2019

Competitive Strategies Of Hospitals: Antecedents And Association With Financial Performance

Akbar Ghiasi
University of Alabama at Birmingham

COMPETITIVE STRATEGIES OF HOSPITALS: ANTECEDENTS AND ASSOCIATION WITH FINANCIAL PERFORMANCE

by

AKBAR GHIASI

ROBERT WEECH-MALDONADO, COMMITTEE CHAIR
LARRY HEARLD
ANTHONY HOOD
MAZI RASULNIA
FERHAT ZENGUL

A DISSERTATION

Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

BIRMINGHAM, ALABAMA

2019

COMPETITIVE STRATEGIES OF HOSPITALS: ANTECEDENTS AND ASSOCIATION WITH FINANCIAL PERFORMANCE

AKBAR GHIASI

PHD PROGRAM IN ADMINISTRATION-HEALTH SERVICES

ABSTRACT

In this three-paper dissertation, first, we examined the relationship between strategic group membership and hospital financial performance in terms of operating margin. The results revealed the important role of strategy on financial performance of a hospital. In the second paper, organizational and environmental antecedents of hospital's business strategy choice were studied. The results showed that environmental and organizational factors may predict the business strategy choice of hospitals. The third paper investigated the moderating effect of environmental instability on the relationship between strategic group membership and financial performance. Environmental instability does not strongly affect the relationship between hospital strategic group membership and financial performance. The results of these studies may be useful for researchers as well as managers of hospitals to understand strategic positioning of hospitals.

Keywords: Competitive Strategy, Strategic Group Membership, Hospital Financial Performance. Moderating Effect, Environmental Instability

DEDICATION

I dedicate this dissertation to my parents, my mother and my father for their patience, constant love and countless sacrifices they have made in raising and educating me.

ACKNOWLEDGMENTS

A dissertation is not the work of one individual but a collective effort of a group. At this period, I would like to take this opportunity to acknowledge those who have made contributed to my doctoral journey and completion of my dissertation. First and foremost, I would like to appreciate my deepest gratitude to my dissertation chair and mentor, Professor Robert Weech-Maldonado. He has been my source of inspiration and encouragement when it comes to doing research. I am indebted for the countless hours and patience he has spent helping me sort out the details of my work including always carefully reading and commenting on several revisions of this manuscript. He has taught me how to conduct research and provides me with insight on future research endeavors. One thing a truly very much value the most is his patience and example on how to mentor students. His patience and support helped me overcome many difficult situations and finish this dissertation. I feel very fortunate to have worked with him through this process.

I would like to thank my committee members, Dr. Larry Herald, Dr. Anthony Hood, Dr. Mazi Raulnia and, Dr. Ferhat Zengul whose areas of expertise I came to depend on and for sharing knowledge including providing me valuable feedbacks and taking the time to read this manuscript.

I would also like to express my deepest appreciation to my fellow Ph.D. students and friends- Neeraj Puro, Seongwan Choi, Ganisher Davlyatov , and Reena Kelly for their support and encouragement during this Ph.D. process and completion of this dissertation.

The contributions of other scholars deserve my deepest gratitude. I am deeply indebted to Dr. William Opoku-Agyeman for his support and guidance throughout my Ph.D. journey. Many friends and family frequently have stepped in and helped me stay on track through these difficult years; I would like to express my heartfelt gratitude and thanks to all of my friends and family members for their support and encouragement in to finish this journey successfully.

TABLE OF CONTENTS

Page

ABSTRACT iii

DEDICATION iv

ACKNOWLEDGMENTS v

LIST OF TABLES viii

LIST OF TABLES (continued) ix

LIST OF FIGURES x

INTRODUCTION TO HOSPITAL INDUSTRY IN THE US. 1

THE ASSOCIATION BETWEEN STRATEGIC GROUP MEMBERSHIP AND HOSPITAL FINANCIAL PERFORMANCE 15

ENVIRONMENTAL AND ORGANIZATIONAL ANTECEDENTS OF HOSPITAL'S BUSINESS STRATEGY CHOICE 56

THE MODERATING EFFECT OF ENVIRONMENTAL INSTABILITY ON HOSPITAL STRATEGY-FINANCIAL PERFORMANCE RELATIONSHIP 92

OVERALL CONCLUSION 122

LIST OF TABLES

Table Page

THE ASSOCIATION BETWEEN STRATEGIC GROUP MEMBERSHIP AND HOSPITAL FINANCIAL PERFORMANCE

1 Identified Strategic Groups Based on Cluster Analysis Results ……..…….….35

2 Dependent, Independent and Control Variables …...…….……..…… 38

3 Frequency of the strategic groups from 2006 to 2016 (Percent) ……...…...41

4 Results of Factor Analysis (Loadings) for Cost-leadership and Differentiation Measures (2016)……....43

5 Descriptive Analyses of Dependent and Independent Variables (2016) ….....45

6 Regression of the Relationship Between Strategic Group Membership and Operating Margin (N=23,387)…….……..……..……. 48

7 Pairwise Comparison of Beta Coefficients of the Four Strategic Groups for Operating Margin……..…….…….... 49

ENVIRONMENTAL AND ORGANIZATIONAL ANTECEDENTS OF HOSPITAL'S BUSINESS STRATEGY CHOICE

1 Assigning Resulted Groups from Cluster Analysis to Strategic Groups (2016)…….72

2 Dependent and Independent Variables Used in Analysis …...……...……..74

3 Descriptive Analyses of Dependent and Independent Variables (2016) …….78

4 Multinomial Regression of Factors Associated with the Strategy Choice of Hospitals (N= 29,518) ……...…….…….…… 83

5 Multinomial Regression of Factors Associated with the Strategy Choice of Hospitals (N= 29,518) ……...…….. 85

THE MODERATING EFFECT OF ENVIRONMENTAL INSTABILITY ON HOSPITAL STRATEGY-FINANCIAL PERFORMANCE RELATIONSHIP

1 Strategic Groups Identification (2016) ……..……... 105

2 Dependent, Independent and Control Variables …..……..108

3 Descriptive Analyses of Dependent and Independent Variables (Year 2016)……112

4 Regression Analysis of the Relationships Among Strategy, Environment Instability and Financial Performance (N= 23,387)...……...……. 115

5 Regression Analysis of the Relationships Among Strategy, Environment Instability, and Financial Performance (N= 23,387)...……...…….116

LIST OF FIGURES

Figure Table

INTRODUCTION TO HOSPITAL INDUSTRY IN THE US.

1 Dissertation Conceptual Framework ……..……...……... 14

THE ASSOCIATION BETWEEN STRATEGIC GROUP MEMBERSHIP AND HOSPITAL FINANCIAL PERFORMANCE

1 Conceptual Framework of the Relationship Between Strategic Group Membership and Hospital Financial Performance …..……...…. …….27

2 Trends of Four Strategic Groups from 2006 to 2016…….……42

ENVIRONMENTAL AND ORGANIZATIONAL ANTECEDENTS OF HOSPITAL'S BUSINESS STRATEGY CHOICE

1 Hospital Strategy ……...……. 62

2 Conceptual Framework of the Antecedents of Hospitals' Business Strategy Choice ……..…….68

THE MODERATING EFFECT OF ENVIRONMENTAL INSTABILITY ON HOSPITAL STRATEGY-FINANCIAL PERFORMANCE RELATIONSHIP

1 Conceptual Framework of Moderating Effect of Environmental Instability on Strategy-Financial Performance Relationship.……...……..101

INTRODUCTION TO HOSPITAL INDUSTRY IN THE US

In the following sections, a brief history of the hospital industry, main policies during the history, hospital financial performance of hospitals, and strategy of hospitals are discussed. In addition, the summary of three dissertation papers as well as the conceptual framework are presented.

The health care sector in the United States consists of a collection of different types of health care facilities, insurance plans, and purchasers of health care services, all operating in various configurations of networks, groups, and independent practices. Some are based in the public sector; others operate in the private sector as either for-profit or not-for-profit entities (Curry, 2005; Dieleman et al., 2018). Hospital is one of the main parts of the healthcare system in the US (Association, 2014). Nationally, hospitals employ more than 5 million people, and every dollar spent by a hospital supports more than $2 of additional economic activity(Association, 2014).

The hospital industry includes acute care facilities, surgical hospitals, psychiatric hospitals, emergency facilities and other specialty facilities. In terms of ownership, there are different types of hospitals including government hospital, for- profit hospital, non-for- profit hospital and investor-owned hospitals (Flannelly, Handzo, Galek, Weaver, & Overvold, 2006; Neuhauser & Turcotte, 1972; Tynan et al., 2010). These institutions are primarily involved in providing comprehensive treatment and diagnostic services in

inpatient and outpatient settings (Tynan et al., 2010). Hospitals also control medical employees, outpatient facilities, inpatient beds and necessary equipment to provide acceptable and comprehensive health services (Berenson, Ginsburg, & May, 2007; Gupta, Epane, & Weech-Maldonado, 2015).

History of Hospitals in the US, with Emphasis on Main Policies

The growth of the hospital industry started mainly from 1870 (Sebastian, 2018). The number of hospitals increased preliminarily in wealthier states and metropolitan areas. During 20th century, there were several major therapeutically and technological breakthroughs as well as the increase of population and improvement of economy (Granshaw & Porter, 1989). These factors increased demand for hospitals and the number of hospitals dramatically increased (Johnson & King Jr, 1996). Some those factors are discussed below.

Great Depression and Hospital Industry. The Great Depression in the 1930 had negative impact on income and survival of hospitals (Clark, 1980). As a result, it was very difficult for hospitals to finance new therapies or technologies. However, hospitals did not support government intervention and they preferred voluntary solutions for health insurance coverage such as Blue Cross and Blue Shield plans (Robinson, 1998a). Blue Cross plans attempted to not cover services that were provided by physicians or mixed up physician payments with hospitals While Blue Shield provided physician reimbursement. Voluntary nature of funding instead of government funding made it possible for administrators and local boards of hospitals to increase their control over the hospitals (Burns, 1990; Rothschild, 1988).

The Impact of Medicare and Medicaid and Influence of Market Forces on Hospitals Industry. The passage of Medicare and Medicaid was an important breakthrough in 1965. These programs escalated health services spending. Medicare designed separate payments for physicians and hospitals that had been previously implemented by Blue Cross and Blue Shield. Fee-for service became Medicare's main reimbursement method and it guaranteed clinical autonomy by free choice of provider (Crosson & Tollen, 2010; Kash & Tan, 2016).

After enactment of Medicare, the need for reform in both provider organizations and payments systems to cope with the explosive growth of health expenditures was emphasized by some reformers. Those reformers advocated for a model of private group practices affiliated with emerging prepaid models developed in the 1920s or primary hospitals established in the 1930s (Burns, 1990). The objective was to extend the footprint of organizations such as Group Health Co-operatives and Kaiser Permanence, which combined capitated health insurance payment and salaried medical practices . Reformers' attempts led to signing of HMO Act by President Richard Nixon in 1973. The provision of federal planning grants made it possible for hospitals to experiment with generation of new prepayment risk-bearing organizations combined with tightly linked physician groups (Chadi, 2009; Tynan et al., 2010).

In addition to new provider and payment models, the investor-owned hospital chains emerged as a new management structure in the late 1960s, which went into the market to strengthen and consolidate a sector of physician-sponsored hospitals and to take advantage of Medicare 's beneficial payment model. These new organizations initiated horizontal consolidation of facilities, capital fundraising through the equity

markets rather than philanthropy, the pursuit of scale economies through more centralized management, pursuit of efficiency and the use of consultants (Freshnock & Goodman, 1980).

Moreover, nonprofit hospitals developed their own regional purchasing organizations, as well as national chains such as the Voluntary Hospitals of America to deal with threat of the growth of investor-owned hospitals. These hospitals also enjoyed from tax exempt financing. Hospitals thus confronted the need to continue with new provider and payment models, growing Medicare regulation, and the details of Medicare politics and new capital financing models (Granshaw & Porter, 1989). Hospitals started to venture and develop strategic alliances with other hospitals, and invested in marketing and strategic planning to become more business organizations rather than community institutions (Burns, 1990).

The push for modern management structures grasped a high point with the passage of a new Medicare Prospective Payment System (PPS) using diagnosis – related groups (DRGs) in 1983 (Commission, 1988). After passage of new the law, the hospitals had to standardize their treatment patterns. DRGs reimbursed hospitals for entire hospitalization instead of paying for hospital inpatient services in separate manner. This enforced hospitals to evaluate and arrange care patterns to avoid large losses under the new reimbursement system (Burns, 2000). Hospitals concentrated more on cost containment strategies during that time and they involved in product line management, usually a cover for promoting profitable clinical services and abandoning unprofitable services (Reinhardt, 2000; Rothschild, 1988).

During the same time, hospitals started using technology or developing networks of remote services or facilities. They also began to enter the ambulatory market by establishing freestanding ambulatory services such as emergency or urgent care imaging, occupational medicine, rehabilitation as well as remote physician offices. Eventually, hospitals entered into a hostile competition with community-based physicians in terms of medical staff (Korenchuk & Hord, 1996; Robinson, 1998b). The shortage of medical staff due to those competitions led to passage of law to increase medical schools from 88 to 126 in 1980 and also favorable immigration policies allowing international graduated people entering into the market (Burns, 2000; Reinhardt, 2000).

The Impact of Managed Care and Market Consolidation on Hospital Industry. In the middle of 1990s, when the HMOs penetrated one-third of the main commercial insurance market, the managed care movement reached its peak point. These managed care models integrated capitated reimbursement with staff and group model clinics, as well as risk-sharing approaches with independent practice associations (IPAs) that were based on physicians (Rosenthal, Landon, & Huskamp, 2001). Global capitation was one of the capitated plans, in which providers were supposed to take risk for outpatient, inpatient, and sometimes pharmaceutical consumption and expenditures. This push was intensified by Federal government' health reform proposed by President Bill Clinton and First Lady Hillary Clinton in 1993. According to this plan, regional health insurance buying collectives were supposed to negotiate with accountable health plans composed of integrated provider networks in local markets (Korenchuk & Hord, 1996). The threat that the Clinton plan would change the rest of the provider market into risk-bearing bodies and the increasing of HMOs penetration resulted in hospitals forming a variety of joint

service delivery networks. In fact, in 1994 hospitals started vertically integrated hospital-physicians networks as well as horizontally integrated networks of hospitals (Burns, 2000).

These integrations had several goals; the first goal was to increase bargaining power of providers by a collective effort of physicians and hospitals to confront the threat of managed care and limit the bargaining power of health plans. They were thinking that the future would be global capitation, closed panel networks, and downsizing of providers. As a result, the integration was a generic response for these potential changes (Reinhardt, 2000). However, these assumptions were not true. Though this movement accelerated in the first years of 1990s, because of pressure from the Balanced Budget Act 1997 and the diminishing number of hospitals outside a system, the integration slowed down in the last years of 1990s (Bazzoli, Lindrooth, Hasnain-Wynia, & Needleman, 2004). In addition, hospital consolidation and physician-hospital integrated networks were anti-competitive movement and they led to monopolies in metropolitan areas (Casalino & Robinson, 2003).

Consolidation was the main event of 1990s in which the different types of health related institution like hospitals, insures, group purchasing organizations, product manufacturers, wholesalers consolidated their activities through mergers and acquisition. However, researchers showed that many of practice acquisition strategies were not successful and they just wasted a great deal of investments and hospital capital (Burns, 2005; Robinson, 1998a). After the decade of integrated networking and finally dissolution of many of them, hospitals returned to employment of physicians in the next decade and this time they employed specialists as well as primary care physicians. With

the looming retirement of the old generation of physicians and declining physician incomes, hospital employment presented physicians a shield from turbulent market competition, a possibility to survive with abating skills, and a float until retirement (Moser & Hastreiter, 2009).

Hospital of the 2000s distinguished from the hospital of the early 1900s by occurring of two significant changes. First, the number of practitioners across the specialty spectrum who had withdrawn from the hospital were increased. More primary care physicians worked on ambulatory and office-based practice. (Lawton R Burns, Goldsmith, & Muller). Second, an increasing number of physicians were salaried contractors to, or, employees of the hospital (Chadi, 2009). Moreover, increasing the number of physician - owned ambulatory surgery centers, imaging centers and office-based surgery intensified competition between physicians and hospitals for control over outpatient services, whereas the investor owned specialty hospitals tried to strip away lower-severity and the more profitable inpatient cases from general hospitals. These changes clearly endangered the elective outpatient care which was the core profitability of hospitals (Lawton Robert Burns & Muller, 2008).

In 2005, a new round of hospital consolidation begun while the Deficit Reduction Act decreased the payments to freestanding imaging facilities for high-technology scans such as CT and MRI, and in 2007, the Centers for Medicare and Medicaid Services (CMS) reduced payments to ambulatory surgery centers to 65% of the fees paid to outpatient departments of hospital. This regulation was in favor of hospitals-sponsored ambulatory services that their payment was not affected by Deficit Reduction Act (Crosson & Tollen, 2010).

In the early 2000s, CMS forced temporary ban on establishment of new specialty hospitals to analyze their performance and the effect of these institution on general hospitals. The result of analysis demonstrated that these hospitals do not offer high quality of care and they also did cream skimming. However, they did not find significant impact on financial performance of general hospitals. The impact of ambulatory surgery centers on hospital was similar to specialty hospitals (Crosson & Tollen, 2010).

The 2007 recession had a major influence on the financial performance of hospitals across the US. National data shows that expenditures for hospital services grew at historically low rates between 2007 and 2010. Hospitals cut their costs of producing services. Nevertheless, their total margins fell from an industry average of 6 percent in 2007 to 1.8 percent in 2008 (Bazzoli, Fareed, & Waters, 2014).

The Impact of Affordable Care Act on Hospital Industry. The Patient Protection and Affordable Care Act (ACA) amended by the Health and Education Reconciliation Act, became law on March 23, 2010 by signing of President Obama. The ACA was completely implemented in 2014, when the employer and individual responsibility provisions took effect, the individual and small-employer group subsidies began to flow, state health insurance exchanges began to operate, and the Medicaid expansions started in some states (Alcalá, Chen, Langellier, Roby, & Ortega, 2017). One expected consequence of the enrollment of more Americans in healthcare insurance was that more patients would seek medical care. (Kash & Tan, 2016).

During 2011 and 2012 dramatic reform occurred in health care of the United States by introducing Patient Protection and Affordable Care Act that changed the health care system significantly (Blumenthal, Abrams, & Nuzum, 2015). Fundamental changes

in health care generated increased competition among hospitals. According to some recent studies and reports, the need for health systems to reconfigure their cost structure increased. In addition to ACA, some legislative actions in recent years—including the Budget Control Act of 2011 (Levit & Labonte, 2012) and the American Taxpayer Relief Act (Sinai & Gyourko, 2004) —amounts to cumulative reductions in Medicaid and Medicare payments to hospitals of an estimated $460 billion until 2023 (Lieberman, 2013); reductions in the ACA alone account for 85 percent—or $390 billion—of this total. Reduced Medicaid and Medicare payments were the main environmental drivers of the need to control costs (Fifer, 2015).

Moreover, ACA sought to improve the quality of care by reducing Medicare payments to account for excess (preventable) hospital readmissions; reducing Medicare payments to some hospitals for hospital-acquired conditions by 1%; developing a national quality improvement strategy that includes priorities to improve the delivery of health care services, patient health outcomes, and population health; and requiring health plans to report the proportion of premium dollars spent on clinical services, quality, and other costs (Kocher & Adashi, 2011; Protection & Act, 2010). Some studies have shown a reduction in Medicare readmission and hospital-acquired conditions due to the implementation of ACA (Alcalá et al., 2017; Blumenthal et al., 2015; Frean, Gruber, & Sommers, 2017). As a result, it seems that the implementation of the ACA affected the strategy of hospitals.

Financial Performance of Hospitals

The United States of America has the most expensive health delivery system throughout the world (Perry, Reynolds, & Clare, 2018). The United States continued to

spend more than all other OECD countries about $ 8508 for each person in 2011 (Serratt, Spetz, & Harrington, 2012; Tynan et al., 2010). This amount is 2.5 times more than the average of all OECD countries. Total health expenditures by the households, businesses and government reached $3.2 trillion in 2015, 5.5% growth compared to previous year (Kalman, Hammill, Schulman, & Shah, 2015). Spending for hospital care increased 4.7 percent to $1.1 trillion in 2016. During the last decades, the costs of hospitals increased dramatically (32 percent of total spending in healthcare) (Dieleman et al., 2018).

Over the last decades, hospitals have experienced turbulent market and financial uncertainty because of higher acuity patients, mergers and acquisition, lower reimbursements from payers, change in legislation to have minimum nurse staff, and growing competition from rival organizations for patients, physicians, nurse staff and technology. As a result, there has been continuing concern about reducing hospital costs, which have had actual growth of about 2% per year in spite of years of attempts at hospital payment reform and operation control (Buerhaus, 2008).

Many hospitals have implemented different strategies to respond to the internal and external challenges surrounding them. Cost containment or cost control strategies that hospitals may adopt and implement to react to those constraints include reduction of tertiary services, changes in service mix, shift in services to outpatient facilities, and downsizing and changes in staffing patterns (Nayar, 2008).

In the literature, three categories of factors have been mentioned as the main reasons of hospital financial problems. These factors include internal characteristics, reimbursement system or payers, and market forces or competition. Internal characteristics include leadership or management (Dalton, Daily, Ellstrand, & Johnson, 1998),

competitive strategy of hospital (Marlin, Huonker, & Sun, 2002; Short, Palmer, & Ketchen Jr, 2002), structure of organization (Daily & Dalton, 1993), provided services (Raju & Lonial, 2002), occupancy rate, cost per length of stay, cost per patient-day, bad-debt, accounts receivable, net operating expenditures and other ratios (Nurettin Oner, 2016). Market factors also can impact hospital financial performance. HMO penetration and hospital competition are two important market factors (Apenteng, Nayar, Yu, Adams, & Opoku, 2015; Ghiasi, Zengul, Ozaydin, Oner, & Breland, 2018). Prospective reimbursements systems as well as lower reimbursement from Medicare and Medicaid could influence the financial performance of hospitals. (Almgren & Ferguson, 1999; Hernandez & Kaluzny, 1983; Kennedy & Dumas, 1983).

Hospitals Strategy

The context of this study is the U.S. hospital industry. The choice of the health care industry as the setting for this research is considered particularly appropriate for some important reasons. First, as mentioned before, the health care industry accounts for about 18 percent of U.S national GNP and hospitals are one of the main parts of the US healthcare system. Second, in recent years, the health care industry has experienced what some observers believe are “quantum changes” and these changes have effected industry profitability. During 2011 and 2012 dramatic reform occurred in health care of the United States by introducing Patient Protection and Affordable Care Act that changed the health care system significantly (Blumenthal et al., 2015). Fundamental changes in health care have increased competition among hospitals. It is very important for hospital to develop the best strategy to gain competitive advantage in a given market. Hospitals like other

firms, face limitations in access to resources and there are constraints for them to apply different strategies. Moreover, there are essentially different arrangements for pursuing each strategy. Thus, it is important to understand why hospital prefer one strategy to another one and how the choice of hospital strategy can affect financial performance.

The strategic group model is one approach that can be used to help identify best strategies. A strategic group is a concept used in strategic management that groups firms within an industry that have similar business models or similar combinations of strategies. The strategic group model offers a specific typology for decision makers to conceptualize strategic positioning and unique basis to compare the resources required to implement alternative strategies. Porter's (1980) Generic Strategy typology defines how a firm gains competitive advantage across its chosen market. Lower cost and differentiation are the two main or pure generic strategies that a firm pursues to gain a competitive advantage in a market. A firm deploys one of the two generic strategies, either by differentiating itself along dimensions that are valued by customers to command a higher price, or by offering lower price or lower costs than its rivals.

Using Porter's strategic group typology and organizational theories, this three-paper dissertation, seeks to understand the relationship between strategic group membership and hospital financial performance and factors influencing the business strategy choice of hospitals. Finally, how the relationship between strategy and financial performance could be moderated by contextual/environmental factors.

Thus, this dissertation attempts to address three questions: First, what is the association between strategic group membership and hospital financial performance? Second, what environmental and organizational factors may affect hospitals to prefer one

strategy over another? Third, how environmental factors may moderate the relationship between strategy and financial performance? These questions are addressed by following three papers:

Paper # 1. Strategic Group Membership and Hospital Financial Performance association

The overall purposes of this paper were to identify the strategic group structure of the hospital industry and to examine the effect of strategic group membership on hospital financial performance. In doing so, we attempted to answers two main questions: (1) what impact, if any, does strategic group membership have on hospital financial performance? and (2) which strategies are performance enhancing? The conceptual framework of this study was based on Porter's (1980) strategic group typology.

