

An Investigation of the Relationships between Contingency Factors Affecting the  
Adoption, Implementation, and Use of Activity-Based Costing in Hospital Accounting

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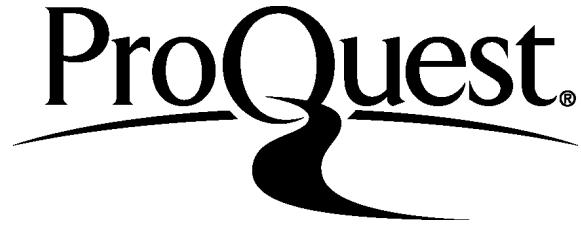
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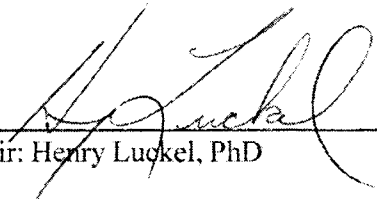
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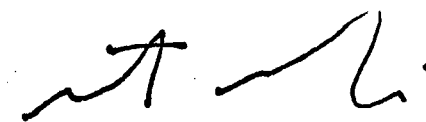
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## Abstract

Activity-based costing (ABC) systems were proposed in the 1980s as a solution to the problems associated with use of obsolescent traditional costing systems in manufacturing firms. The use of traditional costing systems leads the production of cost information that is inaccurate and unreliable. The use of ABC systems in service organizations, including healthcare organizations, was proposed in the 1990s as a means to produce accurate cost information, properly state profits, and realize additional managerial benefits. The problem is that that contingency factors, those variables that may affect the selection and use of management accounting systems including ABC, may influence the low adoption rates of ABC in hospital accounting despite literary support in favor of ABC adoption. The purpose of this quantitative, survey-based study is to examine the relationships between contingency factors associated the adoption, implementation, and use of ABC in hospital accounting. The participants were Chief Financial Officers (CFOs) of hospitals chosen from a cross section of hospital CFOs from across the United States. Degrees of beliefs about the efficacy of the use of ABC do not significantly vary between hospitals where ABC has or has not been adopted and hospitals of different sizes, locations, and taxation statuses. The attitudinal contingency factors measured in this study, with the exception of one contingency factor, are significantly related. This evidence will be useful in the development of a theoretical framework for the adoption of ABC in hospital accounting and the continuing development of the contingency theory of management accounting.

## Acknowledgements

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## Chapter 1: Introduction

Activity-based costing is one of the most significant advancements in managerial accounting (Chapman and Kern, 2013). Recent developments in accounting information systems and computer technology has led to renewed interests in the use and potential use of ABC in healthcare accounting (Dyas et al., 2015). ABC was introduced in 1984 in response to problems identified within costing systems in use at that time in the manufacturing sector, which lead to the production of inaccurate cost data, poor cost management due to inaccurate data, declining profits, unacceptable product quality, and inefficiencies in processes (Kaplan, 1984). The adoption, implementation, and use of ABC, an accounting methodology used to calculate the cost of a product or service, leads to significant improvements in the quality of cost data and improved cost control in adopting organizations (Velmurugan, 2010). Managerial decisions in healthcare organizations, including decisions about the adoption, implementation, and use of costing systems, may be influenced by contingency factors in accordance with the contingency theory. This study examines the relationships between attitudinal contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting in an effort to contribute to contingency theory in the management accounting literature and move towards the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting.

### Background

The ABC methodology was proposed in the management accounting literature in the 1980s in response to the belief that unreliable cost systems (traditional costing systems), which were developed decades before, were being used as the basis for

important managerial decisions in manufacturing firms (Kaplan, 1984). Even though ABC was initially developed within the manufacturing sector, healthcare organizations should adopt, implement, and use ABC in order to realize significant benefits including improved cost control (Chea, 2011). Cost control, which is dependent upon the quality of cost data, is important to healthcare organizations because the costs associated with providing care have increased while reimbursement from governmental and private payors has decreased (Taylor & Nayak, 2012). Even though members of management in healthcare organizations need accurate cost data for decision making purposes, the costing systems used do not satisfy the needs of users and decision makers (Campanale, Cinquiny, & Tenucci, 2014). Without accurate cost data, healthcare managers' decisions and plans are ill-informed (Porter, Pabo, & Lee, 2013). Most healthcare organizations suffer in terms of minimized profits and low reimbursement because of inaccurate cost data. The potential consequences associated with the use of inaccurate cost data may be severe; reduced reimbursement from governmental and third-party payors, decreased profits, and decreased quality of care (Kaplan & Witowski, 2014). A firm's reliance on inaccurate cost data may also negatively impact stakeholders; patients, service providers, and insurance companies (Davis, Davis, & Schmelzle, 2013).

