Strategic Activity and Financial Performance of U.S. Rural Hospitals: A National Study, 1983 to 1988

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ABSTRACT: *This study examines the effect of 13 strategic management activities on the financial performance of a national sample of 797 U.S. rural hospitals during the period of 1983-1988. Controlled for environment-market, geographic-region, and hospital-related variables, the results show almost no measurable effect of strategic adoption on rural hospital profitability and liquidity. Where statistically significant relationships existed, they were more often negative than positive. These findings were not expected; it was hypothesized that positive effects across a broad range of strategies would emerge, other things being equal. Discussed are possible explanations for these findings as well as their implication for a rural health policy relying on individual rural hospital strategic adaptation to environmental change.*

The most critical question that many believe can be asked about the adoption of strategic activities in rural hospitals is what effect, if any, such action has on financial performance. Other papers have sketched the magnitude and correlates of strategic adoption among rural hospitals in the United States (cf. Amundson & Rosenblatt, 1988; Ludke, Westhoff, & Flood, 1992; Mick, et al., 1993a; Mick, et al., 1993b; Seavey, Berry, & Bogue, 1992). For the majority of rural hospitals, and for a variety of reasons, the adoption of strategies like horizontal and vertical integration has been less common than the professional and trade literatures would seem to indicate.

Yet, for those rural hospitals that have been active in this domain, the obvious question is: What association is there between strategic activity and financial performance of these facilities? Although the importance of this question cannot be denied, the lack of analyses, as discussed below, may be surprising. Thus, this study begins to fill the gap that exists by being one of the first that addresses, in a representative national sample, the issue of rural hospital strategy and its potential association with financial performance.

Strategic Management and Performance

Definition and Rationale. The idea behind the potentially positive link between strategic activity and financial performance is drawn directly from organization theory's proposition that organizational survival requires adaptation to changes in environments (cf. Kimberly & Zajac, 1985; Shortell & Zajac, 1990; Topping & Hernandez, 1991). That is, the adapted organization can expect to achieve higher performance levels than unadapted organizations

(Chandler, 1962; Ginsberg & Venkatraman, 1985; Pfeffer & Salancik, 1978; Thompson, 1967). Extensive development of typologies of organizational strategies ensued, ranging from Miles and Snow's (1978) "prospector, defender, analyzer, and reactor" orientations to Herbert and Deresky's (1987) "develop, stabilize, turnaround, and harvest" activities. Explicitly or implicitly, this literature posited a positive connection or association between usually substantial organizational change and performance, the latter often measured by financial indicators.

Previous Research. Outside the realm of health care management, research such as Miller's (1987) showed that conservative cost control strategies correlated positively with stable environments, whereas complex product differentiation strategies correlated positively with turbulent and changing environments. Rhyne (1986) discovered improved long-term results from strategic action and concluded that an openness to the environment and a long-term perspective were characteristics of successful managements. Another study showed significant positive correlations between the formality of strategic planning and a variety of financial performance measures (Pearce, Robbins, & Robinson, 1987). And, Covin and Selvin (1989) concluded that for firms in "hostile environments," higher financial performance was related to "organic" structures, entrepreneurial strategic positions, and a long-term competitive approach to the industry.

In short, outside health care, there appears to be some empirical evidence that strategy and performance are correlated. On the other hand, Greenley's (1986) review of nine studies examining the relationship between strategic planning and organizational performance revealed that methodological weaknesses in sampling, control groups, measurement, and statistical significance limited the ability to assert a positive connection.

Inside the rural health care arena, Mick and Morlock (1990), in their review of rural hospital strategy literature of the 1980s, found virtually no national evidence regarding the positive *or* negative association between strategy and performance, however defined. The exhaustive reviews of Ermann (1990), Moscovice (1989), and the Congressional Budget Office (1991) also have failed to reveal evidence of a consistent relationship between strategy and performance. Two of the few studies addressing the issue have certain limitations. Shortell (1988a) examined several hundred rural hospitals and found little support for a strategy-financial performance link, but because the sampled hospitals were all members of eight multihospital systems, the generality of these findings was constrained because most rural hospitals were not in systems. In another study, Smith, Piland, and Funk (1992) found that "extensively developed strategic planning in rural hospitals" was associated with higher profitability, but here, too, generality was limited because the study sample consisted of 22 hospitals in one state dichotomized into "less developed" and "highly developed" strategic planning systems. Strategically less and highly developed rural hospitals were compared across measures such as cost per patient day and operating margin using bivariate t tests, and thus statistical control of other potential factors affecting financial performance was not possible. One concludes from this review that empirical study both inside and outside the rural health care scene of the strategy-performance relationship has yielded results that are not clear one way or the other, underscoring the need for a more rigorous examination of the relationship.

Hypothesis. This study attempts to overcome previous weaknesses in this research by (1) controlling for possible factors that condition the strategy-performance connection and (2) using a representative sample of all U.S. rural hospitals. Mindful of the theoretical argument in favor of strategy, of the positive tone of the trade and professional literature regarding the benefits of strategic activity (Mick and Morlock, 1990), and of the positive—if limited—findings of the research literature, the following overall hypothesis is posited:

H: The adoption of strategic management activities is positively related to rural hospital financial performance, other things being equal.

Various strategies, e.g., multihospital affiliation versus affiliation with a health maintenance organization (HMO), could well produce associations of different magnitudes, but too little theory and too few previous research results limit refined predictions across strategies.

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Methods

The study consists of the responses of 797 chief administrators of rural hospitals combined with secondary data from the American Hospital Association (AHA), the national Area Resource Files (ARF), and the Health Care Financing Administration's (HCFA) Prospective Payment System (PPS) Medicare Cost Report files. Questions were asked of each administrator to determine what the status of the hospital was during fiscal year 1987-1988 (telephone interviews were conducted from June to December 1989, with several hospital administrators interviewed in early 1990) and what it was earlier in fiscal year 1982-1983.

