THE EFFECT OF JOINING A HEALTH SYSTEM ON FINANCIAL PERFORMANCE

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ABSTRACT

The rate of hospitals merging has increased significantly over the last few years. The number of hospital mergers between 2003 and 2009 averaged 55 per year, while mergers for 2010 and 2011 were 72 and 90, respectfully. This research moved beyond anecdotal reports and by using publicly reported data to not only evaluate the financial success of mergers, but also to look at other factors such as size, ownership, geography, environment (urban vs. rural), and market competitiveness to assess impacts on financial outcomes of mergers. This study examined the effect of joining a hospital system based on financial performance. Further, it assessed the relationship of specific organizational and environmental characteristics to determine if these characteristics had any effect on the success of the mergers.

Resource Dependence Theory (RDT) served as the theoretical framework for this study. Based on RDT precepts, two main hypotheses were studied including (1) Hospitals that join a health system have better financial performance after joining a health system than those that do not join a health system, and (2) For hospitals that have joined a health system, certain organizational and environmental characteristics will have greater influence on financial performance. Data from American Hospital Association, Centers for Medicare and Medicaid, and Area Health Resource File were collected, combined, and analyzed to address the research questions.
The results demonstrated that hospital operating margins significantly improved after joining a health system. Findings also suggested (at the 90% confidence interval) that hospitals located in rural areas had improved results following the second year of the merger. However, this study found no empirical support for the expectations that operating expenses would improve or that organizational characteristics (i.e., ownership and adjusted patient days), or environmental characteristics (i.e., percentage of people living in poverty, competitiveness) had a statistically significant effect on the success of a merger.

As hospitals continue to seek ways to remain competitive and to continually serve their mission to care for the members of their communities, this study can serve as a basis for assessing the effect of system membership on financial performance. The results of this study should not be used as the only basis for making merger decisions as the sample size and time period studied were too narrow to reach overarching conclusions.

Keywords: mergers, acquisitions, resource dependence theory, affiliations
DEDICATION

This research study, degree (hopefully), and knowledge gained is dedicated to my family who has supported my efforts to complete this process. They have supported me tirelessly and given up many hours of personal time to allow me to complete this dream of earning a terminal degree. Specifically, thanks to my wife (Kristen) and father (Larry) for their hours of proof reading assistance and for giving me the confidence that I could actually write a paragraph and not just bullet points. And to my additional parents Sharon (mother), Georgia (step-mother), Kathleen (step-mother), Dennis (father-in-law), and Rhonda (mother-in-law), thank you for teaching me academically, logically, and for loving me unconditionally.

Lastly, I dedicate this paper to our country’s healthcare executives as it is my prayer that we learn to use rigorous data analytics to solve our challenges with access to care, quality, and escalating costs.
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Chapter 1

INTRODUCTION

One interesting area of strategic healthcare research is the effect of mergers and acquisitions on outcomes, both financial and quality, for all organizations involved. The recent passage of the Patient Protection and Affordable Care Act (ACA) has rekindled the philosophy that being part of a larger organization will be necessary to survive under the future healthcare financial models. Numerous hospital mergers and acquisitions took place throughout the 1980s and 1990s. Hospitals sought networks and systems to secure access to financial capital, human capital, compliance and legal expertise, technologies, and total quality management (Bazzoli, Chan, Shortell, & D'Aunno, 2000). These changes led to the belief that independent hospitals would become extinct and that mass consolidation would be required to survive (Bazzoli, Dynan, Burns, & Yap, 2004).

The purpose of this study was to evaluate the effect of joining a health system on financial performance. This new knowledge, in turn, can be used for further research concerning the outcomes of mergers and acquisitions within the healthcare industry.

BACKGROUND

The decision to sell or relinquish “control” of a community asset such as a health system is a difficult one for many communities. The number of merger transactions between 2003 and 2009 was approximately 55 per year. This number has increased over the last couple of years including 72 in 2010 and 90 in 2011 (Yanci, 2013). The growing number of mergers and acquisitions may suggest that industry executives believe joining two or more organizations together will result in better financial performance.

Although there are few studies in the peer-reviewed literature discussing mergers and acquisitions, the topic of hospital mergers is frequently discussed in the popular
healthcare press (Healthcare, 2012). Headlines using terms such as consolidation, mergers, acquisitions, and diversification dominate many of these publications. Interest in this topic is high, and the lack of empirical evidence of successful mergers piqued this author’s interest.

So, why are hospitals deciding to join or merge with other systems? The answer seems to be mostly financial. Before the ACA, hospitals had faced financial challenges due to declining governmental reimbursements and rising costs (Dawsey, 2014). The passage of the ACA presents further challenges to the financial performance of hospitals, which could be driving further consolidation.

The American Hospital Association (AHA) published a paper that described the complex transition of hospitals from “volume-based” to “value-based” care strategies (Trust, 2013). The paper’s author labeled the current payment model in the United States as the “first curve”. The transition to value-based care is described as the “second curve”. The paper concluded by summarizing the transition between the first and second curve identifying steps for healthcare organizations to consider.

This transition will be extremely expensive as it will require levels of expertise and the ability to look at healthcare from a greater scope and scale. Issues such as electronic medical records and connectivity, population health management and continuum of care, and complex reimbursement models, such as accountable care and value-based purchasing, will most likely strain financial resources further.

A number of healthcare providers have suggested that consolidation and diversification of services will lead to improved financial performance (Dawsey, 2014; Evans, 2013). This theory is supported to some extent by an analysis completed in 1999
that found operating margins for hospitals with home health agencies, and within systems, outperformed those that did not (AHA, 1999).

Healthcare providers also posit that improved financial performance will increase their bond ratings, access to capital, and further opportunities to grow in both scale and scope of services. Access to capital for independent hospitals could be reduced as credit agencies are requiring better financial performance from independent hospitals than their larger hospital peers to earn equivalent bond ratings; thus making access to capital more difficult and expensive (Kutscher, 2014).

Diversification could lead to greater scale and scope of services. The consolidation of hospitals and health networks could improve both efficacy and efficiency of regional service line strategies (Evans, 2013). Furthermore, the addition of products such as health insurance plans, long term care facilities, and dialysis companies could enhance hospitals’ abilities to improve financial performance (Healthcare, 2012).

As the United States attempts to lessen healthcare costs, pressure on the healthcare industry to reduce costs of care will continue. Since healthcare providers argue that consolidation of services and diversification of product lines leads to better financial performance and market share, a continued increase in mergers seems logical. The purpose of this research was to determine whether or not mergers and acquisitions do, in fact, improve financial performance.
Relevance of Research

As new demands on operating funds created by the ACA are further implemented, it is important to understand if previous consolidation efforts resulted in improved financial performance. Specifically, health systems should examine whether their efforts will actually improve hospital financial performance. Chief Executive Officers could use this study as part of their due diligence as to whether or not a merger would benefit their specific organizations. The rise in mergers and acquisitions needs to be evaluated for its ability to improve financial performance. Changes in financial performance need to be rigorously evaluated to provide insights into the association between financial performance, mergers (system membership), and organizational characteristics that have significant influence on the success of a merger. If financial performance is not improving, it is questionable as to whether these mergers should actually occur. Additional research will need to be conducted to build upon the results of this study.

Research Questions

It is important to consider the precise nature of the wording used in these questions. Previously, the terms mergers, affiliations, and acquisitions have been used in different contexts with varying definitions. However, this study examined hospitals that joined a health system and experienced a change in ownership. The term health system is defined here as two or more hospitals comprising the system. The “joining” of hospitals is legally referred to as either an acquisition or member substitution. Actual mergers, in which two hospitals join forces to create one new entity, were not used in this study.

Hospitals that established relationships to other providers through various contractual relationships (e.g., network membership) but did not experience governance
and ownership changes were also excluded. These definitions were carefully considered throughout the research design and execution. For simplicity, the terms *merger* or *mergers and acquisitions* are used throughout the paper. These terms were selected as they are the most frequently used terms in recent articles and literature.

QUESTION 1: Do hospitals that join a health system, perform better financially than hospitals that do not join a health system?

QUESTION 2: For hospitals that join a health system, what organizational and community characteristics contribute to successful mergers and acquisitions?
Chapter 2

LITERATURE REVIEW

A literature review was conducted searching for articles published between 1980 and 2015. There are several terms used throughout the research that relate to organizations that decide to partner, join, and otherwise become part of another healthcare entity. For the purpose of this research, the terms mergers and mergers and acquisitions represented all of these types of relationships except where specifically referenced. The results of this literature review identified four strong themes as described below:

*Mergers and acquisitions expand market share, strengthen finances, and consolidate services.*

Health systems forming partnerships that result in consolidated financial statements and provider numbers generally are grouped into a category of having completed a merger. This includes changes to ownership and governance structures as examined by Bogue (1995). Bogue and colleagues (1995) suggested that mergers improve financial results due to the consolidation of services. In this study, consolidations entailed the elimination of services at one hospital while maintaining them at the other. Bogue and colleagues also determined that while rural areas did not see reductions in acute services, many urban hospitals did experience these reductions.

Dranove and Lindrooth (2003) quantified these findings by noting that mergers resulting in consolidation of financial reporting and provider licenses (full mergers) led to decreases in operating costs, while system membership did not change expenses for the
acquired hospitals (Dranove & Lindrooth, 2003). The new company formed, due to full merger, experienced an average savings of 14% for years two, three, and four following the mergers and acquisitions. Despite these savings, the authors did not detect significant savings between groups that merged versus those that did not. This suggests that consolidation “in name only” does not result in improvement, and that operating expenses are decreased only following a full merger.

