THE EFFECTS OF VALUE DYNAMICS AND PATH DEPENDENCE ON FIRM PERFORMANCE

SHEILA GOINS
University of Iowa
S322 John Pappajohn Business Building
Iowa City, IA 52242-1000
(319) 335-0944
(319) 335-1956 (fax)
sheila-goins@uiowa.edu

THOMAS S. GRUCA
University of Iowa
S356 Pappajohn Business Building
Iowa City, IA 52242-1000
(319) 351-3643
(319) 335-1956 (fax)
thomas-gruca@uiowa.edu

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Abstract: How do path dependencies resulting from heterogeneous resource endowments influence a firm's ability to adapt to environmental changes, particularly those associated with changes in the way customers define value in the marketplace? Our study of Chicago hospitals finds that pre-existing resources influenced the ability to gain membership in multi-hospital networks formed to respond to new managed care programs. Additionally, we find that pre-existing resources influenced network membership's subsequent effect on performance. Our results illustrate how path dependence affects a firm's ability to adapt to environmental changes and how these factors interact to influence firm performance.

Key Words: Resource-Based View, Path Dependence, Inter-Organizational Networks, Hospitals

The resource based view of the firm (RBV) states that competitive advantage emerges from a firm's profile of resources, specifically those that are valuable, rare and inimitable (Barney, 1991, Peteraf, 1993; Wernerfelt, 1984). In mature markets, firms possess varying levels of resources and capabilities and use different strategies to manage their competitive environments. This heterogeneity reflects the cumulative effect of past managerial decisions (Hoopes, et al., 2003). However, when the environment changes, firms may have to acquire or develop new resources to adapt to the new competitive circumstances. This process raises a fundamental question: To what extent does a firm's ability to acquire new resources depend upon the resource base accumulated over time? In this paper, we present a framework suggesting that a firm's existing set of resources and capabilities create path dependence with respect to its ability to acquire new strategic resources. We further argue that pre-existing resources determine whether the acquisition of new strategic resources will improve subsequent performance.

Using this framework, we examine the Chicago hospital market during a time when major changes in the health care purchasing process spawned multi-hospital networks. For the individual hospital, network membership was a strategic resource necessary to compete for privately insured patients. We find that different combinations of pre-existing resources influenced the hospitals' ability to acquire network membership. However, the presence of network membership alone did not explain subsequent performance variations. The influence of network membership on future performance depended upon the firms' pre-existing resources and capabilities prior to the change in the marketplace.

Our study makes two important contributions. First, we specifically model the role of path dependence. Our analysis provides a better understanding of how pre-existing

resources affect a firm's ability to adapt to significant market changes. Second, we show how these factors – existing resources and new resources - interact to shape future firm performance. By considering the path dependence emanating from pre-existing resources, we can gain a deeper understanding into the resource acquisition process and it role in influencing firm performance. Understanding the role of path dependence provides a critical step in the development of a fully dynamic RBV theory.

We begin our theoretical discussion and hypotheses by describing one type of market change that prompts new resource acquisition and predict the direct effects that new resources will have on subsequent performance. We then consider the role that path dependence has on the firm's ability to acquire new resources and the direct effect and moderating effects that path dependence has on subsequent performance. Our methodology section includes an in-depth description of our setting, specifying in more detail how the general hypotheses apply to our specific study population. We continue with a description of our analysis, results and discussion.

RBV AND MARKET DYNAMICS

Within RBV, the concept of "value" serves as the nucleus of resource based competitive advantage. Although a resource may be rare and inimitable, if it does not provide value, it will not generate superior performance. However, value is only realized when a product[1] is sold in an economic transaction between a buyer and the firm. Therefore, addressing the question of which resources generate value must begin with consideration of the customer (Bowman, and Ambrosini, 2000).

[1] For convenience, we refer to all products, services and combined offerings from the firm as "products."

In this study, we focus specifically upon "value drivers" - resources that specifically increase the buyer's perception of the value they will gain from a particular product. According to the "Value-Price-Cost" (VPC) model (Hoopes, et al., 2003;Peteraf, and Barney, 2003), price is determined via a bargaining process between buyers and sellers. Cost, in this case, are usually defined as marginal cost (it may be operationalized as unit cost). Consumer surplus - defined as the gap between value and price - influences the likelihood that customers will purchase the firm's product rather than a competitive product. The gap between price and cost influences the firm's unit profitability. From this perspective, a valuable resource would be one that contributes to the firm's ability to provide superior products at higher margins or comparable products at a lower unit cost (Conner, 1994). Whether these advantages and the corresponding performance increases are long-lived is determined in large part by the ability of rivals to obtain comparable value and cost drivers. These drivers are resources that affect the (V – P) or (P – C) gaps respectively.

Given a customer-based definition of value, shifts in consumer preferences or modifications in the buying process may change buyers' perceptions of value. For example, early in the life cycle of a new product, product features and novelty may determine value while ease of use might drive buyer evaluations of value in later life cycle stages (e.g., Christensen, 1997). These types of market changes can affect whether a resource continues to be valuable. Consider the recent withdrawals of drugs used to treat the chronic pain of arthritis, e.g. Vioxx. This event has led physicians and patients to alter their evaluations of alternative therapies. Efficacy may have driven the definition of value until recently when safety has become of primary importance. Changes in customer value definitions in

particular influence a firm's competitive position and prompt organizations to make changes (Levinthal, and Myatt, 1994). Such environmental shifts are of singular importance to RBV theory given the necessity for strategic resources to be valuable. Changes in the way that customers define value can transform the resources needed to provide value to customers (value drivers). Consequently, as value definitions and the associated value drivers change, firms may find it necessary to change their resource profile in order to remain competitive. Their success in acquiring the requisite resources will determine their subsequent competitive position and performance.

Organizational performance should be enhanced if the firm acquires new value drivers that enable it to generate higher perceptions of value than possible using existing resources. Firms' varying success in acquiring value drivers will determine their subsequent competitive position and performance. This leads to our first hypothesis.

Hypothesis 1: Firms that acquire new value drivers will improve their future (post-acquisition) performance.

As discussed above, to meet the changing value definitions of buyers, firms need to continually update by reconfiguring and releasing resources (Eisenhardt, and Martin, 2000). Some argue that the only way to acquire resources that are inimitable and organizationally complex is for firms to develop their own strategic resources (Dierickx, and Cool, 1989) or acquire them in imperfect strategic factor markets (Barney, 1986).