Paper # 2. Antecedents of Hospital's Business Strategy Choice

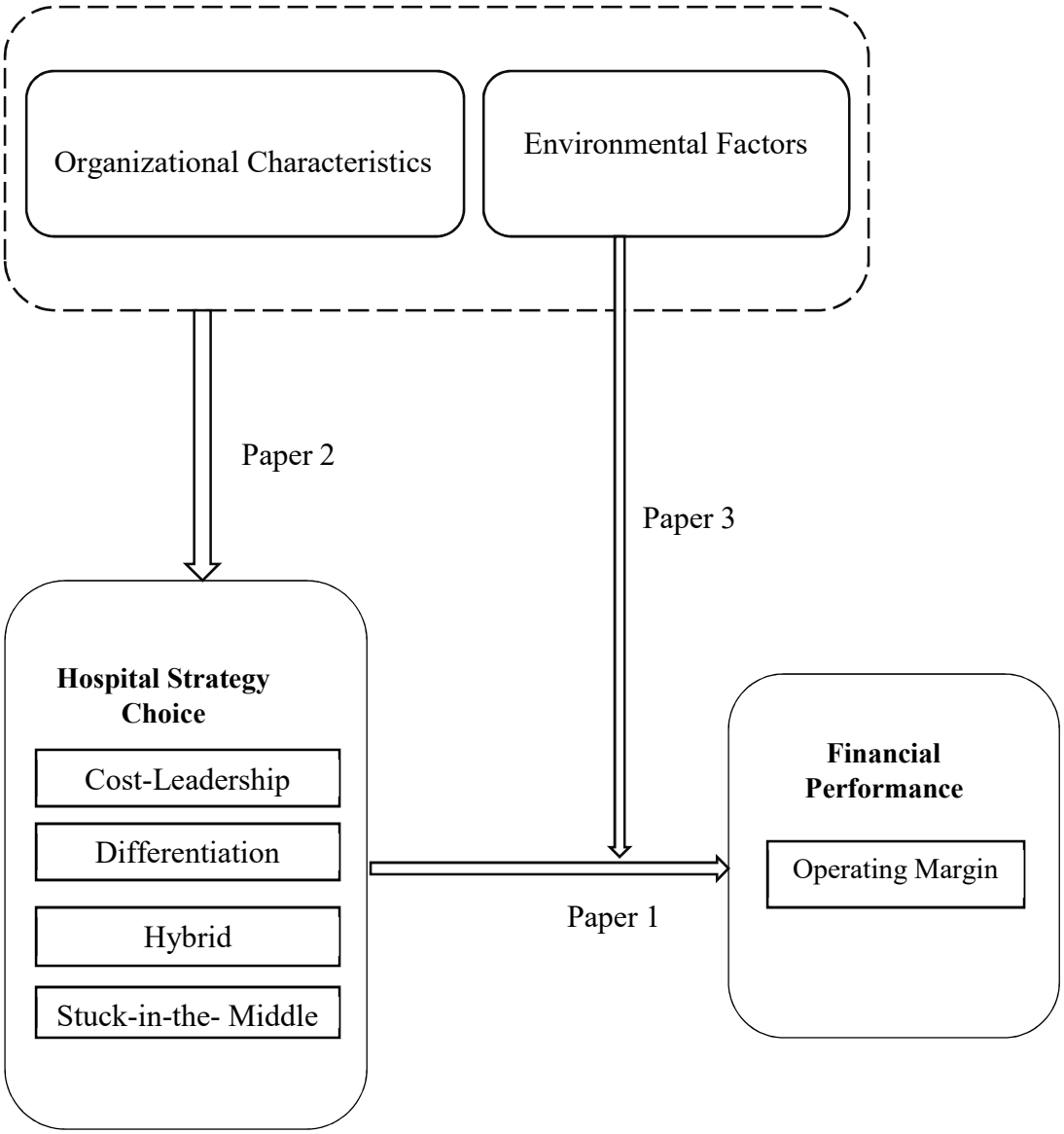
This paper aimed to examine whether environmental factors and organizational characteristics are associated with business strategy choice of the U.S urban acute care hospitals, and how environmental and organizational factors might affect the business strategy choice of hospitals. The conceptual framework of this study was based on resource dependency theory (RDT) and Porter's strategic group typology (Figure 1).

Paper # 3. Environmental Factors as the Moderators of Strategy-Financial Performance Relationship

This paper aimed to examine whether or not Porter's (1980 cost leadership, differentiation, hybrid, and stuck-in-middle strategies can equally affect financial performance of hospitals in different environments of hospital industry and if hospitals

with appropriate strategy-environment combinations exhibit better performance than other hospitals. Following is the conceptual framework of this dissertation.

Figure 1. Dissertation Conceptual Framework



THE ASSOCIATION BETWEEN STRATEGIC GROUP MEMBERSHIP AND HOSPITAL FINANCIAL PERFORMANCE

ABSTRACT

Background: The health care industry is facing constant changes from health care reform; demanding consumers; and new expensive forms of treatment. These changes put more pressures on hospitals and their ability to remain profitable. Understanding how to improve hospital financial performance by applying an appropriate strategy remains a key concern to managers and researchers.

Objective: The overall purpose of this study was to identify the strategic group structure of the hospital industry and to examine the effect of strategic group membership on hospital financial performance.

Methods: We used longitudinal data from 2006 to 2016 related to US urban general acute care hospitals. We used three secondary datasets in the study: the American Hospital Association (AHA) Annual Survey, Medicare cost reports (CMS), and Area Health Resource File (AHRF). We used cluster analysis and multiple regression model with control for time and state fixed effect to analyze data.

Results and Discussion: Our results suggest that on average about 37 percent of hospitals pursue cost-leadership strategy, and about 5 percent of hospitals pursue the differentiation strategy. Hospitals with hybrid strategy outperform hospitals with cost-leadership strategy and stuck-in-the-middle. Absence of a coherent strategy (i.e., stuck-in-the-middle) is likely to lead to poor performance. The results demonstrate the usefulness of

strategic group studies like this study as a method for managers to assess their current strategic situations.

INTRODUCTION

Strategy reflects major administrative decisions about the nature of how a hospital competes. Choice of services offered, growth, pricing, and markets to serve are all strategic choices (Langabeer, Lalani, Yusuf, Helton, & Champagne-Langabeer, 2018). Hospital strategy is a long term plan to achieve pre-specified goals (Bolisani & Bratianu, 2017). Understanding the strategy of a hospital is essential, especially as hospitals operate in a more dynamic and turbulent environment. In the last decade, the healthcare environment has seen a shift in the way healthcare is covered and paid for in light of the passage and continuous effort to repeal or change the Patient Protection and Affordable Care Act (PPACA) (Al-Amin & Housman, 2012; Blumenthal et al., 2015). In addition, hospitals are facing financial pressures due to lower reimbursement rates from Medicaid and Medicare, excessive administrative costs, reduced demand for hospital care, market competition, and staff shortages (Goldstein, Ward, Leong, & Butler, 2002; Topaloglu, McDonald, & Hunt, 2018). In 2014, about 15-30% of hospitals were categorized as financially distressed (Richards, 2014). Hospitals, in an attempt to compete and remain viable in an ever increasingly turbulent and competitive environment (Goldstein et al., 2002; Topaloglu et al., 2018), are adopting or continue to develop strategies that improve their financial performance. To understand which strategy or strategic positioning offers hospitals the best financial outlook, it is important for managers to increase their knowledge about the relationship between strategy and financial performance.

In this study, we use the strategic group model (Hunt, 1972; Porter, 1980) to identify hospitals' strategies. The strategic group is a concept used in the strategic management literature that groups firms within an industry that have similar business models or similar combinations of strategies (Hunt, 1972; Porter, 1980). The strategic group model offers a specific typology for decision makers to conceptualize strategic positioning and unique basis to compare the resources required to implement alternative strategies.

Since the introduction of the strategic group model by Hunt (1972), there has been a great deal of research on this area across different industries (Conant, Mokwa, & Varadarajan, 1990; Ginn, 1990; Goes & Meyer, 1990; Koseoglu, Akdeve, Gedik, & Bertsch, 2015; Perryman & Rivers, 2011; Schimmer, 2012; Warning, 2004; Williams, Young, Shewchuk, & Qu, 2010). In addition, a considerable body of research has examined the relationship between strategic group membership and hospital performance. The empirical results of these studies have been mixed; some studies have found a significant relationship between strategic group membership and hospital performance (Ashmos, McDaniel, & Duchon, 1990; Marlin et al., 2002; Trinh & O'connor, 2002; Yasin, Gomes, & Miller, 2011), while others did not find any significant association (Goldstein et al., 2002; Kumar, Subramanian, & Strandholm, 2001). However, most of these studies were conducted before 2002 and have investigated a single state. Given the aforementioned changes happening in the health care environment, it is important to investigate the association between hospital strategic group membership and financial performance using national data.

The overall purposes of this paper were to identify the strategic group structure of the hospital industry and to examine the relationship between strategic group membership and hospital financial performance. These purposes were examined using data on US urban acute care hospitals at the national level from 2006 to 2016.

This study contributes to the existing literature on strategic group membership and hospital financial performance by: First, using a national level dataset that captured characteristics of acute care hospitals across the entire USA compared to previous studies that have limited the research to only one state. In doing so, the results of this study are more generalizable. Second, we relied on more recent data (2006 - 2016). Since the healthcare industry has experienced extensive changes in the last few years (e.g. ACA), more recent data could increase our knowledge about the relationship between strategic groups and hospital financial performance.

In the following sections of this paper, the conceptual model, corresponding hypotheses, research methods, data analysis, findings, managerial implications, discussion and potential limitations are discussed. In the first section, we introduce the conceptual framework of this study which is based on Porter's strategic group typology, followed by hypotheses development. The next section explores the research methodology used to address the hypotheses developed in the previous section. We discuss data source, sample selections, statistical analysis and results. Finally, the last section, discusses the managerial implications and some study limitations.

Conceptual Framework and Hypotheses

The concept of "strategic groups" was first theorized by Hunt who stated that distinct firms in the home appliance industry have similar strategies (1972). By definition, strategic groups are groups of organizations with similar competitive approaches in a specific industry (Castle, 2003; Hunt, 1972). Membership in a particular strategic group means that firms within a group have similar strategies (e.g. technological leadership, innovation, customer services, efficiency, pricing) (Porter, 1989) and similar organizational characteristics (e.g. skills, products or services, size, and organizational structure); but may have different strategies and organizational characteristics from other groups (Miller, 1987; Perryman & Rivers, 2011; Peteraf & Shanley, 1997; Porter, 2008).

Additionally, strategic groups are assumed to be highly stable due to mobility barriers (McGee & Thomas, 1986). McGee defines mobility barriers as either the absolute cost of moving from one strategic group to another strategic group or as an operating cost relative to the incumbents that the strategic group entrant must face (McGee & Thomas, 1986). Barriers to entry or mobility barriers can include tangible and intangible resources such as assets, technology, skills, reputation, brand loyalty, and so on (Mascarenhas & Aaker, 1989; McGee & Thomas, 1986; Olusoga, Mokwa, & Noble, 1995). These barriers protect each strategic group from outside competition and may lead to performance differences (Schreyögg & von Reitzenstein, 2008).

The evolution of strategic group research has produced two distinct grouping approaches: inductive and deductive approaches. The inductive approach focuses on empirically derived configurations (Ketchen, Thomas, & Snow, 1993). For instance, many strategic group studies have clustered organizations on a variety of industry-specific measures consisting of manufacturing, marketing, and financial characteristics.

The inductive approach provides no theoretical reasoning to expect a specific number of strategic groups in any given industry. In contrast, the deductive approach is a theory-driven approach that specifies generic strategies that can be applied to a wide variety of industry contexts. Due to theoretical support, using a deductive approach is expected a specific number of strategic groups. Given our overarching interest in the comparison of the findings with other studies, we rely on a deductive approach that offers superior generalizability relative to inductive approaches (Ketchen et al., 1993; Short et al., 2002).

The literature on strategic group in the hospital context shows two main deductive typologies including Miles and Snow's and Porter's typology (Ketchen et al., 1993). In the present study, we relied on Porter's typology for several reasons. First, researchers confirmed the reliability of this typology for grouping firms in strategic groups (Conant et al., 1990; Herbert & Deresky, 1987; Nandakumar, Ghobadian, & O'Regan, 2011). Second, this typology has received empirical support from previous research regarding the investigation of the association between strategy and financial performance (Beal, 2000; Dess & Davis, 1984; Miller & Friesen, 1986; Olusoga et al., 1995). Third, prior research has supported the applicability of Porter's typology to the hospital industry (Kumar et al., 2001; Lamont, Marlin, & Hoffman, 1993; Marlin et al., 2002). Finally, Porter's typology allows us to compare the results of this study with findings of other studies (Ketchen et al., 1993).

Porter's Generic Strategy typology defines how a firm gains competitive advantage in its chosen market. Cost leadership and differentiation are two main, pure or generic strategies that a firm may use to gain a competitive advantage in a market. A firm selects to deploy one of these two generic strategies for competitive advantage, either by

differentiating itself along dimensions that are valued by customers to command a higher price, or by lowering price because of lower costs compared to its rivals. According to this typology, each strategy represents a different basis for achieving competitive advantage, and may result in firm performance differences (Porter, 1989).

Porter (1980) states that each of the pure generic strategies provides a firm with the ability to achieve competitive advantage. Firms that pursue the generic strategy of overall cost leadership or low-cost strategy, achieve competitive advantage by becoming the low-cost producers in a given industry. Cost leaders emphasize cost reduction mechanisms such as those achieved from production experience, by building efficient-scale facilities, and by minimizing costs in areas such as marketing, R&D, staffing, and overhead (Porter, 1989, 2008). Examples of cost control strategies used by hospitals include eliminating marginally profitable and unprofitable services, reducing waste by eliminating repetitive procedures, reducing staff, improving efficiency, using technology, innovation, and improving inter-functional coordination (Kumar, Subramanian, & Yauger, 1997).

Differentiators, on the other hand, attempt to produce the products or services in a unique way. Firms with unique products or services may command a higher price than competitors to justify the higher costs of producing unique product or services (Porter, 1980). Differentiators focus on breath of product or service offerings, high technology, special features, or customer service. Approaches to differentiating hospital services have been varied. Literature shows that hospitals implementing a differentiation strategy use different bases, such as creation of a "high tech" image by using the latest (and most expensive) technologies (e.g., magnetic resonance imaging); differentiation by types of

technology and quality of medical support staff; provision of services not commonly offered (e.g. open heart surgery, transplant services); provision of patient support services; and performance of the most sophisticated procedures. In general, however, hospitals pursuing these strategies offer patients a differentiated service that provides value to patients by satisfying their unique needs. By demonstrating competence and high proficiency, hospitals attempt to create a competitive advantage over their rivals (Kumar et al., 1997)

Porter described the cost leadership and differentiation strategies as being mutually exclusive because each represents "fundamentally different approaches to building and sustaining competitive advantage" (Porter, 1980). Therefore, according to Porter (1980), these two strategies cannot occur simultaneously in a successful firm. Porter stated that the benefits of optimizing a strategy cannot be gained if the firm is simultaneously pursuing more than one generic strategy. Thus, successful organizations would exclusively compete on one of the two generic strategies. Firms that are not completely committed to either the cost leadership or differentiation strategy utilize no strategy and are referred to as "stuck-in-the-middle" (Porter, 1980).

While there is limited research supporting Porter's original view (Kumar et al., 2001), some researchers have argued that, differentiation and cost leadership can be viewed as separate dimensions along which firms can score low and high. Researchers have suggested another strategy, usually referred to as a hybrid strategy (Kumar et al., 1997; Lapersonne, Sanghavi, & De Mattos, 2015; Marlin, Hoffman, & Lamont, 1994; Wright, Kroll, Kedia, & Pringle, 1990). The hybrid strategy can be seen when a firm simultaneously and successfully pursues both the cost leadership and differentiation

strategies (Goes & Meyer, 1990; Ketchen et al., 1993; Lamont et al., 1993). It is necessary to mention that the hybrid strategy is distinctively different from the stuck-in-the-middle strategy, in which, firms have higher cost leadership score and lower differentiation score (Figure 1).

A hybrid strategy can be achieved in two main ways: First, the implementation of a differentiation strategy promotes uniqueness mainly through the higher quality and unique products or services. The higher quality and uniqueness would presumably lead to greater market demand and ultimately higher market share, allowing the firm to adopt a low-cost strategy by increased economies of scale (Dess & Davis, 1982, 1984; Porter, 1989). Second, a firm with originally a cost-leadership strategy tends to achieve higher market share by offering lower prices, providing an opportunity to the firm to adopt differentiation strategy by investing on quality improvement, marketing, R&D, unique product or services and so on (Lapersonne et al., 2015; Wright et al., 1990).

Hypotheses

Porter proposed that, regardless of industry context, organizations choose one of the pure generic strategies to compete at the business level. Cost leadership is perhaps the clearest of the generic strategies. With this strategy, a firm sets out to become the low-cost producer in its industry. If a firm can accomplish overall cost leadership, then its performance will be above average in its market provided it can command prices at or near the market average. The adaptation of a low-cost strategy would primarily consist of achieving lower per-unit cost of product or services by attaining scale economies (Wright et al., 1990). A firm pursuing this strategy would have prices equivalent or lower than

its rivals. A cost leader's low-cost position translates into higher profit or better financial performance (Porter, 1989, 2008).

A firm that can achieve differentiation strategy will be an above-average performer in its industry because its price premium would exceed the extra costs incurred in being unique. A differentiator, therefore, seeks ways of differentiating the product/service that leads to a price premium greater than the costs associated with differentiation. Through a differentiation strategy, the firm attains higher revenue compared to its competitors as a result of lower demand elasticity of consumers due to brand loyalty or quality perceptions, and this can ultimately result in better financial performance (Porter, 1980, 2008).

According to Porter, firms should choose one of the two pure generic strategies to gain competitive advantage and eventually outperform their rivals. By pursuing either a cost-leadership or differentiation strategy, firms are expected to have better financial performance compared to a firm that engages in each generic strategy but fails to achieve any of them, or is "stuck-in-the-middle" A firm that is stuck in middle will compete at a disadvantage, because the differentiators and cost leaders will be better positioned to compete in any segment

Although several studies have found significant differences in hospital financial performance across the different strategies, the results are not consistent. For example, Kumar et al. (1997) found that hospitals with either low-cost or differentiation strategies had better financial performance than hospitals with the stuck-in-the-middle strategy. On the other hand, the researchers in another study did not find significant differences between hospitals with stuck-in-the-middle strategy and hospitals with generic strategies

in terms of financial performance (Kumar et al., 2001). However, these studies had two main limitations: First, they were conducted in a single state. Second, they used data prior to the year 2000. Since health care industry has changed a lot during last decade (e.g. Affordable Care Act) and also the fact that conducting a study in national level can increase the generalizability of findings. Considering those limitation and the conceptual foundation of Porter's typology, we argue that hospitals with pure generic strategies have better financial performance than stuck-in-the middle hospitals. In fact, hospitals with a differentiation strategy could have better financial performance than hospitals with a stuck-in-the-middle strategy by offering high tech services, better quality, or rare services, and ultimately lower demand elasticity and improve financial performance. On the other hand, hospitals with cost-leadership strategy might have better financial performance than hospitals in the stuck-in-the-middle group by offering lower price and having greater market share. Thus:

H1. Hospitals with a cost leadership strategy financially outperform hospitals with a stuck-in-the-middle strategy

H2. Hospitals with a differentiation strategy financially outperform hospitals with a stuck-in-the-middle strategy

The literature suggests that low-cost and differentiation strategies may be pursued simultaneously (hybrid strategy) and profitably adopted by a firm. Researchers have stated that a hybrid strategy can be the most performance enhancing strategy (Wright et al., 1990). Researchers in the hospital industry also have shown that hospitals can pursue a hybrid strategy successfully with better financial outcomes (Kumar et al., 1997; Landry, Hernandez, Shewchuk, & Garman, 2010; Marlin et al., 1994).

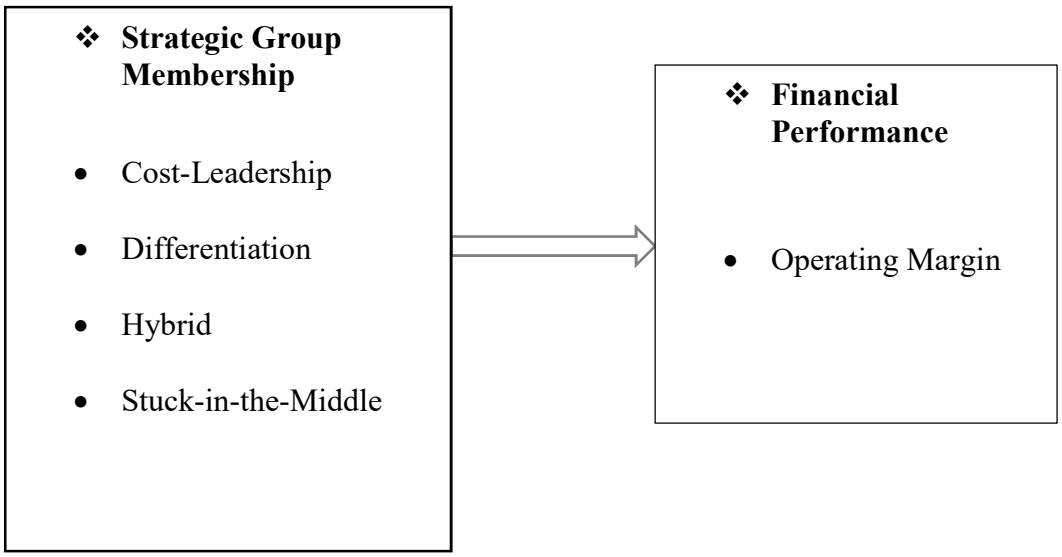
The literature indicates that firms that deploy only a low cost or differentiation strategy may, in some cases, be competitively vulnerable (Wright et al., 1990). For example, when a firm chooses to compete only based on a low-cost strategy it may have a profit margin squeeze due to other firms' lower prices, higher quality or more unique products or services. In this case, management's ability to implement measures to improve products or services, to augment products or services with superior amenities, or to expend more on marketing activities, is limited. Thus, such a firm may be vulnerable to competitor moves that draw customers away from it. A strategic tendency, in this event, might be to lower prices further, which would put even more pressure on profit margins (Wright et al., 1990). Similarly, a firm that chooses to compete primarily with the differentiation strategy, while not stressing low-cost operations, may be vulnerable to competitors that have lower cost positions and might offer counter products or services, occasionally at predatory prices.

On the other hand, firms that compete with a hybrid strategy may surpass those that pursue either a cost leadership or differentiation strategy. One reason could be the mutually reinforcing benefits of a hospital's emphasis on product, services, quality, process innovation, and cost control. Although some studies in the hospital context have found an association between superior financial performance and hybrid strategies over pure generic strategies, findings have been largely inconsistent (Dess & Davis, 1982; Kumar & Subramanian, 1997; Kumar et al., 1997; Wright et al., 1990). However, it can be argued that pursuing a hybrid strategy may give more flexibility to the hospitals by having characteristics of cost control and differentiation, and ultimately lead to a superior financial performance. Thus:

H3. Hospitals with a hybrid strategy financially outperform hospitals with a cost leadership strategy.

H4. Hospitals with a hybrid strategy financially outperform hospitals with a differentiation strategy.

Figure 1. Conceptual Framework of the Relationship Between Strategic Group Membership and Hospital Financial Performance



RESEARCH METHODS

Sample and Data Collection

Data Sources

In this study, we used three secondary datasets for the period of 2006- 2016. First, the American Hospital Association (AHA) Annual Survey provided general organizational information about hospital data including number of services, ownership, size, hospital competition, and teaching status. Second, Medicare cost reports provided the financial data including, revenue, income, and cost of hospitals. Third, the Area Health Resource File (AHRF) was included to examine county-level characteristics such as per capita income, population demographics, and unemployment rate. Observations across these three databases were matched using Medicare provider numbers (AHA to Cost report) and FIPS codes (AHA Cost Reports to AHRF).

Study Population

The sample of this study consisted of all private urban general acute care hospitals in the United States. The reason for focusing on similar hospitals in comparable geographic area was that hospitals in urban areas face different environmental challenges compared to those in rural areas (Trinh & O'connor, 2000). Additionally, one would expect general acute care hospitals to perform differently compared to specialty hospitals (e.g., long-term, psychiatric, substance-abuse, etc.) as well as government hospitals. Finally, by confining the sample to hospitals in urban areas, we expect the competitive environment to be reasonably comparable for hospitals in the study. The final sample size consisted of 23,570 hospital-year observations (or an average of 2700 hospitals per year).

Dependent Variables

Our study relied on operating margin that is a commonly used financial performance measure in the health care literature (Bazzoli et al., 2014; Forte, Hoffman, Lamont, & Brockmann, 2000; Ketchen et al., 1997; Ketchen et al., 1993; Zajac & Shortell, 1989). This variable measures the profitability and efficiency of operations of a hospital. The profitability measures are very important for hospitals because they are measuring the efficiency with which any firm turns business activity into profits (Gapenski & Pink, 2007). We used operating margin which focuses on core business functions of hospital (profit from patient care) and excludes the influence of non-operating income like endowments and non-operating expenses such as interest income (Vélez-González, Pradhan, & Weech-Maldonado, 2011).

Independent Variable: Strategy Measure

The main independent variable was a categorical variable consisting of four groups that identifies the strategic group membership of each hospital: cost-leadership, differentiation, hybrid, and stuck-in-the-middle. In this study, we used Porter's framework to determine the strategic group membership of each hospital. According to this typology, each strategy can be operationalized using two dimensions: cost-leadership and differentiation (Porter, 1989). Three main measures have been used to operationalize cost leadership in the strategic group and financial performance literature in the hospital context: total expenses to the number of occupied beds, total cost per patient day, and total salaries per patient day (Forte et al., 2000; Landry et al., 2010; Marlin, Huonker, & Hasbrouck, 2004). By dividing total expenses by the number of beds occupied, a hospital's expense based on its current level of business was ascertained. Total cost and

salary per patient day also express how efficiently internal finances are managed based on current business (Landry et al., 2010). As expected, we found strong positive correlations among the three cost leadership variables in each year.