### **Statement of the Problem**

Despite evidence found in the literature favoring adoption of ABC, adoption rates of ABC in healthcare organizations remains low (White, Anistal, & Anistal, 2015; Yazadifar, Askarany, Nasser, & Moradi, 2012). This phenomenon is known as the ABC Paradox (Chapman & Kern, 2013). The problem is that the relationships between attitudinal contingency factors (beliefs of hospital Chief Financial Officers (CFOs)) about

the efficacy of ABC related to the adoption, implementation, and use of ABC in hospital accounting have not been examined extensively. An understanding of the relationships between contingency factors related to ABC may assist researchers in explaining the ABC Paradox in hospital accounting and contribute to the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting. An understanding of the relationships between contingency factors will also contribute to the continuing development of a “contingency theory of management accounting”. There are gaps in the literature related to the impact of attitudinal contingency factors related to ABC in hospital accounting. Even though organizational factors impacting the successful implementation of ABC have been examined in the literature (Ibrahim & Saheem, 2013), research examining managements’ beliefs about the efficacy of ABC, hereafter referred to as contingency factors, is limited. No theoretical framework exists for the adoption, implementation, and use of ABC in hospital accounting.

### **Purpose of the Study**

The purpose of this quantitative, survey-based study is to examine the relationships between contingency factors related to the adoption, implementation, and use of ABC in hospital accounting in an effort to understand low adoption rates in hospital accounting and move towards a theoretical framework for the adoption, implementation of ABC in hospital accounting. In hospital accounting, relationships between attitudinal contingency factors (when defined as hospital CFOs’ beliefs about ABC) have not been examined extensively. This study contributes to contingency theory in the management accounting literature by advancing the understanding of attitudinal contingency factors related to ABC in hospital accounting. An understanding of the

relationships between these contingency factors will, in consideration of the ABC Paradox, contribute to the development of a theoretical framework for the adoption, implantation, and use ABC in hospital accounting. This study is needed because research examining ABC attitudinal contingency factors related to ABC in hospital accounting is limited even though evidence in the literature suggests that firms should adopt ABC.

### **Theoretical Framework**

Research in business typically borrows theory from other disciplines, such as psychology and sociology, rather than leading to the creation of new theory (Smith, 2011; Aliyu, Bello, Kasim, & Martin, 2014). The management accounting literature includes frequent citations of contingency theory as the underlying theoretical framework (Islam & Hu, 2012). Early research in management accounting in the 1960s and 1970s examined the importance of environmental contingencies and technology contingencies in the development of management accounting systems (Chenhall, 2003).

In contingency theory, the design and functions of an organization are explained in terms of responses to contingency factors. An underlying assumption in contingency theory is that no single organizational design schema is applicable to every organization. Each organization should be structured and organized based on the match or fit between the organization and relevant variables that impact the organization (Islam & Hu, 2012). Relevant variables identified in contingency theory (not industry specific) include the environment, strategy, technology, organizational structure, organization size, and organizational culture (Chenhall, 2007).

New theories specific to management accounting have been proposed in the management accounting literature. The contingency theory of management accounting

was proposed by Hayes (1977) and revisited by Otley (1980). More recently, the theory of management accounting, which moves beyond theories borrowed from other disciplines including contingency theory, was suggested in 2013 by Al-Htaybat and von Alberti-Alhtaybat. Contingency theory provides a framework for understanding how organizations are influenced by contingency factors including the use of technology, corporate culture, and the external business climate in decision making (Islam & Hu, 2012).

This study contributes to contingency theory in the management accounting literature by examining contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting. More specifically, this study contributes to contingency theory in the management accounting literature in the healthcare sector by examining adoption rates of ABC and quantitatively assessing the degree to which hospital CFOs believe in the efficacy of the use of ABC as applied to specific outcomes defined in the research questions.

### **Research Questions**

The central research question is, “What is the relationship between contingency factors related to the adoption, implementation, and use of ABC in hospital accounting? This study examines hospital CFOs’ beliefs about the efficacy of the use of ABC in hospital accounting in an effort to understand how relationships between attitudinal contingency factors influence the adoption, implementation and the use of ABC systems in hospital accounting.

**Q1.** What is the relationship between hospital CFOs’ degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency

factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted ABC (non-adopters)?

**Q2.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted ABC (non-adopters)?

**Q3.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted ABC (non-adopters)?

**Q4.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to improve managements' understanding of business processes (an attitudinal contingency factor) between where ABC has been adopted (adopters) and hospitals where ABC has not been adopted ABC (non-adopters)?

**Q5.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices?

**Q6.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices?

**Q7.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes?

**Q8.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives?

**Q9.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices?

**Q10.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices?

**Q11.** What is the relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data?



## Hypotheses

**H1<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H1<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H2<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H2<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H3<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H3<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement

initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H4o.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H4i.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H5o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

**H5i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

**H6o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of

a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

**H6i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

**H7o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

**H7i.** There a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

**H8o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

**H8i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

**H9o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H9i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement

initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H11.** There is no statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

**H11.** There is a statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

### **Nature of the Study**

This study is a quantitative, survey-based study designed to contribute to contingency theory in the management accounting literature by examining the relationships between attitudinal contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting. The survey instrument was distributed electronically to a cross section of hospital CFOs in the United States chosen from a purchased, vetted database of current hospital industry contact information. The

population included hospital CFOs in the United States from a cross section of hospital of various sizes, locations, and taxation statuses.