In 2006, Preyra and Pink employed a technical, economic-based theoretical approach to study efficiencies based on two hospitals merging. Study findings suggested that when two hospitals merged into one entity, the new hospital would provide twice the mean output with only 78% of the capital stock (Preyra & Pink, 2006). Although this was not surprising, the authors presented advanced methods and formulas that demonstrated why this phenomenon was predictable. These formulas could be used to predict results in future mergers and acquisitions. Authors noted that this type of research is difficult to conduct since the number of transactions are infrequent and can be difficult to identify.

Bazzoli et al. (2004) conducted a meta-analysis of the research and concluded that hospital consolidation and integration can lead to stronger financial results. Hospitals that experienced improved performance did this through efficiency generating and revenue enhancing activities. The authors also noted that weaker hospitals found stronger hospitals with which to partner. The reduction of administrative functions was the most common source of cost reductions, while elimination of clinical services were fewer and more difficult to quantify. Lesser and Brewster (2002) suggested that clinical consolidation faced less resistance for revenue enhancement activities than cost savings.
measures. This may suggest that physicians are more likely to make changes if they believe patient care will be improved.

Healthcare organizations, specifically hospitals, are merging in order to control escalating costs and to find economies of scale and scope (Lynk, 1995). Measuring cost effectiveness from mergers and acquisitions is a widely studied subject, but lacks contemporary studies. Lynk investigated two metro hospital systems, including four hospitals in one central area. Lynk tracked staffing efficiencies among seven major service lines before and after the mergers and acquisitions process and found evidence that staffing was significantly reduced. The findings of this research suggest that staffing costs may be one of the largest sources of cost savings from consolidation. However, this study was limited to consolidation between only two organizations. Further study is necessary to increase the validity of this finding.

Dranove (1998) produced evidence that consolidation decreases costs. Notably, the author suggested that the size of the organization determines the size of the impact. Dranove compared the impact of non-revenue generating departments across different sized organizations based on the number of discharges and concluded that hospitals with over 10,000 discharges saw a nominal effect of cost savings within non-revenue generating departments such as administration, human resources, public relations, and accounting. Hospitals that were smaller experienced significant cost savings in non-revenue generating departments (Dranove, 1998). While efficiencies were small in areas such as public relations, data processing, printing and duplication, and credit and collection services, Dranove suggested that these services could be outsourced by both large and small organizations.
Huckman (2006) completed one of the most comprehensive studies of cost and quality in healthcare. Specifically, Huckman studied acquisitions in New York between 1992 and 1999 examining only two cardiac surgery service procedures including coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA). For CABG, Huck determined that for every 10% increase in quality and cost, there was a 0.09% reduction in risk adjusted mortality and a 0.8% reduction in cost (Huckman, 2006).

For PTCA, there was no evidence to suggest a significant correlation in quality, most likely due to the infrequency of death for this type of procedure (Vogt & Town, 2006). The findings demonstrated, however, that for every 10% increase in volume, there was a 1.9% decrease in costs. This finding adds further credibility to previous literature which suggests that costs are reduced through consolidation. A summary of research findings, including more precise descriptions of how hospital consolidations affect price and quality can be seen in a literature review by Vogt and Town (2006).


A number of organizations have formed associations which do not require them to consolidate provider numbers or make core changes to their governance structures. Although few mergers and acquisitions are ever blocked, many organizations elect to enter into more loosely arranged relationships such as affiliations or management agreements to make improvements to financial performance (Bogue et al., 1995).

Clement and colleagues (1997) studied the financial impact for hospitals that entered into these types of partnerships and found that performance was not improved
Despite efforts to eliminate the duplication of services, capture economies of scale and scope, and improve access to the continuum of care (Clement et al., 1997). Findings indicated higher cash flows and net revenues, but there were also higher operating expenses. Further, the authors suggested that alliances do not have the teeth needed to make critical strategic decisions.

Lee and Alexander (1999) noted that not all organizational changes are beneficial. The authors suggested that hospital leaders should be cautious and selective in their efforts to revive their hospitals. Similarly, Longo and Chase (1984) posited that joining a multi-hospital system did not enhance chances of survival. Bazzoli et al. (2000) proposed that unified ownership structures generally have better financial performance; this observation was further validated among mergers and acquisitions into one provider license (Bazzoli et al., 2004).

Some degree of centralization is necessary to maximize opportunities for consolidation and cost reduction.

There was significant discussion in the literature related to the centralization of services. The majority of articles suggested that some level of centralization was vital to financial improvements. Bazzoli and colleagues (2000) noted that hospital administrators can make decisions quicker due to reduced approval levels through centralization and that some degree of decentralization is necessary to respond to local markets. Within this body of research, the authors also discovered that complete decentralization lacked the ability to leverage for size and could lead to conflicting strategies (Bazzoli et al., 2000).
However, systems should not over-centralize processes either as this would reduce their ability to adjust to market changes and opportunities. Bazzoli et al. (2001) repeated this research and found similar results. Specifically, the authors detected significant differences in movement towards a moderate centralization model; this degree of centralization declined between 1994 and 1998 (Bazzoli, Shortell, Ciliberto, Kralovec, & Dubbs, 2001). The terms centralization and consolidation appear to reflect the same concept of combining services to gain more efficiencies. For the purpose of this current investigation, this dynamic is referred to as consolidation.

Previous authors have pointed out that centralization is needed to ensure some level of consistency. In 2004, Bazzoli et al. (2004) discovered that hospitals were able to consolidate administrative functions well, but consolidation of clinical activities was much more difficult. Citing Lesser and Brewster (2001), Bazzoli et al. (2004) noted that clinical consolidation faced less resistance when presented as revenue enhancement activities instead of cost reductions. This finding may suggest that physicians respond more positively to improvements to patient care activities than calls to improve finances.

*Decreases in competition can lead to higher prices for consumers.*

It is important to understand the effect of pricing to consumers, insurers, providers, and insurance companies as related to the effects of mergers and acquisitions and consolidation. Pricing is a major concern to regulators as the progression of hospital consolidation continues. In a study conducted from 1999 to 2003, Melnick and Keeler (2007) discovered that hospital systems in California that had merged grew prices 34% faster (large health systems) than those of other hospital systems.
Calem, Dor, and Rizzo (1999) used advanced economic based theory methods and tools to argue that mergers and acquisitions should be reviewed more closely for their effects on pricing. Ultimately, the authors concluded that the greater the differences between two merging organizations, the higher the benefits to consumers. This type of merger and acquisition results in a reduction in prices to consumers. Calem et al. further noted that profit maximizers (for-profit hospitals) tended to stabilize prices while quality enhancers (not-for-profits) tended to expand products by either maintaining prices or increasing them.

**Literature Review Summary**

The purpose of this literature review was to appraise the findings of previous researchers and scholars based on the financial success of mergers and acquisitions in the United States. This literature review represents studies that were conducted between 1980 and 2015 and provides an overview of findings regarding mergers and acquisitions. This review also reveals a gap in recent literature in terms of the financial success post-merger, which provides a compelling rationale for this current study. Further, the definitions of other types of relationships found between hospitals were equivocal in the literature. For this study, the terms mergers, affiliations, and acquisitions were used interchangeably.

**Conceptual Framework and Hypotheses**

Similar to recent mergers in healthcare, mergers in the 1990s were based on a belief that combining two or more organizations improves financial performance and quality indicators. There is paucity of literature regarding motivation for mergers as well as effectiveness of mergers over time. However, hospitals sought strategies to improve
their competitive advantage and could have felt that merging with other hospitals would lead to better outcomes. This adaptation, made internally based on the changing external market, is consistent with resource dependence theory (RDT).

RDT emphasizes the importance of an organization’s ability to secure needed resources from its environment in order to survive (Hickson, Hinings, Lee, Schneck, & Pennings, 1971). RDT has been widely used and is based on Pfeffer and Salancik’s (1978) *The External Control of Organizations: A Resource Dependence Perspective*. Pfeffer and Salancik (1978) characterized the corporation as an open system, dependent on resources from the environment. The authors also suggested that organizations attempt to reduce others’ power over them, often attempting to increase their own power over others (Salancik & Pfeffer, 1978).

Pfeffer (1987) provided the basic argument of the resource dependence perspective and interorganizational relations as: (1) Organizations are the fundamental business unit; (2) Organizations are not autonomous as success depends on their network of interdependencies with others; (3) Survival will depend on the level of uncertainty and interdependence on others; (4) Interdependencies are managed by organizations, but are never completely successful, which continues the evolution of interdependence; and (5) Organizational behavior is altered by the external powers within its environment.

Applying the concepts and theory of RDT seems appropriate for examining hospital mergers and acquisitions. RDT posits that organizations need to secure resources from the external environment in order to survive (Hickson et al., 1971). Previous research suggests that hospitals sought solutions to improve access to critical resources
such as financial capital, human capital, compliance and legal expertise, technologies, and total quality management (Bazzoli et al., 2000).

Hospitals are complex organizations that purchase services from many different entities, and they must satisfy demands from multiple and varying constituents. This complexity suggests that hospitals are open systems that need to adapt to the changing environment while also accessing resources from the environment (Salancik & Pfeffer, 1978). The competitive nature of hospitals is also explained by RDT since mergers and acquisitions are frequently geographic in nature and improve market power; thus increasing their power over others.

Although it is difficult to identify all of the causes for mergers and acquisitions, common reasons and examples of how resources are secured from the external environment include: (a) two hospitals from the same geographic region merge to decrease competition and to maximize resources from each other (Preyra & Pink, 2006); (b) economies of scale are maximized by creating centralized non-clinical administrative type services, such as business office, payroll, human resources, and legal (Bazzoli et al., 2004); and (c) a smaller hospital may merge with the larger system that has better access to capital due to stronger balance sheet performance (Dranove, 1998).