Prior research has demonstrated that hospitals employ various differentiating strategies, such as expanding the breadth or number of services , creating a "high tech" image, using the latest (and most expensive) technologies (e.g., magnetic resonance imaging), and providing rare services (Kumar & Subramanian, 1997). Three main measures have been employed in the literature to operationalize differentiation in the strategic group and financial performance literature in the hospital context: total number of provided services, the number of high-tech services, and number of rare services (Forte et al., 2000; Landry et al., 2010; Marlin et al., 2004). The total number of services represents the sum of all services provided by each hospital, of a possible 135 services (on average) identified in the American Hospital Association's Guide to the Health Care Field. The second measure is total number of high tech services that has been mentioned as an important variable to differentiate hospitals (Landry et al., 2010; Zengul, Weech-Maldonado, Ozaydin, Patrician, & O'connor, 2018). The total number of high tech services represents the sum of hospital services that are considered services that need high and most updated technology (a cardiac catheterization laboratory, an extracorporeal lithotripter, magnetic resonance imaging, open heart surgery, and organ transplantation capability) (Landry et al., 2010; Marlin et al., 2004). The higher technology services imply uniqueness of services and it shows hospitals investing in such services to differentiate themselves from rivals. The number of rare services represents the sum of hospital services that are offered by less than 25 percent of all the hospitals (Landry et al.,

2010). The American Hospital Association's Guide to the Health Care Field was used to identify the rare services. Higher number of rare services may indicate investing in services that are not offered by other competitors. In addition, hospitals may use rare services to create an image of uniqueness or high quality. The American Hospital Association (AHA) Annual Survey was used to extract these three measures. Like the low-cost leadership measures, we found strong positive correlations among the three differentiation variables in each year.

To create composite scores of the cost leadership and differentiation measures, we first confirmed the unidimensionality of each construct through factor analysis. The analysis yielded two factors with eigenvalues greater than 1. One factor included the three differentiation measures. The second factor included the three cost leadership measures. Finally, composite scores for cost leadership and differentiation were calculated by, first, standardizing the three measures for each composite as Z-scores ((x - mean of x)/standard deviation) (Hair, Black, Babin, Anderson, & Tatham, 1998), and then summing the three Z-scores.

To determine the hospital strategic groups, we used a two-stage clustering procedure (hierarchical and nonhierarchical clustering) (Hair et al., 1998) to increase the validity of the cluster solution. (Kumar & Subramanian, 1997; Kumar et al., 1997; Lamont et al., 1993). In the hierarchical procedure (agglomerative method), each object or observation begins as a separate cluster. In each subsequent step, the two clusters that are most similar are combined to build a new aggregate cluster. Hierarchical method is used to determine the number of clusters/groups (Hair et al., 1998). In this study, we used the Ward's hierarchical method, one of the most popular hierarchical clustering methods

in the literature. In the Ward's method, similarity is determined by the sum of squares within the clusters summed over all variables.

We used the composite scores of cost-leadership and differentiation to pursue the two-stage clustering procedure. To identify the optimal cluster solutions based on the Ward's method, we used the following decision criteria in conjunction with visual inspection of the tree-plots (Marlin et al., 2004):

1. Clusters explain at least 65% of the overall variance;

2. An additional cluster increases the overall fit by less than 5%;

3. A local peak in the Cubic Clustering Criterion: The cubic clustering criterion (CCC) is used to estimate the number of clusters using Ward's minimum variance method, k - means, or other methods based on minimizing the within-cluster sum of squares. Local peak in the Cubic Clustering Criterion shows the minimum within-cluster sum of squares (SAS, 2017)

4. A local peak in the pseudo F statistic. The pseudo F statistic describes the ratio of between-cluster variance to within cluster variance. Peaks in the pseudo F statistic are indicators of greater cluster separation (Davies & Bouldin, 1979; SAS, 2017).

5. A small value of the pseudo t^ statistic and a larger pseudo t^ statistic for the next cluster fusion. This index quantifies the difference between two clusters that are merged at a given step. Thus, if the pseudo T-square statistic has a distinct jump at step k of the hierarchical clustering, then the clustering in step k+1 is selected as the optimal cluster (Davies & Bouldin, 1979; SAS, 2017).

If inconsistencies existed across these rules, we relied on visual inspection of the tree-plots and prioritized our use of each rule in the order in which they are listed above. These decision criteria are consistent with those used in prior strategic group research (Forte et al., 2000; Ketchen et al., 1993; Kumar et al., 1997; Marlin et al., 2004), and with clustering stopping rules recommended by the SAS Manual and by the SAS Technical Report A-108 (SAS, 2017). Our analysis showed that a four- group solution was the optimal cluster solution in each year.

After identifying the optimal cluster solution, we used the K -Means clustering method to group hospitals in strategic groups. The K-Means method is a non-hierarchical clustering that groups observations based on researcher- specified number of clusters (Hair et al., 1998). Since, we obtained a four-group solution using the Ward's method, we performed K-Means by 4 groups. After performing the clustering, the four groups were labeled based on the mean composite scores for cost leadership and differentiation. To accomplish this, first, we ranked the four groups that resulted from the K-Means cluster analysis based on their mean composite scores for cost-leadership and differentiation. Second, we identified the group with the lowest cost composite score (1^{st} in rank) and low differentiation score (e.g. 3^{rd} in rank) as a "Cost-Leadership" group. We labeled "Differentiation" as the group with highest differentiation composite score (1^{st} in the rank) and high cost leadership score (e.g. 3^{rd} in rank). We identified "Stuck-in-the-middle" as the worst ranked in both cost-leadership and differentiation composite score mean (sum of the two ranks). Finally, we identified "Hybrid" as a better ranked in both cost-leadership composite score and differentiation compared to stuck-in-the-middle

(sum of the two ranks). In addition, hybrid have better differentiation scores than cost leaders, and lower costs than differentiators. (Please see Table 1 for more details).

Table 1. Identified Strategic Groups Based on Cluster Analysis Results*

Cluster groups	Cost-Leadership Composite Score (Mean)	Cost Leadership Rank	Differentiation Composite Score (Mean)	Differentiation Rank	Identified Strategic Group
2006					
1	-0.1033913	2	-0.9205331	4	Stuck-in-the-middle
2	0.9756581	4	2.254601	1	Differentiation
3	-0.1230073	1	-0.1347113	3	Cost-Leadership
4	0.0871156	3	0.6818204	2	Hybrid
2007					
1	-0.0750426	2	-0.8128101	4	Stuck-in-the-middle
2	0.1306698	3	0.6826248	2	Hybrid
3	0.8521596	4	2.321564	1	Differentiation
4	-0.1061707	1	-0.0740714	3	Cost-Leadership
2008					
1	-0.8496801	1	-0.0792894	4	Cost-Leadership
2	0.1190154	3	0.6859167	2	Stuck-in-the-middle
3	0.8171836	4	2.357396	1	Differentiation
4	-0.1058828	2	-0.0997101	3	Hybrid
2009					
1	-0.1137706	1	-0.8316934	4	Cost-Leadership
2	0.081286	3	0.7075263	2	Hybrid
3	-0.0287881	2	-0.0827304	3	Stuck-in-the-middle
4	0.5883386	4	2.39765	1	Differentiation
2010					
1	0.0208869	3	-0.9329322	4	Stuck-in-the-middle
2	0.1754096	4	2.328899	1	Differentiation
3	-0.0423947	1	-0.1090524	3	Cost-Leadership
4	0.0092523	2	0.7212327	2	Hybrid
2011					
1	0.5934235	4	2.273985	1	Differentiation

2	-0.0718428	1	-0.083248	3	Cost-Leadership
3	0.0844469	3	0.6823204	2	Hybrid
4	-0.0677382	2	-0.852351	4	Stuck-in-the-middle
2012					
1	0.3908391	4	2.365007	1	Differentiation
2	-0.0234302	1	-0.0487881	3	Cost-Leadership
3	-0.0191809	2	0.7602819	2	Hybrid
4	-0.0146965	3	-0.897311	4	Stuck-in-the-middle
2013					
1	0.4031213	4	2.281426	1	Differentiation
2	-0.059225	1	-0.0823018	3	Cost-Leadership
3	0.0401492	3	0.717585	2	Hybrid
4	-0.0268183	2	-0.9238303	4	Stuck-in-the-middle
2014					
1	0.9660527	4	2.43839	1	Differentiation
2	0.1067873	3	0.8045336	2	Hybrid
3	-0.0716644	2	-0.9004022	4	Stuck-in-the-middle
4	-0.1047314	1	-0.0250175	3	Cost-Leadership
2015					
1	0.6145789	4	2.271633	1	Differentiation
2	-0.0926691	1	-0.0992294	3	Cost-Leadership
3	0.0583412	3	0.7000917	2	Hybrid
4	-0.03601	2	-0.9511403	4	Stuck-in-the-middle
2016					
1	0.7856686	4	2.412101	1	Differentiation
2	-0.1403393	1	-0.0799171	3	Cost-Leadership
3	0.0306939	2	0.7303677	2	Hybrid
4	0.0535798	3	-0.9471238	4	Stuck-in-the-middle

*The lowest score on cost leadership composite is ranked 1, while the highest score differentiation composite is ranked 1

Control Variables

Organizational characteristics may have a substantial impact on the financial performance of hospitals (Kumar & Subramanian, 1997; Ramamonjiarivelo, Weech-Maldonado, Hearld, Pradhan, & Davlyatov, 2018; Zengul et al., 2018). Following previous studies, we controlled for organizational characteristics including size, Medicare payor mix, Medicaid payor mix, system affiliation, ownership type, and teaching status of hospitals (Ginn & Young, 1992; Goes & Meyer, 1990; Marlin et al., 2002). Previous studies also have shown that some environmental variables might affect the financial performance of hospitals (Ramamonjiarivelo et al., 2018; Zengul et al., 2018). In this study we controlled for hospital competition, which was measured by the Herfindahl-Hirschman Index (HHI), an indicator of market concentration that is calculated by taking the sum of the squared market shares for hospitals in a health service area (HSA) (Baker, 2001). Market share, which is the proportion of hospitals' average inpatient days in relation to the total inpatient days in a given market, was calculated from the AHA hospital dataset (Everhart, Neff, Al-Amin, Nogle, & Weech-Maldonado, 2013). Per capita income, unemployment rate, and population 65 years and older were other environmental control variables (please see table 2).

Table 2. Dependent, Independent and Control Variables

Variable	Measure Definition	Format	Data Source
Hospital Performance (Dependent Variable)			
Operating Margin	(Net Patient Revenue - Operating Costs) / Net Patient Revenue	Continuous	CMS[1]
Strategic Group Membership (Main Independent variable)			
Strategic Group Membership	Porter's Typology (Cost-leadership, Differentiation, Hybrid, Stuck-in-the-middle)	Categorical	AHA[2], CMS
Organizational and environmental factors (Control Variables)			
Size	Number of Beds	Continuous	AHA
Ownership	I if Not-for-profit, 0 if for profit	Categorical	AHA
Teaching Status	1 if teaching, 0 if non-teaching	Categorical	AHA
System Affiliation	1 if affiliated to system, 0 if non-affiliated	Categorical	AHA
Medicare Mayer Mix	Proportion of Medicare patients	Continuous	AHA
Medicaid Mayer Mix	Proportion of Medicaid patients	Continuous	AHA
Herfindahl-Hirschman Index (HHI)	Sum of the squares of hospital market shares (inpatient days) in a hospital service area (HSA) as defined by the Dartmouth Atlas	Continuous	AHA
Per Capita Income	Total household income in the County/ Total Population of the county	Continuous	ARF[3]
Unemployment Rate	Number of unemployment individuals in the current year /total population in the county	Continuous	ARF
Population Over 65	Number of population 65 years and older in the county/total population in the county	Continuous	ARF

1. American Hospital Association (AHA) Annual Survey
2. Centers for Medicare and Medicaid Services
3. Area Health Resource File

Analysis

The unit of analysis was the hospital. For continuous variables, we reported means and standard deviations. For categorical variables, we reported frequency and percent. For bivariate analysis, we conducted ANOVA to analyze the relationship between the continuous dependent and independent variables and the strategic group membership variable, and chi-square to analyze the relationship between the dichotomous independent variables and the strategic group membership variable. We checked for potential multicollinearity among control variables using variance inflation factors (VIF) from the regression models. We did not find any evidence of multicollinearity among the variables (i.e., VIF => 5; R2= 0.80). We also checked for the normal distribution of variables. If the distribution of the disturbance term was found to deviate from normality, we used a log transformation (s). To partially address potential issues of endogeneity between strategic group membership and the outcome variable, we used one-year lagged variables for the strategic group membership variables. Generalized estimating equation (GEE) regression time invariant, unobserved state-level factors that may affect financial performance and strategy. Rather than modeling the within-subject covariance structure, GEE treats it as a nuisance and simply models the mean response (Diggle, Liang, & Zeger, 1994). We controlled for the aforementioned organizational and environmental factors. We reported the findings in descriptive and analytical tables. We reported beta coefficients for significant associations. SAS 9.4 and Stata 15 were used for data management and data analyses. We used the following equation model:

$$\textit{Financial performance(operating margin}_{it}) = \beta 0 + \beta 1(\textit{strategic group membership}_{it}) + \beta 2(\textit{bed size}_{it}) + \beta 3(\textit{Ownership}_{it}) + \beta 4(\textit{Teaching Hospital}_{it}) + \beta 5(\textit{Not-for-profit Hospital}$$

$_{it}) + \beta 6(\text{Medicare payer mix index}_{it}) + \beta 7(\text{Medicaid payer mix index}_{it}) + \beta 8(\text{System Affiliation}_{it}) + \beta 9(\text{HHI}_{it}) + \beta 10(\text{Per Capita Income}_{it}) + \beta 11(\text{Unemployment Rate}_{it}) + \beta 12(\text{Population Over 65}) + \beta_{13}(\text{Year Dummy Variables}_{it}) + ų(\text{State}_{it}) + \mathcal{E}_{it}$

In this model, the dependent variable is operating margin. The main independent variable is the strategic group membership with four categories including cost-leadership, differentiation, hybrid, and stuck-in-the-middle.

RESULTS

The cluster analysis procedure produced four clusters in each year using Ward's method and K-Means clustering. Table 3 and Figure 2 provide distribution of each strategic group from 2006 to 2016. The cost-leadership strategy was the most pursued strategy in last 11 years. On the other hand, differentiation strategy was the least pursued strategy during the same period. Figure 2 depicts the trend of each strategy from 2006 to 2016. The figure shows two different patterns in the strategic groups before and after 2010. The figure demonstrates substantial fluctuations in strategic group of hospitals before 2010. On the other hand, there is a stable trend in the hospital strategic groups after 2010.

Table 3. Frequency of the strategic groups from 2006 to 2016 (Percent)

Year Strategy	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cost-Leadership	38.9	42.5	27.8	29.1	40.9	42.5	40.5	39.6	41.6	40.7	40.6
Differentiation	5.4	3.9	4.5	4.3	5.2	4.9	4.7	5.1	4.1	5.3	4.3
Hybrid	27.8	25.5	42.1	24.9	26 7	24.4	24.2	26.2	23.5	26.6	27.1
Stuck-in-the-Middle	27.9	28.3	25.6	41.6	27.8	28.20	30.5	29.1	30.7	27.4	28.1
Total	100	100	100	100	100	100	100	100	100	100	100

Figure 2. Trends of Four Strategic Groups from 2006 to 2016

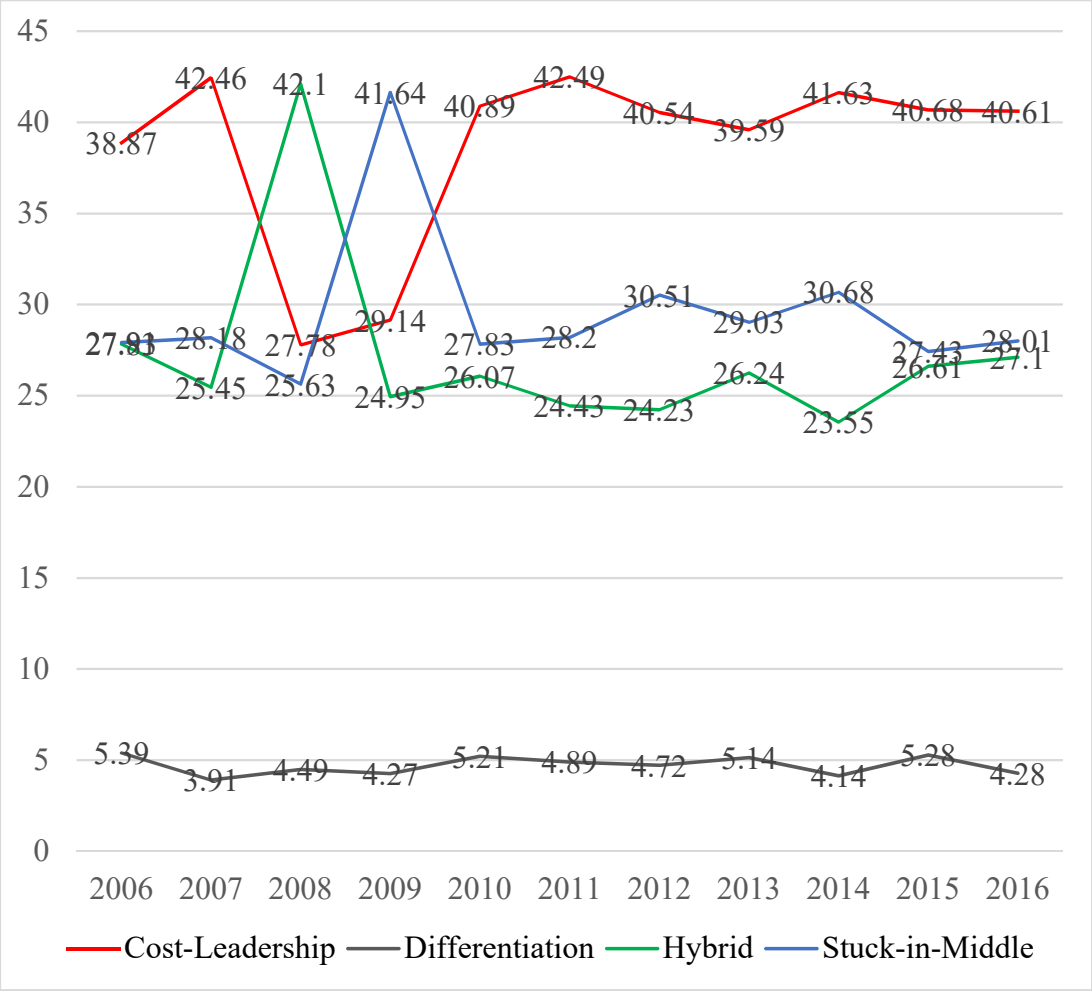


Table 4. Results of Factor Analysis (Loadings) for Cost-leadership and Differentiation Measures (2016)

Variable	Differentiation	Cost-Leadership
Total Services	**0.84**	-0.11
High Tech Services	**0.72**	-0.09
Rare Services	**0.83**	-0.04
Total Cost Per Patient Day	0.004	**0.98**
Salaries Per Patient Day	0.007	**0.98**
Total Expenses Per Occupation	0.24	**0.83**
Eigenvalue	2.27	1.93

Analysis of variance and chi square test results for the relationship between the independent and dependent variables with strategic groups are presented in Table 5. We found significant differences across the four strategic groups in all dependent and independent variables except HHI, suggesting that the cluster analyses produced distinct clusters. As it is seen in the table 5, hybrids have the highest (1.29) operating margin and stuck-in-the-middle group has the lowest (-.46) operating margin. In terms of teaching status, about 99 percent of hospitals in the cost-leadership group are in non-teaching category. On the other hand, about 78% of hospitals in the differentiation group are teaching hospitals. Hospitals in the differentiation group are the largest hospitals with the average size of 370 beds. On the other hand, hospitals in the stuck-in-the-middle group are the smallest with the average size of 152 beds. In terms of hospital environment, differentiators are in the environment with higher per capita income and lower population 65^{+}.

Table 5. Descriptive Analyses of Dependent and Independent Variables (2016)

Variable	Strategic Group Membership				
	Cost-Leadership	Differentiation	Hybrid	Stuck-in-the-middle	P Value
Dependent Variable					
Operating Margin (M/SD)	.96 (12.26)	.90 (11.45)	1.29 (10.76)	-.46 (14.20)	P= 0.001
Organizational Characteristics					
Teaching Status (N/ %)					
1 (teaching)	10 (0.98)	84 (77.78)	70 (10.23)	0	
0 (non-teaching)	1,015(99.02)	24 (22.22)	614(89.77)	707 (100)	P= 0.001
Ownership (N/ %)					
1 Not-for-profit	763 (74.44)	103 (95.37)	591(86.40)	509 (71.99)	P= 0.001
0 for-profit	262 (25.56)	5 (4.63)	93 (13.60)	198 (28.01)	
System Affiliation (N/ %)					
1 (system affiliated)	793 (77.37)	93 (86.11)	555 (81.14)	516 (72.98)	P= 0.0002
0 (independent)	232 (22.63)	15 (13.89)	129 (18.86)	191 (27.02)	
Hospital Size (M/SD)	188.82(177.85)	370.24 (325.19)	257.84(194 .44)	152.12 (171.92)	P= 0.001
Medicare Payer Mix(M/SD)	43.40 (23.10)	41.02 (19.84)	44.31 (20.81)	43.66 (24.58)	P= 0.003
Medicaid Payer Mix(M/SD)	15.50 (14.10)	17.37 (13.28)	15.96 (12.41)	14.92 (14.18)	P= 0.001
Environmental Characteristics					
Herfindahl-Hirschman Index (HHI) (M/SD)	0.68 (.34)	0.43 (.33)	0.60 (.34)	0.73 (.33)	P= 0.272

Per Capita Income(M/SD)	40598.5 (11056.61)	48769.23 (17599.66)	42826.87 (12497.84)	38751.06 (10259.49)	P= 0.001
% of Population 65+(M/SD)	14.22 (3.87)	12.58 (2.14)	13.71 (3.17)	14.42 (3.78)	P= 0.001
Unemployment Rate(M/SD)	6.86 (2.69)	6.56 (2.36)	6.58 (2.42)	7.18 (2.97)	P= 0.001

The results of the GEE regression and pairwise comparison of the strategic groups' beta coefficients is presented in Table 6 and Table 7, respectively. Hypothesis 1 states that hospitals with a cost leadership strategy will financially outperform hospitals with a stuck-in-the-middle strategy. The results of operating margin supported our hypothesis. Hospitals in the stuck-in-the-middle group have 0.38 percent less operating margin compared to hospitals in the cost-leadership group.

In terms of the financial performance differences between the differentiation and the stuck-in-the-middle groups, the hypothesis 2 posits that hospitals with a differentiation strategy financially outperform hospitals with a stuck-in-the-middle strategy. The results supported our hypothesis given that differentiators outperform stuck-in-the-middle in operating margin. As it can be seen in the table 7, hospitals in the stuck-in-the-middle strategic group have 0.97 percent lower operating margin ($p < 0.1$) compared to hospitals in the differentiation strategic group.

Hypothesis 3 stated that hospitals with a hybrid strategy financially outperform hospitals with a cost leadership strategy. The result of analyses supported this hypothesis. As it is shown in table 7, cost leader hospitals have 0.41 percent less operating margin compared to hybrids.

Hypothesis 4 posited that hospitals with a hybrid strategy financially outperform hospitals with a differentiation strategy. The findings did not support this hypothesis. There were no statistically significant differences in the operating margin between hospitals in the differentiation group versus those in the hybrid group.

Table 6. Regression of the Relationship Between Strategic Group Membership and Operating Margin (N= 23,387)

VARIABLES	Operating Margin Beta Coefficient (SE)
Strategic Group Membership (Ref= Hybrid)	
Cost-Leadership	-0.41 (0.17) **
Differentiation	0.184 (0.52)
Stuck-in-the-middle	-0.79 (0.18) ***
Organizational Characteristics	
Teaching Status (1 if teaching)	-1.47 (0.59) **
Ownership (1 if Not-for-profit)	-4.53 (0.33) ***
Hospital Size	0.0003 (0.001)
System Affiliation (1 if system affiliated)	0.16 (0.15)
Medicare Payer Mix	-0.012 (0.001) ***
Medicaid Payer Mix	-0.012 (0.005) **
Environmental Characteristics	
Herfindahl-Hirschman Index (HHI)	0.042 (0.27)
Per Capita Income	-0.03 (0.011) ***
Percent of population over 65	-0.16 (0.04) ***
Unemployment Rate	0.011 (0.03)
Constant	8.52 (0.8) ***

*** p<0.01, ** p<0.05, * p<0.1

Table 7. Pairwise Comparison of Beta Coefficients of the Four Strategic Groups for Operating Margin (N= 23,387)

Strategic Groups	Operating Margin
Differentiation vs Cost-Leadership	0.6
Hybrid vs Cost-Leadership	0.41**
Hybrid vs Differentiation	-0.18
Stuck-in-the-Middle vs Cost-Leadership	-0.4**
Stuck-in-the-Middle vs Differentiation	-0.986*
Stuck-in-the-Middle vs Hybrid	-0.79***

*** p<0.01, ** p<0.05, * p<0.1

DISCUSSION

In this longitudinal study, we examined the relationship between strategic group membership and hospital financial performance in terms of operating margin. Our results suggest that strategic group membership has an impact on the financial performance of urban acute care hospitals. More specifically, we found that: (a) most hospitals pursue a cost-leadership strategy, and least of the hospitals pursue the differentiation strategy; (b) there was a fluctuation of hospital strategic group membership before 2010 and stability after 2010; (c) hospitals with hybrid strategy outperform hospitals with cost-leadership strategy and stuck-in-the-middle. However, there is no significant difference between hybrids and differentiators; (d) about 5 percent of hospitals pursue differentiation strategy; and (e) absence of a coherent strategy (i.e., stuck-in-the-middle) is likely to lead to poor performance. The implications of these findings are discussed below.

First, on average about 37 percent of hospitals in each year were grouped in the cost-leadership strategic group (except years 2008 and 2009). Only about 5 percent of hospitals were grouped in the differentiation strategic group in each year. It seems that the strategy of overall cost leadership has received much attention in the last decade. In fact, hospital managers have focused a great deal of attention on cost control measures in order to protect from competitive forces arising in this industry and to cope with regulatory changes (Blumenthal et al., 2015; Holzhacker, Krishnan, & Mahlendorf, 2015). On the other hand, differentiation strategy has not been a commonly used strategy. One reason could be the high cost of pursuing differentiation strategy. Hospitals have different ways to differentiate themselves, such as providing more services; use of the latest technologies; quality of medical support staff; provision of services not commonly offered; provision of patient support services; and performance of the most sophisticated procedures (Kumar et al., 1997; Yasin et al., 2011). However, these procedures are usually expensive and only a small number of hospitals may be able to invest in them.