The survey instrument includes questions designed to assess hospital CFOs' beliefs about the efficacy of the use of ABC in relation to contingency factors that may influence the adoption of ABC. Likert-scale questions were used to assess the degree of agreement or disagreement with statements about the use of ABC. Participants' degree of belief about specific attributes (contingency factors) related to the use of ABC were measured on a scale of 1 (strongly agree) to 7 (strongly disagree). Respondents selected answers from closed-ended (answer-defined) questions for questions related to organization size based on number of employees, organization location (urban, suburban, or rural), and taxation status (for-profit or not-for-profit). Organization size, location, and taxation status are commonly-used demographic groupings in hospital management. Participants indicated whether leaders in their organization have adopted ABC. The survey was used with permission from Lawson (2005). Written permission to use the survey instrument was granted in November 2015 by Lawson (2005). Additional information about the survey instrument is included in Chapter 3.

The survey method was chosen because hospitals are not required to publically disclose certain managerial accounting information related to costing methodologies. This study is behavioral in nature; based on beliefs. The use of Likert-scale questions was appropriate in assessing hospital CFOs' beliefs about ABC because the use of Likert-scale questions will facilitate quantitative analysis of variables (contingency factors) associated with ABC. Closed-ended questions with defined answers were useful in quantitatively distinguishing between groups of respondents from for-profit, not-for-

profit, urban, suburban, rural, for-profit, and not-for-profit hospitals. The adoption rate (as a percentage) of ABC in respondents' organizations was assessed from each respondent's answer to the question, "have leaders in your organization adopted ABC?"

### **Significance of the Study**

This study contributes to contingency theory in the management accounting literature by examining contingency factors associated with the adoption, implementation, and use of ABC hospital accounting. The literature related to contingency factors and ABC in hospital accounting is limited even though ABC systems are considered to be superior to traditional costing systems. Studies specific to ABC in hospital accounting are limited despite the fact that the management accounting literature suggests adoption of ABC.

An examination of the contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting contributes to contingency theory in management accounting and advances the literature in relation to the development of a theoretical framework for the implementation of ABC in hospital accounting. If this study was not conducted, the lack of a theoretical framework related to the adoption, implementation, and use of ABC in hospital accounting may result in continued low adoption rates of ABC in healthcare organizations despite the existence of significant evidence in the literature suggesting that firms should adopt ABC; the ABC Paradox.

### **Definition of Key Terms**

**Accounting.** Accounting is an information system that collect, process, reports, analyzes, and synthesizes data. Accounting provides members of management information, which facilitates decision making, about economic and financial events

impacting a firm. Accounting is necessary and important to every firm in every industry (Wild, Shaw, & Chiappetta, 2015, p. 4).

**Activity-based costing (ABC).** ABC is a methodology used to determine the cost of an item or service. ABC produces costs that are more reliable than traditional non-ABC costing methodologies in that costs are assigned to items or services in a way that minimizes the allocation of costs that are not specific to the item or service (Carmo & Padovani, 2012). ABC improves the reporting of costs because costs are measured based on the usage of resources in the production or delivery of an item or service (Blocher, Stout, Juran, & Cokins, 2013, p. 12).

**Activity-based management (ABM).** ABM is a set a management practices that allows members of management to use ABC techniques to reduce costs and improve customer satisfaction. By examining information produced the ABC system, members of management may make decisions that aid in the allocation of scarce resources, thereby maximizing the profitability of the firm. Without robust ABC systems, ABM is not possible (Blocher et al., 2013, p. 142).

**Behavior change in healthcare.** In an effort to promote improved patient outcomes, healthcare workers may seek to initiative behavior changes that lead to improved health. Behavior change is influence by motivational readiness of the patient and the patient's readiness for change. Typically, behavior change is not a linear process, which causes the healthcare work to initiate change employing the following techniques: the use of educational materials and outreach visits (Woodward, 2000).

**Cost.** Blocher et al. (2013, p. 68) define a cost as a measure of a resource. The term cost is typically used to represent the economic sacrifice incurred in order to



produce a product or a service. Cost can also be considered the measurement of the effort extent to produce a product or deliver a service. The cost of a product or service may be measured as the sum total of many resources consumed over time (Blocher et al., 2013, p.68).

**Cost accounting system.** A system that measures, analyzes, and reports financial and nonfinancial information relating to the costs of acquiring or using resources is referred to as a cost accounting system. A cost accounting system is a system that uses people, data, and information technology to provide members of management with important information about the economic resources consumed in the production of a product or the providing of a service (Blocher et al., 2013, p. 247).

**Cost allocation.** Cost assignment is a methodology that allows accountants and members of management to allocate or assign cost to products and services. The components of the costs associated with products and services are derived from several sources based on the nature of the cost. Cost assignment is the process of assigning resource costs to cost pools and then from cost pools to cost objects (Blocher et al., 2013, p. 64)

**Cost driver.** A factor that changes total cost is referred to a cost driver. Cost drivers represent the causes of changes in total cost. Cost drivers can be quantities of measure, activities, or units of time. For example, a total cost of a product or a service might change based on the number of square feet allocated to the items occupying space, the number of employees working on an item, or the number of labor hours required to produce the product or service. When a cost driver changes, one or all components may change (Blocher et al., 2013, p. 68)

**Cost object.** Any product, service, customer, activity, or organizational unit to which costs are assigned. A cost object is a unit for which costs are determined. Members of management want information about the total costs associated with a cost object so that costs can be analyzed and measured (Blocher et al., 2013, p. 68)

**Enterprise systems.** An enterprise systems is a computer system which integrates data from all areas of a firm so that members across the firm can use the data. An enterprise system relies of a single database, which houses data from many sources. Multiple users of data can access and use data to produce managerial accounting information. By using enterprise systems, members of management can improve firm operations and profitability (Gelinas, Dull, & Wheeler, 2015, p. 34).