Rural hospitals are defined as those not located in either a consolidated metropolitan statistical area (CMSA) or a metropolitan statistical area (MSA) and that were also on the 1986 AHA tape and the 1986 Medicare PPS databases, the latest year available at that point in the study. Only those that were short-term length of stay were included in the sampling frame; excluded were all federal hospitals. Merging these two databases produced 2,044 hospitals, and from these a 50 percent proportionately stratified random sample of 1,021 hospitals was drawn. The strata were the nine U.S. Bureau of the Census divisions, which improved the chances that states with a small number of rural hospitals would be represented.

The telephone survey measured, among other things, strategic management activities having taken place between 1983 and 1988. In the process of interviewing, the original sample of 1,021 was cut to 991 because of a loss of 30 hospitals. Twenty-two of these hospitals had closed between 1986 and the time the interviews were conducted, although several were trying to reopen. The remainder had converted to nursing homes, psychiatric facilities, or clinics. This 2.9 percent loss of the original sample was small enough that any resulting selection effect was considered insufficient to bias the results of the study and make them unrepresentative of the vast majority of rural hospitals.

The final overall response rate was 80 percent (797 out of 996 hospitals). Of the responding hospitals, the average number of licensed beds was 79.6, the average occupancy rate was 44.2 percent, and 24.7 of the hospitals were located in the West North Central census division, followed by 17.2 percent in the West South Central division, 15.1 percent in the East North Central division, 11.5 percent in the South Atlantic division, 10 percent in the East South Central division, 9.2 percent in the Mountain division, 5.6 percent in the Pacific division, 3.9 percent in the Middle Atlantic division, and 2.8 percent in the New England division. Hospital ownership status was divided as follows: 40.2 percent of the hospitals were community not-for-profit; 11.2 percent were religious not-for-profit; 37.3 percent were municipal, county, or district owned; and 11.4 percent were for profit.

Nonresponding hospitals were compared to responding hospitals using *chi* square tests, and the following groups were found to be less likely to respond to the survey: for-profit hospitals (67.0%, $P<0.05$); hospitals in the 100 to 199 bed size (75.0%, $P<0.05$); and hospitals with Joint Commission on Accredition of Healthcare Organizations (JCAHO) accreditation (77.3%, $P<0.05$). Examples of variables with no nonresponse/response differences included average daily census, occupancy rate, and affiliation with a multihospital system. Caution should still be exercised in applying study findings to for-profit, 100-199 bed, and JCAHO-accredited rural hospitals.

Financial Performance Variables. The financial performance of rural hospitals can be examined using financial ratios (Choat & Tanaka, 1979). This study used two common financial ratios for fiscal years 1982-1983 and 1987-1988 as the dependent variables, each of which taps a separate conceptual dimension of financial performance. The first dimension is *profitability*. Failure to maintain an excess of revenues over expenses cannot be sustained for long—cash flow would be severely restricted, obligations would be unmet, and other financial performance indicators would be adversely affected. This study used total margin, calculated as the difference between revenue (total operating and nonoperating) and expenses (total operating and nonoperating) divided by revenue (total operating and nonoperating). This study did not use operating or patient margin because many of the strategic activities in which there is interest do not necessarily generate patient care revenue, and such measures would be insensitive to this. Other measures of profitability exist, e.g., deductible ratio, return on total assets, and return on equity, but they were not used because most of the literature on rural hospital profitability reports total or operating margin. Second, these rejected measures all correlated highly with total margin. Thus, total margin was selected and also computed the percent change in its values during the period 1983-1988.

The second dimension is liquidity, a reference to a rural hospital's ability to meet its short-term debt obligations. Many consider a worsening liquidity ratio as one of the first signals of a rural hospital in financial trouble (Cleverley, 1988). This study's liquidity measure is the hospital's current ratio, as calculated by current assets divided by current liabilities. The percent change in current ratio during the period 1983-1988 also was used. Other measures of liquidity exist, but they correlate highly with current ratio and were not used.

There are other important dimensions of financial performance that were not examined because such measures, e.g., capital structure (ability to sustain long-term debt financing) often tend be longer term performance indicators. In view of the relatively short time period that was examined in this study (a maximum of six years, although many hospitals adopted strategies later in the study period 1983-1988 so that the time period examined was as a short as a single year), these measures were less likely than the shorter term measures of profitability and liquidity to register any potential effect.

In any given sample of organizations, including rural hospitals, there will be a number of extreme or so-called "outlier" values on financial ratio measures of performance, and these extreme values create non-normal distributions (Deakin, 1976; Lee, 1985), which in turn contribute to biased estimations when subjected to multivariate techniques. Several alternatives exist to deal with this problem, including the removal of outliers (Frecka & Hopwood, 1983), which is the approach used here because this study was not satisfied that the results of a second approach—mathematical transformation of the distributions—sufficiently normalized the ratios. Table 1 shows the means, standard deviations, and medians for the four proposed financial ratio measures. Several comments are in order. First, the sample mean and median estimates of 1987-1988 total margin are extremely close to other estimates of this value for rural hospitals (cf. Prospective Payment Assessment Commission, 1991). The 1987-1988 current ratio sample mean and median also are close to other rural hospital estimates (cf. Cleverley, 1988). Note that this occurs despite the loss of 79 cases in each instance, mostly due to the removal of outliers.