Additional examples and justifications include the following: (d) a not-for-profit hospital may be purchased by a for-profit company to gain access to capital from the stock market; (e) a larger hospital may seek smaller hospital partners to gain tertiary referrals that will help offset higher cost services such as intensive care units and high risk maternal services; (f) costs for legal services and compliance programs can be reduced through centralization of resources; (g) a hospital seeks improved access and cost
control with technological advancements through increased purchasing power; and (h) a hospital may seek improved negotiation power with regional insurance providers due to larger market share and threat to insurance company’s ability to retain/recruit members.

The behaviors observed and described by the hospital industry seem consistent with the resource dependence theory. For example, Bazzoli et al. (2004) found hospitals that consolidated services had stronger results than those that did not. An organization (hospital) seeks access to the resources and expertise provided by the larger system to maximize its ability to compete with the external market.

The larger system also seeks this relationship to improve market power over others as it strengthens market share, maximizes economies, and enhances expertise. As the larger system grows, it minimizes uncertainty by leveraging the enhanced market power to further adapt to the environment. This adaptation could include changes to types, locations, and scope of services offered. Although hospitals merge legally and consolidate some services, they remain physically separate. This dynamic provides the opportunity for increased interdependence between physical locations.

For example, a larger hospital may work with a smaller hospital to provide cardiology services. This relationship allows the larger hospital to maximize its use of cardiologists, while the smaller hospital gains enhanced revenues from cardiology type services at less cost than otherwise available. If this relationship were terminated, the loss of referred cardiology type cases to the larger hospital, and the loss of access to cardiology services for the smaller hospital could result in negative financial consequences for both parties. The new larger entity would continue to share resources in
efforts to maximize performance which would further increase its dependence and interdependence synergies (Salancik & Pfeffer, 1978).

Hospital merger and acquisition behaviors seem to be aligned with resource dependence theory concepts. Applying RDT to hospital mergers, seeking a merger would only be desirable if efforts to remain independent were determined to be unfeasible. It seems logical that mergers are sought in an effort to make hospitals financially stronger and better able to compete in the future. While this belief seems reasonable and supported by RDT, the healthcare industry literature does not provide recent evidence that mergers and acquisitions lead to improved financial performance. This current research provides insights regarding the financial performance of hospitals that merged as well as those that did not participate in mergers and acquisitions.

Hypotheses

Hypothesis 1. Hospitals that join a health system have better financial performance than those that do not join a health system.

Rationale. Combining organizations will maximize efficiency opportunities. Consistent with resource dependence theory, organizations will seek to centralize and eliminate duplicate service lines while maintaining market share throughout their markets or even larger markets. This combination of services ensures consistent strategy development and the ability to respond to local healthcare needs.

Hypothesis 1a. The change in operating margin for hospitals that merge will be greater than the change in operating margin for hospitals that remain independent during the same period.
Hypothesis 1b. The change in operating expenses per adjusted patient days for hospitals that merge will be greater than the change in operating expense per adjusted patient day for hospitals that remain independent during the same period.

Hypothesis 2. For hospitals that have joined a health system, those with certain organizational and environmental characteristics will experience greater financial performance improvements than others.

Rationale. Both internal and external variables such as hospital bed size, revenue size, socioeconomics, and community income levels will play a role in the success of the merging process.

Size, reflected by adjusted patient days, will have a significant impact on financial changes following a merger. The smaller, usually acquired, hospital will have greater financial improvement due to its ability to consolidate services into the larger hospital.

Hypothesis 2a. Smaller hospitals will experience greater financial performance improvements than larger hospitals after joining a health system.

Hospital ownership type may have an impact on the financial changes following a merger. For-profit health systems must generate better financial performance in order to satisfy stockholder demands. They also must pay taxes, thus requiring improved operating margins as compared to not-for-profits.
Hypothesis 2b. For profit hospitals joining a health system will experience greater financial performance improvements than not-for-profit hospitals after joining a health system.

Rural hospitals are typically smaller than their acquiring hospitals, and therefore will experience the same benefit as described in Hypothesis 2a.

Hypothesis 2c. Rural hospitals will experience greater financial performance improvements than urban hospitals.

Hospitals that serve areas with higher poverty rates could experience greater strain on financial resources caused by the increased probability that services are provided for either zero payment or at reimbursement less than actual costs. These financial strains may have an impact on a merger’s ability to improve financial performance.

Hypothesis 2d. Hospitals located in areas with a higher percentage of persons living in poverty will experience less financial performance improvement resulting from joining a system than those hospitals located in areas with lower poverty.

Hospitals competing within similar markets are forced to compete for patients. When hospitals join another hospital within the same market, they have greater consolidation opportunities.

Hypothesis 2e. Hospitals competing in more competitive markets will experience less financial performance improvement resulting from joining a system than those located in less competitive markets.
Conceptual Model

Organizations must choose the right path to follow to ensure their financial stability over time. A conceptual model that describes an organization’s ability to either choose to remain independent or to merge with other organizations can be seen in Figure 1.

![Conceptual Model of Pathways](image)

Figure 1. Conceptual Model of Pathways.

This simple model is a visual description of two different paths hospitals can follow. Essentially, the independent hospital may stay independent or it may choose to merge with another entity. The purpose of this study was to determine if hospitals that joined health systems experienced financial performance improvements greater than hospitals that did not join a health system. Based on resource dependence theory, it was
assumed that hospitals that were part of a system would outperform those that were still independent.
CHAPTER 3
RESEARCH METHODS

The purpose of this study was to evaluate the effect of joining a health system on financial performance. This chapter describes how the research questions and hypotheses were studied. It includes detailed information about the design, data collection, variable selection, and methods used.

Research Design

The purpose of this study was to evaluate the effect of system membership on hospital financial performance. For the purpose of this study mergers were defined as an independent hospital joining a health system. This term is often labeled as a merger or acquisition. However, there were no circumstances in this study in which two hospitals in the same market combined to form one sole entity.

Study Population and Sample

The population included all acute care hospitals in the United States that were in operation between 2007 and 2011. Merger transactions starting in 2007 were used to provide a more recent research timeline than previously studied. Due to Medicare cost report limitations, the study stopped after 2011. Only acute care hospitals were included in this research study. Non-acute care environments, such as long-term care, specialty hospitals, and ambulatory surgical hospitals, were excluded from the study. The final sample size included 94 merger transactions. There are 5,730 registered acute care hospitals in the United States. Hospitals that merged were compared to hospitals of similar characteristics that had not merged during the same timeframe. This matching process is more clearly explained below.
Data Sources and Collection Procedures

Data from 2007 through 2011 were collected by using the American Hospital Association (AHA) Annual Survey databank, Area Health Resource File (AHRF), and Medicare Cost Report Data. AHA data are collected through a self-reporting process by hospitals across the nation. AHA independently places system identifiers (SYSID) in the data which provides more reliable information, especially in terms of identifying independent variable groups. This SYSID identifier was used to identify merged hospitals (AHA, 2012).

Additional advantages of using AHA data include its access to significant variables such as ownership, hospital size, services available, community orientation, and information technology. AHA also maintains the most complete dataset available for hospital information and has the ability to be connected to other datasets using Medicare ID numbers. Notwithstanding, there are some weaknesses to these data including a limited set of outcomes data and the self-reported nature of the data.

Data from the Centers for Medicare and Medicaid Services (CMS) were used to capture financial information. CMS datasets were the most comprehensive data available for this study. Further, these data have the most accurate financial measures and can be linked by ID to the AHA Annual Survey. Financial information such as operating margin and operating expense were used for this study.

Data from the Area Health Resource File (AHRF) were also identified to capture environmental factors such as poverty rates, unemployment, per capita income rates, and the percentage of uninsured citizens.
The Bureau of Health Professions from the U.S. Department of Health and Human Services assembles these data which are included in the AHRF. The estimated percentage of persons in poverty was contained within the AHRF document. This estimate contained in the AHRF documents includes data provided by the Bureau of Census’ Small Area Income Poverty Estimates (SAIPE) files. The primary challenge for this study was manipulating complex datasets. This collection of data identified 94 hospitals that merged between 2007 and 2011.

Measures

Variables and Operationalization

Identifying credible and valid variables was essential to producing results that professionals in healthcare would respect and with which they would relate. Study results must be understandable and utilize terminology that is familiar so that results can be easily described. Both access and clarity of variable definitions was obtained as data were collected and used throughout the analysis.

Dependent Variables

The dependent variables (DV$s) included measures of financial performance within the healthcare sector. Specifically, dependent variables measured profitability and cost. It was important to study how these variables related to one another and to determine their independence from each other. The variables are described below and summarized in Table 1.

Profitability and cost. Evaluating items such as total margin (Bazzoli et al., 2000), total operating margin, and operating expenses per adjusted patient day demonstrate substantial evaluation of financial performance. These measures are
common within the industry and can be considered the outcome of an organization that has leveraged resources both internally and externally to maximize success. Two dependent variables, operating margin and operating expenses per adjusted patient day, were used to study profitability and costs for this study. The strength of using operating margin is that it does not include capital funding, investments, and foundation dollars that are often included in net income results. A weakness of using operating margin is that it presents all of the revenues and expenses under a single metric which makes it difficult to determine which aspects are improving and which ones are declining. Operating expense data were collected from CMS and adjusted by patient day resulting in a ratio metric adjusted for the amount of inpatient care provided, which provides a better sense of the size of the hospital.

Using operating margin and operating expenses allowed for a more rigorous comparison among hospitals. Consistent with resource dependence theory, organizations that have strong financial performance over time have probably reduced costs through consolidation efforts (Hickson et al., 1971).