**Environmental factors in healthcare organizations.** Environmental factors in healthcare firms often contribute to the level of physician satisfaction. Environmental factors that may lead to decreased physician satisfaction may include the proliferation of managed care, reduced reimbursement, and an increase in the number of patient encounters. Physician satisfaction is often studied in relation to patient satisfaction, a key indicator of the performance of a healthcare firm (Mazurenko, Menachemi, & Saha, S., 2012).

**Management accounting.** Accountants who work within organizations are referred to as managerial accountants in the practice of managerial accounting. Managerial accounting involves the following functions: planning, budgeting, cost evaluation, cost control, pricing, and trend analysis. Managerial accounting differs from financial accounting in that managerial accounting focuses on the internal needs of

management while financial accounting focuses on the need of external users (Horngren, 2009, p. 11).

**Personal satisfaction of patients.** Personal satisfaction of patients is an indicator that reflects the performance of healthcare organizations. If the personal satisfaction of patients is not assessed as being high, healthcare outcomes could be adversely impacted. Managerial decisions often affect personal satisfaction of patients, which may impact the firm as a whole (Popesko, Tucková, & Kadak, 2012).

**Performance of healthcare organizations.** Healthcare organizations have been forced to improve performance in terms of balancing limited resources and costs of services. Improved performance of healthcare organizations is often achieved by using process management, the balanced scorecard, customer relationship management software, and additional management techniques implemented. Improved performance of healthcare organizations become more important as public spending on healthcare increases (Popesko et al., 2012).

**Quality healthcare.** Quality healthcare typically refers to the closeness of a desired outcome in terms of patient outcomes with the desired outcome. The demand to quality healthcare has changed as patient demographic information has changed: income, types of illnesses, severity of illness, frequency of illnesses, and changes in technology. The changing environment in healthcare has required healthcare firms to implement a strategy of patient-centered care (Prabhakar, 2014).

**Quality improvement program in healthcare.** An initiative to improve performance by initiation various techniques including culture change within a healthcare organization is referred to a quality improvement program in healthcare. The initiative

typically involves a focus on continuous improvement. Obstacles to implementing the program may include lack of relevance, time, and financial resources. In the implementation of the plan, management seeks to empower employees in the firm (Davis, Mahanna, Joly, Zelek, Riley, Verma, & Solomon-Fisher, 2014).

## Chapter 2: Literature Review

Activity-based costing (ABC) represents one the most significant innovations in management accounting (Chapman and Kern, 2013). ABC systems are part of the management accounting systems used by organizations. Management accounting systems produce information that is used to by members of management to make decisions within organizations (Hayes, 1977). Cost accounting systems are sub-systems of management accounting systems. The information produced from cost accounting systems may significantly influence managerial decisions associated with the operations and the success of an organization (Geri & Ronen, 2005).

Members of management cannot accurately trace or assign costs to products or services using traditional costing systems, which inaccurately assign costs to products and services through the over- or under-allocation of indirect costs (overhead) (Egbunike, Egbunike, & Mofolusho, 2013). The use of ABC leads to the production of cost data that is more accurate than cost data prepared using traditional costing systems (Cooper, 1998; Argyris & Kaplan, 1994). The ABC methodology was developed in response to perceived inaccuracies in traditional costing systems and increased indirect costs arising from advancements in manufacturing technology (Cooper & Kaplan, 1998).

### Documentation

A review of the management accounting literature related to ABC was conducted using the Northcentral University library's EBSCOhost Business Source Complete database and the ProQuest ABI/INFORM database. Several search settings were used: "Boolean/Phrase", "Find All My Search Terms", "Find Any of My Search Terms", "SmartText searching", "Scholarly (Peer Reviewed) Journals", and "Also Search Within

the Full Texts”. The search for studies published in academic, peer-reviewed journal articles was primary limited to articles published within the last 5 years. Articles published prior to 5 years ago were also included in the literature review in accordance with the dissertation guidelines prescribed by the university. Search terms related to the this study included activity-based costing, costing systems, traditional costing systems, contingency theory, agency theory, the theory of constraints, cost management in healthcare organizations, the contingency theory of management accounting, cost accounting, hospital accounting systems, healthcare costs, and related terms.

### **Costing Systems**

The term “costing” refers to all processes and methodologies a firm uses to accumulate, assign, and calculate the cost of a product or a service (Mortaji, Bagherpour, & Mazdeh, 2013). Costing is an all-inclusive term used to describe all accounting methodologies in the cost calculations. Costing involves gathering and assigning costs from many sources of origin using a variety of methodologies or techniques (Chapman, Kern, & Laguecir, 2014). Organizations choose among available costing systems and costing methodologies in order to determine product cost and service cost (Mortaji, Bagherpour, & Mazdeh, 2013). Costing systems should enable organizations to improve cost efficiency and engage in the practice of continuous improvement (Ramsey, 1994).