Second, there was a remarkable fluctuation of hospital strategic group membership before 2010 but membership stabilized after 2010. The fluctuation before 2010 can be related to the Great Recession of 2008 (Dunn, Koepke, & Pickens, 2009). The recession was the worst in 70 years. Every method of income generation available to hospitals were at risk, including reimbursement per discharge (70% of hospitals reported moderate or significant increases in uncompensated care), number of inpatient admissions (over one-half reported a moderate or significant decrease), difficulty obtaining bonds (60% reported at least significant problems), and charitable donations. In addition, over 50% of US hospitals had negative margins in the fourth quarter of 2008

(Association, 2009; Sussman, Halasyamani, & Davis, 2010). These factors created uncertainty in hospital markets, and it may be that due to the financial crisis, hospital administrators were more reactive and uncertain about their environments. On the other hand, economic recovery from the recession, as well as the introduction of Affordable Care Act could be two main reasons for stability in hospitals' strategy after 2010.

Third, our examination of the strategy and performance relationship revealed that pursuing a hybrid strategy conferred specific performance-related advantages upon hospitals competing in this industry. According to the literature, hospitals may pursue both cost-leadership and differentiation strategies to gain competitive advantage and eventually outperform their rivals (Kumar et al., 1997). The results of this study are aligned with those findings.

Fourth, lack of a coherent strategy (i.e., stuck-in-the-middle) is likely to lead to poor performance. Hospitals in the cost-leadership and differentiation strategic groups outperformed hospitals in the stuck-in-the-middle strategic group. This result is aligned with Kumar and Suramanian (2001). According to Porter(1980), the benefits of optimizing a strategy cannot be gained if a hospital is simultaneously and unsuccessfully pursuing more than one generic strategy. Thus, successful organizations should exclusively compete on one of the two generic strategies. (Marlin et al., 1994).

In summary, strategic group membership appears to have a great impact on the performance of urban acute care hospitals. According to Porter's (1980) typology, each strategy entails a different basis for achieving a competitive advantage and different strategies may result in variations of a firm performance. Hospitals need different arrangements in organizational characteristics, such as offered services, procedures,

structure, size, human resources, etc. to pursue a specific strategy. These organizational differences seem to affect the financial performance of hospitals. However, the results of the current study can be misleading. Porter suggests that each of the generic strategies can lead to above average financial performance despite the context. However, hospitals are intricately related to their environment. As such, some strategies may be more effective than others in a given environment. For example, environmental instability and instability may impact the effectiveness of pursuing a given strategy. Thus, is important to investigate how environmental factors may affect the relationship between hospital strategy and financial performance.

MANAGERIAL IMPLICATIONS

The need for hospital administrators to pay attention to cost control is hardly news, but creative strategists recognize that it may be possible to increase their organization's revenue-generating capacity by differentiating its products and services and pursuing cost control activities simultaneously. The result of this study showed that a solitary focus on efficiency or cost minimizing may not be essential for success, and our study suggests that a relentless quest for efficiency or cost control may not be necessarily the best strategy. Since the hospital industry is different from other industries, and many people are ready to pay for expensive but effective services, the strategy of cost-leadership may not be the best strategy for hospital administrators to pursue. Thus, hospital administrators should consider differentiating themselves from their rivals by reshaping their mix of services with the aim of providing a more attractive product, yet still considering whether and how that service mix will affect costs. In effect, then, hospital administrators should strive to channel their creative energies into continuous

efficiency improvement. The conscious decision to provide a range of services implies deciding to offer both unique and ordinary services. However, providing unique and high technology services are very expensive and only large hospitals may be able to afford providing such services. The alternative strategy could be a hybrid strategy. Hospitals can focus on their cost control by performing efficiently, and at the same time, they can invest on more services, high tech services or quality of care. Finally, as it has been mentioned throughout the paper that pursuing stuck-in-the-middle strategy is not a desired strategy for hospitals and according to our analysis it leads to the worst financial performance. However, the results show that almost 28% of hospitals have been categorized in the stuck-in-the-middle group. Hospitals administrators need to change their attitude about strategy development, and they should understand that pursuing an appropriate strategy and eventually a competitive advantage is a vital element to survive in increasingly competitive environment of hospitals. In addition, hospitals need to invest time and effort to understand their capabilities, competitors, negotiating power, regulations, and demand for their services to proactively develop an appropriate strategy and improve their financial performance.

LIMITATIONS

As with almost all studies, limitations were associated with the current study. First, one major limitation of this study was using secondary data. Inherent to the nature of secondary data, the available data are not collected to address the specific research question or to test certain hypotheses. For example, variables related to organizational behavior and leadership characteristics are not readily available for analysis. Using secondary data also has other limitations such as missing values and the retrospective

nature of data. While examining hospitals at the national level increases the generalizability of findings, this type of study limits the ability to control for differences in regulations and other environmental factors among states (although we tried to address this limitation by controlling for state fixed effect). In addition, all the usual caveats concerning the possible methodology and time-dependent nature of the reported findings are applicable. Second, to examine hospital strategic groups, we used three measures to operationalize the cost-leadership dimension and three measures to operationalize the differentiation dimension. These measures were initially developed based on a review of the literature and consultations with industry experts in other studies (Lamont et al., 1993; Landry et al., 2010). However, future research should consider validating the resulting strategic group structure with hospital administrators. At a minimum, we hope that even with these limitations, the results of this study will serve as a point of reference for future studies on the strategy and financial performance relationship in the hospital industry and other industries.

CONCLUSION

The effect of strategic group membership on the financial performance of hospitals has attracted a considerable amount of interest among different scholars (Byles & Labig Jr, 1996; Ketchen et al., 1993; Marlin et al., 2002; Short et al., 2002). Examining the relationship between strategic group membership and hospital financial performance showed the important role of strategy on financial performance of a hospital. The discussion of results demonstrates the usefulness of strategic group studies like this one as a method for managers to assess their current strategic situations. The ability to identify an industry's structure, and the truly distinct strategies that are available, are both

important considerations for successful strategic management. Furthermore, if among these distinct strategies, some are more performance enhancing than others, then it would seem important to know which group you are in and how well you are performing versus other members of your strategic group.

ENVIRONMENTAL AND ORGANIZATIONAL ANTECEDENTS OF HOSPITAL'S BUSINESS STRATEGY CHOICE

ABSTRACT

Background: Hospitals are struggling how to compete and remain viable in an increasingly turbulent and competitive environment. Understanding the factors affecting business strategy choice of hospitals could provide useful information to managers.

Objective: This study aims to examine the relationship between environmental factors and organizational characteristics and business strategy choice of U.S. urban, acute care hospitals, and how these factors may affect the likelihood of pursuing a specific business strategy.

Methods: We used longitudinal data of 2006 to 2016 of the US urban, general acute care hospitals. Three secondary datasets were used in the study: the American Hospital Association (AHA) Annual Survey, Medicare cost reports (CMS), and Area Health Resource File (AHRF). We used multinomial regression model to analyze the data.

Results and Discussion: The results indicated that the number of physicians in the county increases the likelihood of pursuing differentiation and hybrid strategy. Greater population aged 65 years and older increases the likelihood of pursuing cost-leadership strategy compared to differentiation. An increase in the unemployment rate decreases the likelihood of pursuing differentiation and cost-leadership. Higher HHI (less competition) increases the likelihood of pursuing cost-leadership over hybrid strategy. Finally, larger hospitals are more likely to pursue differentiation and hybrid strategies. The results

showed the importance of environmental and organizational factors on predicting the strategy choice of hospitals.

INTRODUCTION

Strategy is a long term plan to achieve pre-specified goals for any firm (Bolisani & Bratianu, 2017). Understanding organizational strategy is especially important for hospitals due to the many changes happening in the hospital environment during recent years like the Patient Protection and Affordable Care Act (2010), value-based reimbursement, and emergence of new technologies (Al-Amin & Housman, 2012; Blumenthal et al., 2015). Hospitals may struggle to adopt an appropriate strategy to compete and remain viable in an increasingly turbulent and competitive environment (Goldstein et al., 2002; Topaloglu et al., 2018). Because hospitals like other firms face limitations in access to resources (Barney, 1991), there are constraints for them to implement alternative strategies. Moreover, fundamentally different organizational arrangements are needed for pursuing each strategy (Porter, 1980). Thus, it is important to understand why a hospital prefers one strategy to another one.

Strategic management focuses on aligning the organization strategy with its external environment as well as organizational characteristics (Venkatraman & Camillus, 1984). Some studies have investigated the strategic response of hospitals to the changes in the industry environment (Ginn, 1990; Trinh & O'connor, 2002; Zajac & Shortell, 1989). The results of these studies show that hospitals have become more proactive, and that they change their strategy in response to the environmental conditions. In addition, literature indicates that organizational factors like hospital size and system affiliation may lead to hospitals diversifying their services (Ginn, 1990; Goldstein et al., 2002).

Despite these prior studies, there has been limited research examining the association between hospitals' selection of business strategy and both environmental and organizational factors. Only one study investigated the effect of organizational and environmental factors on business strategy of hospitals (Ginn & Young, 1992). The researchers used Miles and Snow's typology for grouping of hospital in strategic groups. They found that organizational factors are more likely to influence hospitals' business strategy compared to environmental factors. The results also showed that hospitals, which are relatively small and operate independently, are less likely to pursue a proactive business strategy. This study provided some evidence regarding the effect of organizational characteristics and environmental factors on business strategy choice of hospitals; however, it should be extended in two main ways. First, it was based on data from 1981-1985. There have been many changes in the health care environment since then. Second, the study was conducted only in one state (Texas), so the findings are not generalizable. thus, there is a need for further research using longitudinal, national data from recent years to understand the environmental and organizational antecedents of business strategy choice of hospitals.

This study aimed to examine how environmental and organizational factors might affect the business strategy choice of US acute care hospitals. Porter's strategic group typology (1980) was used to define the business strategy choice of hospitals.

This study contributes to the existing literature on strategic management in the hospital context by: First, using a national level dataset that captured characteristics of acute care hospitals across the entire USA compared to previous study that was limited to one state (Ginn & Young, 1992). Second, we relied on data from 2006 to 2016. Since the

healthcare industry has been experiencing extensive changes in the last few years (e.g. ACA), a more recent longitudinal data can facilitate the exploration of the antecedents/predictors of hospitals' business strategy choice. Third, we used a more comprehensive list of organizational and environmental variables compared to previous studies. Study findings may provide guidance to policymakers and hospital administrators in determining the most important factors affecting strategy development.

In the first section, we introduce the conceptual framework of this study which is based on Porter's strategic group typology and Resource Dependency Theory (RDT), followed by hypotheses development. The next section explains the research methodology used to address the hypotheses developed in the previous section; we discuss data sources, sample selection, statistical analysis and results. Finally, the last section, discusses the implications and some limitations of the study.

Conceptual Framework

The conceptual framework of this study was based on the resource dependency theory (RDT) and Porter's strategic group typology. In this section, each of the frameworks is discussed and corresponding hypotheses are proposed for empirical analysis.

Porter's Strategic Group Typology

Porter's strategic group typology was used to define the business strategy choice of hospitals in this study. Porter's strategic group typology is one of the well-known frameworks in the strategic management literature (Kumar & Subramanian, 1997; Lamont et al., 1993; Marlin et al., 1994). This typology describes how a company

pursues competitive advantage across its chosen market. There are two main or pure generic strategies, which include cost leadership and differentiation (Porter, 1989).

Firms that pursue the generic strategy of overall cost-leadership or low-cost strategy achieve competitive advantage by becoming the low-cost producers in the industry with relatively low differentiation characteristics. Cost leaders are usually internally-oriented and emphasize cost control by constructing efficient-scale facilities, pursuing rigorous cost reduction and cost minimization activities in areas, such as R&D, marketing, operations, and staffing (Porter, 1989, 2008). A relatively lower market research could lead cost leaders to be less skilled than other firms at detecting important environmental changes (Ketchen & Short, 2015).

Differentiators, on the other hand, attempt to produce the products or services in a unique way. As these hospitals emphasize differentiation, they have higher operating costs. Differentiators are externally-oriented or market-oriented firms and they usually focus on the breath of product or service offerings, quality, technology, uniqueness, or customer service (Porter, 1989). Literature shows that hospitals have used many different bases for pursuing differentiation strategy, such as creation of a "high tech" image and use of the latest (and most expensive) technologies (e.g., magnetic resonance imaging); differentiation by types of technology and quality of medical support staff; provision of rare services; provision of patient support services; and performance of the most sophisticated procedures (Kumar & Subramanian, 1997).

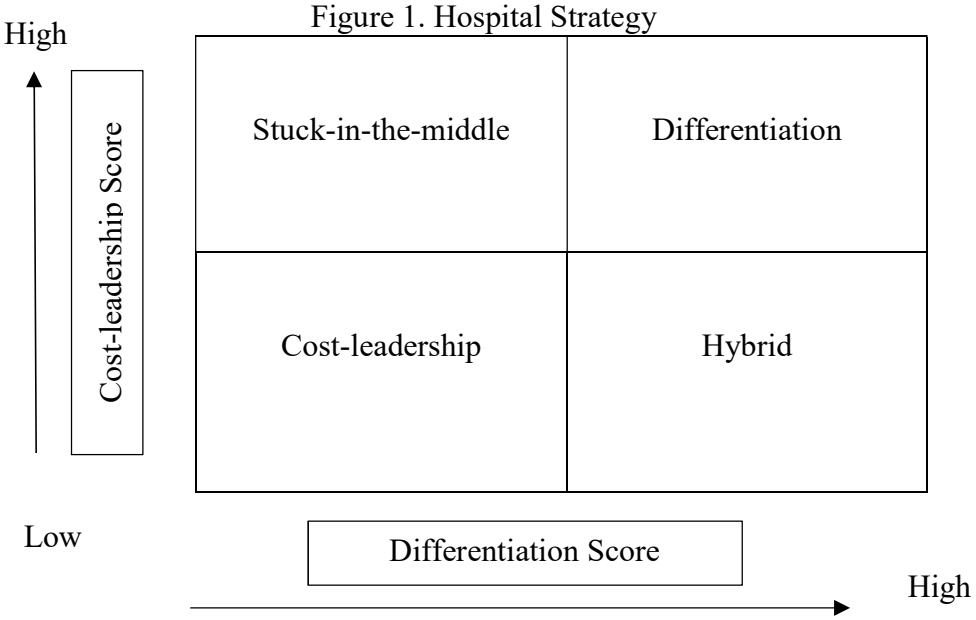
Porter describes the cost leadership and differentiation strategies as being mutually exclusive because each represents a fundamentally different approach to constructing and maintaining competitive advantage. Therefore, these two strategies

cannot occur simultaneously in a successful firm (Porter, 1980, 1989). Specifically, the benefits of optimizing a firm's strategy cannot be gained if a firm is simultaneously pursuing more than one generic strategy. Thus, successful organizations should exclusively compete on one of the two generic strategies. Firms that are not completely committed to one of the two generic strategies are referred to as having a "stuck-in-middle" strategy or muddlers (Porter, 1989). The hospitals in stuck-in-the-middle group are expected to have high cost and low differentiation scores.

However, some researchers have argued that differentiation and cost leadership are dimensions along which firms can score low and high (Kumar & Subramanian, 1997; Kumar et al., 1997; Lamont et al., 1993; Marlin et al., 1994). Therefore, researchers have suggested the existence of another strategy, usually referred to as a hybrid strategy. With the hybrid strategy, a firm successfully and simultaneously pursues both cost leadership and differentiation strategies. Firms with hybrid strategies are between cost leaders and differentiators in terms of being externally orientated (Goes & Meyer, 1990; Ketchen et al., 1993; Lamont et al., 1993). These hospitals have low cost and high differentiation characteristics (Figure 1).

Porter argues that firms in the same strategic group may experience similar environment and have similar organizational characteristics (Porter, 1980). Thus, it is possible that some environmental and organizational factors can explain the likelihood of choosing a specific strategy in acute care hospitals (Ginn & Young, 1992; Miles, Snow, Meyer, & Coleman, 1978; Porter, 1989). In this study, we will use RDT to hypothesize the effect of environmental and organizational characteristics on the business strategy choice of hospital.

Figure 1. Hospital Strategy



RDT and Hospital's Business Strategy Choice

Resource dependence theory (RDT) provides information about directional relationships involving the tenets of power, munificence, and environmental uncertainty (Pfeffer & Gerald, 1978). This open system theory assumes that organizations are not in control of all of the resources they need to survive, and that many of their strategies for survival include attempts to reduce their dependence on external resources in times of uncertainty by securing necessary inputs (Pfeffer & Gerald, 1978). This theory was applied to this study because business strategy choice of hospital is likely a planned endeavor. Hospitals may consciously and purposefully choose their strategy based on recognizable factors (Child, 1972). These recognizable factors can be explored to determine the most important ones that might influence the likelihood of business strategy choice of hospitals.

Building upon RDT, it is assumed that hospitals may view different strategies as the way to secure necessary resources including patient demand and financial

reimbursement (Devers, Brewster, & Casalino, 2003). By using a specific strategy and improving the quality or offering unique services, hospitals may appeal to patients that perceive their services and outcomes to be better than those hospitals with a different strategy (Yasin et al., 2011). Hospitals may also choose a strategy as an approach for improving efficiency and minimizing cost, which could appeal to payer groups including Medicare, Medicaid, and private insurance groups, which have increasingly valued cost containment activities (Blumenthal et al., 2015; Ginn & Young, 1992; Goes & Meyer, 1990; Goldstein et al., 2002; Orszag, 2016). We applied RDT to investigate the factors that affect business strategy choice of hospitals because it provides a relatively complete and comprehensive model to identify significant predictors of business strategy choice of U.S hospitals. In the present study, as explained before, we used Porter's strategic group typology for identifying business strategy choice of hospitals.

Environmental Factors and Hospital's Business Strategy Choice

Dess & Beard (1984) conceptualized environment factors into three constructs: munificence, dynamism, and complexity. In this section, we explain each of these constructs in the context of business strategy choice of acute care hospitals as well as the resulting hypotheses (Figure 2).

Munificence is conceptualized as the availability of resources in the environment that will support sustained instability or growth of the organizations (Sutcliffe, 1994). Munificence has been operationalized as per-capita income, percentage of elderly population, growth in total employment, and the number of active physicians in the county (Alexander, D'Aunno, & Succi, 1996; Dess & Beard, 1984). Literature suggests that the scarcity of resources in the environment can be challenging for organizations and

may affect their strategy. (Miller & Friesen, 1983). In an environment with scarcity of resources, the best strategy would be to focus on minimizing the cost of products or services and increasing efficiency. According to Porter's typology, this situation is suitable for hospitals with a cost leadership strategy. On the other hand, a higher degree of munificence can provide a necessary buffer to the organization in the form of financial and professional slack that can facilitate growth (Andrews & Johansen, 2012). In this type of environment, organizations can expand their business by offering high quality services or investing in unique and more expensive services (Wright et al., 1990). Based on Porter's typology, this condition is suitable for hospitals to pursue differentiation strategy. Finally, hospitals with a hybrid strategy successfully implement both cost-leadership and differentiation strategy, and consequently can benefit from the availability of resources in their environment. However, these hospitals may be more limited than differentiators in their ability to exploit available resources given their pursuit of a cost leadership strategy in some parts of their operations (Lapersonne et al., 2015; Wright et al., 1990). Therefore, we hypothesize:

H1a. Hospitals in more munificent environments are more likely to pursue a differentiation strategy compared to cost leadership and hybrid strategies.

H1b. Hospitals in more munificent environments are more likely to pursue a hybrid strategy compared to cost-leadership strategy.

A dynamic environment is characterized by rapid changes in the external environment that may introduce uncertainty around an organization and affect its strategy (Zajac & Shortell, 1989). In healthcare, those rapid changes refer to various market elements like changes in the unemployment rate, and changes in population (Menachemi,

Mazurenko, Kazley, Diana, & Ford, 2012). Prior research has shown that there is an association between dynamic environments and strategy of hospitals (Lamont et al., 1993; Zajac & Shortell, 1989).

Some studies have suggested that firms that pursue low cost or differentiation strategies may, especially in dynamic environment, be competitively vulnerable compared to firms with a hybrid strategy (Lapersonne et al., 2015; Wright et al., 1990). In a dynamic environment, if the hospital selects to compete only based on a low-cost strategy that is internally-oriented strategy, it may face challenges due to fast changes in the environment. In this situation, the ability to improve products or services, or to expand its marketing activities, may be limited. Therefore, hospitals that compete primarily on a low-cost strategy may not be successful in a dynamic environment. Similarly, a hospital that chooses to compete primarily by deploying a differentiation strategy may be vulnerable in a dynamic environment. For example, changes in demographic characteristics as well as economic conditions can affect demand for medical services, especially unique services that usually are more expensive (Feldstein, 2012). As a result, a dynamic environment can negatively affect the likelihood of pursuing a differentiation strategy. However, it is necessary to mention that differentiators are more externally oriented than cost-leaders, and they may be able to adopt better in a dynamic environment.

On the other hand, hospitals that compete based on a hybrid strategy have the advantages of both low-cost and differentiation strategy and they are more flexible than hospitals that only pursue a low-cost or differentiation strategy. Therefore, it is more likely that hospitals choose a hybrid strategy in a more dynamic environment. Thus:

H2a. Hospitals in more dynamic environments are more likely to pursue a hybrid strategy compared to cost-leadership and differentiation.

H2b. Hospitals in a more dynamic environments are more likely to pursue a differentiation strategy compared to a cost-leadership strategy.

Environmental complexity refers to the degree of heterogeneity (Dess & Beard, 1984). A heterogeneous environment contains diverse types and large number of entities that the organization needs to interact with to access critical resources. In healthcare, a complex environment refers to various market elements, such as Medicare Advantage penetration and competition. It is expected that firms operating in a complex environment need a more externally oriented strategy. According to Porter, differentiators are continuously monitoring their environment to explore new opportunities (Porter, 1980). However, firms with a cost leadership strategy are more internally oriented and they concentrate more on internal resources to maximize efficiency or minimize their costs. Lastly, firms with a hybrid strategy have the characteristics of both cost leadership and differentiation, and this strategy can be the choice of hospitals in more complex environment that may need a mix of strategies. Therefore:

H3a. Hospitals in more complex environments are more likely to pursue a hybrid strategy compared to cost-leadership and differentiation strategies.

H3b. Hospitals in more complex environments are more likely to pursue a differentiation strategy compared to cost-leadership strategy.

Organizational Characteristics and Hospital's Business Strategy Choice

Literature shows that hospital size, as measured by number of beds, and membership in a multihospital system can also be associated with hospital business strategy choice (Ginn & Young, 1992). The literature indicates that slack resources are a critical factor in examining the strategic choice of hospitals (Bigelow & Mahon, 1989). Size has been considered a measure of slack resources. The literature reports a positive association between size and greater provision of diversified alternative services (Shortell, Morrison, Hughes, Friedman, & Vitek, 1987). According to Porter's typology, differentiators provide more diverse services than hospitals with hybrid or cost-leadership strategies. Furthermore, hospitals with a hybrid strategy provide more diverse services than cost-leaders. As a result:

H4a. Larger hospitals are more likely to pursue differentiation strategy compared to cost-leadership strategy and hybrid strategy.

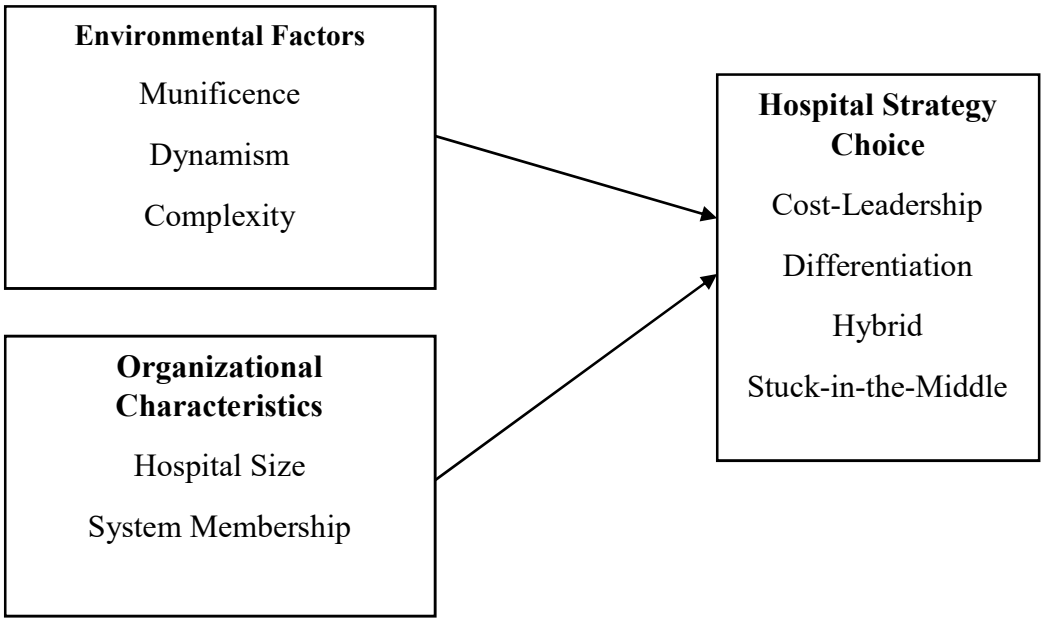
H4b. Larger hospitals are more likely to pursue hybrid strategy compared to cost-leadership strategy.

