A comparison of qualitative and quantitative operationalizations of strategic management constructs

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ABSTRACT

This paper compares two approaches to definition of the environmental and organizational influence constructs in strategic management research by quantitatively examining loading of variables on these constructs versus the predominant qualitative approach to construct definition in the field. Variables operationalizing competition, network externalities, and community resources were used to capture the environmental influence construct based on a qualitative review of the literature. Variables representing organizational complexity, slack resources, control of domain, and size were used to capture the organizational influence construct. Factor analytic methods quantitatively indicated that the qualitative alignment of the variables with the constructs were supported - except for the variable of slack resources. These results and their implications are discussed along with implications for future research. This study suggests the utility of quantitative methods to help define constructs to supplement the predominantly qualitative approach in much strategic management research.

Keywords: constructs, environmental influence, factor analysis, organizational influence, operationalization, principle components, strategic management

INTRODUCTION

Strategic management research tends to draw on qualitative approaches to operationalizing constructs via literature reviews and generally accepted uses of certain variables to capture common constructs of interest. In a multi-year content analysis of strategic management scholarship, it was noted that strategic management, "has been characterized as placing less emphasis on construct measurement that other management subfields" (Boyd, Gove, & Hitt, 2005: 239). This study concluded that more rigorous validation of strategic management constructs is needed. Suitable operationalization of constructs used in theoretical models is integral to research validity (Trochim & Donnelly, 2006). Sophisticated quantitative methods are widely used and reported in behavioral science research to validate that variables used to operationalize constructs actually capture the constructs (Cohen, Cohen, West, & Aiken, 2003). However strategic management research methods have been less rigorous and more oriented to qualitative versus quantitative approaches in this area.

The environmental and organizational influence constructs are widely used in strategic management research (Swayne, Duncan & Ginter, 2009). Organizations are engaged in a continuous process of strategic adaptation to external environmental forces in order to survive and thrive (Kast & Rosenzweig, 1985; Swayne, Duncan, & Ginter, 2009). Adaptation requires that organizations make strategic choices concerning initiatives they will undertake, using their internal organizational capabilities, to achieve alignment with their environment (Barney, 1991; Child, 1997). Which responses are selected and whether they can be successfully enacted by a particular organization depends on a number of factors specific to an organization and its environment (Kimberly & Evanisko, 1981; Hamel & Prahalad, 1994). Thus, both environmental and organizational influences are salient in making strategic choices.

The purpose of this paper is to investigate operationalization of the environmental and organizational influence constructs as an aid to better understanding the relative utility of quantitative and qualitative approaches in strategic management research. This study uses factor analytic methods to examine commonly used environmental and organizational variables cited in the literature to capture these constructs and thereby facilitate a comparison of qualitative and quantitative approaches to construct operationalization. The paper proceeds by briefly reviewing the role of environmental and organizational influences in strategic adaptation as a framework. Specific variables used to operationalize these constructs are next discussed followed by methodological information. Results are then reviewed and findings discussed. Conclusions and implications for further research are given.

LITERATURE REVIEW AND FRAMEWORK

In order to sustain resource transactions with their environment, organizations make strategic choices concerning alternative actions they will take to adapt to environmental forces (Child, 1997). Strategic management is an organizational practice for achieving adaptation. Strategic management has been described as a systematic process for positioning an organization within its environment so that continued success is assured and so that it is able to deal with surprise (Ansoff, 1987). Strategic management thought posits that an organization engages in both intentional and unintentional formation of strategies that are synthesized into the actual strategy it enacts to reconcile internal capabilities with its external environmental possibilities (Mintzberg & Waters, 1985). Organizations develop strategies to attain competitive advantage

in their relationship to their environment relative to their competitors. The source of competitive advantage is an area of debate in the strategic management literature, but two streams of intellectual thought tend to dominate (Luke, Walston, & Plummer, 2003).

One steam of literature, sometimes referred to as the market structure view (MSV), focuses on external advantages primarily attained via favorable market positioning that increases the market power of an organization relative to its competitors (Luke, Walston, & Plummer, 2003). Drawing on work in industrial and organizational economics, the MSV focuses on industry structures and the conduct of competitors. Market structures refer to the features of markets that influence strategies of competitors, whereas conduct refers to actions or strategies organizations take in response to environmental and market forces (Shortell & Kaluzny, 2006). Porter (1980) described these forces in terms of buyer power, barriers to entry, seller power, and availability of substitutes that collectively determine the level of competitive rivalry in a market. This rivalry consequently defines generic strategies open to organizations such as cost leadership, differentiation of offerings, focus on market niches, or some amalgam that represents a middle road among these strategies (Porter, 1980). Thus, market structure, "is often a major determinant of strategic choice" (Shortell & Kaluzny, 2006: 464).