The information produced in cost accounting systems is used by members of management, and managerial performance and organizational success may be significantly influenced by cost accounting data (Goldratt, 1983). If the cost of a product or service is inaccurately under-costed or over-costed, the resulting revenue and profit associated with the product or service will be inaccurate (Basuki & Riediansyaf, 2014).

ABC was proposed in an effort to minimize the distortion of costs and profits observable in traditional costing systems and to provide information that is useful to members of management in relation to planning and control (Al-Basteki & Ramadan, 1994).

**Traditional costing systems.** Traditional costing systems were designed for use in manufacturing environments in which significant direct labor was required for manufacturing products (pre-automation). Indirect costs, costs associated with overhead, were immaterial (minimal) prior to the shift to technology-driven manufacturing (automation) (Goldratt, 1983). Total indirect costs in the form of manufacturing overhead was low compared to the total indirect costs in contemporary, automated manufacturing environments (Egbunike & Egbunike, & Mofolusho, 2013).

Traditional costing systems became obsolete following the wide-spread adoption of automated manufacturing (Goldratt, 1983). Increases in the costs attributed to service departments, such as customer service and inspections, increased the cost of overhead in relation to total cost after the automation movement (Egbunike, Egbunike, & Mofolusho, 2013). As overhead cost as a percentage of total costs increased, a firm's choice of costing system became increasingly important because cost accounting systems enable management to allocate (assign) overhead costs to products and services (McGowan, 1998).

Traditional costing systems were still in use in the 1980s even though these traditional costing systems were introduced in the 1950s and the 1960s prior to changes in manufacturing process (Kaplan, 1984). The use of traditional costing systems led to distortions in the true cost of products. Such distortions in product costs were often undetectable by members of management because members of management prescribed to

incorrect perceptions about the efficacy of traditional costing systems; the reliance on irrelevant cost drivers (events affecting total costs) (Johnson & Kaplan, 1987).

Managements' reliance on incorrect cost data may lead to poor managerial decisions, which may significantly impact and organization (Tsai, Kuo, Lin, Kuo, & Shen, 2010).

Traditional costing systems were designed, developed, implemented, and used when manufacturing operations were based on the consumption of significant amounts of labor provided by manufacturing employees. As a result, the continued use of traditional costing systems after improvements in automation leads to pricing decision that result in the over-pricing of products (Egbunike & Egbunike, & Mofolusho, 2013). Traditional costing systems have been referred to as "an enemy" in terms of manufacturing because of the inefficiencies associated with these systems including over-pricing. Traditional costing systems do not properly measure total costs due to the existence of inefficiencies in the allocation of indirect costs to products in the form of overhead (Lucy, 2003; Goldratt, 1983).

After the proliferation of automated manufacturing techniques, traditional costing systems became antiquated and inappropriate for the production of cost accounting information needed by members of management (Egbunike, Egbunike, & Mofolusho, 2013). Within the framework of all managerial accounting practices, the use of traditional cost systems represents managerial practices that do not address the impact of changes in technology in manufacturing process (Jarrar, Smith, & Dooley, 2007). The use of traditional costing systems may lead to disastrous results (Egbunike, Egbunike, & Mofolusho, 2013). The use of traditional costing system leads to cost data that is based on arbitrary allocations of indirect costs. Arbitrary allocations of costs are not reflective



of cost causations; events or activities that drive (increase) costs (Kaplan, 1983; Johnson & Kaplan, 1987). The use of traditional costing systems leads to the production of inaccurate costs and profits, which is misleading to members of management (Sweenson, 1985). Using a traditional costing system, which utilizes direct labor as the allocation base for indirect costs (overhead) will lead to significant distortions in the true cost of a product or a service (Grondskis & Sapkauskiene, 2011). The use of traditional costing systems precludes members of management from measuring and analyzing the true costs of manufacturing produces and providing services (Chea, 2011).

**Activity-based costing systems.** As advances in technology facilitated automated manufacturing, direct labor costs decreased while overhead costs increased in the form of depreciation on technology, the purchase of manufacturing equipment, and expensive software. After significant increases in overhead costs and related decreases in direct labor costs (an inverse relationship), the number of direct labor hours used in the manufacturing process was obsolete as a cost driver (a unit of measure that affects costs) (Kaplan, 1984).

The ABC methodology was introduced in an effort to address the inappropriate use of direct labor as an allocation basis (cost driver) for overhead costs. More appropriate and relevant cost drivers were proposed: machine hours, number setups of production equipment, number of inspections of products, the square footage of a department, and other cost drivers (Johnson & Kaplan 1987). ABC was introduced in 1984 in response to problems identified in costing systems in use at that time in the manufacturing sector; inaccurate cost data, poor cost management, declining profits, unacceptable product quality, and inefficiencies in processes. Costing systems in use,

traditional cost systems, allocated all overhead to products based on an inappropriate, irrelevant single cost driver, usually direct labor hours. Overhead costs are the costs associated with expenses that cannot be traced directly to a product, a department, or any subunit of the organization (Kaplan, 1984). By improving the methodology associated with allocating overhead costs, ABC becomes a management tool that can be used to manage and reduce the total costs associated with manufacturing products and providing services (Joseph & Vetrivel, 2012).