A firm's resources at any given point in time represent the accumulation of a stream of past resource deployment decisions as well as the fortuitous and unfortunate circumstances that place the organization in a particular competitive position at a certain point in time (Booth, 2003). These "initial conditions" represent the capabilities and

resources that are heavily influenced by the firm's prior activities (Levinthal, and Myatt, 1994:47) and serve to reinforce existing market positions (Rumelt, 1984). Initial conditions can be very general, such as a geographic location (Stuart, and Sorenson, 2003) or very firm specific, such as serving a particular customer base (Levinthal, and Myatt, 1994). These types of co-specialized assets establish a pre-existing condition that limits a firm to a certain trajectory (Teece, et al., 1997) and affects its incentive and ability to respond to environmental change (Kraatz, and Zajac, 2001) thereby limiting possible responses to environmental changes.

For some firms, their existing resources may facilitate their acquisition of new resources and they can easily adapt. For other firms, their existing resources insulate them from environmental changes. Such firms do not expect to be strongly affected by the change and hence have no interest in adaptation. Finally, for a third set of firms, a poor competitive position coupled with a correspondingly low level of financial performance may leave limited opportunity for troubled firms to acquire new resources.

This suggests our second hypothesis.

Hypothesis 2: A firm's pre-existing resources will influence its ability to acquire new value drivers.

Pre-existing resources can directly and indirectly affect the ability of new value drivers to impact subsequent performance. For example, certain sub-markets require distinctive sets of resources or competencies (Levinthal, and Myatt, 1994). If a market niche retains its existing definition of value, a firm that has shaped its resource profile to serve that niche may be relatively unaffected by value definition changes in the rest of the market. Such a firm would be unlikely to acquire the new value drivers and it should not

experience any performance declines.

Under certain fortuitous circumstances, a firm's current set of resources may enable it to respond in such a way that post-change performance is actually improved. The new value driver may be more congruent with the existing resources and capabilities of particular industry members. In this instance, the firm's performance should improve if it successfully acquires the resources necessary to meet the needs of consumers under the new definition of value. For example, due to its familiarity with finding and supporting customers through direct channels (i.e. mail and phone), Dell computer has been more successful integrating the internet selling channel into its business than its competitors (e.g. HP, IBM, etc.) who originally focused on selling through retailers. A firm whose existing resources and capabilities put it in a weak position, may be able to acquire the new resource, but it may not have the capabilities to utilize it as well as firms with stronger market positions. We would expect the performance of such firms to further deteriorate.

This leads to our remaining hypotheses:

Hypothesis 3: A firm's pre-existing resources will influence its future performance.

Hypothesis 4: A firm's pre-existing resources will moderate the influence of new value drivers on performance.

The conceptual model to summarize the above hypotheses is presented in Figure 1. In the next section, we present our empirical study to test the hypotheses presented above.

METHODS

Setting

To test the role of path dependence in resource acquisition and performance, we required a setting in which organizations have measurable and identifiable resources that

influence performance. We further required a context experiencing a significant change in the way customers define value. The hospital industry provides an excellent setting to study changes in value drivers given the significant changes in health care insurance during the past twenty-five years. We selected the 96 non-federal, acute care hospitals in the Chicago metropolitan area from 1986 – 1996 as the population for our empirical analysis. This geographic definition of the service area corresponds to a self-contained hospital market (Nath, and Gruca, 1997). As discussed below, this period represents a time of significant change in the way a large group of customers defined value.

The hospital industry provides an ideal setting due to stable and clearly identifiable strategic resources. Previous research by Nath and Gruca (1997) used extensive secondary research and interviews with industry experts to identify eight variables that represent key cost and value drivers for the individual hospital (Cowing, and Holtmann, 1982;Long, 1982;Sloan, et al., 1983). These variables include bed size, case mix index, scope of medical services, teaching involvement, proportion of Medicare and Medicaid admissions and geographic location.

Changes in health care insurance during the 1980's, resulted in a clear market-driven need for different resources. During this time, a number of employers moved away from traditional indemnity insurance, and began offering lower cost managed care plans. Under traditional health insurance plans, employers contracted with selected insurers to provide coverage for their employees. As patients, employees were free to select their service providers. Managed care plans offer lower prices to employers by negotiating exclusive, discounted contracts with hospitals and other providers to serve covered participants at lower costs than the fees generally charged to traditional indemnity health

insurers. Employers generally pass along a portion of this cost savings to their employees. By enrolling with a managed care plan, employees agree to utilize the plan's selected providers or pay for the cost of care themselves. This arrangement shifts the provider selection decision from individual patients (along with their physicians) to the managed care administrators thereby shifting what is considered valuable from the perspective of the buyers. Patients value proximity and hospital type (Malhotra, 1983), while managed care programs value characteristics that make them attractive to local employers, such as cost, geographic coverage and hospital quality.

Between 1984 and 1987, enrollment in managed care plans in the Chicago metro area grew from 5% of the population to 20% (Perry, 1988). This rapid growth was accompanied by indications of a continued increase in managed care market penetration in the near future. By 1986, it was clear that individual hospitals faced the potential loss of a significant portion of their patient base if they were not able to secure contracts with managed care plans.

Organizations will often form inter-organizational alliances as a way to reduce environmental uncertainty (Pfeffer, and Salancik, 1978). This has been demonstrated both broadly (Beverland, and Bretherton, 2001) and specifically in the instance of hospitals (Cook, et al., 1983). Historically, some hospitals in Chicago were members of multi-hospital systems of similar sized institutions with similar levels of patient care. These systems were characterized by common ownership and, usually, a shared religious heritage. If a system had more than one hospital in the area, members would experience some economies of scale through shared administrative and ancillary services.

The growth of managed care is a type of "structure-loosening event" (Madhavan, et

al., 1998) that precipitates a change in the type of inter-organizational linkages required to meet the changing needs of the environment. The managed care plans needed to provide geographic coverage and a variety of levels of care to its enrollees. A different form of inter-organizational form - the network model - would enable hospitals to effectively compete for contracts to provide hospital services to populations covered by various managed care plans (Goodman, 1986).

The American Hospital Association defines a health care network as a group of hospitals, physicians, other providers, insurers and/or community agencies that work together to coordinate and deliver a broad spectrum of services to their communities. Networks provide geographic coverage for a managed care plan's enrollees by coordinating care at multiple levels (outpatient, primary, and tertiary). While hospital systems tend to be more homogeneous in terms of size and level of care, network members are more heterogeneous, by design, to provide a continuum of care.