The second strategic management stream, sometimes referred to as the resource based view (RBV), focuses internally on all of the assets, capabilities, organizational processes, information, knowledge, and other capacities controlled by a firm that enables it in developing and implementing effective strategies (Barney, 1991; 2001). Barney (1991; 2001) went on to describe organizations as bundles of physical, human, and administrative capabilities that can create sustained competitive advantage to the degree they are valuable, rare, inimitable, and non-substitutable. Barney (1991; 2001) suggests that intangible resources like organizational culture are a primary source of advantage since they are very difficult to imitate, whereas Hamel and Prahalad (1984) suggest that dynamic capabilities resulting from strategic learning are another primary source of inimitable competitive advantage. Indeed, Porter (1985) argued that competitive advantage flows from improving coordination of internal activities that constitute an organization's "value chain" for producing its outputs.

The strategic management process, popularized by the design school of management theorists (Mintzberg, Ahlstrand, & Lampel, 2005), argues that organizations should analyze their external environment for threats and opportunities and examine their internal capabilities for strengths and weaknesses as a basis for formulating deliberate strategies for mitigating weaknesses and threats while capitalizing on organizational strengths to exploit opportunities (Learned, Christensen, Andrews, & Guth, 1965; Swayne, Duncan, & Ginter, 2009). The MSV informs analysis of external environmental threats and opportunities and the RBV informs analysis of internal strengths and weaknesses for strategy development. Thus, these steams converge to facilitate the ultimate goal of strategic adaptation by achieving alignment or fit between internal organizational capabilities and external environmental possibilities (Mintzberg, Ahlstrand, & Lampel, 2005) while realizing that both of these sources of influence are highly interdependent (Luke, Walston, & Plummer, 2003). Thus, the MSV and RBV approaches to strategy suggest that environmental and organizational factors are salient in making strategic choices.

OPERATIONALIZATION OF CONSTRUCTS

A number of variables can be used to operationalize the constructs of environmental and organizational influences. In a study of the adoption of an administrative innovation by hospitals, these constructs were operationalized based on multiple variables commonly reported in the health services research literature (Sanders, 2007) relevant to strategic management. The administrative innovation studied was the "magnet hospital concept" which consists of a well defined set of organizational practices that have been shown to be effective in attracting and retaining registered nurses; scarce human capital necessary for sustaining ongoing hospital operations (McClure & Hinshaw, 2002). The salience of environmental and organizational factors in influencing adoption of this administrative innovation was investigated. Based on this study, the variables of competition, network externalities, and community resources were used to capture environmental influences; while organizational complexity, slack resources, control of domain, and size were used to capture organizational influences on innovation adoption at the implementation stage of the adoption process to capture strategic adaptation. These variables and their measures were developed from a qualitative review of the literature (Sanders, 2007) to operationalize the environmental and organizational constructs as summarized below.

Competition can be viewed as the number of organizations within a market area that vie for acquisition of resource inputs and disposition of outputs (Feldstein, 2011). Numerous empirical studies have examined competition using various operationalizations. While a number of measures are used in health services research, the Herfindahl Index is a very widely adopted measure (Lynk & Morrisey, 1987; Ginn & Young, 1992; Tami, 1999; Trinh & O'Connor, 2000) of market concentration that is used to gauge competition. It has been found that markets that are less concentrated tend to be more competitive (Ginn & Young, 1992). Thus, the lower the Herfindahl index, the more competitive a hospital's market. The Herfindahl index can be calculated as the sum of the squared shares of admissions for all acute care hospitals in a city (or other geographic unit) where a hospital is located and where market share is calculated by dividing each hospital's admissions by the total number of admissions for the city (or other geographic unit) (Ginn & Young, 1992). As such, a hospital market's Herfindahl index can range from 0 to 1, moving from a large number of competitors to a single provider. In this study, competition is operationally defined as a hospital's Herfindahl index within its market (i.e., county). (It should be noted that the higher the Herfindahl Index, the more concentrated the market, so lower values of the index reflect higher degrees of competition.)