Early studies of firms adopting ABC suggested that users of ABC believed that, in comparison to traditional costing systems, the use of ABC systems led to the production of more accurate cost data and provided more timely information to members of management (McGowan, 1998). Prior to the introduction of ABC into the literature, a significant percentage of total product cost, as much as sixty percent, was related to the cost of direct labor, labor of manufacturing employees who work directly with products (Kaplan, 1984). The benefits of adopting ABC include improvements in the ability to manage costs, improved design in business process, and improvements in the quality of managerial decisions including decisions associated with strategic planning, increases in profits, and process improvements (Khalid, 2005; White, Anistal, & Anistal, 2015).

An understanding of the importance of reliable cost data is important for members of management in organizations (Sabouri, 2014). The literature suggests that the adoption, implementation, and use of an ABC system provides cost data that is more accurate compared to cost data produced using a traditional costing system. Accurate cost data may significantly influence a firm's product mix (the amount of one product or service provided in relation to all other products or services), business strategy, process

improvement initiatives, and evaluations associated with business processes (Swenson, 1995; Cooper & Kaplan, 1992). The use of an ABC system allows members of management to produce cost data that more accurately reflects the *true* cost of a product or service (when compared to a traditional costing system) because the ABC methodology more accurately measures the use of resources consumed. Managers need more accurate cost data at every stage of the business cycle (Al-Omiri, 2012). The use of ABC allows members of management to improve the quality managerial decisions because the quality of cost data improved; a direct relationship (Adeoti & Valverde, 2014).

The use of ABC systems enables members of management to manage costs by managing the activities that drive (affect) costs. ABC systems facilitate improvement in operational efficiencies and enable members of management in adopting firms to complete globally due to improvements in the quality of cost data (Egbunike, Egbunike, & Mofolusho, 2013). In this study, managements' beliefs about the quality of cost data will be examined in relation to additional attitudinal variables (hereafter referred to as contingency factors), which may influence decisions related to the adoption, implementation, and use of ABC.

The use of ABC allows firms to remain competitive in the marketplace by improving the accuracy of cost information and enabling members of management to eliminate non-value added activities (Tsai, Kuo, Lin, Kuo, & Shen, 2010). A firm's reliance on inaccurate cost data may negatively impact many stakeholders including patients, service providers, and insurance companies (Davis et al., 2013). The use of ABC enables members of management to identify and track costs that may not be tracked

in the use of traditional costing systems (Mortaji, et al., 2013). By adopting, implementing, and using ABC, members of management can gain improved insight into the cost structures of their products and services (Mansor, Tayles, & Pike, 2012).

Proponents of the adoption, implementation, and use of ABC systems believe that the use of traditional costing systems may not enable members of management to accurately account for all relevant costs of products and services (Onat, Anitsal, & Anitsal, 2014). For firms adopting ABC (adopters), the reliance on cost data that is considered to be more accurate compared to cost data prepared using traditional costing systems (Ibrahim & Saheem, 2013) reinforces the need for adoption, which requires a significant investment by the firm. Firms also adopt, implement, and use ABC in order to increase profits, an important benefit of using an ABC system, which is strongly positively related to improvements in the quality of cost data (Doring & Diaconesu, 2014). The adoption, implementation, and use of an ABC system also leads to “cost visibility” in organizations. The term cost visibility refers managements’ focus and evaluation of the costs associated with providing products and services (Huczynski & Buchanan, 2006).

Application of the ABC methodology requires extensive knowledge about the business processes associated with manufacturing a product or producing a service. Before successfully implementing an ABC system, the firm must identify activities, processes, occurrences, or events that increase the costs associated with providing a product or a service including pre-production and post-production activities (Joseph & Vetrivel, 2012).

In relation to the transition from a traditional cost system to an ABC system, the adoption phase is the time during which the benefits of a traditional costing system are considered in relation to the benefits of an ABC system. During the adoption phase, cost objects (products produced, services provided, and departments examined) are identified. Production or service time is considered. Resources consumed are evaluated. Decisions related to the benefits of transitioning from a traditional costing system to an ABC system are continuously considered. The implementation stage involves the transitioning from a traditional costing system to an ABC system. During the implementation stage, the components of the ABC system, including hardware, software, and processes, are placed into service. Users are trained. In the deployment stage, the ABC system becomes integrated in the operations of the organization and the benefits of using an ABC are realized (Zarei, Rad, Ghapanshi, & Ghapanchi, 2015).

***Activity-based costing as a superior costing methodology.*** Managers across industries generally believe that the use of ABC leads to the production of cost data that is superior; more accurate and more reliable than cost data that is produced using traditional costing systems. The use of ABC systems forces members of management to examine and evaluate resource consumption activities (Geri & Ronen, 2005). ABC systems enable managers to produce cost data that is more accurate than the cost data produced by traditional costing systems because ABC systems allow for the allocation or assignment of the costs associated with overhead to cost objects based on the resources consumed to produce products or services; measurement of the consumption of all resources is imperative. Adopters able to eliminate non-value added activities, practices

that do not create value for customers after successfully implementing an ABC system (Stapleton, D., Pati, S., Beach, E., & Poomipak, 2004).