As a resource, membership in a network primarily affects value position of the individual hospital. Network membership is a value driver for managed care plans in their role as intermediary between the health care customer (employers and patients) and health care providers (Luke, 1991;Luke, et al., 1995). Health care networks provided comprehensive coverage to the geographically dispersed populations covered by managed care plans. Hospitals participating in networks could leverage the reputations and specialized services of other members to increase their attractiveness to managed care plans and their customers (i.e., major businesses) and plan participants (i.e., prospective patients). By bargaining with a plan as a unit, networks eliminated the need for the managed care administrators to negotiate individually with a large number of area hospitals. For these

reasons, other markets with significant managed care penetration experienced growth in the number and size of multi-hospital networks (Scott, et al., 2000).

Time Period

We chose to begin our study in 1986, the year in which two major hospital systems – Evangelical Health Systems (EHS) and Lutheran General Health Care System – announced a joint venture creating the largest hospital network in the area. EHS president John King described the rationale for forming this network as follows, "Because of the expanded geographic coverage, we expect to attract health maintenance and preferred provider organizations," (Goodman, 1986:2). Other stated motivations included economies of scale in purchasing and marketing costs as well as shared laboratory, pharmacy and linen services.

The year 1996 was chosen as the ending date because it was the last year before Columbia/HCA announced the dismantling of its network of hospitals in Chicago (ModernHealthcare, 1997). Columbia/HCA had acquired Humana's hospitals and managed care programs in Chicago in a 1993 merger (Lutz, 1993). This network breakup unofficially marked the end of the significant managed care threat that had existed in this market since Humana's increased market presence in the late 1980's.

Data and Measures

To illustrate the formation of networks in this market, we present an analysis of system ownership (1986 & 1996) and network membership (1996) data. We used the Annual Survey of Hospitals by the American Hospital Association from 1987 through 1997 (published data covers the previous year) to determine membership in multi-hospital

systems[2] and networks. We cross-validated our data using multiple sources including a 1992 report entitled "Chicago-Area Hospital Systems, Networks and Affiliations" from the Metropolitan Chicago Healthcare Council and public media reports. Using these data, we created matrices of hospital relationships across all hospitals in 1986 and 1996 and analyzed the matrices using UCINET (Borgatti, et al., 1999) and Krackplot (Krackhardt, 1999). The results are shown in Figures 2 and 3.

Figures 2 and 3 about here

In 1986, only 34% of the hospitals belonged to a system that included another local hospital. Of the 13 local systems present, ten shared a common religious heritage, e.g. owned by the same religious order. Although these systems may have been part of large, national systems, the number of local hospitals participating in each system was relatively low at 2.53 hospitals per system. These graphs do not reflect instances where a single local hospital was part of a national system.

The 1996 network data shows considerable change in the level of inter-organizational linkages in the market. Of the 96 hospitals in the original population, 14 (14.5%) had closed[3] by 1996. In 1996, system membership had dropped from 34% to 13% of the surviving hospitals participating in 5 hospital systems. However, during the intervening years, 8 multi-hospital networks were created. By 1996, 54% of the surviving hospitals belonged to one of these networks. The networks were larger than the local systems with an average of 5.6 hospital members compared to 2.2 for the systems. Of the

[2] Comparing system membership in 1986 with comparable data in prior years shows very few changes. Details are available from the authors.

[3] One privately-owned hospital – Provident – went bankrupt and closed in 1987. It was subsequently reopened as a Cook county-owned facility in 1993.

original 13 local systems, three remained as multi-hospital systems in 1996[4]. Five systems disbanded and their members joined networks, became independent hospitals or closed. Three systems formed the basis for new 1996 networks. Two hospitals remained in their 1986 system, but joined different networks.

This analysis suggests that the change in the buyer and the buying process for health insurance towards managed care did result in many hospitals acquiring a new resource, membership in a hospital network. We next describe the data we use to test our hypotheses regarding the effect of this new resource on performance and the role of path dependence in this relationship.

Measures

Performance measures. In order to test our hypotheses, we chose two measures of performance: occupancy and operating margin. Given the high level of fixed costs in hospital services, maintaining high levels of occupancy is critical for operational efficiency (Watkins, 2003). An operating margin reflects the strength of the hospital's basic business model from a financial perspective, without the additional consideration of debt obligation (Watkins, 2003). Since all of the institutions in our sample are organized as non-profits, operating margin is an appropriate measure of financial performance (Dranove, and Shanley, 1994).

The primary sources of performance data are the Medicare Cost Reports for 1986 and 1994-1996. The 1994-96 data were made available by HCIA in Baltimore, Maryland. Detailed descriptions of these measures and descriptive statistics are in Table 1.

Table 1 about here

[4] The merger of Cook County and Provident Hospital formed a new 1996 system.

Hospital resource profiles. To test the path dependence hypotheses (3 and 4), we have to model the configuration of pre-existing resources of the hospitals. The data were provided by the American Hospital Association and the Health Care Financing Administration. Specific definitions and descriptive statistics for these variables may also be found in Table 1. We first created resource profiles for each individual hospital using the 1986 data. Using principal component factor analysis, we identified three dimensions that account for 71% of the variance in the hospital resource data. Based on the factor loadings, as displayed in Table 2, we named the dimensions: Scope/Size, Location/Medicaid and Casemix/Medicare respectively.

Table 2 about here

The first factor differentiates the large teaching/tertiary care hospitals from smaller hospitals with a more limited set of services. The second factor relates to the location of the hospital as well as its relationship to the Medicaid population. Hospitals with a high score on this dimension are more likely to be located in the southern and western sections of the city. Consistent with the socioeconomic backgrounds of these areas of the city, such hospitals serve a larger Medicaid population. Finally, the third dimension concerns the resource intensity of cases treated by the hospital. Hospitals with high scores on this dimension have older, sicker patients.

We used Ward's hierarchical clustering algorithm to categorize hospitals according to similarities in their resource profiles. Following Harrigan (1985), we applied the stopping rule of an incremental increase in R^2 less than 5%. This yielded a five cluster solution (overall $R^2 = 66\%$). We confirmed the clustering solution by three significant ANOVA's, one for each factor. This indicates that the five cluster means are significantly

different across each factor. A discriminant analysis of group identification had a total misclassification error of 6.2%, indicating a robust cluster solution (Punj, and Stewart, 1983). The results are presented in Table 3.

Table 3 about here

Comparing performance across resource profiles in 1986 using ANOVA, we found that differences in occupancy were significant at the 0.01 level. The differences in operating margin were significant at the 0.10 level. These results suggest that the resource profiles we identified are significantly related to variations in performance.

Models

Effect of new value driver on performance. For Hypothesis 1, we tested the effect of network membership on hospital performance using performance data from 1986 and years 1994, 1995 and 1996. Our dependent variables were occupancy and operating margin.