Network externalities refer to the number of adopters in place and the resultant relationship to critical mass or tipping point in innovation adoption (Kraut, Rice, Cool, & Fish, 1998). This phenomena is driven by relatively few early adopters that follow the innovators and become the opinion leaders that then influence the early majority group of the utility of adoption until critical mass (Rogers, 2003) or a "tipping point" (Gladwell, 2000) is reached. One study found using network externalities in the health services literature used the percentage of adopting competitors to measure this variable (Krein, 1999). For purposes of this study, network externalities was operationally defined as the presence of other adopters in a hospital's market area and measured as the percentage of competitors in the market (i.e., county) that had already adopted the administrative innovation. The percentage of adopters in place was calculated by county for the year prior to adoption to capture the influence of competitor's adoption behavior.

The resource dependence school of organization theory focuses on an organization's ability to secure needed resources from its environment in order to survive (Pfeffer & Salancik,

1978). Resource acquisition needs create dependency on an organization's environment while the organization simultaneously seeks to remain independent resulting in a dependence-independence tension that influences an organization's form and functions (Shortell & Kaluzny, 2006). A number of operational definitions have been used in empirical studies in the health services research literature for availability of community resources. Physician supply per thousand population has frequently been used to measure workforce availability as a community resource (Alexander, D'Aunno, & Succi, 1996; Bigelow & Mahon, 1989; Krein, 1999; Zajac & Shortell, 1989). Given that the administrative innovation involved recruitment and retention of nursing personnel, community resources availability might best have been operationalized as nursing supply within a hospital's market (i.e., county) as measured by the number of RNs per thousand of population. However, data on the number of RNs by county was not uniformly available for the study period. Thus, an alternative measure of health care workforce availability was used. The number of Healthcare Practitioner Professionals per thousand of population was uniformly available by county from the year 2000 census as a measure of the relative availability of health care workers as a community resource. Healthcare Practitioner Professionals (HPPs) are defined by the U.S. Census Bureau as practitioners in the following occupation codes: Chiropractors, Dentist, Dietitians and Nutritionists, Optometrists, Pharmacists, Physicians and Surgeons, Physicians and Surgeons, Physician Assistants, Podiatrists, Registered Nurses, Audiologists, Occupational Therapists, Physical Therapists, Radiation Therapists, Recreational Therapists, Respiratory Therapists, Speech-Language Pathologists, Therapists-All Other, Veterinarians, and Health Diagnosing and Treating Practitioners-All Other (Bureau of Health Professions, 2005). Thus, HHPs per thousand of population in each hospital's county for the year 2000 was used as a relative measure of community resources in this research.

Organizational complexity can be viewed as either a distinct concept that seeks to capture the overall scope of an organization's operations or as a composite that combines the concepts of specialization (i.e., diversity of skill sets employed in an organization), functional differentiation (i.e., degree to which an organization is divided into subunits), and professionalism (i.e., use of professional knowledge in different organizational units) (Damanpour, 1991). While a number of different operationalizations were found in the literature, the complexity of hospital organizations has been frequently measured in terms of their scope of services (Gautam & Goodstein, 1996). For purposes of this study, organizational complexity was measured as the number of services offered by a hospital.

Slack resources seeks to capture the resources an organization has available beyond what is required to maintain ongoing operations (Damanpour, 1991). In accord with the contingency school of organization theory, resource munificence can influence organizational form and function (Dressler, 1986). Slack resources provides a measure of resource availability for implementing innovations and mitigating related risks thereby facilitating adaptation (Kimberly & Evanisko, 1981). Slack resources have been operationalized using a number of measures. Superior financial performance can lead to greater availability of resources and accumulation of slack resources. While financial measures are frequently used, the most common approach found in the health services literature used a measure of hospital occupancy or census for this factor (Provan, 1987; Glandon & Counte, 1995; Zinn, Weech, & Brannon, 1998; Krein, 1999). In this research, slack resources were measured by percentage of hospital occupancy.