**Independent Variables**

This study compared the differences in changes in operating margin and operating expense per adjusted patient day between each merged hospital (transaction) and its matched independent hospital with similar characteristics. This matching process is described in the control variable section below. Independent variables included organizational and external characteristics that were identified through the literature review.
Organizational characteristics. Dranove (1998) evaluated non-revenue generating department consolidation and found that size matters. For larger hospitals, the effect of consolidation was only nominal. This current study used adjusted patient days to categorize the size of organizations. This measure accounted for the percentage of outpatient versus inpatient volumes. Ownership (not-for-profit and for-profit) were also evaluated, which is consistent with the established research literature (Dranove & Lindrooth, 2003).

Organizational characteristics. Organizations must adapt to their environment as they are both dependent and interdependent on what the environment provides (Hickson et al., 1971). The percentage of people living in poverty, location (urban versus rural), and the measure of competition (Herfindahl-Hirschman Index) are important characteristics. The percentage of people living in poverty indicates levels of income per capita, employment status, and ultimately, the number of patients that could be treated without insurance. This has a significant impact on financial performance as hospitals often care for patients who do not have the ability to pay for services.

Geography, or physical location, could also have an impact on a potential merger. For example, merging a hospital located in a smaller population area (rural) may result in greater financial improvements when it merges with hospitals located in more urban markets. For this study, AHA Region was used to match similar hospitals and to assess its impact on mergers.

The level of competition throughout a market demonstrates an important aspect of environmental characteristics. The Herfindahl-Hirschman Index (HHI) is calculated as the sum of the squared market share of each competing organization. Both the number of
staffed beds and admissions have been used in previous literature to construct the HHI measure. Since the calculation has been inconsistent and admission data were not included within this study’s dataset, the number of beds was selected for the calculation of market share.

The county represents the market; therefore, the percentage of the county’s beds that each hospital maintains represented its competitive nature within the market. HHI is widely used throughout healthcare research to measure competition (Melnick & Keeler, 2007). Consumers may take advantage of a more competitive market to leverage reduction in reimbursement for clinical services. Likewise, hospitals may experience increases in costs as they compete for clinical talent. According to the experts, organizations will seek to perform better than their competitors to reduce their competitor’s power over them (Salancik & Pfeffer, 1978). This behavior is explained by resource dependence theory.

**Control Variables**

This study examined the effects of a merger on hospital financial performance while controlling for urban versus rural status, AHA Region, operating expenses, operating margin, HHI, and adjusted patient days. For each merger observation, an independent hospital of similar characteristics was used to compare. All observations were matched exactly for Urban (Rural) and AHA Region since they are categorical variables. HHI and adjusted patient days were divided into 10 categories representing 10% of each range. When multiple matches were identified, merging hospitals were matched to the independent hospital with the most similar pre-acquisition value of the most appropriate outcome variable (operating margin vs operating expenses per adjusted
patient day). This resulted in some independent hospitals being used multiple times for matching purposes. For the matching process, hospital data from one year prior to the merger were used to match control variables.
# Table 1

**Variable Types and Definitions**

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>Change in Operating Margin</td>
<td>Change in operating margin (net revenue - net expense / net revenue)</td>
</tr>
<tr>
<td>Dependent</td>
<td>Change in Operating Expense per Adjusted Patient Day</td>
<td>Percent change in operating expenses per Adjusted Patient Day</td>
</tr>
<tr>
<td>Independent</td>
<td>Adjusted Patient Days</td>
<td>Categorized into 10 deciles</td>
</tr>
<tr>
<td>Independent</td>
<td>AHA Region</td>
<td>Region 1: CT, MA, ME, NH, RI, VT; Region 2: NJ, NY, PA;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 3: DC, DE, KY, MD, NC, VA, WV; Region 4: AL, FL, GA, MS, SC, PR, TN;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 5: IL, IN, MI, OH, WI; Region 6: IA, KS, MN, MO, NE, ND, SD;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Region 7: AR, LA, OK, TX; Region 8: AZ, CO, ID, MT, NM, UT, WY; Region 9: AK, CA, HI, NV, OR, WA.</td>
</tr>
<tr>
<td>Control</td>
<td>Urban</td>
<td>Location of Hospital in an Urban setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Urban</td>
</tr>
<tr>
<td>Control</td>
<td>Ownership</td>
<td>Ownership Type of Hospital</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = Not-for-profit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = For-profit</td>
</tr>
<tr>
<td>Control</td>
<td>% Population in Poverty</td>
<td>Percent of population estimated to be living in poverty</td>
</tr>
<tr>
<td>Control</td>
<td>HHI Hospital Index</td>
<td>Herfindahl - Hirschman Index of market competitiveness (adjusted patient days)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Categorized into 10 different segments. Category 1 = 0.1-0.19,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Category 2 = 0.2-0.29,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Category 3 = 0.3-0.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Etc.</td>
</tr>
</tbody>
</table>
Data Analysis Methods

This study examined relationships between two different strategic paths (joining a health system versus remaining independent). It can be considered a non-experimental study that required both univariate and multivariate analysis. A univariate analysis was conducted to understand the data and to produce a set of descriptive information from which to draw comparative information. For the multivariate analysis, a difference-in-difference analysis using matched control hospitals was conducted to assess for differences in performance change between merging and independent hospitals. To compare groups, it was necessary to determine the differences between the groups through t-tests. Finally, a linear regression was conducted to look for associations between financial outcomes and environmental and organizational factors.

Methods

The study focused on hospitals that merged with a health system between 2007 and 2011. Data were collected from previously described sources and coded to create variables that addressed the needs of analysis. A descriptive analysis was conducted for three main groups including (1) permanently independent hospitals, (2) merged hospitals, and (3) the control group. The permanently independent hospital group was defined as those hospitals that remained independent throughout the course of this study period. The merged hospital group included hospitals that were identified to have joined a health system, while the control group included hospitals that were independent; the control group was used to compare to specific merger hospital transactions.

For Hypothesis 1, the effect of a merger on the merged hospital was assessed by calculating the differences between means of each observation (merger) compared to the
differences between the means of a matched hospital (control). The differences between these two means determined the net effect of the merger. Therefore, a difference-in-difference analysis was conducted. The difference-in-difference method accounts for the natural changes in performance across the industry by comparing the differences in percent change in operating margin and operating expenses per adjusted patient day with merged hospitals versus the differences in percent change in a similar matched hospital during the same period. This process looked at two different time periods. The first analysis assessed the differences of effect for one year prior to the merger versus one year post-merger. The second analysis looked at one year prior to the merger versus two years post-merger.

A series of matched sample t-tests was conducted to evaluate the change in financial performance. Operating margin and operating expenses per adjusted patient day were the two variables of interest for this study. The results of the matched sample t-test demonstrated the difference of means between the year prior to and one (and two) years post-merger versus the same results for the control hospital. Selecting one year prior to the merger as the baseline was to assess hospital financial performance before the merger occurred. Looking at years one and two post-merger was designed to see if there was a difference over time. If statistically significant findings were discovered, an association between financial performance and merger would be observed.

For Hypothesis 2, an association between certain organizational and external characteristics with financial performance was assessed using a linear regression analysis. For the regression, the difference between operating margin for years one and two post-merger was the outcome variable (did_opmarg_t1 & did_opmarg_t2). The changes of
financial performance (difference-in-difference for operating margin) determined if organizational (adjusted patient days, ownership) or environmental (HHI, urban versus rural, uninsured) characteristics had any relationship with financial performance.

**Methods Summary**

This study examined the relationship between hospitals that merged and hospitals that remained independent. The study methodology was previously explained in this chapter. The population sample, data collection process, and data sources for each variable were identified. A difference-in-difference analysis was used to examine if financial performance improved following a merger as compared to a similar hospital that did not experience a merger. A linear regression model was used to see if certain organizational and external characteristics had a predictable impact on financial improvements in hospitals following a merger.
CHAPTER 4

ANALYSIS AND PRESENTATION OF FINDINGS

Introduction

The purpose of this study was to determine the effect of joining a health system on financial performance. The first section of this chapter describes the different groups of hospitals including those that merged, the control group of hospitals, and the permanently independent hospitals during the time period examined. The second section shares the results of the difference-in-difference analyses and linear regression analyses. This chapter concludes with a summary of findings by hypothesis.

Description of the Study Data

Study data were compiled from credible sources and included hospital financial and operational metrics as well as other metrics in the original dataset. All acute care hospitals associated with Medicare reporting were included in the sample; these data were later coded to meet the needs of data analysis. All analyses and tests were completed using SPSS statistics version 22.

Descriptive Statistics

Descriptive tests were performed once outliers and observations with missing data were removed. Three different groups were analyzed descriptively to contextualize and assess the differences between study groups. These groups included (1) Merged Hospitals, (2) Control Hospitals, and (3) Permanently Independent Hospitals. The merged hospital group included all mergers in the study. The control hospital group shared the same characteristics of the hospitals that were used to match with each merged hospital. The permanently independent groups within the study period of 2007-2011 provided data
for the entire sample size and offered insights regarding similarities between the merged, control group, and independent hospitals.

Descriptive statistics of the dependent, independent, and control variables are presented in Table 2. While the number of hospitals within the merged hospitals (n=94) group was close to the number of control hospitals (n=81), there were more permanently independent hospitals (n=1,900) not used for comparison. The number of control hospitals was less than merged hospitals because some controls were used more than once. The dependent variables used for profitability and costs analysis included operating margin and operating expenses per adjusted patient day. The operating margin for merged hospitals (-3%) was closer to that of control hospitals (-5%), while permanently independent hospitals (-6%) had margins two times that of merged hospitals. The operating expense per adjusted patient day was higher for merged hospitals ($1,662.70) than both control ($1,550.92) and permanently independent ($1,553.68) hospitals.