Clearly, selection effects will be evident in the data if performance is related to whether a given hospital is successful in joining a network. We used the "difference-in-differences" approach common in economics (Meyer, 1995).

The basic model is:

$$Y_{i,t} = \alpha + \beta*NETWORK_{i,t} + \delta*PERIOD + \gamma*INTERACT_{i,1} + \varepsilon_{i,t}$$

where $Y_{i,t}$ is the performance measure of all hospitals in time t and PERIOD is coded 0 for the base year (in our case 1986) and 1 for the later time periods (e.g., 1996). This term controls for overall changes in performance across all hospitals. The term $NETWORK_{i,t}$ is coded 1 for hospital's that joined a network by 1996 and 0 otherwise. This term will indicate if the hospitals that joined a network by 1996 had systematically higher or lower performance than those who did not. This term controls for the selection of higher

performing hospitals as network partners.

The term $INTERACT_{i,1}$ is an interaction term involving the hospitals in networks and performance in the later periods. If this term is significantly positive, it would indicate a positive influence of network membership on performance over and above that which we would have predicted based upon the hospital's performance in 1986.

The term $\varepsilon_{i,t}$ is a random error term.

Effects of the pre-existing resources and network membership on performance. To test Hypotheses 3 & 4, we used a multi-factor ANOVA. The factors were time period, network membership and the five resource profiles discussed above. The dependent variables are occupancy and operating margin. Due to missing observations, for example, due to a hospital's closing, we used a pooled ANOVA rather than a repeated measures design.

The results in Table 3 show that these profiles are significantly related to performance in 1986. Therefore, this ANOVA approach controls for expected differences in performance across the five resource profiles in the years 1994-96.

RESULTS

Hypothesis 1: Effect of network membership on future performance. We estimated the model described above using OLS. The results are presented in Table 4.

Table 4 about here

The overall model for occupancy was significant at the $p < 0.01$ level ($F = 11.56$, df = 5). Average occupancy fell marginally between 1986 and 1996 (Year 1996 = -0.047, $p < 0.061$). The hospitals that ended up as members of a network had significantly higher levels of occupancy in both time periods (NETWORK = 0.144, $p < 0.001$). Contrary to our expectations though, the average occupancy for network member hospitals fell significantly

(INTERACT = -0.099, $p < 0.002$).

The overall model for operating margin was significant ($F = 2.23$, df =5, $p < 0.051$). Each of the year indicators was significant greater than zero suggesting that overall hospital margins were higher on average compared to the base year of 1986. However, the interaction between network status and performance was not significant (INTERACT = -0.046, $p < 0.14$). Given the importance of maintaining profitable operations, the lack of significant findings for operating margins leads us to conclude that success in acquiring network membership itself does not lead to better performance. Therefore, we fail to find support for Hypothesis 1.

Hypothesis 2: The effect of pre-existing resources on network membership

We hypothesized that the resource profiles of different groups of hospitals serve to either enhance a hospital's options or constrain its ability to adapt to the change in value drivers. The proportion of hospitals that joined networks varied considerably across the resource profiles as did the proportion of hospitals that closed between 1986 and 1996. The incidence of network membership and closure by resource profile is presented in Table 5.

Table 5 about here

The data show that the response pattern to changes in value drivers varied depending on the resource profile of the group of hospitals (Chi-Square = 24.54, $p < .02$). These results can be seen graphically in Figure 4.[5]

Figure 4 about here

[5] Using a separate multinomial logit model, we found that the hospital's position with respect to the three resource factors (Scope/Size, Location/Medicaid, Casemix/Medicare) had a significant impact on their status as of 1996 (stand-alone, closed, system-owned or network member). Further details are available from the authors.

Large teaching hospitals were the most likely to join networks (Group 5). The specialized services offered by the hospitals in teaching hospitals are attractive to network partners (Defino, 1994). Due to their size and market power, these organizations often took the leadership role to create network entities in order to negotiate with managed care plans. The large hospitals in the near northwest suburbs (Group 2) were also more likely to join networks. Their location in the growing and more affluent northwestern suburbs would make them ideal network partners. In contrast, the small inner-city hospitals (Group 3) were probably viewed as very unattractive partners and thus had the lowest network membership percentage. Their high reliance upon Medicare and Medicaid patients created financial difficulties, as evidenced by the high proportion of closures. The ex-urban hospitals in the outer fringe of the city (Group 1) were more likely to remain as stand-alone hospitals rather than join networks. Perhaps their geographic distance provided some level of financial protection. As well, they might not have been viewed as attractive network partners because of their geographic distance from the other hospitals.

In summary, these results suggest that pre-existing resources influence a firm's need to and ability to respond positively to the change in value drivers. Therefore, we find support for Hypothesis 2.

Hypotheses 3 & 4: Main and moderating effects of pre-existing resources and network membership on future performance

To test for the effect of the pre-existing resources and network membership on performance, we first verified the stability of the resource profiles identified using the 1986 data. We collected the same measures of hospital resources for the year 1996. We then used the standardized scoring coefficients from the 1986 results (based on the varimax factor

rotation reported in Table 3) to determine each hospital's 1996 factor scores for the three dimensions. Using these data and the discriminant functions estimated on the 1986 results, we classified each surviving hospital into one of the five extant resource profile types. We found that more than 70% were correctly classified into the same group, which is significant at the 0.01 level (Press's Q = 138.85). These results indicate that the structure of the resource profiles did not change substantially between the two time periods.[6]

We tested the effect of the hospital's resource profile and its membership in a network on 1994-96 performance using ANOVA. The independent variables were the year, the resource profile and an indicator of the status of the hospital as of 1996, i.e. stand-alone, system owned or network member. The results are presented in Table 6.

Table 6 about here

We find that a hospital's resource profile (PROFILE) is a significant determinant of occupancy and operating margin. Therefore, we find support for Hypothesis 3.

The STATUS variable (including network membership) did not have a main or interactive effect on occupancy. However, with respect to operating margin, there was a significant interaction between the hospital's status with respect to network or system membership and its resource profile. To illustrate these effects, we graphed the estimate group means for operating margins for 1994-96 for stand-alone, system-owned and network member hospitals. These results are presented in Figure 5.

Figure 5 about here

The results are very interesting. From the figure, we can see that the benefits of network membership varied significantly depending upon the hospital's resource profile.

[6] Further details are available from the authors.

Large teaching hospitals that were members of networks experienced higher average operating margins than those not included in networks. In contrast, performance is worse, on average, for those small, center city hospitals that were successful in joining a network. For that group, those that remained in systems exhibited the highest operating margins. The small ex-urban group of hospitals exhibited very little difference in operating margins between stand-alone, system and network status.