Control of domain seeks to capture the power of a professional group in an organization over decisions, activities, and outcomes important to their professional interests (Flood & Scott, 1978; Flood & Scott, 1987). The greater the control of domain of a professional group the

greater the impetus they have to exert control that is in their professional interests and the greater influence they exert over organizational outcomes relevant to their professional arena. As regards this study, the greater the control of domain of a professional group, such as nursing, the greater the influence they exert over outcomes relevant to their professional arena, such as adoption of the proposed innovation. The more nurses that a hospital has relative to its capacity, the greater potential RNs have to exert control over their domain and the greater expertise there is available to implement the innovation. Control of domain was defined as a hospital's nursing supply in this study and was measured by the number of RNs per bed in operation at a hospital similar to the way strength of professional presence has been captured in other studies (Alexander, D'Aunno, & Succi, 1996; Wheeler, Burkhardt, Alexander, & Magnus, 1999).

Contingency theory of organization supplements and modifies classical bureaucratic theory by recognizing that there are important factors that influence how organizations differentiate and coordinate activities that determine structure and processes (Dressler, 1986). An organization's size has been viewed as a contingency variable influencing the structural flexibility of an organization in adopting new forms to achieve adaptation to environmental demands and in providing wherewithal to support innovation (Dressler, 1986; Katz & Kahn, 1978). The literature indicates that size has a positive influence on innovation adoption if it is statistically significant, but empirical results have been mixed on its significance (Kimberly & Evanisko, 1981). While hospital size can be captured by a number of measures, number of operating beds has been a frequently used metric (Alexander, D'Aunno, & Succi, 1996; Gautam & Goodstein, 1996; Trinh & O'Connor, 2000; Wheeler et al., 1999) and was used to operationalize hospital size in this study.

In summary, the constructs of environmental influences and organizational influences were operationalized for purposes of this study using multiple variables and corresponding measures based on a qualitative review of the relevant research literature. The variables of competition, network externalities, and community resources were used to capture environmental influences. Likewise, organizational complexity, slack resources, control of domain, and size were used to capture organizational influences based on this review. Whether these variables actually capture the constructs can be quantitatively assessed using statistical methods.

METHODS

Principal components and common factor analysis are related data reduction techniques commonly used to examine the interrelationship among continuous variables where it is assumed that observed covariation between the variables is due to some underlying common trait or traits, designated as components or factor depending on the method (Dixon, 2005; Bryant & Yarnold, 1995). In the principal components method all observed variance is considered, whereas factor analysis focuses only on common variance in identifying underlying traits. In well designed studies with adequate sample sizes, whether principal components or common factor analysis is used makes little practical difference in the results obtained and running multiple analyses varying methods for cross validation is recommended (Nunnally & Bernstein, 1994). Sample sizes need to be in the range of five to ten cases per variable and at least 100 to 200 cases minimum are recommended (Dixon, 2005; Bryant & Yarnold, 1995). Of more importance is the goal of the factor analytic method utilized. Exploratory factor analysis does not assume a particular set of factor and lets any pattern emerge from the data. Confirmatory factor analysis tests a formal hypothesis about the factors that are expected to underlie the data. In this study,

sample size assumptions were met and both principal components and exploratory factor analysis were used for cross-validation as were multiple methods of identifying the number factors.

The data used in this study were drawn from three secondary sources. The American Nurses Credentialing Center (ANCC) web site (ANCC, 2006) was consulted in May 2006 to obtain the names, identifiers, and related information on hospitals that met designation or re-designation criteria as adopters of a particular administrative innovation up through 2005. The American Hospital Association (AHA) annual survey datasets for the study period (i.e., 1999-2004 data years) were used to obtain data for both the adopters and a random sample of non-adopters. The Area Resource File (ARF) of the Bureau of Health Professions (Bureau of Health Professions, 2005) was used to obtain environmental and demographic data related to each adopter and non-adopter. Data were extracted from these secondary data sources and cleaned and coded as necessary and new measures calculated as needed and ultimately merged into a new dataset for statistical analysis. The final sample used in this study consisted of 725 hospitals. Some 156 were adopters of the administrative innovation and 569 were non-adopters drawn as a 15% random sample from a sampling frame of 3617 non-adopter hospitals in accord with recommendations by King and Zeng (2001a, 2001b) for rare event sampling. This sample size met requirements for use of factor analytic methods.