The organizational characteristics were described using adjusted patient days and ownership structure for this study. Adjusted patient days for control (66,711) and permanently independent (62,304) hospitals were similar whereas merged hospitals (74,038) were noticeably different. Not-for-profit ownership was clearly the most frequently observed variable as evidence by 100% for the merged and permanently independent hospitals and only 0.2% of control hospitals that were owned by for-profit companies.

The environmental characteristics used for this study included urban location, AHA region, HHI, and percentage of population living in poverty. Relatively few hospitals were located in urban areas for all three hospital categories. The AHA Region
breakdown provided a glimpse into a potential regionalization effect. The merged and control hospitals appeared to be well matched as evidenced by similar representation between regions. In region 3, there was an observable difference of over 6% between the merged (23.05%) and control (16.57%) hospitals. Hospitals within more competitive markets (HHI) were observed for the merged (0.77) and control (0.74) hospitals. The permanently independent (0.68) hospitals appeared to be in less competitive environments. The percentage of people living in poverty appeared to be similar for matched (15.70%) and permanently independent (15.61%) hospitals while a rate difference of 1% did not seem material for the control (16.08%) hospitals.
### Table 2
*Descriptive Statistics*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Merged Hospitals</th>
<th>Control Hospitals</th>
<th>Permanently Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Hospitals</td>
<td>94</td>
<td>81</td>
<td>1,900</td>
</tr>
<tr>
<td>Profitability and Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Margin</td>
<td>-3%</td>
<td>-5%</td>
<td>-6%</td>
</tr>
<tr>
<td>Expense per adjusted patient day</td>
<td>$1,662.70</td>
<td>$1,550.92</td>
<td>$1,553.68</td>
</tr>
<tr>
<td>Org Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted Patient Days</td>
<td>74,038</td>
<td>66,711</td>
<td>62,304</td>
</tr>
<tr>
<td>Ownership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for Profit</td>
<td>100%</td>
<td>99.80%</td>
<td>100%</td>
</tr>
<tr>
<td>For Profit</td>
<td>0%</td>
<td>0.20%</td>
<td>0%</td>
</tr>
<tr>
<td>Environmental Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Metropolitan</td>
<td>88%</td>
<td>89%</td>
<td>88%</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>12%</td>
<td>11%</td>
<td>12%</td>
</tr>
<tr>
<td>AHA Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region 1</td>
<td>2.94% (15)</td>
<td>2.94% (15)</td>
<td>94.12% (480)</td>
</tr>
<tr>
<td>Region 2</td>
<td>4.3% (40)</td>
<td>3.22% (30)</td>
<td>92.48% (861)</td>
</tr>
<tr>
<td>Region 3</td>
<td>23.05% (160)</td>
<td>16.57% (115)</td>
<td>60.37% (419)</td>
</tr>
<tr>
<td>Region 4</td>
<td>3.28% (38)</td>
<td>3.02% (35)</td>
<td>93.7% (1086)</td>
</tr>
<tr>
<td>Region 5</td>
<td>5.23% (75)</td>
<td>4.88% (70)</td>
<td>89.88% (1288)</td>
</tr>
<tr>
<td>Region 6</td>
<td>0.94% (15)</td>
<td>0.94% (15)</td>
<td>98.11% (1561)</td>
</tr>
<tr>
<td>Region 7</td>
<td>6.32% (90)</td>
<td>6.18% (88)</td>
<td>87.51% (1247)</td>
</tr>
<tr>
<td>Region 8</td>
<td>3.56% (25)</td>
<td>3.41% (24)</td>
<td>93.03% (654)</td>
</tr>
<tr>
<td>Region 9</td>
<td>1.12% (10)</td>
<td>1.12% (10)</td>
<td>97.77% (875)</td>
</tr>
<tr>
<td>Total</td>
<td>5.01% (468)</td>
<td>4.30% (402)</td>
<td>90.69% (8471)</td>
</tr>
<tr>
<td>HHI Hospital Index (mean)</td>
<td>0.77</td>
<td>0.74</td>
<td>0.68</td>
</tr>
<tr>
<td>% Population Poverty (mean)</td>
<td>15.70%</td>
<td>16.08%</td>
<td>15.61%</td>
</tr>
</tbody>
</table>
A comparison between groups was needed to assess the effectiveness of the matching process. The matching process provided a mechanism to compare each merged hospital with the most similar independent hospital during the same time period. AHA Region and Urban (rural) location variables were perfectly matched for each pairing. Since ownership and percentage in poverty were not used in the matching process, these variables (AHA Region, rural location, ownership, and percentage in poverty) are not compared in the tables below. There were occasions when multiple hospitals were identified as matches throughout the process. When this occurred, the most appropriate outcome variable (operating margin vs operating expenses per adjusted patient days) was selected. Tables 3 and 4 represent the comparison between the different group pairings.

Table 3
*Matching Descriptive Comparison Analysis for Operating Margin*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Merged Hospitals</th>
<th>Control Hospitals</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Hospitals</td>
<td>94</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Operating Margin</td>
<td>-4%</td>
<td>-4%</td>
<td>0.854</td>
</tr>
<tr>
<td>Adjusted Patient Days</td>
<td>72,575</td>
<td>63,495</td>
<td>0.032</td>
</tr>
<tr>
<td>HHI Hospital Index (mean)</td>
<td>0.76</td>
<td>0.76</td>
<td>0.267</td>
</tr>
</tbody>
</table>

*Matched exactly for AHA Region and Urban
**Did not match for Ownership and Percent Poverty

Table 3 represents the comparison between merged and control hospitals for hypothesis 1a which evaluated the difference-in-difference in the change of operating margins between these two groups. For this table, operating margin (p= 0.854) and HHI
(p=0.267) were not found to be statistically significant as their p values were greater than 0.05. Adjusted patient days (p=0.032) were found to be statistically significant. Thus, operating margin and HHI were well-matched as there were no significant differences between the merged and control groups. The significant differences between the merged and control hospitals’ adjusted patient days indicated a less accurate matching process. This finding could be explained by the grouping (deciles) techniques utilized and should be considered while interpreting results.

Table 4
**Matching Descriptive Comparison Analysis for Operating Expense Per Adjusted Patient Day**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Merged Hospitals</th>
<th>Control Hospitals</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Hospitals</td>
<td>94</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Expense per adjusted patient day</td>
<td>$1,590.04</td>
<td>$1,473.60</td>
<td>0.000</td>
</tr>
<tr>
<td>Adjusted Patient Days</td>
<td>72,575</td>
<td>68,472</td>
<td>0.361</td>
</tr>
<tr>
<td>HHI Hospital Index (mean)</td>
<td>0.76</td>
<td>0.76</td>
<td>0.267</td>
</tr>
</tbody>
</table>

*Matched exactly for AHA Region and Urban
**Did not match for Ownership and Percent Poverty

Table 4 represents the comparison between merged and control hospitals for hypothesis 1b which evaluated the difference-in-difference in the change of operating expenses per adjusted patient day. In addition to AHA Region and Urban location which were perfectly matched. For this table, adjusted patient days (p=0.267) were not found to be statistically significant as their p values were greater than 0.05. Operating expense per adjusted patient days (p=0.000) were found to be statistically significant. Thus, adjusted
patient days and HHI were well-matched as evidenced by no significant differences between the merged and controlled hospitals. The significant differences between the merged and control hospitals’ operating expense per adjusted patient day indicated a less accurate matching process. This finding should be considered while interpreting these results.

**Evaluation of Assumptions and Outlier Analysis**

With such a large dataset, it was important to exclude outliers that may have skewed the results. It was determined that the best way to handle outliers was to exclude hospitals that had operating margins and operating expense means that were more than two standard deviations from the mean. This resulted in a decrease in independent hospitals and did not negatively affect the study sample size of 94.

**Difference-in-Difference Analysis**

The difference-in-difference (DnD) analysis is a statistical method used to assess associational relationships. For this study, identifying the effect of joining a health system on financial performance was essential to the research question. Since comparisons were made for hospitals pre-intervention (merger) and post-intervention, it was necessary to control for selection bias; DnD helps to manage groups and estimate a true treatment (merger) effect.

**Difference-in-Difference for Operating Margin**

For the first year test, the difference in operating margin for merged hospitals versus control hospitals was studied. The difference in operating margin mean for merged hospitals was 0.02 and 0.00 for the control group. This finding was statistically significant (p=0.032); therefore, we reject the null hypothesis and note that operating margins improved one year post-merger by a difference of 0.02 (0.02-0.0).
For the second year test, the difference in operating margin mean for merged hospitals was 0.02 and -0.01 for the control group. This finding was also statistically significant (p=0.050) at the 90% confidence interval; therefore, we reject the null hypothesis and find that operating expenses improved two years post-merger by a difference of 0.03 (0.02-0.01). Table 5 contains specific details for this analysis.

Table 5
*Matched Samples T Test: Change of Operating Margin*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Error</th>
<th>95% Confidence Interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 year post merger</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merged Hospitals</td>
<td>0.02</td>
<td>0.104</td>
<td>0.104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched Control Hospitals</td>
<td>0.00</td>
<td>0.77</td>
<td>0.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference-in-Differences</td>
<td>0.027</td>
<td>0.118</td>
<td>0.012</td>
<td>0.002-0.051</td>
<td>0.032</td>
</tr>
<tr>
<td><strong>2 years post-merger</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merged Hospitals</td>
<td>0.02</td>
<td>0.114</td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched Control Hospitals</td>
<td>-0.01</td>
<td>0.093</td>
<td>0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference-in-Differences</td>
<td>0.030</td>
<td>0.145</td>
<td>0.015</td>
<td>0.000-0.059</td>
<td>0.050</td>
</tr>
</tbody>
</table>

**Difference-in-Difference in Change of Operating Expenses per Adjusted Patient Day**

For the first year test, the difference in operating expenses per adjusted patient day for merged hospitals versus control hospitals was studied. The difference in operating expense per adjusted day mean for merged hospitals was 0.11 and 0.11 for the control group suggesting there were no difference in change between the two groups. This finding was not statistically significant (p=0.629); therefore, we fail to reject the null hypothesis. For year two, the difference in operating margin per adjusted patient day mean for merged hospitals was 0.22 and 0.16 for the control group. This finding was also
not statistically significant (p=0.367); therefore, we fail to reject the null hypothesis.