For the sample hospitals of this study, the 1983-1988 average percent change in total margin and in current ratio were 0.025 percent and 1.077 percent, respectively. Percent median changes of both were negative, but small. Given the wide dispersion of these change variables and the existence of some relatively extreme values even after removal of the worst outliers, one can conclude that the over-time values of total margin and current ratio were mostly static, i.e., that little aggregate percent change in financial performance resulted during the study period. The Prospective Payment Assessment Commission (1991) reported a 1.4 to 1.9 percent decline in total margin for rural hospitals during the same rough time period. Had it not been for the absence of 124 missing cases and removed outliers, a slightly negative change might have existed. The same argument might well hold for current ratio change, in which there were 274 missing cases due to missing data and removal of outliers (Note 1). However, Wise (1993), using these same data with their large number of missing cases, computed comparisons between those hospitals that had missing data versus those that did not. Only two or three statistically significant differences emerged from literally dozens of comparisons, and this study concluded that the hospitals with complete financial data constituted a representative sample of the whole.

Table 1. Financial Ratio Data, U.S. Rural Hospitals, 1983-1988.

	Rural Hospital Sample				
	Grand Sample Mean	Grand Sample SD	Grand Sample Median	Number Missing Cases and Number Outliers Removed	Sample n
Total Margin 1987-1988	0.015	0.074	0.022	79	718
Current Ratio 1987-1988	2.411	1.196	2.217	79	718
Change Total Margin, 1983-1988	0.021	17.779	-0.713	124	673
Change Current Ratio, 1983-1988	1.077	13.563	-0.748	274	523

Strategy Variables. The critical independent variables of the study refer to 13 strategic management activities that are often proposed as potential

areas for improvement in rural hospital viability and performance (Mick, et al., 1993a). Although the list of strategies is not exhaustive, it is comprehensive and consists, first, of a group of four horizontal integration variables: group purchasing, multihospital affiliation, consortium affiliation, and mergers. The remaining nine strategies comprised a group of vertical integration or diversification strategies: nursing home affiliation, ambulance services, adoption of swing beds, outpatient services inside the hospital service area, HMO affiliation, prefered provider organization (PPO) affiliation, integration into other health-related services, integration into nonhealth-related services, and outpatient services outside the hospital service area. A more detailed justification of these strategies and their estimated distributions are found in Mick, et al. (1993a). The percentage of rural hospitals having adopted these strategies during the study period ranged from 80.4 percent for group purchasing arrangements to only 1.8 percent for outpatient services outside the hospital's service area. Intermediate strategies included those such as swing-bed programs (46.4%), HMO affiliation (22.0%), outpatient services inside the hospital's service area (17.2%), and mergers (5.8%).

The year of adoption of each strategy is the measurement basis of each variable: each rural hospital was coded into one of the following five categories: adoption of a given strategy before 1983, adoption in 1983-1984, in 1985-1986, in 1987-1988, or no adoption (Note 2). The two-year groups were used because in many instances the number of strategic adoptions was too small in a single year to permit analysis. Further, two-year groupings, rather than an aggregate "yes/no" response for the entire period, were used because it allows an assessment of whether, as is so often argued (cf. Shortell, Morrison, & Friedman, 1990), results of strategic adoption take time to emerge, e.g., a strategy adopted in 1983-1984 might show a positive result in 1987-1988 whereas one adopted in 1987-1988 might not.

Control Variables. The current analysis controls for potentially confounding variables that might mediate the association between strategic activity and performance. Used here are three groups of variables (*viz*: environmental market, regional location, and hospital related). All environmental-market variables are derived from the national Area Resource Files (ARF) and therefore refer to the county as the unit of measurement. Although there are valid concerns that can be raised regarding the use of the county as the appropriate measure of the environment and market of a rural hospital, it was the most practical approach to take because other national schemes that define rural hospital markets do not yet exist, although progress is now being made (Phibbs & Robinson, 1993). Readers are referred to Mick, et al., (1993b) for a fuller justification.

Environment-Market Variables. A number of organizational theories posit an effect of the environment or market on the performance of hospitals (cf. Pfeffer & Salancik, 1978; Shortell & Zajac, 1990). Study environment-market variables were classified in an earlier study by this group according to three dimensions: munificence, complexity, and dynamism (Mick, et al, 1993a). Munificence refers to the resource level or capacity of the environment to sustain the needs of organizations, and it is measured by population density (natural log population per square mile), per capita income, and percent Medicare enrollees. Population density is a measure not only of rurality but also of the potential demand for hospital services. Per capita income is another measure of potential demand, and percent Medicare enrollees is a measure of the degree to which a rural hospital may be dependent on Medicare payment. All these variables are measured at the baseline year of the study—1983. In general, the relationship that theoretically exists between munificence and performance is positive: the less munificent an environment-market, the lower the financial performance is expected to be.

Complexity refers to the level of heterogeneity or the concentration of organizations, or both, in the environment. Examples include number and types of other health care organizations, especially competitors. Two measures are used: the proximity of the next nearest hospital (natural log miles to the next hospital), and physicians per 1,000 population, both of which were measured for 1983 (Note 3). The relationship between complexity and financial performance is difficult to specify. A more complex environment as measured by close proximity of another hospital taps a competitive dimension that increases uncertainty. Under this circumstance, the relationship might be negative: the greater the complexity, the poorer the financial performance. On the other hand, when complexity is measured by the number of physicians in the county, the relationship could be positive or negative. More physicians could mean more potential for admissions into the hospital that would yield an improvement in hospital finances. But, more physicians also could lead to physician-hospital competition that would yield a

Table 2. Descriptive Statistics for Control Variables.