These results provide support for Hypothesis 4.

DISCUSSION

Changes in customer preferences or buying processes often require firms to develop or acquire new resources to enable them to survive and compete in a changing market environment. While significant progress has been made to understand the idea of dynamic capabilities (Teece, et al., 1997;Zollo, and Winter, 2002) and the capability life cycle (Helfat, and Peteraf, 2003), little attention has been paid to the more tangible resources within a dynamic RBV framework (Mathews, 2003). In this paper, we begin to address this need by examining the impact of path dependence on the acquisition and performance implications of network affiliations, one of the more unique tangible resources studied in strategy.

In the Chicago hospital market, more than half the surviving organizations responded to the shift towards managed care by joining a network. Historical resource configurations and past experiences determined their need and/or ability to join networks. Network membership was imperative for some hospitals, while unnecessary for others. In some cases, the hospital's existing resources precluded it from joining a network.

Existing resources affect an organization's ability to undertake a significant change. This is particularly salient for a social type of resource, such as a network alliance, that by definition, involves another actor. Our findings highlight that network partner attractiveness as it relates to a strategic value driver is of critical importance. As (Ahuja, 2000:338) notes, "(t)he attractiveness of a firm on the interfirm linkage market depends upon what the firm can provide to its partners." For example, a hospital choosing to decline network membership is very different from not being invited to join a network. Hospitals that did not join networks fell into two categories: underperforming hospitals that were not considered attractive network partners and stand-alone hospitals occupying a protected niche in the market. In the case of underperforming hospitals, their historical performance may have made them unattractive network partners. In some instances, they remained members of systems, even though system membership did not provide additional benefits of value to buyers. In the instance of the stand-alone hospitals, their geographic location and historically strong performance minimized the perceived threat posed by the influx of managed care programs into the market.

We found that path dependence played a significant role in the impact of new resources on performance. Generally, we might expect that the link between acquiring a particular value driver and performance is more direct in the early stages of industry or firm evolution. However, we found that network membership did not increase profitability overall. Our results suggest that once an industry reaches maturity or firms establish positions in the marketplace, the link between acquiring a new value driver and performance is more complex. With established positions, the path dependence created by prior decisions regarding the firm's resources has a greater influence on performance. We

found that the additional influence of networks varied. For hospitals with certain resource profiles, such as teaching hospitals, network affiliation generated a significant improvement in performance. For other groups, the affiliation may have enabled them to maintain status quo or prevent further deterioration.

Cook, et al. (1983) suggest that increased pressure on an organization leads to responses involving inter-organizational linkages. By defining membership in a multi-hospital provider network as a resource, we seem to depart from the traditional assumptions of current RBV theory. For example, Diericks and Cool (1989) restrict their definition of valuable resources to those developed internally since only this type of resource would be infused with the causal ambiguity and social complexity necessary to make imitation unlikely. In addition, Peteraf & Barney (2003) suggest that only resources completely under the control of the firm can be a source of competitive advantage. Given the required cooperation of firms, network membership is not a resource fully under the control of a given firm. In addition, this resource is acquired externally. However, a large body of literature demonstrates the effects networks have on firm performance (Brass, Galaskiewicz, Greve, & Tsai, 2004), and recently, Hoopes, Madsen and Walker (2003) discuss how networks can play an important role as value drivers in understanding competitive heterogeneity. While some networks create value on the basis of leveraging different organizational skills or providing geographic access, for hospitals in our study network membership is a value driver in the sense the networks, as a whole, provides value to managed care plans that no single hospital can. In addition, because each network consists of a particular combination of hospitals, this resource has a degree of uniqueness that cannot be exactly imitated (Gulati, Nohria, & Zaheer, 2000).

One interesting coda to our study is the ultimate penetration rate of managed care in the Chicago market. Despite the initiatives of several large players, managed care enrollment only reached 23.6% in the market by 1996. This level of managed care enrollment might not have been sufficient enough to differentiate network membership as a value driver with performance implications for all hospitals.

CONCLUSION

Noda and Collis suggest that RBV as a theory remains incomplete and of little importance to managers until we understand, "the dynamic processes and mechanisms by which a firm establishes a favorable resource position," (2001: 898). This paper helps to further the conceptualization of a dynamic RBV. We highlight the influence of the path dependence created by pre-existing resource profiles in the development of new strategic resources and explain variability in strategic responses to changes in buyer-defined value drivers.

The overarching goal of strategy research is to understand why some firms are successful and why others fail. Using an RBV framework, our research demonstrates that a critical dimension of varying levels of performance is the ability to respond to inevitable environmental changes. In addition, our work highlights the role that existing resources play in this level of adaptation. By broadening the view of a dynamic RBV to include the impact of path dependence, we deepen our understanding of sustained variations in firm performance and the dynamics of strategic change.

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Table 1

Measures of Hospital Resources and Performance in 1986

Variable	Definition	Sample Mean	Sample Std. Dev.
Size	Bed size (short-term, staffed)	315.96	187.45
Loc1/Loc2	East-west, North-south location (w/ respect to city center (1/10's mile))	-74.23 / 16.27	89.91 / 105.95
Teaching	Medical residents (FTE)	36.68	91.33
Scope	Number of service offered by hospital / Total number of services listed by AHA	0.59	0.23
Casemix	Casemix index based on average lengths of stay for 467 DRG's for individual hospital and entire sample	88.32	22.65
Medicare	Proportion of Medicare admissions	0.18	0.12
Medicaid	Proportion of Medicaid admissions	0.13	0.18
Occupancy	Average daily census / total staffed short-term beds	63.42	14.40
Margin	Net Operating Revenue / Net Operating Expenses	0.95	0.15

Table 2

Varimax Rotated Factor Loadings

Variable	**Factor 1**	**Factor 2**	**Factor 3**
Teaching	0.86	0.23	-0.08
Size	0.83	0.14	0.33
Scope	0.80	-0.15	0.12
Loc1	0.12	0.79	0.19
Loc2	-0.05	-0.68	-0.33
Medicaid	-0.02	0.76	-0.37
Medicare	0.02	0.12	0.83
Casemix	0.49	0.04	0.68
Eigenvalue	2.89	1.63	1.16
Variance explained	0.36	0.20	0.15
Labels	Size/Scope	Location/Medicaid	Casemix/Medicare

Table 3

Means by Resource Profile (1986)