Table 6 contains the detailed results for this analysis.

Table 6
Matched Samples T-Test: Change in Operating Expense

<table>
<thead>
<tr>
<th>Year post-merger</th>
<th>Merging hospitals Mean</th>
<th>Std Dev</th>
<th>Std Error</th>
<th>95% Confidence Interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year post-merger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merging hospitals</td>
<td>0.11</td>
<td>0.375</td>
<td>0.039</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched control hospitals</td>
<td>0.11</td>
<td>0.384</td>
<td>0.040</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference-in-differences</td>
<td>-0.004</td>
<td>0.508</td>
<td>0.052</td>
<td>(0.108)-0.100</td>
<td>0.943</td>
</tr>
<tr>
<td>2 years post-merger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merging hospitals</td>
<td>0.22</td>
<td>0.561</td>
<td>0.058</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched control hospitals</td>
<td>0.16</td>
<td>0.463</td>
<td>0.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference-in-differences</td>
<td>0.063</td>
<td>0.678</td>
<td>0.070</td>
<td>(0.075)-0.202</td>
<td>0.367</td>
</tr>
</tbody>
</table>

Factors Associated with Post-Merger Improvement

Linear regression was used to determine if certain organizational and external characteristics were associated with improvements in financial performance. The operating variable for this study was the difference-in-difference in the changes in operating margin for post years one and two. Before performing the regression, tests were completed to ensure linear regression assumptions were met. Hospitals with operating margins and operating expenses per adjusted patient day greater than two standard deviations from the mean were removed prior to analysis. Regressions were conducted for both one and two years post-merger, and results are contained in Tables 5 and 6.
Table 7

Hospital and Market Characteristics Associated with One Year Changes in Operating Margin (N=94)

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-.007</td>
<td>.069</td>
</tr>
<tr>
<td>Adjusted Inpatient Days</td>
<td>-1.086E-7</td>
<td>.000</td>
</tr>
<tr>
<td>Not-for-profit</td>
<td>.042</td>
<td>.071</td>
</tr>
<tr>
<td>Urban Location</td>
<td>-.021</td>
<td>.041</td>
</tr>
<tr>
<td>Percent Persons in Poverty</td>
<td>.002</td>
<td>.003</td>
</tr>
<tr>
<td>HHI</td>
<td>.046</td>
<td>.043</td>
</tr>
</tbody>
</table>

Outcome: Difference-in-Difference in Operating Margin for Year 1 Post-Merger

Table 7 presents the results of the regression of changes in operating margin on hospital and market characteristics for one year pre-merger compared to one year post-merger. Adjusted patient days (b= -1.086E-7, p=0.493), hospital ownership (b=0.042, p=0.553), urban location (b= -0.021, p= 0.612), percentage of persons in poverty (b= 0.002, p= 0.559), and HHI (b= 0.046, p= 0.293) were not statistically significant as indicated by p values greater than 0.05. Thus, for year one there was no evidence that certain organizational characteristics influenced the impact of a merger.
Table 8

*Hospital and Market Characteristics Associated with Two Year Changes in Operating Margin (N=94)*

<table>
<thead>
<tr>
<th>Unstandardized Coefficients</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.054</td>
</tr>
<tr>
<td>Adjusted Inpatient Days</td>
<td>4.422E-09</td>
</tr>
<tr>
<td>Not-for-profit</td>
<td>-.044</td>
</tr>
<tr>
<td>Urban location</td>
<td>-.104</td>
</tr>
<tr>
<td>Percent Persons in Poverty</td>
<td>.000</td>
</tr>
<tr>
<td>HHI</td>
<td>.085</td>
</tr>
</tbody>
</table>

Outcome: Difference-in-Difference in Operating Margin for Year 2 Post-Merger

Table 8 presents the results of the regression of changes in operating margin on hospital and market characteristics at year two post-merger. Urban location (b=-0.104, p=0.033) was the only statistically significant finding for Year 2. Adjusted patient days (b= 4.422E-9, p=0.981), hospital ownership (b=-0.044, p= 0.599), percentage of persons in poverty (b= 0.000, p= 0.940), and HHI (b= 0.085, p= 0.098) were not statistically significant as indicated by p values greater than 0.05. But, the HHI finding is interesting and should be noted for its significance in the 90th percentile (p=0.098). Results for year two produced evidence that rural hospitals that joined systems may have enjoyed greater growth in operating margin than urban hospitals that merged. Holding all other variables constant, merged hospitals located in urban markets had operating margins that were 0.104 lower than rural hospitals.
Summary of Findings by Hypothesis

This research investigated two primary hypotheses to answer the research questions. Research hypotheses are presented in the following section.

**Hypothesis 1: Effect of Joining a Health System on Financial Performance**

The first hypothesis proposed that when a hospital joined a health system, which was generically called a merger for this study it would experience better financial performance than those that remained independent. A difference-in-difference analysis assessed the effect of the merger on operating margins and operating expenses per adjusted patient day. The measurement period started one year prior to the merger, and changes one and two years post-merger were analyzed. Operating margin and operating expenses per adjusted patient day served as the dependent variables for this study.

There was a statistically significant (p<0.05) finding for year one which suggests that operating margin improved during year one by 0.02 percentage points. In year two, statistical significance was only found at the 90% confidence interval (p=0.05). Operating margins improved by 0.03 percentage points for year two. The average margin for merged (-3%) hospitals within this study was two percentage points greater than control (-5%) hospitals. The improvement of 0.02 percentage points may not be a material finding. The results supported the decision to reject the null hypothesis and provided conclusive evidence that operating margins for hospitals that merged were better than operating margins for hospitals with similar characteristics that were independent during the same period of time.

The difference-in-difference for operating expenses per adjusted patient day was studied to assess the second component of financial performance. Adjusted operating
expenses as a function of adjusted patient days was used to account for differences in organizations that could affect total expenditure such as inpatient/outpatient mix, number of observation days, and unused (unstaffed) inpatient beds. For years one and two, no statistical significance was found with p values of 0.0629 and 0.367, respectively. Therefore, Hypothesis 1 was not supported. Evidence did not support the contention that merged hospitals would have lower operating expenses per adjusted patient day than those that remained independent.

**Hypothesis 2: For Hospitals that Joined a Health System, Those with Certain Organizational and Environmental Characteristics Will Experience Greater Financial Performance Improvements than Others.**

The second purpose of this study was to assess if, for hospitals that joined a health system, certain organizational and environmental characteristics would result in greater financial performance improvements than others. The rationale for this purpose was to provide healthcare executives a tool to determine the potential merits of a merger for their organizations. Selected characteristics were based on a review of the literature for frequently used measurements of organizational and environmental characteristics. Variable selection and its relationship to resource dependence theory were discussed in Chapter 3. The five characteristics considered in this investigation included adjusted patient days, hospital ownership, urban location, percentage of persons in poverty, and HHI. Two multiple regression analyses were performed using the difference-in-difference of operating margins for years one and two.

For year one, none of the five variables was found to have a statistically significant association to changes in operating margin with p values greater than 0.05.
Year two did find that being located in an urban location affected financial performance by a factor of a negative 0.104. This finding suggests that urban hospitals experienced less improvement in operating margins than rural hospitals. Table 7 summarizes findings for all of the hypotheses.

Table 7

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Hypothesis Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1a</strong> The change in operating margin for hospitals that merge will be greater than the change in operating margin for hospitals that remain independent during the same period.</td>
<td>Yes Yes</td>
</tr>
<tr>
<td><strong>1b</strong> The change in operating expenses per adjusted patient days for hospitals that merge will be greater than the change in operating margin for hospitals that remain independent during the same period.</td>
<td>No No</td>
</tr>
<tr>
<td><strong>2a</strong> Smaller hospitals will experience greater financial performance improvements than larger hospitals after joining a health system.</td>
<td>No No</td>
</tr>
<tr>
<td><strong>2b</strong> Hospital ownership type may impact the success of mergers.</td>
<td>No No</td>
</tr>
<tr>
<td><strong>2c</strong> Rural hospitals will experience greater financial performance improvements than Urban hospitals. Hospitals located in areas with higher percentage of persons living in poverty will experience less financial performance improvement resulting from joining a system than those hospitals located in areas with lower poverty.</td>
<td>No Yes</td>
</tr>
<tr>
<td><strong>2d</strong> Hospitals competing in more competitive markets will experience less financial performance improvement resulting from joining a system than those located in less competitive markets.</td>
<td>No No</td>
</tr>
</tbody>
</table>
Summary

This chapter presented the results and findings for both hypotheses. The results from the difference-in-difference analysis provided support for the proposal that operating margins for merged hospitals are better than those of hospitals that remained independent. However, the results did not support the idea that operating expense per adjusted patient day significantly improved. Multiple regression analyses were performed to determine if certain organizational and environmental characteristics led to better financial performance for merged hospitals. The results did not support any conclusions to this effect. The next chapter discusses study findings and their implications as well as recommendations for future research.
CHAPTER 5
DISCUSSION AND CONCLUSIONS

Introduction

The purpose of this chapter is to discuss the findings of this research study and to identify implications, limitations, and opportunities for future research. First, research findings are summarized and discussed for each hypothesis. Second, implications for researchers, healthcare leadership, and the public are outlined. Third, study limitations are explained as well as opportunities for future research. Finally, concluding thoughts on the research findings and contributions are presented.