Organizations adopting ABC realize improvements in activities related to cost control, improvements in managements' ability to control costs, and improved recognition of events and activities that influence costs (Clark, Hill, & Stevens, 1999; Hussain, Gunasekaran, & Laitinen, 1998). The use of ABC leads to the realization of the following benefits: increases in the firm's profitability, improvements in managements' ability to manage the costs associated with providing goods and services, improvements in the accuracy of the allocation of indirect costs (overhead), improvements in the identification of the cause of increasing costs across the organization, and improvements in the design and functionality of business processes (White et al., 2015).

Across organizations, cost distortion and non-value-added activities impede success. The adoption, implementation, and use of ABC allows members of management to overcome these two significant operational and managerial obstacles. ABC enables managers to overcome cost distortions, the misstatement of total costs due to misallocations of indirect costs (overhead), by improving the processes associated with allocating indirect costs (Joseph & Vetrivel, 2012).

In an ABC system, indirect costs are first accumulated in the aggregate (in total) in cost pools, groups of related costs. Then, throughout the production process, indirect costs are allocated to each unit of product based on an identified relevant cost driver, an activity or event that leads to the consumption of resources and thereby increases the total cost of a cost object. The use of ABC leads to the elimination of non-value-adding activities, activities do not add value in terms of features, functionality, or value for the

customer by members of management to focus on activities that lead to waste (Joseph & Vetrivel, 2012).

The use of ABC may lead to increases in a firm's profits by influencing product mix, the combination of all goods and services offered to customers. The use of ABC enables members of management to improve the overall profits of the firm if profitable products and services are identified based on improvements in the quality of cost data. If members of management focus attention on products, services, departments, and business units that are profitable, the overall profits of the organization are likely to increase. The process of identifying profitable products and services enables member of management to then direct resources to profitable endeavors, thereby improving product mix; an offering of goods and services that maximizes the profits of the firm (Velmurugan, 2010). By allowing members of management to exercise cost control activities in relation to current and future costs, an ABC systems generates value for adopting firms. The use of ABC systems facilitates improved managerial business practices and improves efficiency within the organization (Kalicinan & Knezevic, 2013).

***ABC as a management tool for improvements.*** ABC systems were designed to improve the quality of managerial activities by facilitating of more timely cost data in comparison to traditional costing systems. By using ABC, firms are able to identify business process problems and bottlenecks in operations, which lead to excessive costs. The identification of business process problems and bottlenecks in operations may lead to the creation and implementation of process improvement initiatives. The time associated with activities, which drive (or affect) costs may be decreased through process improvement initiatives. Non-value-added activities may be eliminated and costs may

decrease. The use of ABC allows members of management to achieve reductions in costs by highlighting wastes and inefficiencies and implement continuous improvement initiatives (Kalicinan & Knezevic, 2013).

ABC is one of the tools available to managers utilizing the concept of total quality management (TQM) (Narong, 2009). The use of ABC allows members of management to examine costs in many ways: at the item level, by product line, by department, by region, or by operating segment (Chea, 2011). By examining the profitability of the firm at the per-item basis, by product line, by department, by region, or by operating segment, management may be able to make informed choices about product and service mix, which products or services to continue offering, and where to allocate resources within the organization. Analysis using ABC focuses managements' attention on process improvement initiatives; actions that should be taken in order to improve profits (Cooper & Kaplan, 1992). Cost reduction and process improvement initiatives may be launched after the implementation and use of an ABC system because the ABC highlights value added activities versus non-value-added activities (Brimson & Antos, 1994). The use of an ABC system facilitates extensive managerial analysis work including "what if" analysis capabilities (Williamson, 1988). As the result of adopting, implementing, and using an ABC system, managers are able to engage in activity-based management (ABM) (Fetzer & Kren, 2012). ABM involves the management and control of activities that drive or increase costs.

***Factors influencing a change to activity-based costing.*** Within an organization, certain variables may significantly influence the adoption, implementation, and use of an ABC system (Baird, Harrison, & Reeve, 2007). Conversions of management



accounting systems, such as a change from a traditional costing system to an ABC system, may be driven by changes in the business environment in which a firm operates. Changes in the business environment often influence changes within the organization (Waweru, Hoque, & Uliana, 2004). Organizations may adopt ABC systems in response to changing business environments and the need to be competitive in the market (Al-Omiri, 2011). Changes within an organization, such as a review of cost management policies, may prompt an organization to abandon a traditional costing system and adopt a new system (Baird, et al., 2007). Theoretically, the ideas of “efficient choice”, “fashion”, “fad”, and “forced selection” may influence managements’ decision to adopt or fail to adopt ABC (White et al., 2015). Positive correlations between the following behavioral variables in relation to the adoption, implementation, and use of ABC have been identified in the literature: managements’ support for the ABC initiative, the perception of links between ABC and process improvement practices, the perception of links to managements’ compensation, the resources available to the firm in relation to ABC, and the culture of the organization (Jarrar et al., 2007).