Resource Profile	**1** **Small Ex-Urbs**	**2** **Large, NW of City**	**3** **Small, Center City**	**4** **Large, SW of City**	**5** **Teaching**
Number of Hospitals	16	23	24	23	10
Strategy Variable Means					
Factor 1 Size/Scope					
Teach	0.13	22.26	1.04	12.08	270.50
Size	215.68	322.39	177.17	354.57	705.90
Scope	0.61	0.69	0.39	0.57	0.91
Factor 2 Location/Medicaid					
Loc1	-212.75	-85.87	-36.87	-29.43	-18.50
Loc2	173.00	22.60	-16.54	-43.60	-32.60
Medicaid	0.03	0.06	0.26	0.11	0.17
Factor 3 Casemix/Medicare					
Medicare	0.11	0.15	0.10	0.33	0.23
Casemix	76.21	97.03	67.95	99.95	109.84
Performance Measures (1986)					
Occupancy**	60.05	67.88	55.88	64.41	74.38
Operating Margin*	0.98	0.98	0.88	0.99	0.93

* ANOVA significant at $p < 0.10$, ** ANOVA significant at $p < 0.05$.

Table 4

Effect of Network Membership on Performance (1994-96)

Dependent Variable	Occupancy		Operating Margin	
	Coefficient (std. error)	t-statistic	Coefficient (std. error)	t-statistic
CONSTANT	0.568 (0.019)	30.7***	0.935 (0.018)	51.7***
Year 1994	-0.012 (0.024)	-0.49	0.071 (0.023)	3.05***
Year 1995	-0.25 (0.025)	-0.98	0.067 (0.024)	2.82***
Year 1996	-0.047 (0.025)	-1.88*	0.058 (0.024)	2.43**
NETWORK	0.144 (0.027)	5.26***	0.035 (0.026)	1.30
INTERACTION	-0.099 (0.032)	-3.08**	-0.046 (0.031)	-1.438
Adjusted R-squared	0.132		0.018	

t-statistic significant at (*) $p < 0.10$, (**) $p < 0.05$, (***) $p < 0.01$ level.

Table 5

Closure, System and Network Membership

Resource Profile	Closed 1986-1996	Standalone (1996)	Member of Local Multi-hospital System (1996)	Member of Health Care Network (1996)
Small Ex-urbs	0	8	2	6
Large, NW of City	2	4	2	15
Small, Center City	9*	7	1	7
Large, SW of City	3	9	2	9
Teaching	0	1	2	7
Total	14	29	9	44

* One privately-owned hospital – Provident – went bankrupt and closed in 1987. It was subsequently reopened as a county-owned facility in 1993.

Table 6

ANOVA Results for Performance (1994-96) by Resource Profile and Status[a]

Dependent Variable: Occupancy

Source	Type III Sum of Squares	df	Mean Square	F
Corrected Model	1.137	44	.026	1.45**
Intercept	54.930	1	54.930	3077.45***
Year	.028	2	.014	.78
Profile	.472	4	.118	6.60***
Status	.028	2	.014	.78
Year * Profile	.014	8	.002	.09
Year * Status	.007	4	.002	.10
Profile * Status	.220	8	.027	1.54
Year * Profile * Status	.042	16	.003	.15
Error	3.606	202	.018	
Total	82.064	247		
Corrected Total	4.743	246		

Dependent Variable: Operating Margin

Source	Type III Sum of Squares	df	Mean Square	F
Corrected Model	.866	44	.020	2.53***
Intercept	155.636	1	155.636	19993.27***
Year	.009	2	.005	.60
Profile	.414	4	.103	13.29***
Status	.005	2	.002	.30
Year * Profile	.029	8	.004	.47
Year * Status	.003	4	.001	.10
Profile * Status	.507	8	.063	8.14***
Year * Profile * Status	.040	16	.003	.32
Error	1.518	195	.008	
Total	242.858	240		
Corrected Total	2.384	239		

[a] Status = stand alone, system owned or network member.

* Significant at $p < 0.10$, ** significant at $p < .05$, *** significant at $p < .01$.

Figure 1

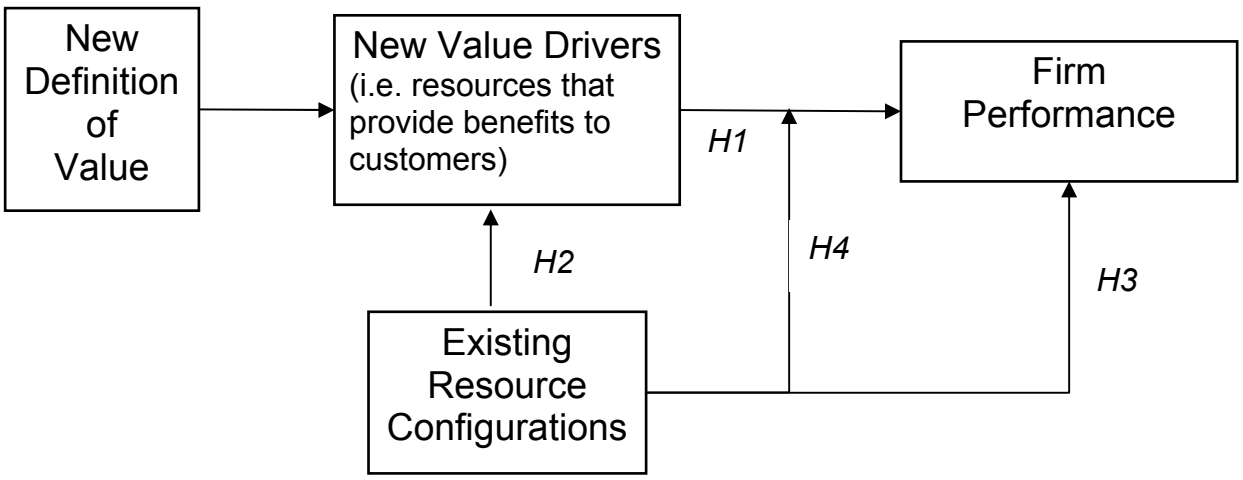

New Definition of Value
New Value Drivers (i.e. resources that provide benefits to customers)
Firm Performance
H1
H2
H3
H4
Existing Resource Configurations