Conclusion by Hypothesis and Explanation of Findings

The purpose of this study was to determine if hospitals that join health systems experienced financial performance improvements greater than hospitals that did not join a health system. For this study, the term merger generically represented any organization that joined a health system and self-reported this change in the AHA survey.

The second purpose of this investigation was to determine if, for hospitals that joined the health system, there were any predictable characteristics that may have led to more successful mergers such as the location, size, poverty levels, and ownership (Not-for-profit). These goals were identified to assist healthcare leaders in their assessment of potential benefits for merger opportunities.
Hypotheses

**Hypothesis 1. Hospitals that join a health system have better financial performance than those that do not join a health system.** The rationale and assumed theory for this hypothesis was that hospitals that chose to merge did so in an effort to improve in areas of performance including finance, quality, insurance contracting, group purchasing, and more. To narrow this assumption, this study focused only on financial performance. Resource dependence theory posits that organizations seek out resources to maintain market share throughout their markets (Hickson et al., 1971).

To ensure empirical and rigorous analyses, a difference-in-difference (DnD) method was used. DnD considered performance one year prior to a merger and compared it to the first and second years following the merger. This timeline was chosen to account for many unknowns such as the timing of cost reports, multiple definitions of fiscal years amongst hospitals, and various unpredictable variables that affect organizations as they prepare for a merger. The specific results are discussed for each sub-hypothesis below.

**Hypothesis 1a.** The change in operating margin for hospitals that merge will be greater than the change in operating margin for hospitals that remain independent during the same period.

Operating margin was selected due to its frequent use in previous research (Bazzoli et al., 2000) as well as its ability to measure how a hospital is performing strictly from an operations perspective. The evidence for this hypothesis supported this conclusion by suggesting that, on average, hospital leaders can expect to see their operating margins improve to a greater extent through a merger than if they had remained an independent hospital.
**Hypothesis 1b.** The change in operating expenses per adjusted patient days for hospitals that merge will be greater than the change in operating expenses per adjusted patient day for hospitals that remain independent during the same period.

Operating expenses data were obtained from CMS datasets. To account for the various reasons that one hospital might have higher costs than another, operating expenses were assessed as a function of adjusted patient days. Adjusted patient days accounted for differences in inpatient versus outpatient volumes; it may also be a better indicator of hospital size than the number of licensed or staffed beds. The weakness of this approach was that it did not account for acuity levels which may have driven costs higher. There was not sufficient evidence to support the statistical significance of this hypothesis. The small sample size, number of unaccounted variables discussed earlier, and the limited timeframe could explain this lack of significance. This finding should be examined further by researchers. Hospital leaders should not conclude that operating expenses per adjusted patient days do not improve following a merger based solely on the results of this current study.

**Hypothesis 2.** For hospitals that have joined a health system, certain organizational and environmental characteristics will experience greater financial performance improvements than others. It seems logical that when a hospital joins a health system, it does so for financial benefit as well as to continue to provide services to the local community. When hospital executives are considering the option to merge with a health system, they should investigate potential benefits of the merger. An executive may look for answers regarding how his or her hospital may fare following a merger.
The rationale for hypothesis 2 was to examine whether organizational and environmental characteristics would provide a predictable effect on the merger. Organizational factors such as hospital bed size and ownership play a role in financial performances of local hospitals. For example, Dranove et al. (1998) found that hospital size matters when looking at non-revenue producing departments and merging efforts for larger hospitals produce nominal improvements (Dranove & Lindrooth, 2003). Environmental factors such as people living in poverty, the concentration of industry and resources (urban versus rural), and the concentration of healthcare providers (HHI) also play an important role in the financial performance of hospitals.

_Hypothesis 2a._ Smaller hospitals will experience greater financial performance improvements than larger hospitals after joining a health system.

Based on previous research which suggested that “size matters” (Dranove, 1998), hypothesis 2a posited that smaller hospitals would see greater improvements in financial performance. This hypothesis examined the size of hospitals as a function of their adjusted patient days. This metric also adjusted for differences in inpatient and outpatient volumes. The finding of no statistical significance for both years one and two post-merger was unexpected. However, the limited sample size could have led to this conclusion; further research with a larger sample size needs to be conducted.

_Hypothesis 2b._ Hospitals joining a for-profit health system will experience greater financial performance improvements than not-for-profit hospitals after joining a health system.

This study compared the merger impacts of not-for-profit and for-profit hospitals during merger year. The sample included only two hospitals that were for-profit facilities.
There were no statistically significant findings reported for this hypothesis. With only two for-profit facilities represented in the sample, this was not representative of the larger for-profit sector. Further, over the past five years (2010-2015), there have been increases in mergers between for-profit facilities; therefore, future studies of hospital types are warranted.

**Hypothesis 2c.** Rural hospitals will experience greater financial performance improvements than urban hospitals.

Hospitals located in rural areas tend to be smaller in size and have limited resources. Resource Dependence Theory (Salancik & Pfeffer, 1978) and previous research into the effects of mergers suggests that a hospital located in a rural area will see a predictable improvement in financial performance. This current study used the identifier urban versus rural to segregate the difference between larger communities with more resources and smaller communities with fewer resources. No statistical significance was detected for year one, but statistical significance was observed for year two. This finding may suggest that it takes time following a merger for a hospital or health system to see a net effect. It is also possible that the sample size was too small and the time period too short, which limited this investigation. Therefore, the researcher proposes that hospitals in rural areas that merged may see improvements to financial performance over a period greater than one year.

**Hypothesis 2d.** Hospitals located in areas with higher percentage of persons living in poverty will experience less financial performance improvement resulting from joining a system than those hospitals located in areas with lower poverty.
Hospitals rely heavily on attracting patients who have the ability to pay for their healthcare. The mix of insurance providers, self-pay patients, and governmental health plans has an impact on financial performance. This is often referred to in the healthcare industry as *payer mix*. The data necessary to assess the payer mix for this study were not available. Metrics such as percentage of persons living in poverty and number of persons under 65 years of age without health insurance were identified as potential indicators.

The category of *persons without health insurance* was not used for this study due to an inconsistency in its reporting as stated in the footnotes of the AHRF. The next best available metric was percentage of persons living in poverty. This metric captured data relative to level of income, employment, and other economic factors that could affect a person’s ability to pay for his or her healthcare. This study found that, on average and within the limitations of this study, the percentage of persons living in poverty could not be identified as a potential characteristic that might lead to changes in financial performance post-merger; the findings for this metric were not statistically significant. The limitations of the data, timeframe, and sample size may have influenced this result; therefore, further investigation of this variable is warranted.

**Hypothesis 2e.** Hospitals competing in more competitive markets will experience less financial performance improvement resulting from joining a system than those located in less competitive markets.

There are several reasons that a hospital may seek a merger opportunity. Once a merger is decided, it seems plausible that the local competitive environment will have an impact on the financial outlook following the merger. To assess the level of competitiveness, this study used the Herfindahl-Hirshman Index (HHI) which is
commonly used to evaluate the competitiveness of local markets (Melnick & Keeler, 2007).

The findings of this study did not support the claim that a competitive environment impacts the financial performance following a merger; this metric was not statistically significant. Similar to previous statements, the variability of this assessment, sample size, and other factors may have led to this result. This study used county identifiers to define the hospital markets from which to calculate the HHI. This methodology would not account for competitors from neighboring counties and states. If the HHI had been statistically significant, it would be important to further investigate this finding.

**Strengths and Limitations of the Study**

**Strengths**

There were a number of significant strengths to this study that are noteworthy. Strengths included (a) the identification of merged hospitals, (b) matching of independent hospitals, (c) use of difference-in-difference methodology, and (d) industry application of the research questions. Research questions regarding mergers and their effects on financial performance seemed important to both academic and operational environments. Healthcare executives need to have access to research that provides information needed to assess the potential benefits of a merger. Determining environmental and organizational characteristics that lead to financial improvements and how these characteristics apply to a potential hospital merger could be of great value to the industry.

The identification of merged hospitals was also a strength of this investigation. This study used the full databank of AHA to identify the year in which a merger
occurred. This data point was necessary to create variables that considered the hospital one year prior to merger as well as the same hospital at one and two years following a merger.

As noted, the use of the difference-in-difference (DnD) method was another strength of the study. This method helped to control for trends over time that affected both the merging and non-merging hospitals. It also accounted for other external factors such as change in local economy and payment policies (both state and national). While the DnD technique required rigorous coding upfront, it provided a more robust view of actual financial performance changes.

Most importantly, the matching of hospitals was a significant strength of this study. Matching a specific observation (merged hospital) with a hospital of similar characteristics (independent) during the same time period, comparing percent changes of each hospital independently, and comparing these differences between hospitals to assess for overall changes reduces selection bias. These strengths should be considered in future research efforts.

**Limitations**

The quality of data available, small sample size, and limited timeframe were limitations of this study. Identification of quality data sources was considered while designing the study as well as in determining which methods would be used. Collection of data, however, was challenging as a number of elements relied on self-reported data with several missing and incomplete data fields noted and excluded from the analysis. Using the variable Urban (Rural) was also somewhat ambiguous when determining the location and access to local resources.
The small sample size (n=94) presented a significant challenge in controlling for the variability contained within the merged hospital group, the control hospital group, and the environment. Variables used, such as operating margin, operating expenses, and adjusted patient days, contained significant variability. Therefore, the combination of these variables created even greater variability; a larger sample size may have resulted in a different conclusion.