Both principal components analysis and factor analysis were used to examine the alignment of the metric variables (i.e., measures for competition, network externalities, community resources, organizational complexity, slack resources, control of domain, and size) within the categories of environmental and organizational influences. While these two methods typically yield similar results (Stevens, 1992), particularly with large samples, both methods were used to cross-validate findings. Analyses were performed using correlation matrices for the variables. To determine factorability of the data, the size of the determinant was assessed and the Kaiser-Meyer-Oklin test of sampling adequacy was used along with Bartlett's test of sphericity. To determine the number of components or factors suggested by the variables, the Kaiser criterion (i.e., eigenvalues greater than one) and Scree plots were used. Both orthogonal (i.e., varimax) and oblique (i.e., promax) rotations were employed for comparative purposes to clarify the loading of specific variables on the components or factors. The criterion for assessing loading was a minimum loading factor of $|0.3|$ with loadings of $|0.4|$ or higher desired for practical significance, although a loading as small as $|0.2|$ would be statistically significant for a sample of 725 cases and $p = 0.01$ (Stevens, 1992).

RESULTS AND DISCUSSION

Validity of the qualitative operationalization of the environmental and organizational constructs was empirically assessed using both principal components analysis and factor analysis to examine the association of the metric variables (i.e., measures for competition, network externalities, community resources, organizational complexity, slack resources, control of domain, and size) with these constructs. Key findings were as follows.

Correlations between the variable measures are presented in Tables 1 (Appendix). While magnitudes of the correlation coefficients vary, the coefficients were low to moderate at best. The two highest correlations were between total beds and number of service ($R = 0.474$) and RNs/bed and number of services ($R = 0.324$) both of which are measures of variables associated with the organizational construct from the qualitative literature review. Another notable correlation was for the percent of prior adopters and Herfindahl index ($R = -0.244$) with these

measures of variables associated with the environmental construct per the literature review. Interestingly, occupancy as a measure of slack resources had a relatively high correlation with both the Herfindal Index (R = -0.303), the measure for competition of the environmental construct literature, and total beds (R = 0.316), the measure for size, of the organizational construct literature. The other variable measures had relatively lower correlations. See Table 1 in the Appendix.

Table 2 (Appendix) presents results of the principal components and the factor analyses. For both of these analyses, the determinant test (i.e., determinant > 0.000001), the KMO criterion (i.e., KMO > 0.6), and the Bartlett test of sphericity ($p < 0.000$) supported sampling adequacy and factorability of the variables. The Kaiser criterion (i.e., eigenvalues > 1.0) and Scree plots both supported a two component or factor solution. The cumulative variance explained by the two components or factors was at least 47.7 percent. The measures for organizational complexity, control of domain, and size loaded (i.e., loadings > |0.3|) on a component or factor that could be reasonably designated as organizational influences. The measures for competition, network externalities, and community resources loaded on a component or factor that could be reasonably designated as environmental influences. The measure for slack resources (i.e., percentage of hospital occupancy) loaded on the environmental influences component and factor rather than the organizational component or factor as expected based on the literature review. All of the above findings were similar for both principal components and factor analysis and for orthogonal (i.e., varimax) and oblique (i.e., promax) rotations.

Results of quantitative analysis of the variables alignment with constructs matches expectations based on qualitative review of the literature except for the slack resources variable as measured by hospitals occupancy. Slack resources loaded on the environmental influence instead of the organizational influence component or factor as expected. While the literature review indicated that hospital occupancy was widely used to operationalize slack resources, hospital occupancy is at best an indirect measure that assumes that hospitals that have higher occupancies are better able to accumulate slack resources. Intuitively hospital occupancy seems to be an internal organizational measure, but it is de facto comparing internal resources (i.e., beds) with external demand (i.e., admissions). It is possible that variation in this measure was actually capturing variation in external demand across the sample versus availability of internal resources and so loaded with the demand versus resources side of the ratio. Other more direct operationalizations might be better proxies for slack resources, such as net income, operating margin, reserves, return on assets, and other financial indicators that have been cited in the literature. Also, potentially confounding the influence of this factor is size and organizational complexity, which could be related to a hospital's accumulation of surplus resources. This finding clearly demonstrates a divergence in operationalizing a construct using a qualitative versus a quantitative approach. A combination of these approaches provides a more rigorous assessment of construct integrity as a basis for research on strategic adaptation in particular and on strategic management constructs in general.