Variable	Mean or Percent	Standard Deviation
Environment-Market		
Munificence		
Natural log of population per square mile—1983	3.506	1.133
Per capita income, 1983 ($)	9279.509	1614.838
Percent Medicare eligibles, 1983	15.684	3.901
Complexity		
Natural log miles to next nearest hospital	2.944	0.939
Physicians per 1,000 population, 1983	0.865	0.837
Dynamism		
Natural log change in population per square mile, 1983-1987	-0.001	0.096
Change in per capita income, 1983-1987 ($)*	1552.581	1220.73
Change in percent Medicare eligibles, 1983-1987	0.777	0.993
Change in percent unemployment, 1981-1987	-0.007	0.118
Change in physicians per 1,000 population, 1983-1987	0.059	0.219
Census Division		
New England	0.028	—
Middle Atlantic	0.039	—
South Atlantic	0.115	—
East North Central	0.151	—
West North Central	0.247	—
East South Central	0.100	—
West South Central	0.172	—
Mountain	0.092	—
Pacific	0.056	—
Hospital-Related		
Natural log operating beds	3.886	0.735
Case-mix index, 1983	1.039	0.847
Voluntary not-for-profit community	0.402	—
Voluntary not-for-profit church	0.112	—
For-profit	0.114	—
Government (municipal, county, district)	0.373	—
Number of head administrators, 1983-1988	2.211	1.568

* Real 1983 dollars.

negative relationship. In either case, a strong theoretical case exists for including controls for complexity.

Dynamism refers to the level of instability or turbulence in the environment. Indicators include change between 1983 and 1988 in each of the measures of munificence and complexity. This study added a change variable for percent unemployment, but had to use a 1981 baseline score because there were no data for 1983. The 1981 percent unemployment measure was not used in the analysis because of its high correlation with its change score. In general, positive change is thought to correlate positively with rural hospital financial performance, and *vice versa*. In the instances of changes in complexity, one could well expect either positive or negative relations as discussed in the preceding paragraph.

Regional Variables. The nine U.S. census divisions were used to specify the location of each rural hospital. Although there is no developed theory to justify the use of this kind of variable, there is interest among those interested in rural hospitals in knowing whether regional location does not make some difference in rural hospital performance. Location in the census divisions was determined from the address of the hospitals.

Hospital-Related Variables. Features of the hospital

itself must also be controlled, and several recent studies, among many others, have shown the effect that such variables have on performance (Gapenski, Vogel, & Langland-Orban, 1993; Ginn & Young, 1992). Thus, one might expect larger hospitals to have higher economies of scale, lower per unit costs, and more overall organizational slack to undertake strategic activity than smaller hospitals. For-profit ownership might be expected to lead to greater cost consciousness and attention to financial performance than public hospitals. Higher case-mix levels might be thought to lead to higher payment and improved financial performance. And, finally, higher administrative turnover, shown as it has to be related to higher levels of strategic activity (Mick, et al., 1993b) might be expected to reap improved levels of financial performance.

Hospital variables used in this study include size in acute care operating beds and administrative turnover, which derived from the telephone survey. Hospital ownership comes from AHA data and case-mix change comes from the Federal Register for 1983 and 1987. A 1983 baseline case-mix variable was not used because of its high correlation with the case mix change variable. Descriptive statistics of all control variables are shown in Table 2.

Statistical Approach. Ordinary least squares (OLS) is the statistical procedure used here because the dependent variables are financial ratios or percent changes in financial ratios, all of which are continuous measures. After controlling for environment-market, regional location, and hospital-related variables, strategic activity measures, based on two-year groupings of adoption, are entered as dummy variables using the "no strategy adoption" hospital group as the reference category.

This approach runs the risk of simultaneity between strategic management activity and financial performance of the hospital. Are strategies engaged in because of improved financial performance? Or, is improved financial performance a result of strategic activity? Even though this study explored associations and did not try to determine causal ordering strictly speaking, it took certain steps to reduce the salience of this problem. First, predictor variables either precede the dependent variable in time or predictor variables are change values, or both.

Second, and closely allied to the use of change variables, is the technique of using first difference or change variables for the dependent variable. This technically circumvents the endogeneity problem because the error terms of the dependent variable can be assumed to be uncorrelated with potentially endogenous independent variables. This approach is valid so long as unmeasured variables during the period of time themselves remain relatively constant, an assumption this study made.

Statistical techniques also exist to deal with the simultaneity problem. These include simultaneous equation systems, but when tried here, they created so-called identity problems, leading to rejection of this approach. What was done instead was to model each of the four financial performance variables with the hypothesized sets of independent variables, omitting the 13 horizontal and vertical strategies of interest. Computed next was the average value of the residual of each dependent variable for each of the categories of the strategy variable. A one-way analysis of variance was computed on each strategy's averages. This study does not report the results of these procedures here because they produced substantially the same results as the more straightforward OLS procedures that included strategy variables in the models (Note 4). In short, this latter approach confirmed the first.

Findings

1987-1988 Total Margin and Current Ratio. Table 3 presents the models predicting the profitability and liquidity of hospitals in 1987-1988 using total margin and current ratio, respectively. Across the 13 strategies, the equations are statistically significant for both dependent variables although the percent variation explained never exceeds 10.5 percent for total margin and 8.3 percent for current ratio. For total margin, none of the environment-market variables are significant, and only one regional difference emerges: hospitals in the West North Central census division was more likely to have a have a higher total margin than the reference division—the East North Central census division. Larger hospitals, i.e., those with more operating beds, and those with low head administrator turnover were more likely to have higher total margins. There is a notable absence of any association of the time periods of adoption of the 13 strategies with total margin except for a positive relationship between nursing homes adopted in 1985-1986 and a negative association between PPOs adopted in 1987-1988.

For current ratio, again by the absence of relationships for most of the control variables, especially

Table 3. Summary of OLS Regression Models, 1987-1988 Total Margin (TM) and Current Ratio (CR), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals.