Figure 2

1986 Hospitals with Common Ownership (Local Systems)

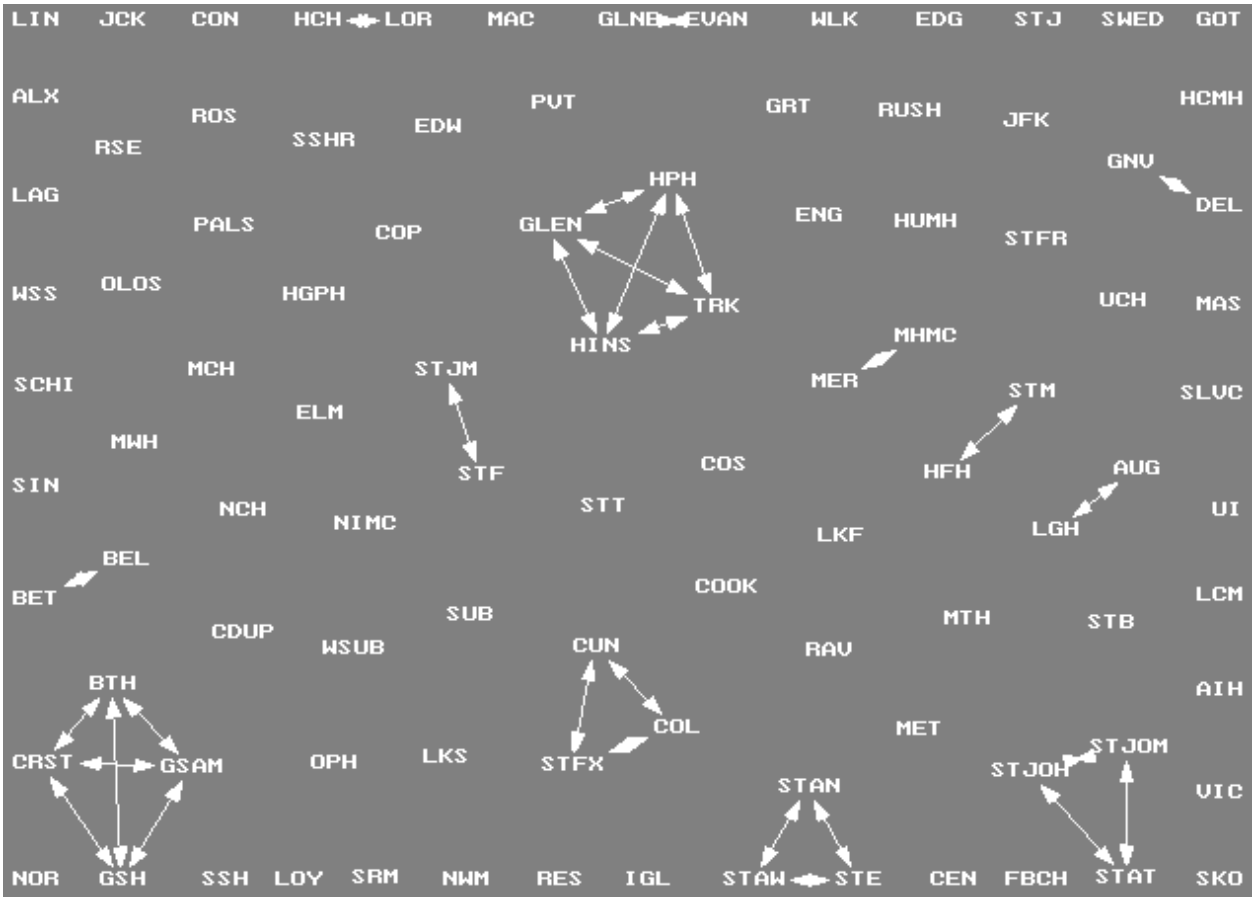


Figure 3

1996 Multi-Hospital Networks & Systems

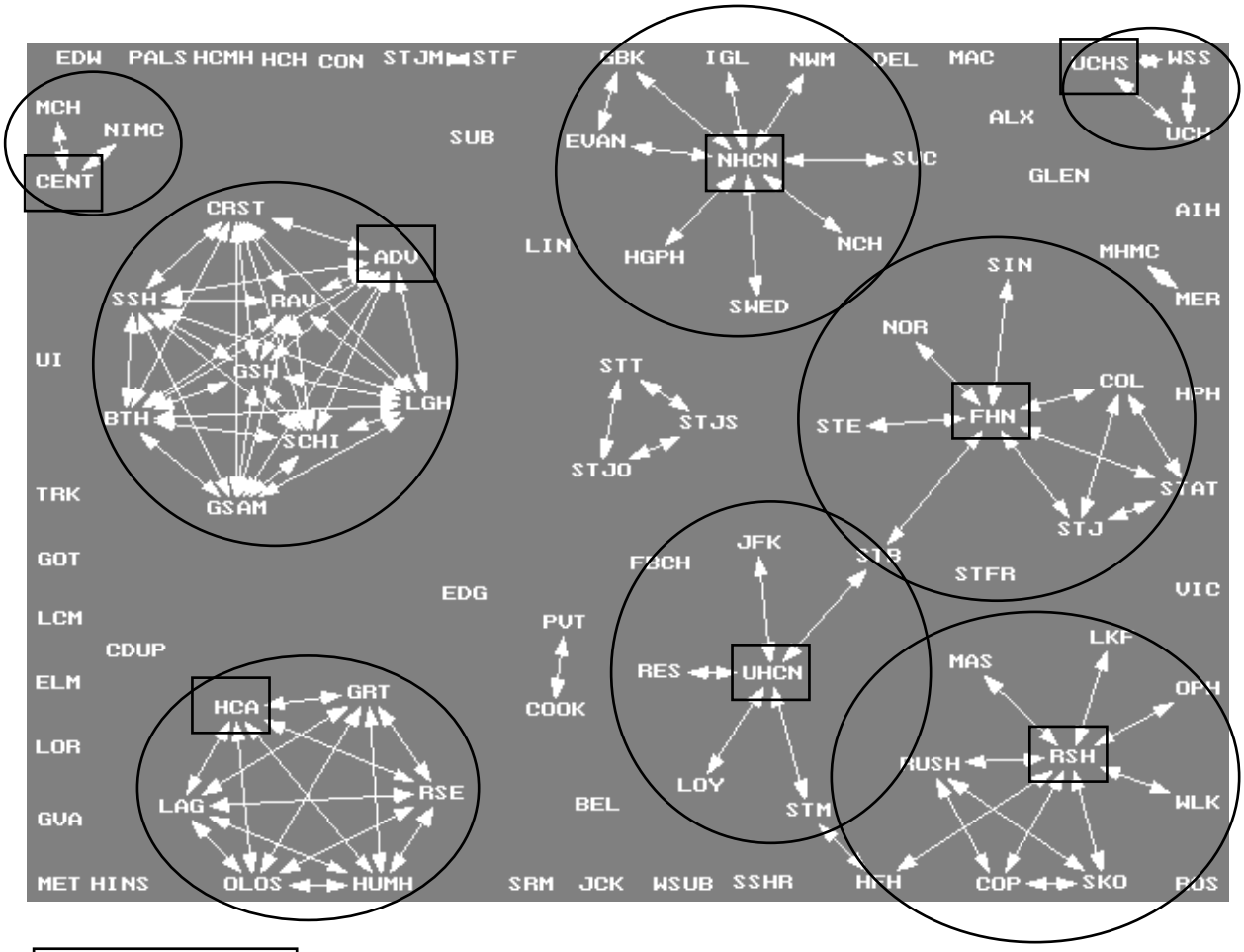


Figure 4

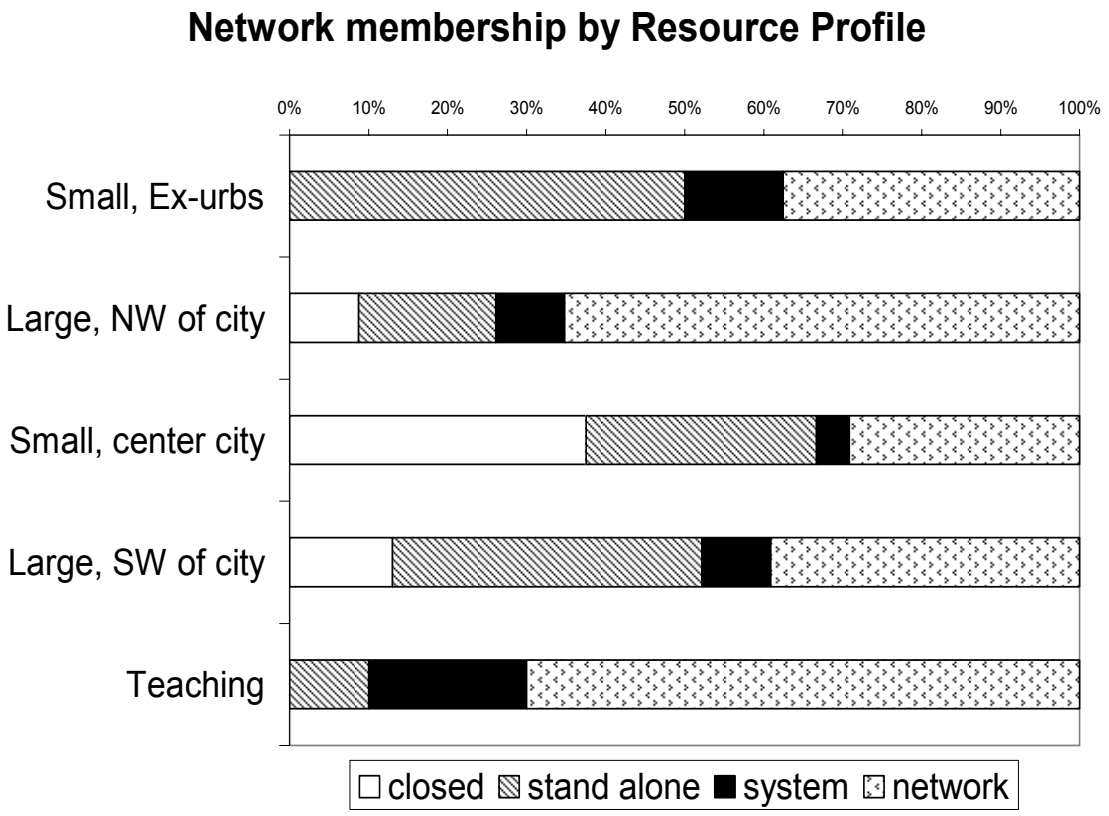
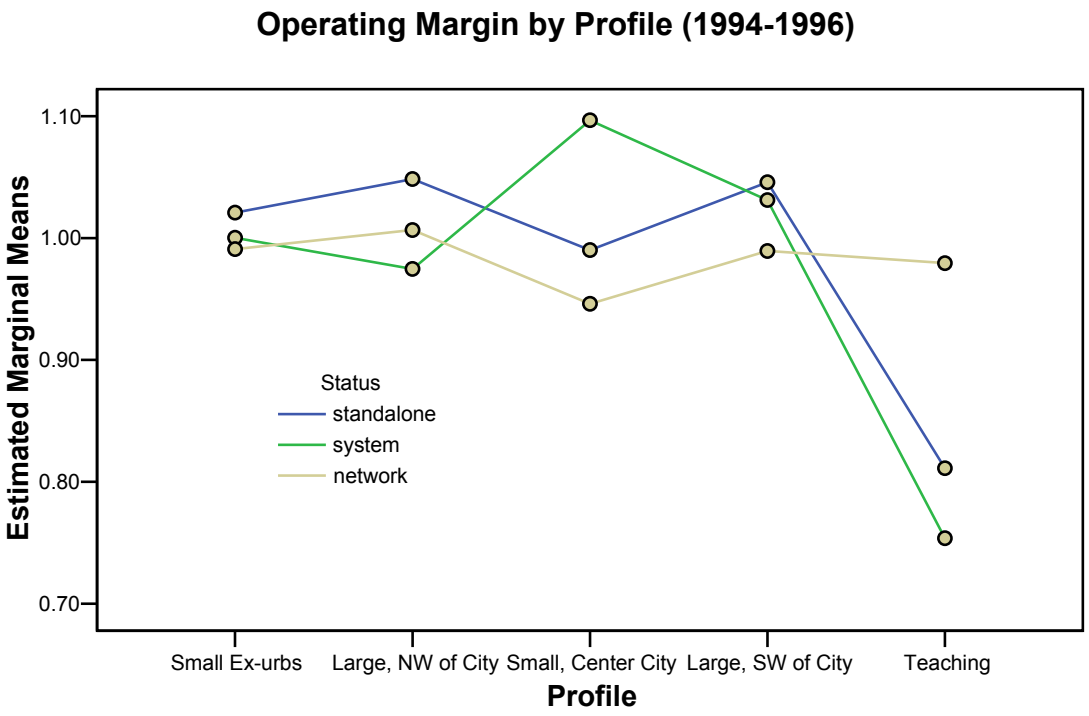

Network membership by Resource Profile
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Small, Ex-urbs
Large, NW of city
Small, center city
Large, SW of city
Teaching
closed
stand alone
system
network

Figure 5


Operating Margin by Profile (1994-1996)
Estimated Marginal Means
1.10
1.00
0.90
0.80
0.70
Status
standalone
system
network
Small Ex-urbs
Large, NW of City
Small, Center City
Large, SW of City
Teaching
Profile