CONCLUSION AND FUTURE DIRECTIONS

This study supports the use of factor analytic methods for quantitatively assessing the operationalization of constructs for strategic management research. While qualitative approaches are necessary for identifying variables and their measures from the research literature, solely relying on qualitative approaches can lead to ambiguous or erroneous

operationalizations of constructs. Quantitative approaches like principal components and factor analysis provide a much more rigorous testing of operationalizations to support construct validity. This rigor is needed to assure that the variables used to operationalize constructs under study are indeed capturing these constructs so that the relationships that are hypothesized are in fact being tested in a research study.

The strategic adaptation model presented in this paper was used to demonstrate the critical importance of properly operationalized constructs to investigating the influence of environmental and organizational constructs on innovation adoption and consequent adaptation by organizations. Using data from an actual study of strategic adaptation via adoption of an administrative innovation by a group of hospitals, a difference between qualitative and quantitative operationalizations was demonstrated. While the literature suggested that the slack resources variable was associated with organizational influence on innovation adoption, both principal components and factor analysis methods indicated that this variable, as measured, was primarily capturing the environmental influence construct.

There are a number of limitations that needed to be considered related to this study. First, this is a field study subject to the limitations that are inherent in the nature of ex post facto research methodologies (Trochim & Donnelly, 2006). Second, this study was conducted using an administrative innovation unique to hospitals and the health care industry. Thus, results from this setting may not be generalizable too other organizations in other industries. Third, while random sampling was used in sample selection there is always the possibility that the study sample may not be representative of the sampling frame and that the sampling frame may not be representative of the population. Fourth, there is the potential that the variables selected and/or their measures do not adequately capture the constructs. Also, only a limited number of variables were used to operationalize each construct. Fifth, data reliability is always a concern in studies relying on secondary data.

This research approach can be extended in a number of directions in the future based on this study. A limited set of variables intended to capture the environmental and organizational influence constructs was investigated. There are many other variables that merit investigation for these constructs from qualitative review of the literature along with many other measures for the variables beyond those used. In addition, other constructs might be investigated resulting from the literature review such as the importance of individual level influences. Future research also needs to be repeated in other industries, settings, and with other types of organizations in order to support the generalizability of findings. Importantly, use of a statistical technique such as confirmatory factor analysis needs to be investigated for use in quantitatively testing constructs. With these techniques, formal hypotheses concerning the association of variables with underlying constructs can be tested. Obviously, many other constructs of interest in strategic management research need quantitative examination as part of the research process.

In summary, this paper quantitatively examined the environmental and organizational influence constructs used in strategic management research. Variables operationalizing competition, network externalities, and community resources were used to capture the environmental influence construct based on a qualitative review of the literature. Variables representing organizational complexity, slack resources, control of domain, and size were used to capture the organizational influence construct. Both principal components and factor analysis indicated that the qualitative alignment of variables with constructs was supported except for slack resources. This study demonstrates the utility of quantitative analysis of constructs to supplement qualitative approaches common in strategic management research.

REFERENCES

Alexander, J.A., D'Aunno, T.A., & Succi, M.J. (1996). Determinants of rural hospital conversion: A model of profound organizational change. *Medical Care*, 34(1): 29-43.

American Nurses Credentialing Center (ANCC) (2002). *The Magnet recognition program: Instructions and application process*. Washington, DC: American Nurses Credentialing Center.

Ansoff, H.I. (1987). The emerging paradigm of strategic behavior. *Strategic Management Journal*, 5: 501-515.

Barney, J.B. (1991). Firm resources and sustained competitive advantage. *Journal of Management,* 17(1): 99-120.

Barney, J.B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27(6): 643-650.

Bigelow, B., & Mahon, J. (1989). Strategic behavior of hospitals: A framework for analysis. *Medical Care Review,* 46(3): 295-311.

Boyd, B., Gove, S., & Hitt, M. (2005). Construct meansurement in strategic management research: Illustion or reality? *Strategic Management Journal*, 26(3): 239-257.

Bryant, F.B., & Yarnold, P.R. (1995). Principal-components analysis and exploratory and confirmatory factor analysis. In L. G. Grimm & P.R. Yarnold (Eds.) *Reading and understanding multivariate statistics* (pp. 99-136). Washington, DC: American Psychological Association.