Variable	Group Purchasing		Multihospital System		Consortium		Merger	
	TM	CR	TM	CR	TM	CR	TM	CR
Munificence								
Log population/square mile, 1983								
Per capita income, 1983								
Percent Medicare, 1983								
Complexity								
Log miles nearest hospital								
Physicians/1,000 population, 1983								
Dynamism								
Log change population/square mile, 1983-1987								
Change per capita income, 1983-1987								
Change percent Medicare, 1983-1987								
Change percent unemployment, 1981-1987								
Change physicians/1,000 population, 1983-1987								
Census Division								
East South Central								
Mountain								
West North Central	0.032***		0.029**		0.027**		0.031***	
West South Central		0.396**				0.355*		0.506**
South Atlantic								
New England		-0.888**		-0.824**		-0.904**		-0.899**
Pacific								
Mid-Atlantic								
Hospital-Related								
Log operating beds	0.017***	0.180**	0.016**	0.174*	0.018***	0.191*	0.018***	
Case-mix index, 1983								
Not-for-profit, church								
For-profit								
Governmental								
Administrator turnover, 1983-1988	-0.005**	-0.067*	-0.005*		-0.006**	-0.079**	-0.006**	-0.064*
Strategy								
< 1983								
1983-1984								
1985-1986				-0.462**				-0.083*
1987-1988				-0.547**				
Intercept	-0.085*	1.529**	-0.077*	1.612**	-0.078*	1.466*	-0.076*	1.975**
Number of Cases	702	705	703	704	698	699	705	705
R^2	0.100	0.069	0.100	0.080	0.099	0.061	0.104	0.083
F	2.678***	1.787**	2.683***	2.094***	2.611***	1.563*	2.801***	1.960**

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

Table 3. Summary of OLS Regression Models, 1987-1988 Total Margin (TM) and Current Ratio (CR), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals—continued.

Variable	Nursing Home		Ambulance		Swing Beds		Inpatient Service Inside Service Area	
	TM	CR	TM	CR	TM	CR	TM	CR
Munificence								
Log population/square mile, 1983								
Per capita income, 1983								
Percent Medicare, 1983								
Complexity								
Log miles nearest hospital								
Physicians/1,000 population, 1983								
Dynamism								
Log change population/square mile, 1983-1987								
Change per capita income, 1983-1987								
Change percent Medicare, 1983-1987								
Change percent unemployment, 1981-1987								
Change physicians/1,000 population, 1983-1987								
Census Division								
East South Central								
Mountain								
West North Central	0.030**		0.029**		0.030**		0.029**	
West South Central								0.353*
South Atlantic								
New England		-0.994**		-0.898**		-0.974**		-0.848**
Pacific								
Mid-Atlantic								
Hospital-Related								
Log operating beds	0.014**		0.017***	0.191*	0.014*		0.016***	0.202*
Case-mix index, 1983								
Not-for-profit, church								
For-profit								
Governmental								
Administrator turnover, 1983-1988	-0.006**	-0.088**	-0.006**	-0.080**	-0.006**	-0.085**	-0.006**	-0.078**
Strategy								
< 1983		-0.332**						
1983-1984				-0.429*				
1985-1986	0.039*							
1987-1988								
Intercept		1.721**	-0.081*	1.354*	-0.079*	1.744**	-0.078*	1.327*
Number of Cases	700	703	701	702	660	662	702	700
R^2 0.105	0.075	0.102	0.073	0.112	0.066	0.101	0.073	
F	2.806***	1.962**	2.723***	1.886**	2.853***	1.598*	2.709***	1.895**

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

Table 3. Summary of OLS Regression Models, 1987-1988 Total Margin (TM) and Current Ratio (CR), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals—continued.

Variable	HMO		PPO		Other Health		Nonhealth		Inpatient Outside Service Area	
	TM	CR	TM	CR	TM	CR	TM	CR	TM	CR
Munificence										
Log population/square mile, 1983										
Per capita income, 1983										
Percent Medicare, 1983										
Complexity										
Log miles nearest hospital										
Physicians/1,000 population, 1983										
Dynamism										
Log change population/square mile, 1983-1987										
Change per capita income, 1983-1987										
Change percent Medicare, 1983-1987										
Change percent unemployment, 1981-1987										
Change physicians/1,000 population, 1983-1987										
Census Division										
East South Central										
Mountain	0.026*		0.027*							
West North Central	0.029**		0.029**		0.029**		0.032***		0.031***	
West South Central						0.351*				0.486**
South Atlantic										
New England		-1.069**		-0.856**		-0.932**		-0.944**		-0.883**
Pacific										
Mid-Atlantic										
Hospital-Related										
Log operating beds	0.016**	0.170*	0.017***	0.185*	0.016**	0.189*	0.017***	0.183*	0.017***	
Case-mix index, 1983										
Not-for-profit, church										
For-profit										
Governmental										
Administrator turnover, 1983-1988	-0.005**	-0.082**	-0.005**	-0.076*	-0.006**	-0.76*	-0.006**	-0.077**	-0.006**	
Strategy										
< 1983				1.539*						
1983-1984										
1985-1986										
1987-1988			-0.020*							
Intercept		1.562**		1.349*	-0.073*	1.600**	-0.080*	1.479*	-0.081*	1.768*
Number of Cases	703	703	688	691	699	700	702	703	707	708
R^2	0.089	0.068	0.096	0.069	0.100	0.064	0.100	0.064	0.096	0.072
F	2.199***	1.745*	2.330***	1.743*	2.659***	1.640*	2.668***	1.634*	2.575**	1.679*

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

environmental-market variables, West South Central division hospitals had higher current ratios than the comparison division (East North Central), and New England hospitals had lower ones. Larger hospitals had higher current ratios, but hospitals with higher administrative turnover had lower ratios. The lack of association between strategies and current ratio is evident: only 6 of 52 possible coefficients were statistically significant, and all but one were negative: multihospital affiliation in 1985-1986 and 1987-1988, merger in 1985-1986, nursing home affiliation before 1983, and ambulance affiliation in 1983-1984.