System membership has been considered to produce slack resources (Ruiz-Moreno, Garcia-Morales, & Llorens-Montes, 2008). Shortell et al. (1985) showed that hospitals which belong to a system are more likely than their counterparts to provide diversified alternative services. As mentioned before, differentiators provide more diverse services than hospitals with a hybrid or cost-leadership strategies. In addition, hospitals with a hybrid strategy provide more diverse services than cost-leaders. As a result:

H5a. Hospitals in a multisystem are more likely to pursue a differentiation strategy compared to cost-leadership and hybrid strategies.

H5b. Hospitals in a multisystem are more likely to pursue a hybrid strategy compared to cost-leadership strategy.

Figure 2. Conceptual Framework of the Antecedents of Hospitals' Business Strategy Choice



METHODOLOGY

Sample and Data Collection

We used longitudinal data from 2006 to 2016 of the US urban, general acute care hospitals. These years were selected because the health care environment of the US has experienced significant change (e.g. Affordable Care Act) during these years.

Data Sources

We used three secondary datasets in the study. First, the American Hospital Association (AHA) Annual Survey provided general hospital data including number of services, ownership, size, and teaching status. Second, Medicare Cost Reports provided the financial information including, revenue, income, and cost of hospitals. Third, the Area Health Resource File (AHRF) was included to capture environmental characteristics such as per capita income, population 65+, and unemployment. Observations across these three databases were matched using Medicare provider numbers (AHA to Cost report) and FIPS codes.

Study Population

The sample of this study was all urban general acute care hospitals in the United States. The reasoning was that, hospitals in urban areas face different environmental challenges compared to hospitals in rural areas (Trinh & O'connor, 2000). In addition, it is expected that general acute care hospitals perform differently compared to other specialty (e.g., long-term, psychiatric, substance-abuse, etc.) and government hospitals. The final sample size was an average of 2700 hospitals per year with 29,518 hospital-year observations.

Dependent Variable

In this study, the dependent variable represents the business strategy choice of hospitals. We used Porter's strategic group typology to define the business strategy of hospitals.

To implement Porter's approach and test hypotheses, we used three measures to capture the cost leadership dimension including total expenses to the number of beds occupied, total costs per patient day, and total salaries per patient day (Forte et al., 2000; Landry et al., 2010; Marlin et al., 2004). By dividing total expenses to the number of beds occupied, a hospital's expense based on its current level of business can be ascertained. Total cost and salary adjusted per patient day also express how efficiently internal finances are managed based on current business (Landry et al., 2010).

To operationalize differentiation, we used three measures: First, total number of services offered by a hospital was included to indicate each hospital's breadth of operations. Second, total number of high technology services offered (a cardiac catheterization laboratory, an extracorporeal lithotripter, magnetic resonance imaging, open heart surgery, and organ transplantation capability) by each hospital. A higher number of high technology services implies that hospitals are invested in these types of services to differentiate itself from rivals. Third, total number of rare services, with rare defined as a service offered by less than 25 percent of all the hospitals in the sample. This variable is important since it captures the services the hospital can use to differentiate itself.

To create composite scores of the cost leadership and differentiation measures, we first confirmed the unidimensionality of each construct through factor analysis. The factor analysis was conducted with varimax rotation (Lamont et al., 1993). The analysis yielded two factors with eigenvalues greater than 1. One factor included the three differentiation measures, and the other three cost-leadership measures. We standardized all the cost-leadership and differentiation measures to eliminate the effects of scale differences across measures (Hair et al., 1998). Finally, we summed up the cost-leadership measures to create a composite low-cost measure, and the differentiation measures to have a composite differentiation measure.

We used two-stage (hierarchical and non-hierarchical clustering) clustering procedure for grouping hospitals in strategic groups. A two-stage model is valuable because it increases the validity of cluster solutions (Kumar & Subramanian, 1997; Kumar et al., 1997; Lamont et al., 1993). This procedure first uses hierarchical clustering to determine the number of groups (i.e., Ward's method) and then a nonhierarchical clustering (i.e., K-means). The result of Ward's method showed that four group solution was a desired solution in each year as described in Paper 1. We were expecting to have four strategic groups including cost leaders, differentiators, stuck-in-the-middle and hybrid that align with the typology (Allen & Helms, 2006; Gopalakrishna & Subramanian, 2001; Marlin et al., 2002).

We used the standardized composite measures for cost-leadership and differentiation to cluster the hospitals using K-means clustering method. After performing the clustering, the four groups were labeled based on the mean score of cost leadership and differentiation composite measure/score. To accomplish this, first, we

ranked the four groups that resulted from the K-Means cluster analysis, based on their mean composite score of cost-leadership and mean composite score of differentiation. Second, we identified the group with the lowest cost composite score (1st in rank) and low differentiation score (e.g. 3rd of 4th in rank) as a "Cost-Leadership" group. We labeled "Differentiation" as the group with highest differentiation composite score mean (1st in the rank) and high cost leadership score mean (e.g. 3rd or 4th in rank). We identified "Stuck-in-the-middle" as the worst ranked in both cost-leadership and differentiation composite score means (sum of the two ranks). Finally, we identified "Hybrid" as a better ranked in both cost-leadership composite score and differentiation compared to stuck-in-the-middle (sum of the two ranks). In addition, hybrid have better differentiation scores than cost leaders, and lower costs than differentiators. (Please see table 1 for more details).

Table 1. Assigning Resulted Groups from Cluster Analysis to Strategic Groups (2016)

Cluster Groups	Cost-Leadership Composite Score (mean)	Cost Leadership Rank	Differentiation Composite Score (Mean)	Differentiation Rank	Identified Strategic Group
1	0.7856686	4	2.412101	1	Differentiation
2	-0.1403393	1	-0.0799171	3	Cost-Leadership
3	0.0306939	2	0.7303677	2	Hybrid
4	0.0535798	3	-0.9471238	4	Stuck-in-the-Middle

* The lowest score on cost leadership composite is ranked 1, while the highest score differentiation composite is ranked 1

Independent Variables

Environmental Variables: We operationalized environmental factors in three main categories including munificence, dynamism and complexity (Dess & Beard, 1984; Menachemi, Shin, Ford, & Yu, 2011; Miller, 1987). Measures of munificence (H1a, H1b) included per capita income, number of active physicians per 1000 population, and percent of population 65 years and older(Trinh & O'connor, 2002). Measures of dynamism (H2a, H2b) included moving average of percent change in county population for three years prior, and yearly change in county unemployment rate (Menachemi et al., 2011). Lastly, Medicare Advantage penetration and hospital competition (Herfindahl-Hirschman Index) were measures of complexity (H3a, H3b) (Justin Tan & Litsschert, 1994). (Table 2).

Organizational Characteristics: In this study, we used two organizational characteristics including size (H4a,H4b) (number of beds) and system membership (H5a,H5b) (1 if hospital is a system member, 0 if independent hospital) to analyze the effect of organizational characteristics on business strategy choice of acute care hospitals (Ginn & Young, 1992) (Table 2).

Control Variables

Literature has suggested that some organizational characteristics like Medicaid and Medicare payer mix, teaching status and ownership type may affect the strategy of hospitals (Ginn, 1990; Ginn & Young, 1992). As a result, we controlled for these variables (table 2).

Table 2: Dependent and Independent Variables Used in Analysis

Variables	Measure Definition	Format	Source
Strategic Group Membership	Porter's typology (cost-leadership, differentiation, hybrid, stuck-in-the-middle)	Categorical	AHA[1], CMS[2]
Munificence			
Percent of Population 65 Years and Older	Number of population 65 years and older in the county/total population in the county	Continuous	AHRF[3]
Number of Active Physicians Per 1000 Population	(Number of active physicians in the county/total number of physicians in the county) x 1000	Continuous	AHRF
Per Capita Income	Total household income in the county/ total population of the county	Continuous	AHRF
Dynamism			
Growth/Change in Population Rate	Current population in the county-population compared to last year in the county/current population in the county*100	Continuous	AHRF
Change in County Unemployment Rate	Number of unemployment individuals in the current year – number of unemployment individuals last year/ number of unemployment individuals in the current year *100	Continuous	AHRF
Complexity			
Herfindahl-Hirschman Index (HHI)	Sum of the Squares of hospital market shares (inpatient days) in a Hospital service area (HSA) as defined by the Dartmouth Atlas	Continuous	AHA
Medicare Advantage (MA) Penetration	Total number enrolled in an MA plan/ total number of Medicare beneficiaries	Continuous	AHA
Organizational Characteristics			
Hospital Size	Number of hospital beds	Continuous	AHA
System Affiliation	1 If a hospital is a member of a system, 0 if non-affiliated	Binary	AHA
Control Variables			
Ownership	1 if Not-for-profit, 0 if for profit	Binary	AHA
Teaching Status	1 if teaching, 0 if non-teaching		AHA

Medicare Payer Mix	Proportion of Medicare patients	Continuous	AHA
Medicaid Payer Mix	Proportion of Medicaid patients		AHA

1. American Hospital Association (AHA) Annual Survey
2. Centers for Medicare and Medicaid Services
3. Area Health Resource File

Analysis

The unit of analysis was the hospital-year. The dependent variable was the business strategy choice of hospitals that included four categories: cost-leadership, differentiation, hybrid, and stuck-in-the-middle. Hausman's Specification Test showed the assumption of independence of irrelevant alternatives was established (independence of irrelevant alternatives is not rejected) (Long, Long, & Freese, 2006; Starkweather & Moske, 2011). Therefore, we used a multinomial regression model with generalized estimating equation to analyze the data with time and state fixed effect to control for time invariant, unobserved state-level factors that may affect business strategy of hospitals. Rather than modeling the within-subject covariance structure, GEE treats it as a nuisance and simply models the mean response (Diggle et al., 1994). The independent and control variables included environmental and organizational characteristics. We used the SAS 9.4 and Stata 14 for data management and data analysis. The findings are reported in descriptive and analytical tables. Odds ratios are reported for the multinomial regression results, and significance is established at p-value < 0.05. Following is the proposed equation model:

$$Ln \Pr\frac{(Yi=k-1)}{\Pr(Yi=k)} = \beta_0 + \beta_1 (\textit{Percent of population 65 years of age and older}_{it}) + \beta_2 (\textit{Number of active physicians per 1000 population}_{it}) + \beta_3 (\textit{Per capita Income}_{it}) + \beta_4$$

$(Growth\ in\ Population_{it}) + \beta_5 (County\ unemployment\ rate_{it}) + \beta_6 (Herfindahl\text{-}Hirschman\ Index_{it}) + \beta_7 (Medicare\ Advantage\ penetration_{it}) + \beta_8 (Size_{it}) + \beta_9 (Chain\ Affiliation_{it}) + \beta_{10} (Ownership_{it}) + \beta 11 (Teaching\ status) + \beta_{12} (Medicaid\ Payer\ Mix_{it}) + \beta_{13} (Medicare\ Payer\ Mix_{it}) + \beta_{14} (Year\ Dummy\ Variables_{it}) + ų (State_{it}) + \varepsilon$

Where:

Yi is the categorical outcome (dependent variable), which can take on one of K possible values. In this study Yi is the business strategy choice of hospitals that can have 4 possible values. In this model, we tested both environmental and organizational antecedents.

RESULTS

Table 3 presents the means and standard deviation for continuous variables, and frequencies for categorical variables in 2016. Analysis of variance and chi square tests were used to test for significant differences by the four strategy dimensions. We found significant differences across four strategic groups in all dependent and independent variables except HHI, suggesting that the cluster analyses produced distinct clusters. As it shown in Table 3, hospitals in the differentiation group are in counties with the lowest percent of older adults' population (12.58 percent). On the other hand, hospitals in the stuck-in-the-middle are in the counties with highest percent of older adults' population (14.42 percent). Differentiator hospitals are in counties with the highest number of active physicians and per capita income. In contrast, hospitals in the stuck-in-the-middle strategic group have the lowest number of active physicians and per capita income in their counties. In terms of the growth in population, hospitals in the cost-leadership group are in counties with highest population growth, and hybrids are in the counties with

lowest growth of population. In terms of organizational characteristics, hybrids have the highest (1.29) operating margin, and the stuck-in-the-middle group has the lowest (-0.46) operating margin. In terms of teaching status, about 99 percent of hospitals in the cost-leadership group are in non-teaching category. On the other hand, about 78 hospitals in the differentiation group are teaching hospitals. Hospitals in the differentiation group are the largest hospitals with the average size of 370 beds. On the other hand, hospitals in the stuck-in-the-middle group are the smallest with the average size of 152 beds.

Table 3. Descriptive Analyses of Dependent and Independent Variables (2016)

Variable	Strategic Group Membership				
	Cost-Leadership	Differentiation	Hybrid	Stuck-in-the-Middle	P Value
Environmental Characteristics					
Percent of population 65+(M/SD)	14.22 (3.87)	12.58 (2.14)	13.71 (3.17)	14.42 (3.78)	P= 0.001
Number of Active Physicians	6.39 (1.91)	8.21 (.94)	7.14 (1.59)	5.10 (2.24)	P= 0.001
Per Capita Income(M/SD)	40598.3 (11056.6)	48769.23 (17599.6)	42826.87 (12497.8)	38751.06 (10259)	P= 0.001
Growth in Population	32.25 (10.82)	29.91 (12.15)	17.96 (10.98)	20.27 (73.75)	P= 0.033
Change in Unemployment rate(M/SD)	6.86 (2.69)	6.56 (2.36)	6.58 (2.42)	7.18 (2.97)	P= 0.001
Herfindahl-Hirschman Index (HHI) (M/SD)	0.68 (.34)	0.43 (.33)	0.60 (.34)	0.73 (.33)	P= 0.27
Medicare Advantage Penetration	31.33 (14.16)	34.21 (12.85)	30.05 (13.83)	29.95 (16.02)	P= 0.019
Organizational Characteristics					
Hospital Size (M/SD)	188.82 (177.85)	370.24 (325.19)	257.84 (194.44)	152.12 (171.92)	P= 0.001
System Affiliation (N/ %)					
1 System affiliated	793 (77.37)	93 (86.11)	555 (81.14)	516 (72.98)	P=0.0002
0 Independent	232 (22.63)	15 (13.89)	129 (18.86)	191 (27.02)	
Control Variables					
Ownership (N/ %)					
1 Not-for-profit	763 (74.44)	103 (95.37)	591 (86.40)	509 (71.99)	P= 0.001
0 For-Profit	262 (25.56)	5 (4.63)	93 (13.60)	198 (28.01)	

Teaching Status (N/ %)					
1 Teaching	10 (0.98)	84 (77.78)	70 (10.23)	0	P= 0.001
0 Non-Teaching)	1,015(99.02)	24 (22.22)	614 (89.77)	707 (100)	
Medicare Payer Mix (M/SD)	43.40 (23.10)	41.02 (19.84)	44.31(20.81)	43.66 (24.58)	P= 0.003
Medicaid Payer Mix (M/SD)	15.50 (14.10)	17.37 (13.28)	15.96 (12.41)	14.92 (14.18)	P= 0.001

Tables 4 and 5 present the results of the multinomial regression analysis. Hypothesis 1a states that hospitals in more munificent environments are more likely to pursue a differentiation strategy compared to cost leadership and hybrid strategies. We used three variables to operationalize munificence: number of active physicians, per capita income, and population 65 years and older. There was partial support for hypothesis 1a, with the results showing that hospitals located in counties with an additional active physician per 1000 population were associated with 13% greater odds of pursuing differentiation compared to a hybrid strategy higher ($p<0.1$) (Table 4). In addition, an increase in the number of active physicians, reduces the odds of pursuing a cost-leadership strategy by 24 percent compared to a differentiation strategy (table 5). In terms of per capita income, the results did not show any significant differences in likelihood of pursuing differentiation strategy over hybrid and cost-leadership strategies (Table 4 and 5). Finally, the results showed that an increase of one percent of population 65 years and older, reduces the odds of pursuing a differentiation strategy by 13 percent compared to the odds of pursing a hybrid strategy (Table 4). Moreover, an increase of one percent of population 65^{+} and older, increases the odds of pursing cost-leadership strategy by 14 percent compared to a differentiation strategy (Table 5). Thus, contrary to

our expectation, the findings showed reverse association between change in population 65^{+} and pursuing differentiation strategy versus hybrid and cost-leadership strategies.

Hypothesis 1b posits that hospitals in more munificent environments are more likely to pursue a hybrid strategy compared to cost-leadership strategy. There was partial support for hypothesis 1b. The results showed that by increasing one active physician per 1000 population in the county, the odds of pursuing cost-leadership strategy are decreased by 14 percent compared to hybrid strategy (table 4). On the other hand, the analyses did not show any significant differences in the likelihood of pursuing specific strategy (hybrid, cost leadership and differentiation) for per capita income or percent of population 65^{+} years (Table 4).

Hypothesis 2a suggests that hospitals in more dynamic environments are more likely to pursue a hybrid strategy compared to cost-leadership and differentiation. We had two variables to operationalize the dynamic environment; change in population and change in unemployment rate in a county. There was partial support for our hypothesis. The change in unemployment was associated with strategy as predicted. An increase of one percent in the unemployment rate decreases the odds of pursuing differentiation strategy by 4 percent compared to hybrid strategy (Table 4). In addition, the findings showed that a one percent increase in the unemployment rate, reduces the odds of pursuing cost-leadership strategy 3 percent versus the odds of pursuing hybrid strategy (Table 4). The results of analysis did not show any significant differences on the likelihood of using a specific strategy by change in population (Table 4).

Hypothesis 2b posits that hospitals in more dynamic environments are more likely to pursue a differentiation strategy compared to cost-leadership strategy. There was no

support for hypothesis 2b. As it shown in Table 5, there was no significant difference between pursuing cost-leadership and differentiation strategies by change in population or unemployment rate.

According to hypothesis 3a, hospitals in more complex environments are more likely to pursue a hybrid strategy compared to cost-leadership and differentiation strategies. We used two variables to measure the complexity of environment: higher competition (lower HHI) and higher rate of Medicare advantage penetration are related to more complexity in the environment. There was partial support for the hypothesis. A one unit increase in HHI (less competition) increases the odds of using a cost-leadership strategy by 34 percent compared to the odds of adopting a hybrid strategy (Table 4). However, there was no significant difference between HHI and the likelihood of pursuing hybrid versus differentiation strategies (Table 4). In addition, the findings related to the relationship between Medicare Advantage penetration and the likelihood of pursuing a specific strategy showed a reverse effect compared to our hypothesis. In fact, one unit increase in Medicare Advantage penetration is related to one percent increase in the odds of pursuing a cost-leadership strategy compared to a hybrid strategy (table 4). Moreover, one unit increase in Medicare advantage penetration increases the odds of pursuing cost-leadership strategy by 1 percent compared to the odds of pursuing the differentiation strategy (table 5).

According to hypothesis 3b, hospitals in more complex environments are more likely to pursue a differentiation strategy compared to a cost-leadership strategy. There was no support for hypothesis 3b. There was no significant association between

environment complexity and the likelihood of pursuing cost-leadership versus a differentiation (table 5).

Hypothesis 4a states that larger hospitals are more likely to pursue differentiation strategy compared to cost-leadership strategy and hybrid strategy. We used the number of beds to operationalize the hospitals size. The result showed that, one additional bed is associated with 1 percent increase in the odds of pursuing a differentiation strategy compared to cost-leadership and hybrid strategies (Table 5). Therefore, the results supported our hypothesis.

Hypothesis 4b indicates that larger hospitals are more likely to pursue hybrid strategy compared to cost-leadership strategy. The findings showed that one additional hospital bed is associated with 1 percent increase in the odds of using hybrid strategy compared to cost-leadership strategy (table 4). Thus, the results supported our hypothesis.

Hypothesis 5a states that hospitals in a multisystem are more likely to pursue a differentiation strategy compared to cost-leadership and hybrid strategies. The result showed a reverse relationship to our hypothesis. System membership increases the likelihood of pursuing a cost-leadership strategy by 25 percent compared to differentiation strategy. However, this relationship is significant in the 90 percent confidence (Table 5).

Hypothesis 5b posits that hospitals in a multisystem are more likely to pursue a hybrid strategy compared to cost-leadership strategy. There is no significant association between being a part of multisystem and pursuing a hybrid strategy versus cost-leadership strategy. The results did not support this hypothesis.

Table 4. Multinomial Regression of Factors Associated with the Strategy Choice of Hospitals* (N= 29,518)

Variable	Cost-leadership OR (95% CI)	Differentiation OR (95% CI)	Stuck-in-the middle OR (95% CI)
Munificence			
Number of Active Physicians per 1000 Population	0.86*** (-0.1858, -0.1015)	1.13* (0.2680, 0.0141)	0.73*** (-0.3684, -0.2687)
Per Capita Income	1.00 (-0.0039, 0.0090)	1.00 (-0.0167, 0.01190)	1.00 (-0.0026, 0.0112,
Population 65+	1.00 (-0.0024, 0.0070)	0.87*** (-0.2040, -0.0611)	0.99 (-0.0302, 0.0079)
Dynamism			
Change in Population Size	1.00 (-0.001, 0.001)	1.00 (0.0000, 0.001)	0.99*** (0.0000, 0.001)
Change in Unemployment Rate	0.971*** (-0.0416, -0.0165)	0.96*** (-0.0106, -0.0604)	1.03*** (0.0177, 0.0443)
Complexity Herfindahl-Hirschman Index (HHI)	1.34*** (0.1136-0.4792)	0.99 (-0.4637, 0.4810)	1.12 (-0.0846, 0.3096)
Medicare Advantage Penetration	1.01*** (0.0084, 0.0181)	1.01** (0.0002, 0.0261)	0.99*** (-0.0047, -0.0012)
Organizational Characteristics			
Hospital Size	0.99*** (-0.0015, -0.0009)	1.01** (0.001, 0.0009)	0.99*** (-0.0024, -0.0017)
System Affiliation 1 if Affiliated to System	1.03 (-0.0622, 0.1341)	0.83 (-0.4195, 0.0457)	1.00 (-0.1108, 0.1050)
Control Variables			
Medicare Payer Mix	.98*** (-0.0041, -0.0007)	.97 (-0.0070, 0.0027)	.99*** (-0.0047, -0.0012)
Medicaid Payer Mix	1.03*** (0.0030, 0.0088)	.97 (-0.0141, 0.0019)	1.01*** (0.0015, 0.0079)
Ownership 1 if Not-for-profit	0.39*** (-1.0808, -0.7545)	2.05* (-0.0413, 1.4789)	0.36*** (-1.1863, -0.8254)

Teaching Status 1 if Teaching	0.14*** (-2.3616, -1.4864)	2.58*** (2.8789, 3.6254)	0.27*** (-1.4787, -1.1211)

*** p<0.01, ** p<0.05, * p<0.1
*Reference group=Hybrid

Table 5. Multinomial Regression of Factors Associated with the Strategy Choice of Hospitals* (N= 29,518)

Variable	Cost-leadership OR (95% CI)	Hybrid OR (95% CI)	Stuck-in-the middle OR (95% CI)
Munificence			
Number of Active Physicians per 1000 Population	0.76*** (-0.4129, -0.1282)	0.87* (-0.0141, -0.2680,)	0.64*** (-0.5904, -0.3006)
Per Capita Income	1.00 (-0.0148, 0.0151)	1.00 (-0.01190, 0.0167)	1.00 (-0.0135, 0.0172)
Population 65+	1.14*** (0.0623, 0.2051)	1.13*** (0.061, 0.2040)	1.13*** (0.0500, 0.1928)
Dynamism			
Change in Population Size	1 (-0.0000- 0.0000)	1 (0.0000, 0.0000)	1.01*** (0.0000, 0.0000)
Change in Unemployment Rate	1.00 (-0.0200, 0.0330)	1.04*** (0.0604,0.0106)	1.06*** (0.0395, 0.0936)
Complexity			
Herfindahl-Hirschman Index (HHI)	1.35 (-0.1822, 0.7923)	1.01 (-0.4810, 0.4637)	1.13 (-0.3700, 0.6123)
Medicare Advantage Penetration	1.00 (-0.0132, 0.0134)	.99** (-0.0261, -0.0002)	1.00 (-0.0088, 0.0179)
Organizational Characteristics			
Hospital Size	0.99*** (-0.0022, -0.0012)	.99** (-0.0009, -0.0004)	0.99*** (-0.0030, -0.0019)
System Affiliation 1 if Affiliated to System	1.25* (-0.0174, 0.4632)	1.17 (-0.0457, 0.4195)	1.21 (-0.0604, 0.4285)
Control Variables			
Medicare Payer Mix	0.99 (-0.0051, 0.0046)	1.03 (-0.0027, 0.0070)	.97 (-0.0057, 0.0041)

Medicaid Payer Mix	1.02** (0.0038, 0.0202)	1.03 (-0.0019, 0.0141)	1.1** (0.0025, 0.0191)
Ownership 1 if Non-Profit	0.19*** (-2.4034, -0.8693)	0.48* (-1.4789, 0.0413)	0.17*** (-2.4926, -0.9566)
Teaching Status 1 if Teaching	0.05*** (-5.7202, -4.6321)	0.38*** (-3.6254, -2.8789)	0.01*** (-4.9596, -4.1444)

*** p<0.01, ** p<0.05, * p<0.1
*Reference group= differentiation

DISCUSSION

This study used Porter's typology to examine a hospital's business strategy choice in relation to several environmental and organizational variables. The results suggest that: a) environmental and organizational factors can predict the likelihood of pursuing a specific business strategy; b) a higher number of physicians in the county increases the likelihood of pursuing differentiation and hybrid strategy; c) more population 65+ years increases the likelihood of pursuing cost-leadership strategy compared to differentiation strategy; d) an increase in the unemployment rate decreases the likelihood of pursuing differentiation and cost-leadership strategies versus the hybrid strategy; e) less competition (higher HHI) increases the likelihood of pursuing cost-leadership over hybrid strategy; f) larger hospitals are more likely to pursue a differentiation strategy over hybrid, and hybrid over cost-leadership strategy. The implications of these findings are discussed below.