The matching process, which previously was described as a strength of this study, did have some inherent weaknesses that may lead to less accurate pairing of hospitals. It is also important to note that this study considered the difference between two different hospitals that were matched based on similar characteristics. It did not evaluate how the merged hospital would have performed financially if it remained independent.

Another limitation of this study is that it did not control for time of year in mergers occurred. Financial performance results change for mergers that occur during different time periods. Different time periods may have resulted in varying levels of change. The limited timeframe used for this study led to many of the limitations listed above.

This study evaluated all transactions and data between 2007 and 2011. The beginning year of 2007 was selected based on its relevance to today’s needs. The ending year of 2011 was selected to ensure accurate cost reporting and completeness of data. Assessing the change in performance between one year prior to the merger versus one and two years post-merger was essential to allow adequate time to pass for improvement to happen. This approach limited the number of transactions to only those that occurred between two years (2008-2009).
The limited number of transactions of this study could have had a significant impact on the final results. The cause for the recent increase in mergers has been attributed to the ACA and its current and future financial implications (Healthcare, 2012). Since this study did not fully cover sufficient post-ACA years, it would be important to complete a follow-up study to assess for different results.

**Implications**

There are a few important implications for this research that managers and policy makers should consider. As previously discussed, resource dependence theory (RDT) suggests that organizations will seek strategies to enhance their market position and financial power. The results of this current research do not fully support this theory and therefore suggest that RDT has limited explanatory power for the behavior of organizations seeking mergers as a means to improve financial performance. The methodology of using the difference-in-difference model to assess for the effect on financial performance should be considered in future studies. The matching procedure used in this study was designed to pair *most similar* hospitals. This process should be fine-tuned and utilized in further studies. The results of this study should only be used to develop further examination of this topic since the findings were limited due to the time period and sample size.

**Managerial Implications**

Managers of healthcare organizations should find interest in this topic. As more independent and existing systems explore ways to expand their scope and size, it is important to understand both motivations and actual results. This study demonstrated an improved operating margin following a merger, but failed to determine if operating
expenses were affected. The lack of clear evidence regarding improvements in operating expenses needs to be further examined as this seems counterintuitive to the idea of service scaling. This equivocal finding suggests that improved operating margins may occur elsewhere within the operating revenues. If the improvement is within revenues, further study should be reviewed to determine increases in revenues due to factors such as price increases and implementation of higher margin services.

Although published articles suggest improvement in hospital margins, it is important to review the methodology and other study details to determine if their analyses meet similarly rigorous data methodology as provided in this study. As fewer independent hospitals exist, the industry is seeing systems combine to create super systems. Managers should consider these results and seek further study results of such mergers. Changing primary and matching variables may also be important to managers to address more specific research questions.

**Public Policy Implications**

Legislators face the daunting task of finding ways to reduce the costs of healthcare within the United States. The subject of hospital mergers has been discussed publicly for many years. Constituents have offered varying opinions regarding why hospitals are merging and how mergers will affect the wellbeing of the local communities they serve, both financially and in terms of quality. Interestingly, there is frequently a difference between what is “good” for the financial viability of the hospital and the perceived “good” of the community.

One example of this dilemma is obstetrical services. Families need access to high quality obstetrical services to ensure timely delivery of children. However, obstetrics is a
high cost low reimbursement service that often leads to negative margins for hospitals. For hospitals with negative overall margins, this loss could lead to irreparable harm causing the closure of all hospital services. Thus, the perceived community need for delivery of newborns would lead to the total elimination of hospital services. This difference should be carefully considered by lawmakers.

When hospitals join systems, legislators should consider issues such as access to care, costs of care, and the quality of care to be delivered in the future. As systems grow in size, it will be important to ensure that growth in systems does not lead to increased costs due to newly found market power. Systems with market power could have the ability to negatively influence pricing, resulting in further increases in costs to healthcare consumers. Further thought and consideration should be given regarding how public policy should dictate the healthcare industry and its ability to centralize or decentralize services through mergers.

For example, should policy makers govern the industry or just let the “free market” prevail? Since healthcare appears to be a social issue and arguably a citizen right, it seems appropriate for policy makers to govern and create policies to protect the general public. Another potential policy discussion involves using organizational and environmental characteristics to either allow or deny certain mergers. Further research could include the quality and cost of care within smaller communities versus larger tertiary systems. Regulations and funding policies could be developed to support smaller facilities if they provide cost savings over time.
Future Research

Overall, this study should re-ignite the research topic of mergers and acquisitions. As evidenced by the literature review, there has been little recent rigorous testing of the value of hospital mergers. From a theory perspective, RDT suggests that organizations will seek ways to maximize profits by accessing the resources necessary. It is likely that the motivation for a hospital to merge is to improve its ability to compete within its given market. The findings of this research are vulnerable to the accuracy of self-reported data from hospitals as contained within the AHA Annual Survey. As such, the outcomes of this research should be used as a guide to promote further research in the field.

There are several ideas of ways to expand this study to find more causal statistically significant results. These ideas are articulated below.

- Create a longer longitudinal study that uses similar methodology but looks at mergers over a longer period of time such as three, four, and five years post-merger. It may also be helpful to look at two years pre-merger to compare results.
- Changes to matching method could provide a different view of this topic. A new study could modify the matching methods and provide a better comparison between merged and non-merged hospitals. Matching for a greater than 1:1 ratio would provide greater statistical power.
- Further study could control for time (year of transaction).
- Perform a more recent study using data from 2009 to create another opportunity to gain new knowledge and understanding. More recent studies could also evaluate the post-ACA impact which has been cited as a cause for many of the recent mergers. This may be difficult due to the delays with cost reports, but new
data management possibilities will be driven by the demands of policy makers, insurers, and providers.

- Select more specific financial performance indicators to produce more relevant and consequential outputs. It may also be worthwhile to consider other environmental and organizational characteristics to assess their effect on merger successes.

- The finding of no statistical significance of operating expenses being decreased was an unanticipated finding. If increasing sample size does not produce statistically significant results, further study should occur.

- Use of acuity adjusted data metrics may also be considered to offer a more robust comparison between facilities. Finding variables that could be case mix adjusted could be used for matching purposes.

- Researchers could engage with large entities such as Community Health Systems (CHS), Hospitals Corporation of America (HCA), or the Veterans Administration (VA) to access more precise and current data to study the effects of mergers. This type of study could even consider consolidation efforts from both the centralization and decentralization efforts of these companies. This approach could replicate previous research (Bazzoli et al., 2000).

- Researchers could study the effects of mergers by ownership type. It would be interesting to study the effect of mergers on financial, quality, and costs for the investor versus not-for-profit owners.
Conclusion

The purpose of this study was to determine the effect of joining a health system on financial performance. Second, the study was designed to identify if, for hospitals that joined a health system, certain characteristics (organizational and environmental) resulted in greater financial performance improvement than others. The findings of the study were somewhat inconclusive as the study only produced statistically significant evidence that operating margins increased and minimal evidence that hospitals located in a rural area affected operating margins in year two post-merger. These results suggest that mergers do improve operating margins for hospitals merging into systems. This study does not, however, support RDT as discussed in previous chapters. Further research is needed to advance the theory, methodology, and results contained within this study.

This study documented some significant strengths and weaknesses to the study of this topic and its research implications. Additionally, this study documented several ideas for future research. This study should provide guidance to those considering further research into the effect of mergers on financial performance. In the absence of strong evidence-based findings, the methodology used in this study combined with the thoughts for future research may provide opportunities for future discovery. It is imperative for managers to innovate and identify best practices so that hospitals can provide the right care, for the right costs, in the right environment.
References


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http://dx.doi.org/10.1016/j.jhealeco.2006.10.002

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APPENDIX A

INSTITUTIONAL REVIEW BOARD DOCUMENTATION
DATE: 11/12/14

MEMORANDUM

TO: Kenneth J. Cochran
   Principal Investigator

FROM: Carl Oliver
   Assistant Director
   Institutional Review Board for Human Use (IRB)

RE: Request for Determination—Human Subjects Research
IRB Protocol #N141105003 – The Effect of Hospital Mergers on Financial Performance

A member of the Office of the IRB has reviewed your Exempt application with the above title, and it was determined that the application qualifies for the designation of Not Human Subjects Research.

The reviewer has determined that this proposal 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.
Request to Change Graduate Study Committee

To: Dr. Bryan D. Noe, Graduate School Dean

This is to request a change in the graduate study committee for the following student:

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Student Blazer ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenneth Joseph Cochran</td>
<td>kendsc 601213591</td>
</tr>
</tbody>
</table>

In the following program:

Administration-Health Services

Members to be DELETED from the committee:

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Blazer ID</th>
<th>email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kristine Ria Heard (Baker)</td>
<td>Health Services Admin</td>
<td>kheard</td>
<td><a href="mailto:kheard@uab.edu">kheard@uab.edu</a></td>
</tr>
</tbody>
</table>

Members to be ADDED to the committee:

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Blazer ID</th>
<th>email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nathaniel Carroll</td>
<td>Health Services Admin</td>
<td><a href="mailto:ncarroll@uab.edu">ncarroll@uab.edu</a></td>
<td></td>
</tr>
</tbody>
</table>

Reason for change:

Dr. Heard has suggested this change. Dr. Carroll has completed recent doctoral level work that is similar to this research project. Dr. Cochrane also supports this change.

Program Director:

Signature: [Signature]
Email address: hernande@uab.edu
Date: 10/21/14

Approval: Bryan D. Noe, Dean
Date: 10/23/14