1983-1988 Percent Total Margin and Current Ratio Change. Table 4 contains the same analysis as above, but for the percent change dependent variables. None of the 13 models calculated for percent change in total margin is statistically significant, although a few of the individual control variables are significant and three coefficients for strategy variables (out of a possible total of 52) are positive and significant. As for percent change in current ratio, similar findings emerge: marginal to no statistical significance occurs for most of the 13 models. Where the overall model is statistically significant, such as in the adoption of ambulance services, the association of financial performance with strategy is negative. Of the five significant strategic coefficients, three are actually negative.

Discussion

The findings of this study confirm no widespread or consistent connection between strategic action and positive financial performance. In the case of total margin and current ratio at the end of the study period, the multivariate analysis showed practically no relationship between these measures and strategic activity. Percent change in total margin during the period of study failed even to register statistically significant multiple regression models, as was the tendency for percent change in current ratio. The associations that were found were more often negative than positive. Further, one would expect some association by chance alone in view of the number of potential coefficients assessed (52 for each dependent variable; 208 for the four dependent variables altogether). In short, the basic hypothesis of the study is not supported in these data (Note 5).

Although financial measures do not capture the full meaning of organizational performance (Chakravarthy, 1986), they do nevertheless constitute an important starting point in any evaluation. A first question is whether one should be surprised at these findings. Others have noted that strategic action's effect on rural hospitals is hard to determine. For example, what the outcomes of multihospital membership for rural hospitals have been are unclear (Berry, Tucker, & Seavey, 1987). And, in a large study of not-for-profit and for-profit multihospital systems, Shortell (1988b) argued that many of the hoped-for outcomes of system affiliation had not been realized. In view of the these studies and those reviewed earlier in this paper, there is room to wonder whether strategic activity would have a positive effect on financial performance of rural hospitals. This study's data support the review of nonhealth-care findings of Greenley (1986) rather than those of Rhyne (1986), the former study concluding that there were no consistent findings that strategy improved financial performance; the latter, concluding the opposite. On the other hand, Rhyne (1986), along with Shortell (1988b), suggest that strategy may take at least five years to translate into favorable financial performance, and thus one might not be surprised that no strategy impact effect was found.

Why No Strategy Impact? Nevertheless, the overwhelming lack of support for this study's central hypothesis requires some explanation. There are issues of method, but, to save space, these are discussed elsewhere, and the interested reader is referred to them (Mick, et al., 1993a, 1993c).

On a substantive note, other explanations may reside in a broader formulation of strategy. Other indicators probably need to be examined, and they include measures of community support, private fund raising, increased local tax support, political finesse, and the like. In short, a so-called "multiple constituency" approach that weighs the rural hospital's activities in relation to the views of clients, donors, boards of trustees, professionals, municipal or county planners, and so forth, is probably the next step that is required to understand how rural hospitals are able to cope with their environments (Savage, Blair, Benson, & Hale, 1992). The case studies of Seavey, et al. (1992), the WAMI interventions (Amundson & Rosenblatt, 1988), and numerous other smaller scale studies, reveal that rural hospitals as often as not are engaged in social and political behavior to ensure the survival of their facilities, behavior the results of which would not necessarily be sensitive to measures of financial performance. In

Table 4. Summary of OLS Regression Models, 1987-1988 Total Margin Change (TMC) and Current Ratio Change (CRC), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals.

Variable	Group Purchasing		Multihospital System		Consortium		Merger	
	TMC	CRC	TMC	CRC	TMC	CRC	TMC	CRC
Munificence								
Log population/square mile, 1983								
Per capita income, 1983								
Percent Medicare, 1983								
Complexity								
Log miles nearest hospital								
Physicians/1,000 population, 1983	2.930*		2.634*				2.719*	
Dynamism								
Log change population/square mile, 1983-1987								
Change per capita income, 1983-1987								
Change percent Medicare, 1983-1987		-2.167*		-1.928*		-2.140*		-1.958*
Change percent unemployment, 1981-1987								
Change physicians/1,000 population, 1983-1987								
Census Division								
East South Central								
Mountain	7.918*							
West North Central								
West South Central								
South Atlantic								
New England								
Pacific								
Mid-Atlantic		-6.094*						
Hospital-Related								
Log operating beds								
Case-mix index, 1983		2.396*		2.352*	2.025*	2.368*		2.331*
Not-for-profit, church			-6.174*				-5.327*	
For-profit								
Governmental								
Administrator turnover, 1983-1988								
Strategy								
< 1983								
1983-1984						7.247**		14.810**
1985-1986			7.831*					
1987-1988				-5.847*				
Intercept								
Number of Cases	658	512	659	512	654	506	661	513
R^2 0.057	0.088	0.067	0.088	0.043	0.099	0.062	0.091	
F	0.891	1.433	1.054	1.420	1.013	1.598*	0.827	1.493*

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

Table 4. Summary of OLS Regression Models, 1987-1988 Total Margin Change (TMC) and Current Ratio Change (CRC), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals—continued.