First, the environmental and organizational factors like number of active physicians, population 65+, change in population growth, change in unemployment, HHI, Medicare Advantage penetration, hospital size, and system affiliation predict the likelihood of pursuing a specific business strategy. the findings of current study are

consistent with findings of other studies particularly in organizational factors (Bigelow & Mahon, 1989; Ginn & Young, 1992).

Second, a greater number of physicians in the county increases the likelihood of pursuing differentiation and hybrid strategy. Availability of physician in the market can provide a necessary buffer to the hospitals in the form of financial and professional slack that will help organizations facilitate growth (Andrews & Johansen, 2012). In such environment, hospitals can expand their services by offering high quality services or investing in unique and rarer services that require physicians as one of the critical resources. As a result, hospitals may pursue a differentiation strategy when more physicians are available in their market.

Third, more population 65 years and over increases the likelihood of pursuing cost-leadership strategy. Although, it has been argued that higher number of elderly population increases the demand for hospitals care and that can be a sign of munificence in the market (Strunk, Ginsburg, & Banker, 2006), our results did not support this premise. One reason could be the type of health insurance and their reimbursement rates. Since the population 65 or older is more likely to have Medicare or Medicaid, and these payers have lower reimbursement rates compared to private insurers (Cunningham, Rudowitz, Young, Garfield, & Foutz, 2016; Ryan, Burgess Jr, Pesko, Borden, & Dimick, 2015), this may force hospitals to adopt a cost-leadership strategy. More specifically, the lower reimbursement rates of Medicare and Medicaid may force hospitals to apply containment strategies, improve efficiency of operations, minimize administrative costs, and ultimately pursue cost-leadership strategy.

Fourth, an increase in the unemployment rate decreases the likelihood of pursuing differentiation and cost-leadership strategies versus the hybrid strategy. As mentioned before, a dynamic environment is characterized by rapid changes in the external environment, which may introduce uncertainty in an organization and affect its strategy (Zajac & Shortell, 1989). Since hybrid strategy is more flexible than differentiation and cost-leadership strategies, hospitals may prefer to adopt this strategy when changes in the unemployment rate are incurring.

Fifth, higher HHI (less competition) increases the likelihood of pursuing cost-leadership over hybrid strategy. This finding was aligned with our hypothesis. It has been theorized that cost leadership strategies are appropriate in stable and predictable environments (Hambrick, 1988; Lamont et al., 1993). Hospitals that pursue a strategy of cost leadership are required to become the lowest-cost producers in an industry. They must devote more effort to cost control so that above average returns can be maintained. A cost leadership strategy is most effective in stable and predictable environments, since environments that are unpredictable or subject to much change will create severe diseconomies for organizations trying to pursue a cost leadership strategy (Lamont et al., 1993; Miller, 1987). Higher HHI means less competition in the environment and more stability. In this environment, hospitals tend to pursue cost-leadership strategy compared to other strategies.

Sixth, larger hospitals are more likely to pursue a differentiation strategy over a hybrid strategy, and hybrid strategy over cost-leadership strategy. With respect to hospital size, the results provide support for other researchers' contention that organizational resources are an important determinant of a hospital's business strategy

choice (Ginn & Young, 1992). Although it seems that organizational resources like hospital beds facilitate the selection of proactive or externally oriented strategies including differentiation and hybrid, it is possible that the pursuit of proactive strategies results in accretion of organizational resources. However, the result is consistent with earlier research (Ginn & Young, 1992; Shortell et al., 1987).

In this study, we only investigated the effect of different environmental and organizational factors on the likelihood of pursuing specific strategies. However, one main question remains unanswered: Is there any difference among the viability of business strategies in different environments? This question can be answered by examining the effect of different environmental factors on the viability of each strategy. Moreover, we did not find strong association between system affiliation and the likelihood of selecting a specific strategy, suggesting that interorganizational linkage strategies like mergers, acquisitions, and joint ventures may not influence the strategy of hospitals. However, future research comparing strategies of hospitals before and after getting involved in interorganizational linkage strategies may provide further insights.

MANAGERIAL IMPLICATIONS

Study results have implications for the future structure of hospital industry. During the last 10 years, hospitals have selected internally oriented strategy (cost-leadership) rather than externally oriented strategies. The main reason could be the financial pressure that hospitals have faced with some challenges like economic recession, low reimbursement rates from Medicaid and Medicare, excessive administrative costs, reduced demand for hospital care, market competition, and staff shortages (Dunn et al., 2009; Goldstein et al., 2002; Topaloglu et al., 2018). These factors

may force hospitals to focus on their internal procedures and pursue a cost-leadership strategy. Hospitals administrators should be aware about their environment and internal capabilities while developing their strategy. For example, the results of this study suggest that large hospitals tend to pursue proactive or externally oriented strategies. Moreover, hospitals that operate in more dynamic, munificent, and complex environments tend to pursue externally oriented strategies, like differentiation or hybrid strategies. Although, it is very important for hospitals managers to understand their internal and external environment when they develop their competitive strategies, they need to have performance measures that clearly indicates the effectiveness of hospitals strategy.

LIMITATIONS

The main limitation of this study was using secondary dataset. Inherent to the nature of the secondary data, the available data are not collected to address the specific research question or to test certain hypotheses. Using secondary data also has other limitations including missing values, limited number of variables, and retrospective nature of dataset.

CONCLUSION

This study focused on the association between the hospital business strategy and some organizational and environmental factors. Business strategy or business strategy choice of hospitals was assessed using Porter's typology. RDT was used to explain the associations between organizational and environmental factors with hospital business strategy choice. The result showed the importance of environmental and organizational

factors on predicting the strategy choice of hospitals. The result of this study may be useful for researchers as well as managers of hospitals.

THE MODERATING EFFECT OF ENVIRONMENTAL INSTABILITY ON HOSPITAL STRATEGY-FINANCIAL PERFORMANCE RELATIONSHIP

ABSTRACT

Background: The health care industry is facing constant change and pressures from health care reform; demanding consumers; new expensive forms of treatment; and an ever-growing presence of health care providers. One of the main arguments in the strategy management literature is that the appropriateness of a hospital's strategy can be determined as a fit between environmental contingencies and hospital strategy.

Objective: This study aimed to examine whether or not Porter's typology of cost leadership, differentiation, and hybrid are equally viable in different environments of the hospital industry.

Methods: In this study we used longitudinal data of 2006 to 2016 of the US urban, general acute care hospitals. Three secondary datasets were used: the American Hospital Association (AHA) Annual Survey, Medicare cost reports (CMS), and Area Health Resource File (AHRF). Multiple regression model with an interaction term was used to analyze data.

Result and Discussion: Cost-leaders are in the most stable environment and differentiators on the other hand are in the most unstable environment. Cost leaders outperform hybrids in an unstable environment compared to stable environment. However, there was no performance difference between the cost-leaders versus differentiators, and hybrids versus differentiators in stable and unstable environment. More research using other variables for environmental instability needs to be conducted.

INTRODUCTION

The strategy of a firm is a way in which it pursues its goals given the opportunities and threats in the environment (Rue & Holland, 1989). An effective strategy provides sustainable competitive advantage to a firm resulting in superior performance (Porter, 1980). Nonetheless, this goal may only be achieved if the strategy fits appropriately with the firm's external environment (Nandakumar, Ghobadian, & O'Regan, 2010).

One of the main arguments in the strategic management literature is that the appropriateness of a firm's strategy can be determined by its fit with environmental contingencies (Roley, 2006; Zajac, Kraatz, & Bresser, 2000). Strategic fit has been defined as to how an organization's strategy combines or matches together with its environment, to impact firm performance. Strategic fit is a core concept in the strategy formulation, and the pursuit of fit strategy with external environment has typically been regarded as having desirable performance (Lamont et al., 1993).

There is the idea of equally viable strategies across different environments, versus the notion of particularly appropriate environment-strategy combinations (Zajac & Shortell, 1989). On the one hand, generic strategy typologies (Miles et al., 1978; Porter, 1980) have assumed that despite differences in the environment, various strategies are viable across different environments. On the other hand, contingency theorists suggest that performance is contingent on the match between strategy and environment (Burns & Stalker, 1981; Dess, Ireland, & Hitt, 1990; Kim & Lim, 1988). As such, the core debate is whether strategy development is only organizationally determined, or are environmental factors important as well (Astley & Van de Ven, 1983). If strategy development is

affected by environmental factors, then it is expected that firms with appropriate strategy-environment combinations may exhibit higher performance.

The notion of an appropriate strategy-environment fit and its impact on hospital financial performance is an important area of study. Environmental factors may alter an industry and change the bases of competition (Lamont et al., 1993), resulting in inappropriate combinations of strategy and environment. This has been the case in the hospital industry where environmental changes like the Patient Protection and Affordable Care Act (Obama, 2016), the emergence of new technologies, change in consumer expectations, and new sources of competition have contributed to the hospital industry's environment becoming more unstable (Al-Amin & Housman, 2012; Alcalá et al., 2017; Apenteng et al., 2015).

While the notion of an appropriate strategy-environment fit has received substantial attention in other industries, there is a dearth of research in the hospital setting (Lamont et al., 1993; Marlin et al., 1994; Zajac & Shortell, 1989). The literature indicates that environmental contingencies such as regulations, market structure, unemployment rate, income, competition, wage index, number of physicians per capita, and population 65 years and older can change the strategy of hospitals, and ultimately affect hospital financial performance (Goes & Meyer, 1990; Nurettin Oner, 2016; Short et al., 2002). Moreover, a considerable number of empirical studies have examined the relationship between business-level strategy and hospital performance (Kumar & Subramanian, 1997; Lamont et al., 1993; Marlin et al., 2002; Short et al., 2002). However, none of them has examined how environmental factors may affect the strategy-financial performance relationship.

The type of fit has been analyzed by previous researchers in different ways such as fit as co-variation, fit as mediation, fit as matching, fit as moderation, fit as Gestalts, and fit as profile deviations (Nandakumar et al., 2010; Prescott, 1986). In this study we examined the nature of fit between strategy and environment using fit as moderation perspective as it is broadly used in the strategic management literature (Matthews & Scott, 1995; Nandakumar et al., 2010; Prescott, 1986; Venkatraman, 1989). In this study, Porter's (1980) strategic group typology was used to define hospital strategy.

This study aimed to examine whether or not Porter's (1980) typology of cost leadership, differentiation, hybrid and stuck-in-the-middle strategies equally affect financial performance, or if they perform differently in various environmental conditions. Furthermore, we explored whether hospitals with appropriate strategy- environment combinations exhibit higher performance than other hospitals.

In the remaining sections of this paper, we present the conceptual model, corresponding hypotheses, research methodology, data analysis, results, discussion and potential limitations. In the next section we introduce the conceptual framework on the basis of contingency theory and Porter's typology, which were used in developing the hypotheses.

Conceptual Framework: Contingency Theory, Porter's strategic group typology and hypotheses

Structural contingency theory has been widely considered a way to understand the fit between organization and its external environment. In a contingency perspective, it is presumed that "contingency variables" referring to any contextual variables have

association with organizational structure and consequent performance (Drazin & Van de Ven, 1985; Murray, 1988; Young, Beekun, & Ginn, 1992). A central assumption of this theory in strategic management is that firms pursue different strategies in response to multiple contingencies, and when the firm's strategy fits with external contingencies, it results in superior performance. Therefore, with this perspective, a firm is viewed as a reactive body that seeks to respond to environmental contingencies strategically. Moreover, contingency theory assumes that the performance differences observed in firms are a result of different reactions to environmental contingency factors, such as market competition, consumer expectation, demographic changes, technology, policies, etc. (Donaldson, 2001; Fry & Smith, 1987; Van de Ven & Drazin, 1984).

According to Van de Ven & Drazin (1985), there are three different conceptual approaches related to the structural contingency theory including selection, interaction, and systems approach. The interaction approach emphasizes on explaining variations in organizational performance from joint influence of organizational structure and context (Drazin & Van de Ven, 1985). This approach explains how organization's performance is influenced by an interaction between context and organizational design. The selection approach on the other hand, is more about the relationship between context and organizational structure. In fact, the selection approach focuses on investigating how organizations select certain organizational structures given different contexts. Lastly, differing from these two approaches that tend to put an emphasis on a singular dimension of relationships among contextual factors, organizational structural factors, and performance, the systems approach considers multiple contingencies simultaneously to explain variances in performance (Drazin & Van de Ven, 1985). As mentioned before,

we used the interaction approach to study the effect of environmental factors on hospital strategy-financial performance relationship. Structural contingency theory with an emphasis on the interaction approach is a preferred theoretical framework for guiding this research for two main reasons. First, the theory highlights the adaptive nature of an organization strategy to environmental contingencies. Second, the interaction approach emphasizes on the moderation effect of context the organizational structure-performance relationship (Drazin & Van de Ven, 1985).

Porter's generic strategy typology describes how an organization may pursue competitive advantage across its market. Cost leadership and differentiation are two main or pure generic strategies. According to this typology, cost leaders emphasize minimizing costs related to administrative overhead, marketing, research and development, and sales related activities, in addition to emphasizing efficient ways to operate (Ketchen & Short, 2015; Kumar et al., 1997; Porter, 1980). Differentiators, on the other hand, attempt to produce the products or services in a unique way. Firms with unique products or services can command a higher price than competitors to justify for the higher costs of producing unique product or services. (Porter, 1989, 2008).

Porter posits that the benefits of optimizing a firm's strategy cannot be gained if a firm is simultaneously pursuing more than one generic strategy. Thus, successful organizations should exclusively compete on one of the two specific generic strategies. Firms that are not completely committed to one of the two generic strategies (cost leadership or differentiation) are referred to as "stuck-in-the-middle." (Porter, 1980, 1989). While there is limited research that supports Porter's view, some researchers argue that differentiation and cost leadership are indeed dimensions along which firms can

score low and high (Kumar et al., 2001). Therefore, the researchers have suggested another strategy, usually known as a hybrid strategy. The hybrid strategy can be seen when a firm successfully and simultaneously pursue both the cost leadership and differentiation strategies (Goes & Meyer, 1990; Ketchen et al., 1993; Lamont et al., 1993).

As mentioned before, there are two school of thoughts regarding the idea of equally viable generic strategies versus the notion of particularly appropriate environment-strategy combinations (Zajac & Shortell, 1989). Porter's framework (Miles et al., 1978; Porter, 1980) implies that generic strategies of cost leadership and differentiation may be equally viable across different environments. However, the literature has shown contradictory results respect to the association between strategy and hospitals financial performance (Kumar & Subramanian, 1997; Kumar et al., 1997; Lamont et al., 1993; Marlin et al., 1994). These researchers have discussed the potential moderating effect of environmental factors on the strategy-financial performance relationship, but they have not investigated it empirically. The potential effect of environmental factors on strategy-financial performance relationship is originated in contingency theory and it suggests the existence of match or fit between strategy and environmental contingencies. The fit between environment and strategy may lead to desired financial performance in the hospital context (Burns & Stalker, 1981; Dess et al., 1990; Kim & Lim, 1988).

Contingency theory suggests that key strategic requirements vary depending upon environmental conditions (Prescott, 1986). In fact, there should be a match between environment and hospital strategy (Lamont et al., 1993). For instance, hospitals with cost

leadership strategy are assumed to perform efficiently in stable or predictable environments compared to unstable or unpredictable environments. Hospitals with a cost-leadership strategy are more internally-oriented and they usually focus on improving the efficiency of their operations through internal resources. In stable environments, hospitals with a cost-leadership strategy do not need to invest as much on marketing, research and development or offering new services (Kumar et al., 1997; Marlin et al., 1994). Since these hospitals are more internally oriented, they are better able to focus on how to control and minimize their costs and maximize their profit and eventually improve their financial performance in a stable environment compared to unstable environment.

On the other hand, differentiators are more externally-oriented and they may perform financially well in unstable environments because of their ability to insulate the hospital from costly price competition (Marlin et al., 2004). In an unstable environment, hospitals need to invest more on new services, marketing and research to keep track of rapid changes in the environment and also maintain their existing market share or increase their market share and ultimately improve their financial performance (Marlin et al., 2004; D. Marlin, J. W. Huonker, & M. Sun, 2002). Therefore, the relationship between hospital strategic group membership and financial performance is expected to be moderated by environmental instability such that:

H1. Hospitals with a cost leadership strategy have a better financial performance than differentiators in more stable environments compared to unstable environments.

H2. Hospitals with a differentiator strategy have a better financial performance than cost leaders in more unstable environments compared to stable environments.

Hospitals with a cost leadership strategy are more internally-oriented than hybrids and they try to gain competitive advantage mainly by focusing on using internal resources efficiently (Kumar & Subramanian, 1997; Porter, 1980). Hospitals with a hybrid strategy on the other hand, pursue both cost leadership and differentiation strategies at the same time (Kumar et al., 1997). Hospitals that are pursuing a hybrid strategy have the advantages of a cost leadership strategy like controlling costs and lowering the price of services (Wright et al., 1990). In addition, hybrids pursue differentiation strategy in some of their functional areas (Kumar & Subramanian, 1997). Pursuing differentiation strategy makes these hospitals to be more externally-oriented than cost leaders. As a result, in an unstable environment, hospitals with a hybrid strategy may have advantages over cost leaders due to their ability of predicting environmental instability better than hospitals only pursuing cost leadership strategy. In an unstable environment, due to frequent changes in environment, it is very crucial to match the strategy of hospital with environmental changes. Pursuing a differentiation strategy beside cost leadership strategy may provide the advantage for hospitals with a hybrid strategy over cost leaders. As a result:

H3. Hospitals with hybrid strategy have better financial performance than hospitals with a cost-leadership strategy in an unstable environment compared to stable environment.

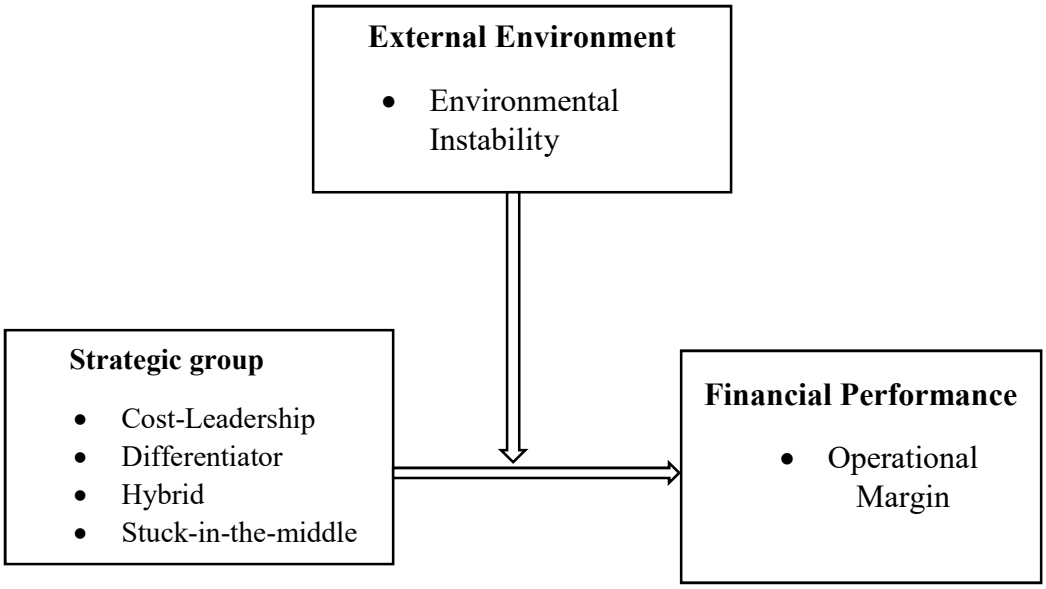
As mentioned before, hospitals with a differentiation strategy can perform better than cost leaders in unstable environments, because they are more proactive in such environments due to their externally oriented nature, with more investments in marketing, R&D, quality, customer service. Differentiators can also predict environmental changes more effectively the other strategies (Kumar & Subramanian, 1997). Hospitals with a

hybrid strategy also enjoy these advantages and they can relatively perform well in an unstable environment.

However, hospitals with a differentiation strategy may not perform well in stable environments. Because the market in a stable environment is relatively mature, it is difficult for differentiators to introduce new products or services to gain competitive advantage (Wright et al., 1990). On the other hand, hospitals with a hybrid strategy may gain competitive advantage over differentiators in stable environments, by pursuing cost-leadership strategy and focusing on their internal operations to lower their costs. Thus, it can be hypothesized that hybrids perform better than differentiators in stable environments. Thus:

H4. Hospitals with a hybrid strategy have better financial performance than hospitals with a differentiation strategy in a stable environment compared to unstable environments.

Figure 1. Conceptual Framework of Moderating Effect of Environmental Instability on Strategy-Financial Performance Relationship



METHODOLOGY

Data Sources

We used longitudinal data (2006 to 2016) from three secondary data sources: American Hospital Association (AHA) Annual Survey provided general organizational information about hospitals, such as type of services, occupancy, ownership, size, and teaching status. The Medicare Cost Reports provided information about cost, expenses, income and revenue of hospitals. Finally, the Area Health Resource File (AHRF) provided county level information such as unemployment rate, population growth, and Medicare Advantage penetration. We matched the AHA data sets with the Medicare cost report data using Medicare provider numbers and AHRF data using county identifiers.

Study Population: The study sample included all urban, private acute care hospitals in the US. We limited the study sample to private general acute care hospitals since other types of hospitals (e.g., specialty hospitals, government) are expected to perform differently. Also we limited the sample to urban areas because hospitals in rural areas might function differently (Trinh & O'connor, 2000). The final sample size consisted of 3,006 individuals with 23,570 hospital-year observations.

Dependent Variable

Our dependent variable was financial performance of hospitals. Based on previous research (Bazzoli et al., 2014; Forte et al., 2000; Ketchen et al., 1997; Zajac & Shortell, 1989), operating margin was selected as a measure of hospital profitability. The profitability ratios are very important because they measure efficiency with which firms turn business activity into profits (Gapenski & Pink, 2007). We used operating margin in

this study because it captures core patient related activities and revenues and excludes the influence of non-operating income like endowments and non-operating expenses such as interest income (Vélez-González et al., 2011).

Independent Variables

The first independent variable is a categorical variable with four groups including cost leadership, differentiation, hybrid and stuck-in-the-middle. We used Porter's strategic group typology to determine the strategic group of each hospital. While other approaches are available (Short et al., 2002), Porter's typology has been used extensively in the health care context, and it has been shown as a reliable typology in the hospital setting (Kumar et al., 1997; Lamont et al., 1993; Landry et al., 2010; Marlin et al., 1994).

To implement Porter's strategy approach and test hypotheses, we calculated measures of cost leadership and differentiation. We used three measures to capture the cost leadership dimension including total expenses to the number of beds occupied, total cost per patient days and total salaries per patient days (Forte et al., 2000; Landry et al., 2010; Marlin et al., 2004). By dividing total expenses by the number of beds occupied, a hospital's expense per bed can be determined based on its current level of business activity. Total cost and salary adjusted per patient day also express how efficiently internal finances are managed based on current business (Landry et al., 2010).

To operationalize the differentiation dimension, we used three measures: Total number of services. Number of services ranged from 134 to 138 according to AHA dataset. Total number of high technology services offered (a cardiac catheterization laboratory, an extracorporeal lithotripter, magnetic resonance imaging, open heart

surgery, and organ transplantation capability). The more the high technology services implies that a hospital invests in these types of services to differentiate itself from rivals. Total number of rare services, with rare defined as a service offered by less than 25 percent of all the hospitals in the sample. Having this variable is important due to capturing the rare services that a hospital can differentiate itself in the market. We used America Hospital Association (AHA) Annual Survey to capture these variables.

A two-stage clustering procedure (hierarchical and non-hierarchical clustering) was used for classification of hospitals in the strategic groups. A two-stage process is valuable because it increases the validity of cluster solutions (Hair et al., 1998; Kumar & Subramanian, 1997; Kumar et al., 1997; Lamont et al., 1993). This procedure first uses hierarchical clustering to determine the number of groups (i.e., Ward's method) and then uses these results in a nonhierarchical clustering (i.e., K-means). Results from the Ward's method showed that a four-group solution was optimal. According to the Porter's typology and available literature, we also expected to have four strategic groups (Allen & Helms, 2006; Gopalakrishna & Subramanian, 2001; Marlin et al., 2002). The next step was to perform the nonhierarchical clustering.

Before running K-means clustering, we used factor analysis to test if those measures of cost-leadership and differentiation are correlated enough to create composite score of cost-leadership and differentiation. The result of factor analysis showed high correlation between three measures of cost-leadership and three measures of differentiation. After standardizing cost leadership and differentiation measures, we summed up the three measures of cost leadership and differentiation to create the composite score of cost-leadership and differentiation.

Next, we used the standardized composite measures for cost leadership and differentiation to cluster the hospitals using the K-means method. After performing the clustering, the four groups were classified into a strategic group based on the mean score of cost-leadership and differentiation composite score. To accomplish this, first, we ranked the four groups resulted from K-Means cluster analysis based on their mean composite score of cost-leadership and mean composite score of differentiation. Second, we identified the group with lowest cost composite score (1st in rank) and low differentiation score (e.g. 3rd of 4th in rank) as a "Cost-Leadership" group. We classified "Differentiation" as the group with highest differentiation composite score (1st in the rank) and low cost leadership score (e.g. 3rd or 4th in rank). We identified "Stuck-in-the-middle" as the worst ranked in both cost-leadership and differentiation composite score mean (sum of the two ranks). Finally, we identified "Hybrid" as a better ranked in both cost-leadership composite score and differentiation compared to stuck-in-the-middle (sum of the two ranks). In addition, hybrid have better differentiation scores than cost leaders, and lower costs than differentiators. (Please see table 1 for more details).