Bureau of Health Professions, (2005). *User documentation for the area resource file (2005 Release).* Washington, DC: Nation Center for Health Workforce Analysis, Health Resources and Services Administration, Department of Health and Human Services.

Child, J. (1997). Strategic choice in the analysis of action, structure, organizations and environment: Retrospect and prospect. *Organization Studies*, 18(1): 43-76.

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied multiple regression/correlation: Analysis for the behavioral sciences*. Mahwah NJ: Lawrence Erlbaum Associates Publishers

Damanpour, F. (1991). Administrative innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34(3): 555-590.

Dixon, J. K. (2005). Exploratory factor analysis. In B. H. Munro (Ed.), *Statistical methods for health care research (5th ed.)* (pp. 321 – 349). Philadelphia: Lippincott Williams & Wilkins.

Dessler, G. (1986). *Organization theory: Integrating structure and behavior*. Englewood Cliff, NJ: Prentice-Hall.

Feldstein P.J. (2011). *Health economics (7th ed.).* Albany, NY: Delmar Publishers.

Flood, A.B. & Scott, W.R. (1978). Professional power and professional effectiveness: The power of the surgical staff and quality of surgical care in hospitals. *Journal of Health and Social Behavior*, 19(3): 240-254.

Flood, A.B & Scott, W.R. (1987). *Hospital structure and performance*. Baltimore: John Hopkins Press.

Gautam, K. & Goodman, J. (1996). Insiders and business directors on hospital boards and strategic change. *Hospital and Health Services Research*, 41(4): 423- 440.

Ginn, G.O. & Young, G.J. (1992). Organizational and environmental determinants of hospital strategy. *Hospital and Health Services Administration*, 37(3): 291-302.

Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. New York: Little Brown and Company.

Glandon, G.L. & Counte, M.A. (1995). An analysis of the adoption of managerial innovation: Cost accounting systems in hospitals. *Health Services Management Research*, 8(4): 243-251.

Hamel, G. & Prahalad, C. (1994). *Competing for the future*. Boston: Harvard Business School Press.

Kast F. & Rosenzweig, J. (1985). *Organization and management: A systems and contingency approach (4th edition).* New York: McGraw Hill Book Company.

Katz, D. & Kahn, R.L. (1978). *The social psychology of organizations (2nd ed.).* New York: Wiley.

Kimberly, J.R. & Evanisko, M.J. (1981). Administrative innovation: The influence of individual, organizational, contextual factors on hospital adoption of technological and administrative innovations, *Academy of Management Journal*, 24(4): 689-713.

King, G. & Zeng, L. (2001a.) Explaining rare events in international relations. *International Organization*, 55(3): 693-715.

King, G & Zeng, L. (2001b). *Logistic regression in rare events data*. Political Analysis, 9(2): 137-163.

Kraut, R., Rice, R., Cool, C., & Fish, R. (1998). Varieties of social influence: The role of utility and norms in the success of a new communication medium, *Organization Science*, 9(4): 437-453.

Krein, S.L. (1999). The adoption of provider based rural health clinics by rural hospitals: A study of market and institutional forces. *Health Services Research*, 34(1): 33-60.

Learned, E.P., Christensen, C.R., Andrews, K.R., & Guth , W.D. (1965). *Business policy: Text and cases.* Homewood, IL: Irwin.

Luke, R.M., Walston, S.L., & Plummer, P.M. (2003). *Healthcare strategy: In pursuit of competitive advantage*. Chicago: Health Administration Press.

Lynk, W. & Morrisey, M. (1987). The Economic Basis of Hyde: Are Market Power and Hospital Exclusive Contracts Related? *Journal of Law and Economics*, 30(2): 399-421.

McClure, M.L. & Hinshaw, A.S. (2002). *Magnet hospitals revisited*. Washington, DC: American Nurses Publishing.

Mintzberg, H. & Waters, J.A. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal*, 6: 257-272.

Mintzberg, H., Ahlstrand, B. & Lampel, J. (2005). *Strategy safari: A guided tour through the wilds of strategic management.* New York: The Free Press.

Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory (3rd ed.).* New York: McGraw-Hill.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.), New York: Free Press.

Provan, K. (1987). Environmental and organizational predictors of adoption of cost containment policies in hospitals. *Academy of Management Journal*, 30(2): 219-239.

Pfeffer, J. & Salancik (1978). *The external control of organizations: A resource dependence perspective.* New York: Harper and Row.