Variable	Nursing Home		Ambulance		Swing Beds		Outpatient Inside Service Area	
	TMC	CRC	TMC	CRC	TMC	CRC	TMC	CRC
Munificence								
Log population/square mile, 1983								
Per capita income, 1983								
Percent Medicare, 1983								
Complexity								
Log miles nearest hospital								
Physicians/1,000 population, 1983			2.493*		2.740*		2.777*	
Dynamism								
Log change population/square mile, 1983-1987								
Change per capita income, 1983-1987								
Change percent Medicare, 1983-1987		-2.091*		-2.499*		-2.327		
Change percent unemployment, 1981-1987								
Change physicians/1,000 population, 1983-1987								
Census Division								
East South Central								
Mountain								
West North Central								
West South Central								
South Atlantic								
New England								
Pacific								
Mid-Atlantic				-6.096*				
Hospital-Related								
Log operating beds								
Case-mix index, 1983		2.146*		2.646**				2.504*
Not-for-profit, church								
For-profit								
Governmental								
Administrator turnover, 1983-1988								
Strategy								
< 1983								
1983-1984			10.075**					
1985-1986	12.459**			-7.634*				
1987-1988				-9.635**				
Intercept								
Number of Cases	656	511	658	513	622	477	658	511
R2	0.072	0.073	0.068	0.100	0.060	0.070	0.055	0.073
F	1.137	1.153	1.087	1.653*	0.875	1.028	0.865	1.162

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

Table 4. Summary of OLS Regression Models, 1987-1988 Total MarginChange (TMC) and Current Ratio Change (CRC), Regression Coefficients at $P \leq 0.05$, Rural U.S. Hospitals—continued.

Variable	HMO		PPO		Other Health		Nonhealth		Outpatient Outside Service Area	
	TMC	CRC	TMC	CRC	TMC	CRC	TMC	CRC	TMC	CRC
Munificence										
Log population/square mile, 1983										
Per capita income, 1983										
Percent Medicare, 1983										
Complexity										
Log miles nearest hospital										
Physicians/1,000 population, 1983	2.767*		2.972*		2.785*		2.533*		2.740	
Dynamism										
Log change population/square mile, 1983-1987										
Change per capita income, 1983-1987										
Change percent Medicare, 1983-1987		-1.996*		-2.038*		-2.018*		-2.091*		-2.021*
Change percent unemployment, 1981-1987										
Change physicians/1,000 population, 1983-1987										
Census Division										
East South Central										
Mountain										
West North Central										
West South Central										
South Atlantic										
New England										
Pacific										
Mid-Atlantic		-6.241*								
Hospital-Related										
Log operating beds										
Case-mix index, 1983		2.355*		2.343*		2.373*		2.319*		2.332*
Not-for-profit, church										
For-profit										
Governmental										
Administrator turnover, 1983-1988										
Strategy										
< 1983										
1983-1984										
1985-1986										
1987-1988										
Intercept										
Number of Cases	659	513	646	502	656	507	658	511	663	516
R^2	0.051	0.074	0.060	0.075	0.061	0.073	0.051	0.073	0.051	0.071
F	0.790	1.187	0.925	1.178	0.944	1.148	0.799	1.157	0.798	1.137

Note: Reference categories = not-for-profit voluntary, East North Central census division, no strategy present in 1988.

* $P \leq 0.05$
** $P \leq 0.01$
*** $P \leq 0.001$

view of the paucity of links between strategic activity and financial performance that this study has unearthed, study of other measures assumes an even greater importance (Kanter & Summers, 1987).

It also needs underscoring that the measures of strategy used in this study are global and the measures of performance are quite specific. Hence, a lack of sensitivity between the two might have resulted. A next step in research would be to develop more precise indicators of strategic activity. For example, Cleverley and Harvey (1992) have demonstrated that cost control efforts, especially in lowering patient length of stay, in increasing labor productivity, and in reducing overall overhead costs, have a positive empirical effect on improving rural hospital financial performance. Control of length of stay, productivity, and overhead are largely internal inward looking managerial activities and, as such, they are not the focus of this study. What may be called for, however, is more attention on strategies defined specifically, e.g., acquisition of new diagnostic technology, addition of home health services, and so forth.

Other explanations for the lack of strategy impact might include administrators' and others' (e.g., trustees) lack of preparedness to undertake it, or, more likely, it could be a combination of this and the overselling of strategic action. Although some rural hospitals can and do successfully implement certain kinds of strategies, those that are most effective may be those that are internal and under the greatest control of the administrator, e.g., those examined by Cleverley and Harvey (1992), the broader, more futuristically oriented approaches appear to be eschewed by most. Consistent with this is Cleverley and Harvey's (1992) finding that diversification is not an effective strategy in improving performance, a finding also supported for urban and rural hospitals in California (Clement, 1987), the need and ability of many rural administrators to deal with internal control problems that may actually be barriers to a more outward looking approach.

On the other hand, it is possible that strategy actually was associated with financial performance, but it was not visible given that the this study measured financial performance at only the beginning and end of the study period. That is, hospitals not adopting strategies might have been able to maintain uniform financial performance over time. Hospitals that would have experienced a decline in performance, by adopting strategies, were also able to maintain uniform financial performance. Revenues generated from strategic activity might have substituted for losses from other already existing operations. Further study of this explanation is required (Note 6).

It is also the case that the demands of strategic planning, forecasting, and action are not costless and they may simply not be in the purview of most administrators of rural facilities in which there is both little or no personnel available and no accessibility of other resources and information to do this kind of work. Zahra and Chaples (1993) argue that strategic action requires astute competitive analysis, but the latter is complicated, time-consuming, and requires significant amounts of organizational resources, creativity, imagination, and insight. No matter how clever and well-trained a rural administrator might be, he or she is often the only person equipped to undertake such work. Combine this with small size, low occupancy, high unit cost, and high cost of technology, it is no wonder that strategic activity may be constrained.