Table 1. Strategic Groups Identification (2016)

Cluster groups	Cost-Leadership Composite Score (mean)	Cost Leadership Rank	Differentiation Composite Score (Mean)	Differentiation Rank	Identified Strategic Group
1	0.7856686	4	2.412101	1	Differentiation
2	-0.140339	1	-0.0799171	3	Cost-Leadership
3	0.0306939	2	0.7303677	2	Hybrid
4	0.0535798	3	-0.9471238	4	Stuck-in-the-Middle

Environmental factors: An interaction term of environmental instability and strategic group was used to test the moderation between environmental factors on the strategic group- financial performance relationship. We used three variables to operationalize environmental instability (Dess & Beard, 1984; Menachemi et al., 2011; Miller, 1987). Unstable or dynamic environments are characterized by rapid changes in an external environment that may introduce instability in an organization and affect its strategy (Zajac & Shortell, 1989). In this study, we used change in population in the county, yearly change in county unemployment rate, and change in poverty level (Menachemi et al., 2011) to operationalize instability of the environment. (Table 2). Based on the three variables, we created a composite score for environmental instability. To create the composite score, we first standardized all variables to remove the effect of different scales. Then, an average of the z-scores was calculated to obtain the composite score of instability. In this case, higher scores on the composite score represent a more unstable environment.

Control Variables

Organizational characteristics may have a substantial impact on the financial performance of hospitals (Kumar & Subramanian, 1997; Ramamonjiarivelo et al., 2018; Zengul et al., 2018). Following previous studies, we controlled for organizational characteristics including hospital size, Medicare payer mix, Medicaid payer mix, system affiliation, ownership type, and teaching status of hospitals). Similarly, previous studies have shown that environmental variables may affect the financial performance of hospitals (Ramamonjiarivelo et al., 2018; Zengul et al., 2018). Therefore, we also controlled for environmental variables including number of active physicians per 1000

population, Herfindahl-Hirschman Index (HHI), Medicare Advantage penetration, and per capita Income.

Table 2. Dependent, Independent and Control Variables

Variable	Measure Definition	Format	Source
Hospital Performance (Dependent Variable)			
Operating Margin	(Net Patient Revenue - Operating Costs) / Net Patient Revenue*100	Continuous	CMS[1]
Strategic Group Membership			
Strategic Group Membership	Porter's Typology (Cost-leadership, Differentiation, Hybrid, Stuck-in-the-middle)	Categorical	AHA[2], CMS
Environmental Instability			
Change in Population growth	Current population in the county-population three years back in the county/current population in the county*100	Continuous	AHRF
Change in Unemployment Rate	Number of unemployment individuals in current year – number of unemployment individuals last year/ number of unemployment individuals in the current year *100	Continuous	AHRF
Change in Poverty Rate	Difference between rate of people below federal poverty level current year and level last year/total population in the county	Continuous	AHRF
Organizational Control Variables			
Size	Number of Beds	Continuous	AHA
Ownership	I if non-profit, 0 if for profit	Categorical	AHA
Teaching Status	1 if a member of consul of teaching hospitals, 0 if non-teaching	Categorical	AHA
System Affiliation	1 if affiliated to system, 0 if non-affiliated	Categorical	AHA
Medicare Mayer Mix	Proportion of Medicare patients	Continuous	AHA
Medicaid Mayer Mix	Proportion of Medicaid patients	Continuous	AHA
Environmental Control Variables			
Number of active physicians	Number of active physicians in the county/total number of physicians in the county	Continuous	AHRF

Herfindahl-Hirschman Index (HHI)	Sum of the squares of hospital market shares (inpatient days) in a hospital service area (HSA) as defined by the Dartmouth Atlas	Continuous	AHA
Medicare Advantage penetration	Total number Enrolled in an MA Plan/ Total Number of Medicare Beneficiaries	Continuous	AHA
Per Capita Income	Total household income in the County/ Total Population of the county	Continuous	ARF[3]

1. American Hospital Association (AHA) Annual Survey
2. Centers for Medicare and Medicaid Services
3. Area Health Resource File

Analysis

The unit of analysis was a hospital-year. For continuous variables, we reported mean and standard deviations. For categorical variables, we reported frequency and percent. The dependent variable was a continuous variable - operating margin. The independent variable was the strategic group membership that is a categorical variable with four groups: cost-leadership, differentiation, hybrid, and stuck-in-the-middle. Furthermore, we used the interaction term to examine the moderation effect of environmental instability on the strategic group-financial performance relationship. The interaction was between four strategic groups (cost leaders, differentiators, stuck-in-the-middle and hybrid) and the environmental instability composite score. We checked for potential multicollinearity among control variable using variance inflation factors (VIF) from regression models. We did not find evidence of multicollinearity among variables. We also checked for the normal distribution of variables. If the distribution of the disturbance term was found to deviate from normality, we used log transformation (s).

We used multiple regression with generalized equation estimation (GEE) method with control for time-invariant and state-fixed effects that may affect financial performance of hospitals. Rather than modeling the within-subject covariance structure, GEE treats it as a nuisance and simply models the mean response (Diggle et al., 1994). We controlled for organizational and environmental factors. The findings of this study have been reported in descriptive and analytical tables. Beta coefficients were reported for significant associations (p-value<0.05). We used Stata 14 for data management and analyses. Following is the equation model:

$$\textit{Financial performance (operating margin)} = \beta 0 + \beta 1\ (\textit{strategic group membership}_{it}) + \beta 2\ (\textit{composite instability variable}_{it}) + \beta 3\ (\textit{percent of population 65 years of age and older}_{it}) + \beta 4\ (\textit{number of active physicians per 1000 population}_{it}) + \beta 5\ (\textit{Herfindahl-Hirschman Index}_{it}) + \beta 6\ (\textit{Medicare Advantage Penetration}_{it}) + \beta 7\ (\textit{per capita Income}_{it}) + \beta 8\ (\textit{Strategic group* composite instability variable}_{it}) + B9(\textit{bed size}_{it}) + \beta 10(\textit{Ownership}_{it}) + \beta 11(\textit{Teaching Hospital}_{it}) + + \beta 12(\textit{Medicare payer mix index}_{it}) + \beta 13(\textit{Medicaid payer mix}_{it}) + \beta 14(\textit{System Affiliation}_{it}) + \beta_{15}\ (\textit{Year Dummy Variables}_{it}) + \mu\ (\textit{State}_{it}) + \varepsilon$$

RESULTS

Table 3 presents the results of the analysis of variance and chi square tests for the relationships between the independent/dependent variables and the strategic groups. We found significant differences across the four strategic groups in all dependent and independent variables except HHI, suggesting that the cluster analyses produced distinct clusters. Hybrids have the highest (1.29) operating margin, and stuck-in-the-middle group has the lowest (-0.46) operating margin. With respect to the environmental instability composite score, hospitals in the cost-leadership group are in the most stable environment, and hospitals in the differentiation group are in the most unstable environment. Hospitals in the differentiation group are the largest hospitals with the average size of 370 beds, while hospitals in the stuck-in-the-middle group are the smallest ones with the average size of 152 beds. In terms of teaching status, about 99% of hospitals in the cost-leadership group are in the non-teaching category, while about 78% of hospitals in the differentiation group are teaching hospitals. In terms of hospital environment, differentiators are in an environment with higher number of active physicians, higher Medicare Advantage penetration, and higher per capita income. On the other hand, hospitals in the stuck-in-the-middle strategic group are in an environment with the lowest number of active physicians, least competition, lowest Medicare Advantage penetration, and lowest per capita income.

Table 3. Descriptive Analyses of Dependent and Independent Variables (Year 2016)

Variable	Strategic Group Membership				
	Cost-Leadership	Differentiation	Hybrid	Stuck-in-the-Middle	P Value
Operating Margin	.96 (12.26)	.90 (11.45)	1.29 (10.76)	-.46 (14.20)	P=0.001
Environmental Instability (M/SD)	-.024 (.60)	.042 (.65)	.008 (.61)	.021 (.65)	p= 0.001
Control variables (Organizational Characteristics)					
Hospital Size (M/SD)	188.82(177.85)	370.24 (325.19)	257.84(194.4)	152.12 (171.92)	p= 0.001
Teaching Status (N/ %)					
1 (teaching)	10 (0.98)	84 (77.78)	70 (10.23)	0	p= 0.001
0 (non-teaching)	1,015(99.02)	24 (22.22)	614(89.77)	707 (100)	
Ownership (N/ %)					
1 non-profit	763 (74.44)	103 (95.37)	591(86.40)	509 (71.99)	p= 0.001
0 for-profit	262 (25.56)	5 (4.63)	93 (13.60)	198 (28.01)	
System Affiliation (N/ %)					
1 (system affiliated)	793 (77.37)	93 (86.11)	555 (81.14)	516 (72.98)	p= 0.002
0 (independent)	232 (22.63)	15 (13.89)	129 (18.86)	191 (27.02)	
Medicare Payer Mix(M/SD)	43.40 (23.10)	41.02 (19.84)	44.31 (20.81)	43.66 (24.580	p= 0.003
Medicaid Payer Mix(M/SD)	15.50 (14.10)	17.37 (13.28)	15.96 (12.41)	14.92 (14.18)	p= 0.001
Control Variables (Environmental Factors)					
Number of Active Physicians	6.39 (1.91)	8.21 (.94)	7.14 (1.59)	5.10 (2.24)	p= 0.001
Herfindahl-Hirschman Index (HHI) (M/SD)	.68 (.34)	.43 (.33)	.60 (.34)	.73 (.33)	p= 0.272

Medicare advantage penetration	31.33 (14.16)	34.21 (12.85)	30.05 (13.83)	29.95 (16.02)	p=0.019
Per Capita Income(M/SD)	40598.53 (11056.6)	48769.23 (17599.66)	42826.87 (12497.84)	38751.06 (10259.5)	p= 0.001

Tables 4 and 5 present the regression results. Hypothesis 1 states that hospitals with a cost leadership strategy have a better financial performance than differentiators in more stable environments compared to unstable environments. The result of the interaction analysis between strategic group membership and environmental instability composite score did not show any significant moderating effect (Table 4).

Hypothesis 2 states that hospitals with a differentiation strategy have a better financial performance than cost-leaders in more unstable environments compared to stable environments. The result of the interaction analysis between strategic group membership and environmental instability composite score did not show any significant moderating effect (Table 4).

Hypothesis 3 suggests that hospitals with a hybrid strategy have better financial performance than hospitals with a cost-leadership strategy in an unstable environment. The result of analysis showed opposite moderating effect of environmental instability on the relationship between strategic group membership and hospital financial performance. Hospitals in the hybrid strategic group have 0.61 percent lower operating margin compared to hospitals in the cost-leadership strategic group for one unit increase in the instability of the environment (Table 4).

Hypothesis 4 posits that hospitals with a hybrid strategy have better financial performance than hospitals with a differentiation strategy in a stable environment

compared to unstable environments. The result of interaction analysis between strategic group membership and environmental instability composite score did not show any significant moderating effect (Table 5).

Table 4. Regression Analysis of the Relationships Among Strategy, Environment Instability, and Financial Performance (N= 23,387)

VARIABLES	Operating Margin
Differentiation	0.23 (0.52)
Hybrid	0.37 (0.17) **
Stuck-in-the-Middle	-0.5 (0.15) ***
Environmental Instability	0.2 (0.17)
Differentiation * Instability	-0.03(0.41)
Hybrid * Instability	-0.61 (0.22) ***
Stuck-in-the-Middle * Instability	-0.16 (0.23)
Control variables (Organizational Characteristics)	
Hospital Size	0.0001 (0.001)
Ownership (1 if non for profit)	-4.38 (0.33) ***
Teaching Status (1 if teaching)	-1.01 (0.57) ***
System Affiliation (1 if affiliated to system)	0.11 (0.14)
Medicare Payer Mix	-0.001 (0.002)
Medicaid Payer Mix	-0.01 (0.004)
Control Variables (Environmental Factors)	
Active physicians in the county	0.64 (0.11) ***
Herfindahl-Hirschman Index (HHI)	0.5 (0.27)*
Medicare Advantage Penetration	-0.001 (0.01)
Per Capita Income	-0.02 (0.01)

*** p<0.01, ** p<0.05, * p<0.1
*Reference group=Cost-Leadership

Table 5. Regression Analysis of the Relationships Among Strategy, Environment Instability, and Financial Performance (N= 23,387)

VARIABLES	Operating Margin
Cost-Leadership	-0.23 (0.52)
Hybrid	0.14 (0.5)
Stuck-in-the-Middle	-0.74 (0.53)
Environmental Instability	0.17 (0.38)
Cost * Instability	0.03 (0.41)
Hybrid * Instability	-0.58 (0.41)
Stuck-in-the-Middle * Instability	-0.12 (0.41)
Control Variables (Organizational Characteristics	
Hospital Size	0.0001 (0.001)
Ownership (1 if non for profit)	-4.09 (0.34) ***
Teaching Status (1 if teaching)	-1.09 (0.57) ***
System Affiliation (1 if affiliated to system)	0.24 (0.15)
Medicare Payer Mix	-0.001 (0.01)
Medicaid Payer Mix	-0.001 (0.04)
Control Variables (Environmental Factors)	
Active physicians in the county	0.67 (0.01) ***
Herfindahl-Hirschman Index (HHI)	0.5 (0.06)
Medicare Advantage Penetration	0.004 (0.7)
Per Capita Income	-0.02 (0.15)
Constant	4.42 (0.95) ***
Observations	23,365

*** p<0.01, ** p<0.05, * p<0.1
*Reference group=Differentiation

DISCUSSION

In this longitudinal study, we examined the relationship between strategic group membership and hospital financial performance in terms of operating margin. The main goal of this study was to look at the moderating effect of environmental instability on the relationship between strategic group membership and financial performance. Our results suggest that (a) hospitals in the cost-leadership group are in the most stable environment and hospitals in the differentiation group are in the most unstable environment; (b) hospitals with cost-leadership strategy have better financial performance than hospitals with a hybrid strategy in more unstable environments; (c) there was no performance difference between hospitals in the cost-leadership strategic group and differentiation strategic group based on environment instability; (d) there was no difference in operating margin of hospitals in the hybrid strategic group versus hospitals in the differentiation strategic group based on environmental instability; and (e) environmental instability moderates to some extent the relationship between hospital strategic group membership and financial performance. The implications of these findings are discussed below.

First, hospitals in the cost-leadership group are in the most stable environment and hospitals in the differentiation group are in the most unstable environment. An unstable environment is characterized by rapid changes in the external environment that may present uncertainty around an organization and affect its strategy (Zajac & Shortell, 1989). As it was mentioned before, the main characteristic of the cost-leadership strategy is focusing on internal activities to identify the most efficient ways of operating. On the other hand, differentiators are more externally oriented and tend to be more proactive in response to their environment (Kumar & Subramanian, 1997; Porter, 1980). Due to these

characteristics, hospitals in stable environments tend to adopt an internally oriented strategy and pursue cost-leadership strategy. On the other hand, hospitals in unstable environments may prefer to pursue a differentiation strategy.

Second, hospitals with cost-leadership strategy have better financial performance than hospitals with a hybrid strategy in more unstable environments. We had proposed that in more unstable environments, hospitals with a hybrid strategy may have advantages over cost leaders due to their dual pursuit of a cost leadership and differentiation strategy. We argued this may better position hybrids to respond to environmental instability compared to hospitals only pursuing a cost leadership strategy, and ultimately result in better financial performance. However, the results were counter to what we had hypothesized. One potential reason may be the costs associated with pursuing a hybrid strategy in an unstable environment. Pursuing both a differentiation strategy and a cost-leadership strategy may increase administrative and other costs for hospitals with a hybrid strategy, and that may negatively affect their operating margin compared to cost-leaders. However, more research should be conducted to further explore this counter result.

Third, there was no performance difference between hospitals in the cost-leadership strategic group and differentiation strategic group in more unstable environments. According to Porter (Porter, 1980), both differentiation and cost-leadership strategy are expected to create competitive advantage regardless of context to improve the performance. Our results are aligned with Porter's competitive advantage typology.

Fourth, there was no difference in operating margin of hospitals in the hybrid strategic group versus hospitals in the differentiation strategic group in more unstable environments. Hospitals with a differentiation strategy are more externally oriented and they focus on providing unique services or high quality care to improve their financial performance. On the other hand, hospitals with hybrid strategy pursue both generic strategies (cost leadership and differentiation). It seems that despite the greater investment of resources, differentiators are able to perform as well as hybrids in more unstable environments.

Finally, environmental instability does not appear to strongly moderate the relationship between hospital strategic group membership and financial performance. Even though we did not find supportive evidence for three hypotheses (H1, H2, H4), we found a counter result for the third hypothesis (H3). Cost leaders perform better financially than hybrids in more unstable environments. These findings can be useful for hospitals administrators when the develop their strategy.

MANAGERIAL IMPLICATIONS

The results of this study showed that pursuing strategies like cost-leadership and differentiation can improve the financial performance of hospitals despite the context or environment of hospitals. These findings suggest that hospitals administrators can develop and pursue one of these generic strategies to have better financial performance.

In addition, the results of this study showed that hospitals with hybrid strategy do not perform well in an unstable environment compared to hospitals with cost-leadership strategy. As mentioned before, one potential reason may be the cost of pursuing hybrid

strategy in such environments, and cost leaders may be better positioned. Thus, it is crucial for hospitals managers to assess the cost of pursuing their strategy as well as the effectiveness of the strategy before implementation. Finally, managers of hospitals needs to understand that, even though pursuing hybrid strategy is considered as one of the performance enhancing strategies because of it has the advantages of both cost-leadership and differentiation strategy simultaneously, it may create internal instability due to pursuing two different strategies (cost-leadership, differentiation), since each strategy may need different organizational arrangements for implementation.

LIMITATION

The main limitation of this study was using secondary data. Inherent to the nature of the secondary data, the available data are not collected to address the specific research question or to test certain hypotheses. Using secondary data also has other limitations including missing values, limited number of variables, and the retrospective nature of the data. In addition, we only tested for linear interaction between strategic group membership and environmental instability variable. There may be non-monotonic (non-linear) relationships between these two variables. Finally, we used three variables including change in population growth in the county, change in county poverty level, and change in county unemployment rate to create the environmental instability composite score. Future research should explore other environmental variables to operationalize environmental instability. Despite these limitations, the results of this study can serve as a point of reference for future studies.

CONCLUSION

This study focused on the moderation effect of environmental factors on the hospital business strategy- financial performance relationship. Hospital strategic groups of hospital were operationalized using Porter's typology. Contingency theory was used to explain the moderation effect of environmental factors on the hospital business strategy-financial performance relationship. The results of this study showed that environmental instability does not strongly moderate the relationship between strategy and hospital financial performance. The findings may be useful for researchers as well as managers of hospitals.

OVERALL CONCLUSION

In this three-paper format dissertation, we examined the relationship between strategic group membership and hospital financial performance in terms of operating margin, organizational and environmental antecedents of hospital's business strategy choice, and the moderating effect of environmental instability on the relationship between strategic group membership and financial performance.

Examining the relationship between strategic group membership and hospital financial performance disclosed the important role of strategy on financial performance of a hospital. Our results suggest that on average about 37 percent of hospitals pursue cost-leadership strategy, and only about 5 percent of hospitals pursue the differentiation strategy. Hospitals with hybrid strategy outperform hospitals with cost-leadership strategy and stuck-in-the-middle. Absence of a coherent strategy (i.e., stuck-in-the-middle) is likely to lead to poor performance. Finally, strategic group membership appears to have a significant impact on the performance of urban acute care hospitals. The results demonstrate the usefulness of strategic group studies like this study as a quick way for managers to understand their current strategic situations. The ability to identify an industry's structure and the truly distinct strategies that are available are both important considerations for successful strategic management. Results suggest the importance for hospital administrators to think about creative strategists that may increase their organization's financial performance by differentiating its products and services and pursuing cost control activities simultaneously. It is also important to understand that a persistent focus on efficiency or cost minimizing may not be essential for success, and the results of the analyses suggest that an insistent quest for efficiency or

cost control may not be necessarily the best strategy. Since hospital industry is different from other industries and many people are ready to pay for expensive but effective services, the strategy of cost-leadership may not be the best strategy that some hospital administrators may think.

The second paper focused on the association between some organizational and environmental factors and hospital's business strategy choice. Business strategy or business strategy choice of hospitals was assessed using Porter's typology. RDT used to model the associations between organizational and environmental factors with hospital's business strategy choice. The result showed the importance of environmental and organizational factors such as number of active physicians, population 65+, change in population growth, change in unemployment, HHI, , and hospital size, on predicting the strategy choice of hospitals. The results indicated that the number of physicians in the county increases the likelihood of pursuing differentiation and hybrid strategy. Greater population aged 65 years and older increases the likelihood of pursuing cost-leadership strategy compared to differentiation. An increase in the unemployment rate decreases the likelihood of pursuing differentiation and cost-leadership strategies versus the hybrid strategy. Higher HHI (less competition) increases the likelihood of pursuing cost-leadership over hybrid strategy. Finally, larger hospitals are more likely to pursue differentiation strategy over hybrid, and hybrid strategy over cost-leadership strategy. The results have some implications for the future structure of hospital industry. During last 10 years, hospitals have selected internally oriented strategies (cost-leadership) rather than externally oriented strategies. The main reason could be the financial pressure that hospitals have faced with some challenges like economic recession, low reimbursement

rates from Medicaid and Medicare, excessive administrative costs, reduced demand for hospital care, market competition, and staff shortages. These factors may force hospitals to focus on their internal procedures and pursue cost-leadership strategy. The results of this study suggest that hospitals that are relatively large, operate in more dynamic, munificence, and complex environment pursue externally oriented strategies like differentiation and hybrid strategies. Managers of hospitals need to understand their organizational characteristics and their market when they make strategic decisions.

In the third paper, we examined the moderating effect of environmental instability on the relationship between strategic group membership and hospital financial performance. Our results demonstrated that hospitals in the cost-leadership group are in the most stable environment and hospitals in the differentiation group are in the most unstable environment. Hospitals with cost-leadership strategy have better financial performance than hospitals with a hybrid strategy in an unstable environment compared to stable environment. There was no performance difference between hospitals in the cost-leadership strategic group and differentiation strategic group, and hybrid strategic group versus hospitals in the differentiation strategic group, in stable and unstable environments. Lastly, environmental instability appears to moderate in some degree the relationship between hospital strategic group membership and financial performance. The results of this study may be useful for researchers as well as managers of hospitals.

Limitations

The first and main limitation of this study was using secondary dataset. Using secondary data set has some limitations including the nature of data (it is not collected for research purpose), inadequate variables, missing values, limited number of variables, and

retrospective nature of dataset. Second, while examining hospitals in national level increases the generalizability of findings, this type of study limits the ability to control for differences in regulations and other environmental factors among states. However, we used state fixed effects to control for time invariant, unobserved state-level factors that may affect financial performance and strategy. Third, following the available literature, we used three measures to operationalize cost-leadership dimension and three measures for operationalizing the differentiation dimension. Although these measures were initially developed based on a review of the literature and consultations with industry experts, it would be useful to validate the strategic group findings with hospital administrators or use other measures (e.g. quality of care measures). Finally, we used three variables including change in population growth in the county, change in county poverty level, and change in county unemployment rate to create the environmental instability composite score. Other measures of environmental instability should be explored in future research. Despite of these limitations, we hope that the results of this study can serve as a point of reference for future studies.

Future studies

In this dissertation, we attempted to answer some important questions about hospital strategic grouping. However, there are many unanswered questions that can be investigated in future studies. In this study, we only used financial performance of hospitals to assess the effect of strategic group membership on performance of hospitals. Although the result of these analyses can be very useful for managers of hospitals, it would be more helpful to include some quality outcomes and see how strategic group membership is related to those variables. In these three papers, we did not study how

hospitals change their strategic group during the time and how the strategic group change may affect their performance. Therefore, the strategy change can be an interesting research agenda for future researchers. As mentioned before, we followed the literature and we used three measures of cost-leadership and three measure for differentiation. In future studies, it will be very helpful to use other strategic grouping measures like new services (e.g. robotic services) or quality of care measures. In addition, the strategic group membership of each hospital can be validated by hospitals administrators. Finally, mixed method analysis can be used to comprehensively study how hospitals make strategic decisions and how they develop their competitive strategy (s).

APPENDIX: IRB APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 | irb@uab.edu

NHSR DETERMINATION

TO: Ghiasi, Akbar

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance Number FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)

DATE: 20-Apr-2018

RE: IRB-300000699
Strategic group membership and hospital performance

The Office of the IRB has reviewed your Application for Not Human Subjects Research Designation for the above referenced project.

The reviewer has determined this project is not subject to FDA regulations and is not Human Subjects Research. Note that any changes to the project should be resubmitted to the Office of the IRB for determination.

REFERENCES

Al-Amin, M., & Housman, M. (2012). Ambulatory surgery center and general hospital competition: entry decisions and strategic choices. Health Care Manage Rev, 37(3), 223-234.

Alcalá, H. E., Chen, J., Langellier, B. A., Roby, D. H., & Ortega, A. N. (2017). Impact of the Affordable Care Act on health care access and utilization among Latinos. The Journal of the American Board of Family Medicine, 30(1), 52-62.

Alexander, J. A., D'Aunno, T. A., & Succi, M. J. (1996). Determinants of profound organizational change: choice of conversion or closure among rural hospitals. Journal of Health and Social Behavior, 238-251.

Allen, R. S., & Helms, M. M. (2006). Linking strategic practices and organizational performance to Porter's generic strategies. Business Process Management Journal, 12(4), 433-454.

Almgren, G., & Ferguson, M. (1999). Urban Ecology of Hospital Failure: Hospital in the City of Chicago, 1970-1991, The. J. Soc. & Soc. Welfare, 26, 5.

