percentage of Medicare & Medicaid, 3. capacity & utilization: average daily census swing-SNF beds, 4. size: number of beds, 5. location: urban or rural and 6. ownership status: FP or NP. Moreover, the variable of ownership status is excluded from model 2 and model 3; also, variables of amount of research and education activity, teaching status, and bond rating revision are especially included in model 3 due to the specific nature of not-for-profit hospitals.

3. Model Specification & Variable Definition

(1) Model 1:

$$\begin{aligned} \text{CLO} = & \text{TPM} + \text{ARD} + \text{AGE} + \text{TAPA} + \text{OUPREV} + \text{TOV} + \text{OCC} + \text{MED} + \\ & \text{ADCSNF} + \text{SIZE} + \text{LOC} + \text{OWNER} + \text{EQFIN} + \text{CFTD} + \text{LTDPB} + \\ & \text{FTEPOB} + \text{LOS} + \varepsilon \end{aligned}$$

Where

CLO = closure, coded 0 if a financially not-distressed hospital, coded 1 if a financially distressed and failed hospital, and coded 2 if a financially distressed and recovered hospital

TPM = total profit margin, net income/total revenues

ARD = net days revenue in accounts receivable, (net patient accounts receivable)/(net patient service revenue/days in period)

AGE = average age of plant, accumulated depreciation/depreciation expense

TAPA = total assets per admission, total assets/total admissions

OUPREV = outpatient revenue as a percentage of total revenue, outpatient revenue/total gross revenue

TOV = fixed asset turnover, total operating revenue/net fixed assets

OCC = occupancy rate, 100(patient days)/(365 x licensed beds)

MED = percentage of Medicare & Medicaid, $100(\text{Medicare} + \text{Medicaid discharges})/\text{total discharges}$

ADCSNF = average daily census swing-SNF beds, inpatient swing bed SNF days/days in period

SIZE = number of beds

LOC = location, urban if in MSA and rural if not

OWNER = ownership status, coded 1 if a for-profit hospital and coded 0 otherwise

EQFIN = equity financing, fund balance/total assets

CFTD = cash flow to total debt, $100(\text{excess of revenue over expenses} + \text{depreciation})/\text{total debt}$

LTDPB = long-term debt per bed, long-term liability/hospital bed size

FTEPOB = full-time equivalent employees (FTEs) per occupied bed, total FTEs/occupied beds

LOS = hospital length of stay, patient days/total discharges

ε = error term

(2) Model 2: (FP)

$$\text{CLO} = \text{TPM} + \text{ARD} + \text{AGE} + \text{TAPA} + \text{OUPREV} + \text{TOV} + \text{OCC} + \text{MED} + \text{ADCSNF} + \text{SIZE} + \text{LOC} + \text{APP} + \text{PPD} + \text{LTDTE} + \text{CEPHB} + \text{CPD} + \text{MEDLOS} + \varepsilon$$

Where

CLO = closure, coded 0 if a financially not-distressed hospital, coded 1 if a financially distressed and failed hospital, and coded 2 if a financially distressed and recovered hospital

TPM = total profit margin, net income/total revenues

ARD = days in accounts receivable, $(\text{net accounts receivable} * 365) / \text{net patient revenue}$

AGE = age of physical plant, accumulated depreciation/depreciation expense

TAPA = total assets per admission, total assets/total admissions

OUPREV = outpatient revenue as a percentage of total revenue, outpatient revenue/total gross revenue

TOV = fixed asset turnover, total operating revenue/net fixed assets

OCC = occupancy rate, $100(\text{patient days}) / (365 * \text{licensed beds})$

MED = percentage of Medicare & Medicaid, $100(\text{Medicare} + \text{Medicaid discharges})/\text{total discharges}$

ADCSNF = average daily census swing-SNF beds, inpatient swing bed SNF days/days in period

SIZE = number of beds

LOC = location, urban if in MSA and rural if not

APP = average payment period, current liabilities/ [(operating expenses-depreciation)/365]

PPD = profit per discharge, profit/total discharges

LTDTE = 100(long-term liability)/total equity

CEPHB = capital expense per hospital bed, 100 [(interest + depreciation)/(total operating expense – interest – depreciation)] /hospital bed size

CPD = cost per discharge, inpatient operating expense/total discharges

MEDLOS = Medicaid length of stay, Medicaid patient days/total Medicaid discharges

ϵ = error term

(3) Model 3:

$$\text{CLO} = \text{TPM} + \text{ARD} + \text{AGE} + \text{TAPA} + \text{OUPREV} + \text{TOV} + \text{OCC} + \text{MED} + \text{ADCSNF} + \text{SIZE} + \text{LOC} + \text{RESEDU} + \text{TEACH} + \text{RATING} + \text{EQFIN} + \text{CFTD} + \text{LTDPB} + \text{FTEPOB} + \text{LOS} + \epsilon$$

Where

CLO = closure, coded 0 if a financially not-distressed hospital, coded 1 if a financially distressed and failed hospital, and coded 2 if a financially distressed and recovered hospital

TPM = total profit margin, net income/total revenues

ARD = days in accounts receivable, (net accounts receivable*365)/net patient revenue

AGE = age of physical plant, accumulated depreciation/depreciation expense

TAPA = total assets per admission, total assets/total admissions

OUPREV = outpatient revenue as a percentage of total revenue, outpatient revenue/total gross revenue

TOV = fixed asset turnover, total operating revenue/net fixed assets

OCC = occupancy rate, 100(patient days)/(365xlicensed beds)

MED = percentage of Medicare & Medicaid, 100(Medicare + Medicaid discharges)/total discharges

ADCSNF = average daily census swing-SNF beds, inpatient swing bed SNF

days/days in period
SIZE = number of beds
LOC = location, urban if in MSA and rural if not
RESEDU = amount of research and education activity (?)
TEACH = teaching status, coded 1 if a teaching hospital and coded 0 otherwise
RATING = bond rating revision, coded -1 if a bond rating downgrade, coded 0 if no revision, and coded 1 if a bond rating upgrade
EQFIN = equity financing, fund balance/total assets
CFTD = cash flow to total debt, $100(\text{excess of revenue over expenses} + \text{depreciation})/\text{total debt}$
LTDPB = long-term debt per bed, long-term liability/hospital bed size
FTEPOB = full-time equivalent employees (FTEs) per occupied bed, total FTEs/occupied beds
LOS = hospital length of stay, patient days/total discharges
 ε = error term

4. Data Sources

Medicare cost reports (Medicare database) are the primary source for the study data we obtain. In addition, the data for bond rating revision for sample of nonprofit hospitals is obtained from the Merritt Research Healthcare database, a credit and investment analysis database.

5. Research Method

Multinomial logit regression analysis will be conducted for the samples of each year from 1995 to 1999. The variables found significant in logit regression will then be inserted into a discriminant model for determination of the marginal value. We then use this marginal value as a criteria to predict the possibility of specific hospital closure in the future. In addition, Pearson correlation approach will be used to check if there exists a multicollinearity problem among variables. Also, a sensitivity test will be done to check for the robustness and generalizability of the results.

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