An associated question is what the strategic process in rural hospitals is like. Luke and Begun (1987) stress that this process is probably less rationally determined than one might expect due to lack of clarity and widespread agreement on objectives, lack of information concerning the full range of problems and strategic options, constraints imposed by social and political relationships, and choices based on historical precedent, as well as on "satisfying" rather than maximizing criteria.

It also has been emphasized that the key ideas central to organizational strategies do not necessarily derive from complicated plans of action or fully formalized conceptualizations of an organization's pathway to survival or success; they may be as much a product of insight and values as of formal analytic thinking (Mintzberg, 1985). The ideas or strategies may, in fact, emerge only informally, incrementally and unexpectedly, as guiding frameworks for action and growth (Quinn, 1980). In fact, the process, if there is one, may more often lead to a determined view that living from day-to-day makes more strategic sense that committing the scarce resources of a rural hospital to potentially ruinous ventures. It must not be assumed that rural administrators did and do not frequently and deliberately chose to stay away from unproven strategic activity, despite the hectoring to the contrary by professional and academic literatures.

For those administrators who did take the "strategic plunge," it may have been due more to an unfortunate tendency of some executives in the health care sector, both in urban and rural facilities,

to engage in follow-the-leader behavior rather than sensitive, rational strategic planning. Both with the shift in federal health policy and the pressures of other features of the U.S. health care environment, the institutional pressure on hospitals during the 1980s was especially strong in urging hospitals to adopt market-oriented behavior (Alexander & D'Aunno, 1990). Under the circumstances, one might not be surprised if strategic action has no discernable effect on financial performance because other goals are being met.

A Strategic Management Policy? Adoption of strategies, at least those that involve external relationships with other organizations and activities, does not seem to matter in these data, and although, as noted above, one can argue that strategies take time to gestate and produce hoped-for results, this may be small comfort to the administration, health professionals, board, and community people working in and served by a hard-pressed hospital looking for ways out of financial dilemmas. Furthermore, no evidence was found of a trend over time of improved financial performance. Surely rural hospitals having adopted a set of strategies before or early in the study period would have shown higher financial performance had it been present. A hospital affiliating with a nursing home in 1983 could hardly expect to have to wait more than five years past 1988 to show some effect one way or the other on financial performance. No such effect was found.

This study argues that there has been an implicit or *de facto*, if not at times explicit and conscious, strategic management policy on the part of federal and state governments, payers (both private and public) and others. This means many things, but it includes the idea that hospitals ought to become more like "tubs on their own bottoms," i.e., financially independent and responsible, weaned away from cost-based reimbursement schemes, and made to act like competitive, market-oriented corporate entities. The wisdom of this view—and there are many who have held and who now hold it—is challenged by the results of this study. That is, the view is challenged to the extent that it emphasizes the positive association of strategy and rural hospital viability; it is less challenged if strategy, when adopted, helped avoid decline.

So, although one cannot say that strategic activity has been harmful, and may even have been helpful but not particularly visible, the lack of a clear positive impact suggests a national "strategy of strategy" for rural hospitals may not be sufficient if the goal is to maintain viable networks of rural acute care facilities. If this is the case, proposals of federal health policy in favor of competitive managed care systems that would include rural hospitals must be scrutinized very carefully.

Notes

1. Two comments are important. First, hospital financial ratios are notoriously unstable with surprising variation in any given sample. This study's sample is no exception and is why so many outliers exist. Some of this is due to errors in reporting by the hospital and in coding by HCFA, and some to accounting procedures that make some some years exceedingly profitable and others exceedingly unprofitable. Second, after beginning the study, it was discovered that the HCFA Medicare Cost Report tape lacked financial data on 162 out of 797 hospitals for fiscal year 1982-1983. Of the 162 hospitals, there was literally no information on 45 and partial information on the remaining 117. Some, but by no means all, of the missing data came from states that were exempted from the PPS system in its early years, e.g., New York. The amount of missing information in the early years of PPS appears not to be a widely known fact, although the Prospective Payment Assessment Commission (1991) makes an allusion to the problem. Months were spent tracking down these missing data, and to make the task more feasible, information requirements were narrowed to data that would permit calculation of total margin only. Through a variety of means, the number of missing cases was reduced to just 11 (out of a sample of 797 rural hospitals). However, information was still lacking to calculate other financial ratios like the 1982-1983 current ratio, and this accounts for the large loss of missing data for the change in current ratio variable which necessarily had to use the 1982-1983 variable in its calculation.
2. The questions concerning global strategic activity in the telephone interview were simple "yes" and "no" questions: e.g.,"Did your hospital engage in multihospital affiliation?," and if "yes," in what year the strategy took place was asked.
3. Hospital beds in the county, adjusted for population, were not used because this measure was highly correlated with physicians per population and because of numerous errors in the ARF leading to negative numbers of beds when the number of hospitals beds of the responding hospital was subtracted from the county total.
4. Interested readers may write the primary author for these results. It is noted that the problem with this approach is that an omitted variable bias might result precisely because of the exclusion of the strategy variables from the equation or model. A given strategy may well be correlated with other independent variables, e.g., operating bed size, and the exclusion of the strategy variable may bias not only individual regression coefficients but also the total strength of the model, i.e., its statistical significance. By comparing these models with the appropriate models containing each of the strategies for each of the four financial performance measures, omitted variable bias was assessed and none was evident.
5. The same conclusion is reached when the 13 strategies are measured as simple "presence/absence" variables and entered into the models as a single dummy. Virtually none of

the coefficients had a significant association with any of the four dependent variables. These results may be obtained by writing the primary author.

6. The authors wish to thank one of the anonymous reviewers for drawing our attention to this explanation, and also acknowledge the advice of two other anonymous reviewers and as well as that of the editor of *The Journal of Rural Health.*

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