Andrews, R., & Johansen, M. (2012). Organizational Environments and Performance: A Linear or Nonlinear Relationship? Public Organization Review, 12(2), 175-189.

Apenteng, B. A., Nayar, P., Yu, F., Adams, J., & Opoku, S. T. (2015). Organizational and environmental correlates of the adoption of a focus strategy in U.S. hospices. Health Care Manage Rev, 40(2), 148-158. doi:10.1097/HMR.0000000000000016

Ashmos, D. P., McDaniel, R. R., Jr., & Duchon, D. (1990). Differences in Perception of Strategic Decision-Making Processes: The Case of Physicians and Administrators. The Journal of Applied Behavioral Science, 26(2), 201-218. doi:10.1177/0021886390262010

Association, A. H. (2009). The impact of the economic crisis on health services for patients and communities. Washington DC Available from: URL: www. aha. org/aha/content/2009/pdf/090311econcrisisdatabank. pdf.

Association, A. H. (2014). Fast facts on US hospitals. In.

Astley, W. G., & Van de Ven, A. H. (1983). Central perspectives and debates in organization theory. Administrative Science Quarterly, 245-273.

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

Bazzoli, G. J., Fareed, N., & Waters, T. M. (2014). Hospital financial performance in the recent recession and implications for institutions that remain financially weak. Health Affairs, 33(5), 739-745.

Bazzoli, G. J., Lindrooth, R. C., Hasnain-Wynia, R., & Needleman, J. (2004). The Balanced Budget Act of 1997 and US hospital operations. INQUIRY: The Journal of Health Care Organization, Provision, and Financing, 41(4), 401-417. Beal, R. M. (2000).

Berenson, R. A., Ginsburg, P. B., & May, J. H. (2007). Hospital-physicians relations: cooperation, competition, or separation? Health Affairs, 26(1), w31-w43.

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

Blumenthal, D., Abrams, M., & Nuzum, R. (2015). The affordable care act at 5 years. In: Mass Medical Soc.

Bolisani, E., & Bratianu, C. (2017). Knowledge strategy planning: an integrated approach to manage uncertainty, turbulence, and dynamics. Journal of Knowledge Management, 21(2), 233-253.

Buerhaus. (2008). The future of the nursing workforce in the United States: Data, trends, and implications. Journal of the American Medical Association, 300(16), 1950.

Burns. (1990). The transformation of the American hospital: From community institution toward business enterprise. Comparative Social Research, 12(1), 77-112.

Burns. (2000). The fall of the house of AHERF: the Allegheny bankruptcy. Health Affairs, 19(1), 7-41.

Burns. (2005). The financial performance of integrated health organizations. Journal of Healthcare Management, 50(3).

Burns, & Stalker, G. (1981). The Management of Innovation, Tavistock, London, 1961. BurnsThe Management of Innovation1961.

Burns, L. R., Goldsmith, J. C., & Muller, R. W. History of physician-hospital collaboration.

Burns, L. R., & Muller, R. W. (2008). Hospital-physician collaboration: Landscape of economic integration and impact on clinical integration. Milbank Quarterly, 86(3), 375-434.

Byles, C. M., & Labig Jr, C. E. (1996). Hospital strategy and its relationship to administrative practices and performance: a partial test of the miles and snow typology. Journal of Managerial Issues, 326-342.

Casalino, L., & Robinson, J. C. (2003). Alternative Models of Hospital-Physician Affiliation as the United States Moves Away from Tight Managed Care. Milbank Quarterly, 81(2), 331-351.

Castle, N. G. (2003). Strategic groups and outcomes in nursing facilities. Health Care Manage Rev, 28(3), 217-227.

Chadi, N. (2009). Medical leadership: doctors at the helm of change. McGill Journal of Medicine, 12(1), 52-57.

Child, J. (1972). Organizational structure, environment and performance: The role of strategic choice. sociology, 6(1), 1-22.

Clark, R. C. (1980). Does the nonprofit form fit the hospital industry? Harvard Law Review, 1416-1489.

Commission, P. P. A. (1988). Medicare Prospective Payment and the American Health Care System Report to the Congress. June 1988.

Conant, J. S., Mokwa, M. P., & Varadarajan, P. R. (1990). Strategic types, distinctive marketing competencies and organizational performance: a multiple measures-based study. Strategic Management Journal, 11(5), 365-383.

Crosson, F. J., & Tollen, L. A. (2010). Partners in health: How physicians and hospitals can be accountable together (Vol. 44): John Wiley & Sons.

Cunningham, P., Rudowitz, R., Young, K., Garfield, R., & Foutz, J. (2016). Understanding Medicaid hospital payments and the impact of recent policy changes. Kaiser Family Foundation.

Curry, L. (2005). The Future of the Public's Health in the 21st Century. Generations, 29(2), 82.

Daily, C. M., & Dalton, D. R. (1993). Board of directors leadership and structure: Control and performance implications. Entrepreneurship theory and practice, 17(3), 65-81.

Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. Strategic Management Journal, 19(3), 269-290.

Davies, D. L., & Bouldin, D. W. (1979). A cluster separation measure. IEEE transactions on pattern analysis and machine intelligence(2), 224-227.

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. Administrative Science Quarterly, 52-73.

Dess, G. G., & Davis, P. S. (1982). An Empirical Examination of Porter's (1980) Generic Strategies. Paper presented at the Academy of Management Proceedings.

Dess, G. G., & Davis, P. S. (1984). Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance. Academy of Management Journal, 27(3), 467-488.

Dess, G. G., Ireland, R. D., & Hitt, M. A. (1990). Industry effects and strategic management research. Journal of Management, 16(1), 7-27.

Devers, K. J., Brewster, L. R., & Casalino, L. P. (2003). Changes in hospital competitive strategy: a new medical arms race? Health Serv Res, 38(1p2), 447-469.

Dieleman, J. L., Sadat, N., Chang, A. Y., Fullman, N., Abbafati, C., Acharya, P., . . . Alizadeh-Navaei, R. (2018). Trends in future health financing and coverage: future health spending and universal health coverage in 188 countries, 2016–40. The Lancet, 391(10132), 1783-1798.

Diggle, P., Liang, K.-Y., & Zeger, S. L. (1994). Longitudinal data analysis. New York: Oxford University Press, 5, 13.

Donaldson, L. (2001). The contingency theory of organizations: Sage.

Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. Administrative Science Quarterly, 514-539.

Dunn, D., Koepke, D., & Pickens, G. (2009). The current recession and US hospitals. New York: Thomson Reuters.

Everhart, D., Neff, D., Al-Amin, M., Nogle, J., & Weech-Maldonado, R. (2013). The effects of nurse staffing on hospital financial performance: Competitive versus less competitive markets. Health Care Manage Rev, 38(2), 146.

Feldstein, P. J. (2012). Health care economics: Cengage Learning.

Fifer, J. J. (2015). Cost structure: reduction [not equal to] reconfiguration: hospitals and health systems are reconfiguring their cost structures, a process that presents a two-fold challenge. Healthcare Financial Management, 69(6), 24-25.

Flannelly, K. J., Handzo, G. F., Galek, K., Weaver, A. J., & Overvold, J. A. (2006). A national survey of hospital directors' views about the importance of various chaplain roles: Differences among disciplines and types of hospitals. Journal of Pastoral Care and Counseling, 60(3), 213.

Forte, M., Hoffman, J. J., Lamont, B. T., & Brockmann, E. N. (2000). Organizational form and environment: an analysis of between-form and within-form responses to environmental change. Strategic Management Journal, 753-773.

Frean, M., Gruber, J., & Sommers, B. D. (2017). Premium subsidies, the mandate, and Medicaid expansion: Coverage effects of the Affordable Care Act. Journal of Health Economics, 53, 72-86.

Freshnock, L. J., & Goodman, L. J. (1980). The organization of physician services in solo and group medical practice. Medical Care, 18(1), 17-29.

Fry, L. W., & Smith, D. A. (1987). Congruence, contingency, and theory building. Academy of Management Review, 12(1), 117-132.

Gapenski, L. C., & Pink, G. H. (2007). Understanding healthcare financial management: Health Administration Press Chicago.

Ghiasi, A., Zengul, F. D., Ozaydin, B., Oner, N., & Breland, B. K. (2018). The impact of hospital competition on strategies and outcomes of hospitals: A systematic review of the US hospitals 1996-2016. Journal of Health Care Finance, 44(2).

Ginn, G. O. (1990). Strategic change in hospitals: an examination of the response of the acute care hospital to the turbulent environment of the 1980s. Health Serv Res, 25(4), 565.

Ginn, G. O., & Young, G. J. (1992). Organizational and environmental determinants of hospital strategy. Journal of Healthcare Management, 37(3), 291.

Goes, J. B., & Meyer, A. D. (1990). Patterns of strategic change, environmental change, and performance: a longitudinal study of California hospitals. Paper presented at the Academy of Management Proceedings.

Goldstein, S. M., Ward, P. T., Leong, G. K., & Butler, T. W. (2002). The effect of location, strategy, and operations technology on hospital performance. Journal of Operations Management, 20(1), 63-75.

Gopalakrishna, P., & Subramanian, R. (2001). Revisiting the pure versus hybrid dilemma: Porter's generic strategies in a developing economy. Journal of Global Marketing, 15(2), 61. doi:10.1300/J042v15n02_04.

Granshaw, L., & Porter, R. (1989). The hospital in history: Routledge.

Gupta, S., Epane, J. P., & Weech-Maldonado, R. (2015). Hiring internationally educated nurses in hospitals: role of competition and resource availability. Journal of Hospital Administration, 4(3), p79.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). Multivariate data analysis (Vol. 5): Prentice hall Upper Saddle River, NJ.

Hambrick, D. C. (1988). Strategies for mature industrial-product businesses: a taxonomical approach. Strategic Management Frontiers. JAI Press, Greenwich, CT.

Herbert, T. T., & Deresky, H. (1987). Generic strategies: an empirical investigation of typology validity and strategy content. Strategic Management Journal, 8(2), 135-147.

Hernandez, S. R., & Kaluzny, A. D. (1983). Hospital closure: a review of current and proposed research. Health Serv Res, 18(3), 419.

Holzhacker, M., Krishnan, R., & Mahlendorf, M. D. (2015). The impact of changes in regulation on cost behavior. Contemporary Accounting Research, 32(2), 534-566.

Hunt, M. S. (1972). Competition in the major home appliance industry, 1960-1970: Harvard University.

Johnson, B., & King Jr, M. L. (1996). Health Care in the Early 1960s. HEALTH CARE FINANCING REVIEW, 18(2).

Justin Tan, J., & Litsschert, R. J. (1994). Environment-strategy relationship and its performance implications: An empirical study of the Chinese electronics industry. Strategic Management Journal, 15(1), 1-20.

Kalman, N., Hammill, B., Schulman, K., & Shah, B. (2015). Hospital overhead costs: the neglected driver of health care spending? Journal of Health Care Finance, 41(4).

Kash, B., & Tan, D. (2016). Physician Group Practice Trends: A Comprehensive Review. Journal of Hospital & Medical Management.

Kennedy, L., & Dumas, M. B. (1983). Hospital closures and survivals: an analysis of operating characteristics and regulatory mechanisms in three states. Health Serv Res, 18(4), 489.

Ketchen, Combs, J. G., Russell, C. J., Shook, C., Dean, M. A., Runge, J., . . . Baker, R. (1997). Organizational configurations and performance: A meta-analysis. Academy of Management Journal, 40(1), 223-240.

Ketchen, & Short, J. (2015). Mastering strategic management: University of Minnesota Libraries Publishing.

Ketchen, Thomas, & Snow. (1993). Organizational configurations and performance: A comparison of theoretical approaches. Academy of Management Journal, 36(6), 1278-1313.

Kim, L., & Lim, Y. (1988). Environment, generic strategies, and performance in a rapidly developing country: A taxonomic approach. Academy of Management Journal, 31(4), 802-827.

Kocher, R. P., & Adashi, E. Y. (2011). Hospital readmissions and the Affordable Care Act: paying for coordinated quality care. Jama, 306(16), 1794-1795.

Korenchuk, K. M., & Hord, J. M. (1996). Managed care plans and the organizational arrangements with group practices. The Journal of ambulatory care management, 19(4), 11-17.

Koseoglu, M. A., Akdeve, E., Gedik, I., & Bertsch, A. (2015). A bibliometric analysis of strategic management articles in healthcare management literature: Past, present, and future. International Journal of Healthcare Management, 8(1), 27-33.

Kumar, & Subramanian, R. (1997). Porter's strategic types: Differences in internal processes and their impact on performance. Journal of Applied Business Research, 14(1), 107.

Kumar, Subramanian, R., & Strandholm, K. (2001). Competitive strategy, environmental scanning and performance: A context specific analysis of their relationship. International Journal of Commerce and Management, 11(1), 1-33.

Kumar, Subramanian, R., & Yauger, C. (1997). Pure Versus Hybrid: Performance Implications of Porter's Generic Strategies. Health Care Manage Rev, 22(4), 47-60.

Lamont, B. T., Marlin, D., & Hoffman, J. J. (1993). Porter's generic strategies, discontinuous environments, and performance: a longitudinal study of changing strategies in the hospital industry. Health Serv Res, 28(5), 623.

Landry, A. Y., Hernandez, S. R., Shewchuk, R. M., & Garman, A. N. (2010). A configurational view of executive selection behaviours: A taxonomy of USA acute care hospitals. Health Serv Manage Res, 23(3), 128-138.

Langabeer, J. R., Lalani, K. H., Yusuf, R. A., Helton, J. R., & Champagne-Langabeer, T. (2018). Strategies of High-Performing Teaching Hospitals. Hospital topics, 1-7.

Lapersonne, A., Sanghavi, N., & De Mattos, C. (2015). Hybrid Strategy, ambidexterity and environment: toward an integrated typology. Universal Journal of Management, 3(12), 497-508.

Levit, M. R., & Labonte, M. (2012). The budget control act of 2011: The effects on spending and the budget deficit when the automatic spending cuts are implemented.

Lieberman, S. M. (2013). Reforming Medicare through 'version 2.0'of accountable care. Health Affairs, 32(7), 1258-1264.

Long, S. J., Long, J. S., & Freese, J. (2006). Regression models for categorical dependent variables using Stata: Stata press.

Marlin, Hoffman, J. J., & Lamont, B. T. (1994). Porter's generic strategies, dynamic environments, and performance: A profile deviation fit perspective. The International Journal of Organizational Analysis, 2(2), 155-175.

Marlin, Huonker, & Sun. (2002). An examination of the relationship between strategic group membership and hospital performance. Health Care Manage Rev, 27(4), 18-29.

Marlin, Huonker, J. W., & Hasbrouck, R. B. (2004). Navigating Turbulent Times: Strategic Groups and Performance in the Hospital Industry, 1983 to 1993. Organizational Analysis, 12(2), 91-107.

Marlin, D., Huonker, J. W., & Sun, M. (2002). An examination of the relationship between strategic group membership and hospital performance. Health Care Manage Rev, 27(4), 18-29.

Mascarenhas, B., & Aaker, D. A. (1989). Mobility barriers and strategic groups. Strategic Management Journal, 10(5), 475-485.

Matthews, C. H., & Scott, S. G. (1995). Uncertainty and planning in small and entrepreneurial firms: An empirical assessment. Journal of Small Business Management, 33(4), 34.

McGee, J., & Thomas, H. (1986). Strategic groups: Theory, research and taxonomy. Strategic Management Journal, 7(2), 141-160.

Menachemi, N., Mazurenko, O., Kazley, A. S., Diana, M. L., & Ford, E. W. (2012). Market factors and electronic medical record adoption in medical practices. Health Care Manage Rev, 37(1), 14-22.

Menachemi, N., Shin, D. Y., Ford, E. W., & Yu, F. (2011). Environmental factors and health information technology management strategy. Health Care Manage Rev, 36(3), 275-285.

Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational strategy, structure, and process. Academy of Management Review, 3(3), 546-562.

Miller, D. (1987). The structural and environmental correlates of business strategy. Strategic Management Journal, 8(1), 55-76.

Miller, D., & Friesen, P. H. (1983). Strategy-making and environment: the third link. Strategic Management Journal, 4(3), 221-235.

Miller, D., & Friesen, P. H. (1986). Porter's (1980) generic strategies and performance: an empirical examination with American data: part I: testing Porter. Organization Studies, 7(1), 37-55.

Moser, J. W., & Hastreiter, D. M. (2009). 2007 survey of radiologists: source of income and impact of the Deficit Reduction Act of 2005. Journal of the American College of Radiology, 6(6), 408-416.

Murray, A. I. (1988). A contingency view of Porter's "generic strategies". Academy of Management Review, 13(3), 390-400.

Nandakumar, Ghobadian, A., & O'Regan, N. (2010). Business-level strategy and performance: The moderating effects of environment and structure. Management Decision, 48(6), 907-939.

Nandakumar, Ghobadian, A., & O'Regan, N. (2011). Generic strategies and performance - evidence from manufacturing firms. International Journal of Productivity and Performance Management, 60(3), 222-251.

Nayar, P. (2008). The impact of Medicare's Prospective Payment System on staffing of long-term acute care hospitals: The early evidence. Health Care Manage Rev, 33(3), 264-273.

Neuhauser, D., & Turcotte, F. (1972). Costs and Quality of Care in Different Types of Hospitals. The ANNALS of the American Academy of Political and Social Science, 399(1), 50-61.

Nurettin Oner, M. (2016). Organizational and environmental factors associated with hospital financial performance: A systematic review. Journal of Health Care Finance, 43(2).

Obama, B. (2016). United States health care reform: progress to date and next steps. Jama, 316(5), 525-532.

Olusoga, S. A., Mokwa, M. P., & Noble, C. H. (1995). Strategic groups, mobility barriers, and competitive advantage: an empirical investigation. Journal of Business Research, 33(2), 153-164.

Orszag, P. R. (2016). US health care reform: cost containment and improvement in quality. Jama, 316(5), 493-495.

Perry, M., Reynolds, L., & Clare, J. (2018). Contributions to public health around the world. International Paramedic Practice, 8(1), 3-9.

Perryman, M. M., & Rivers, P. A. (2011). Strategic groups in health care: A literature review. Health Serv Manage Res, 24(3), 151-159.

Peteraf, M., & Shanley, M. (1997). Getting to know you: A theory of strategic group identity. Strategic Management Journal, 18(S1), 165-186.

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

Porter. (1980). Competition Strategy. In: New York: The Free Press.

Porter. (1989). From competitive advantage to corporate strategy. In Readings in strategic management (pp. 234-255): Springer.

Porter. (2008). Competitive advantage: Creating and sustaining superior performance: Simon and Schuster.

Prescott, J. E. (1986). Environments as moderators of the relationship between strategy and performance. Academy of Management Journal, 29(2), 329-346.

Protection, P., & Act, A. C. (2010). Patient protection and affordable care act. Public law, 111(48), 759-762.

Raju, P., & Lonial, S. C. (2002). The impact of service quality and marketing on financial performance in the hospital industry: an empirical examination. Journal of Retailing and Consumer Services, 9(6), 335-348.

Ramamonjiarivelo, Z., Weech-Maldonado, R., Hearld, L., Pradhan, R., & Davlyatov, G. K. (2018). The Privatization of Public Hospitals: Its Impact on Financial Performance. Medical Care Research and Review.

Reinhardt, U. E. (2000). The rise and fall of the physician practice management industry. Health Affairs, 19(1), 42-55.

Richards, C. A. (2014). The effect of hospital financial distress on immediate breast reconstruction: Columbia University.

Robinson, J. C. (1998a). Consolidation of medical groups into physician practice management organizations. Jama, 279(2), 144-149.

Robinson, J. C. (1998b). Financial capital and intellectual capital in physician practice management. Health Affairs, 17(4), 53-74.

Roley, P. (2006). Strategic management for competitive advantage. Harvard business review, 108(9), 163-123.

Rosenthal, M. B., Landon, B. E., & Huskamp, H. A. (2001). Managed care and market power: Physician organizations in four markets. Health Affairs, 20(5), 187-193.

Rothschild. (1988). Alternative dispute resolution in hospital-medical staff relationships. Trustee: the journal for hospital governing boards, 41(10), 23.

Rue, L. W., & Holland, P. G. (1989). Strategic management: Concepts and experiences: McGraw-Hill New York, NY.

Ruiz-Moreno, A., Garcia-Morales, V. J., & Llorens-Montes, F. J. (2008). The moderating effect of organizational slack on the relation between perceptions of support for innovation and organizational climate. Personnel Review, 37(5), 509-525.

Ryan, A. M., Burgess Jr, J. F., Pesko, M. F., Borden, W. B., & Dimick, J. B. (2015). The Early Effects of Medicare's Mandatory Hospital Pay-for-Performance Program. Health Serv Res, 50(1), 81-97.

SAS, I. (2017). 2017. SAS® Enterprise Miner™ 14.3: Reference Help. Cary, NC: SAS Institute Inc.

Schimmer, M. (2012). Competitive dynamics in the global insurance industry: Strategic groups, competitive moves, and firm performance (Vol. 9783834939920).

Schreyögg, J., & von Reitzenstein, C. (2008). Strategic groups and performance differences among academic medical centers. Health Care Manage Rev, 33(3), 225-233.

Sebastian, A. (2018). A dictionary of the history of medicine: Routledge.

Serratt, T., Spetz, J., & Harrington, C. (2012). Are staffing changes in California's hospitals sensitive to individual hospital characteristics? Nursing Economics, 30(6), 339.

Short, J. C., Palmer, T. B., & Ketchen Jr, D. J. (2002). Resource-based and strategic group influences on hospital performance. Health Care Manage Rev, 27(4), 7-17.

Shortell, S. M., Morrison, E. M., Hughes, S. L., Friedman, B. S., & Vitek, J. L. (1987). Diversification of health care services: the effects of ownership, environment, and strategy. Advances in health economics and health services research, 7, 3-40, 111-114.

Shortell, S. M., Morrison, E. M., & Robbins, S. (1985). Strategy making in health care organizations: A framework and agenda for research. Medical Care Review, 42(2), 219-266.

Sinai, T., & Gyourko, J. (2004). The asset price incidence of capital gains taxes: evidence from the Taxpayer Relief Act of 1997 and publicly-traded real estate firms. Journal of Public Economics, 88(7-8), 1543-1565.

Starkweather, J., & Moske, A. K. (2011). Multinomial logistic regression. Consulted page at September 10th: http://www. unt. edu/rss/class/Jon/Benchmarks/MLR_JDS_Aug2011. pdf, 29, 2825-2830.

Strunk, B. C., Ginsburg, P. B., & Banker, M. I. (2006). The effect of population aging on future hospital demand. Health Aff (Millwood), 25(3), w141-149.

Sussman, J. B., Halasyamani, L. K., & Davis, M. M. (2010). Hospitals during recession and recovery: vulnerable institutions and quality at risk. Journal of Hospital Medicine, 5(5), 302-305.

Sutcliffe, K. M. (1994). What executives notice: Accurate perceptions in top management teams. Academy of Management Journal, 37(5), 1360-1378.

Topaloglu, O., McDonald, R. E., & Hunt, S. D. (2018). The theoretical foundations of nonprofit competition: a resource-advantage theory approach. Journal of Nonprofit & Public Sector Marketing, 1-22.

Trinh, H. Q., & O'connor, S. J. (2000). The strategic behavior of US rural hospitals: a longitudinal and path model examination. Health Care Manage Rev, 25(4), 48-64.

Trinh, H. Q., & O'connor, S. J. (2002). Helpful or harmful? The impact of strategic change on the performance of US urban hospitals. Health Serv Res, 37(1), 143.

Tynan, A., November, E., Lauer, J., Pham, H., Cram, P., & LTHPOLICY, P. C. (2010). General hospitals, specialty hospitals and financially vulnerable patients. In.

Van de Ven, A. H., & Drazin, R. (1984). The concept of fit in contingency theory. Retrieved from

Vélez-González, H., Pradhan, R., & Weech-Maldonado, R. (2011). The role of non-financial performance measures in predicting hospital financial performance: the case of for-profit system hospitals. Journal of Health Care Finance, 38(2), 12-23.

Venkatraman, N. (1989). Strategic orientation of business enterprises: The construct, dimensionality, and measurement. Management Science, 35(8), 942-962.

Venkatraman, N., & Camillus, J. C. (1984). Exploring the concept of "fit" in strategic management. Academy of Management Review, 9(3), 513-525.

Warning, S. (2004). Performance differences in German higher education: Empirical analysis of strategic groups. Review of Industrial Organization, 24(4), 393-408.

Williams, D., Young, C., Shewchuk, R., & Qu, H. (2010). Strategic groupings of US biotechnology initial public offerings their market influence. Technology Analysis and Strategic Management, 22(4), 399-415.

Wright, P., Kroll, M., Kedia, B., & Pringle, C. (1990). Strategic profiles, market share and business performance. Industrial Management, 32(3), 23-28.

Yasin, M. M., Gomes, C. F., & Miller, P. E. (2011). Competitive strategic grouping for hospitals. TQM Journal, 23(3), 301-312.

Young, G., Beekun, R. I., & Ginn, G. O. (1992). Governing board structure, business strategy, and performance of acute care hospitals: a contingency perspective. Health Serv Res, 27(4), 543.

Zajac, E. J., Kraatz, M. S., & Bresser, R. K. (2000). Modeling the dynamics of strategic fit: A normative approach to strategic change. Strategic Management Journal, 429-453.

Zajac, E. J., & Shortell, S. M. (1989). Changing generic strategies: Likelihood, direction, and performance implications. Strategic Management Journal, 10(5), 413-430.

Zengul, F. D., Weech-Maldonado, R., Ozaydin, B., Patrician, P. A., & O'connor, S. J. (2018). Longitudinal analysis of high-technology medical services and hospital financial performance. Health Care Manage Rev, 43(1), 2-11.