Porter, M. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: Free Press.

Porter, M. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.

Sanders, T. J. (2007). *Factors influencing the adoption of administrative innovations.* Unpublished doctoral dissertation, University of Alabama at Birmingham.

Shortell, S.M. & Kaluzny, A.D. (2006). *Health care management: Organization design and behavior (5th ed.).* Clifton Park, NY: Thompson Delmar Learning.

Stevens, J. (1992). *Applied multivariate statistics for the social sciences(2nd ed.).* Hillsdale NJ: Lawrence Erlbaum Associates Publishers.

Swayne, L.E., Ginter, P.M. & Duncan, W.J. (2009). *Strategic management of health care (6th ed.) organizations.* Malden, MA: Blackwell Publishing.

Tami, M. (1999). Analysis of the rationale for and consequences of, nonprofit and for-profit ownership conversions. *Health Services Research*, 34(1): 83-101.

Trochim, W.M.K. & Donnelly, J.P. (2006). *The research methods knowledge base (3rd ed.)* Cincinnati, OH: Atomic Dog Publishing.

Trinh, H.Q. & O'Connor, S.J. (2000). The strategic behavior of U.S. Rural Hospitals: A longitudinal and Path Model examination. *Health Care Management Review*. 25(4): 48-64.

Wheeler, J.R.C., Burkhardt, J., Alexander, J.A., & Magnus, S.A. (1999). Financial and organizational determinants of hospital diversification into subacute care. *Health Services Research,* 34(1): 61-81.

Zajac, E.J. and Shortell, S.M. (1989). Changing generic strategies: Likelihood, direction, and performance implications. *Strategic Management Journal*, 10: 413-430

Zinn, J.S., Weech, R.J. & Brannon, D. (1998). Resource dependence and institutional elements in nursing home TQM adoption. *Health Services Research*, 33(2): 261-273.

APPENDIX

Table 1. Pearson's R Correlations of Variables

	Competition	*Network Externalities*	*Community Resources*	*Org. Complexity*	*Slack Resources*	*Control Domain*	*Size*
Mea-sures	Herfindal Index	% of Prior Adopters	HPP/1000	Number of Services	Occu-pancy	RNs /Bed	Total Beds
Herfin-dal Index	1.00						
% of Prior Adopters	-0.244*	1.00					
HPP /1000	-0.188*	0.117*	1.00				
Number Services	-0.175*	0.133*	0.182*	1.00			
Occu-pancy	-0.303*	0.126*	0.202*	0.187*	1.00		
RNs/Bed	-0.137*	0.052	0.169*	0.324*	0.143*	1.00	
Total Beds	-0.276*	0.150*	0.170*	0.474*	0.316*	0.198*	1.00

*indicates correlation is significant at the 0.01 level (2-tailed)

TABLE 2. Comparison of Principal Components and Factor Analysis Results

Method	Principal Components				Factor Analysis (Principal Axis Method)			
Determinant	.454		.454		.454		.454	
KMO test	.711		.711		.711		.711	
Bartlett test	p<0.000		p<0.000		p<0.000		p<0.000	
Kaiser Criterion Factors	2		2		2		2	
Scree Plot Factors	2		2		2		2	
Variance Explained	47.7%		47.7%		47.7%		47.7%	
Rotation	Varimax		Promax		Varimax		Promax	
Category of Components or Factors	Org.	Env.	Org.*	Env.*	Org.	Env.	Org.*	Env.*
Org. Complexity	.790	.132	.805/ .801	-.012/ .266	.859	.113	.910/ .862	-.102/ .327
Control of Domain	.709	-.043	.752/ .690	-.180/ .080	.348	.157	.337/ .375	.081/ .240
Size	.634	.363	.599/ .689	.260/ .466	.489	.374	.429/ .562	.283/ .485
Competition	-.123	-.732	.005/ -.252	-.744/ -.742	-.115	-.611	.049/ -.254	-.643/ -.620
Network Externalities	-.096	.696	-.225/ .026	.730/ .653	.090	.314	.008/ .161	.323/ .327
Slack Resources	.269	.574	.177/ .367	.551/ .612	.184	.483	.063/ .291	.485/ .514
Community Resources	.298	.378	.243/ .360	.340/ .423	.183	.300	.115/ .248	.282/ .336