Prior to 2011, quantitative theoretical research related to behavioral factors contributing the adoption (or lack of adoption) of ABC was limited (Al-Omiri, 2011). Al-Omiri (2011) examined beliefs about ABC in Saudi Arabia firms, finding that respondents may adopt ABC systems for the following reasons: advice from an affiliated company (such as a parent company), a changing competitive environment, the use of ABC by competing firms, pressure from regulatory (or government entities), advice from auditors, and the desire to try new management accounting systems

***Measuring the success of activity-based costing.*** The question of the meaning of “success” related to the adoption, implementation and use of ABC systems has been examined in the literature (Pierce and Brown, 2006; Al-Omiri, 2011; Moisello, 2012). The definition of success related to the implementation of ABC is not simplistic and differs from stakeholder to stakeholder. Members of management, employees, suppliers, and customers may have differing views on success related to an ABC implementation project. Success can only be measured in terms of the defined objectives for adopting ABC compared to the associated outcomes after the implementation project and the use of ABC (Moisello, 2012).

Measuring successes associated with the adoption of ABC has been a challenge for researchers (Al-Omiri, 2011). Studies have examined the satisfaction of ABC users as a measure of success (Innes & Mitchell, 1995; Swenson, 1995; Foster & Swenson, 1997; McGowan & Klammer, 1997, Innes, Mitchell, & Sinclair, 2000; Cotton, Jackman, & Brown, 2003). The importance of ABC in modifying managerial decisions has also been cited as a success factor (Innes & Mitchell, 1995; Foster & Swenson, 1997). The actual realized financial benefits of the use of ABC and managements’ beliefs about the importance of ABC have also been identified as a success factors in the adoption, implementation, and use of ABC (Foster & Swenson, 1997; Innes & Mitchell, 2007; Innes et al., 2000). In order for a firm to successfully adopt, implement, and use an ABC system, behavioral and organizational variables (organizational contingency factors) must be addressed: support for ABC from top management, perceptions of the relevance of ABC to the firm’s strategy, and training in the use of ABC systems (Shields, 1995).

In the management accounting literature, weaknesses or deficiencies in traditional costing systems have been cited as reasons for the adoption of ABC. Increasing competition and changes in the business environment influence the adoption of ABC systems over traditional costing system. If members of management feel that the benefits associated with the adoption, implementation, and use of ABC do not exceed the costs associated with the adoption and implementation of ABC, then ABC adoption is less likely. An overall support for the ABC methodology and knowledge of how to use ABC systems impact decisions related to the adoption of ABC. If a lack of support for ABC is evident in an organization, or if the requisite knowledge of how to use ABC is limited within an organization, the firm may decide not to adopt ABC (Al-Omiri, 2011).

Managements' support for the adoption and use of ABC systems has been identified as an important theme in the management accounting literature (Al-Omiri, 2011). However, studies related to the effect of the motivational antecedents that contribute to the existence or lack of existence of management support for the adoption, implementation, and use of ABC are limited. Support from management in favor of the use of ABC may be a contributing factor in the use of ABC (Ibrahim & Saheem, 2013). The success or failure of an ABC implementation may be related to contingency factors, behavioral in nature, within the organization including the culture of the organization, willingness to adopt technology, and support from members of senior leadership (Velmurugan, 2010).

In practice, managerial support for the adoption of ABC is critical (Ibrahim & Saheem, 2013). The *perception* of management support has been cited as a factor impacting the success of the use of ABC systems in organizations (Innes & Mitchell,

1995). Ongoing employee buy-in and support from members of senior leadership are critical success factors in implementing ABC in hospitals (Campanale et al., 2014).

Training in the use of the ABC systems, the availability of resources, and the perceived impact on the strategic initiatives of the organization are also contingency factors related to the success or failure of an ABC implementation (Velmurugan, 2010). In healthcare organizations, the focus of this study, the involvement of clinical personal and top-management's support is imperative to the success in implementing an ABC system (Campanale et al, 2014).

***Second generation activity-based costing.*** Time-driven activity-based costing (TDABC) was proposed in an effort to address perceived inefficiencies of ABC; the costs associated with the implementation of ABC and the systems-intensive nature of the initial implantation of ABC. Proposed variations in the technical aspects of the use of ABC lead to the development of TDABC, a methodology designed to minimize the challenges and obstacles associated with the implementation and use of ABC (Mortaji et al., 2013).

Problems has been identified in the implementation of ABC systems. Members of management must have extensive knowledge of all processes or activities associated with manufacture of a production or the delivery of a service. Activities must then be “linked” or associated with a cost object. A cost object is any entity that is being costed: an item, a service, a department within an organization, a manufacturing plant, a division, or a division. The TDABC methodology uses units of time associated with the manufacture of a product or the completion of a service rather than discrete activities to calculate the cost of a product or a service (Adeoti & Valverde, 2014).

Developments in modified ABC methodologies may lead to continuous improvements in ABC systems throughout the implementation process. Proponents of the use of TDABC cite perceived shortcomings of the ABC (non-TDABC) methodology as the antecedent for a move to TDABC: the cost of the initial setup of an ABC system and the subjective nature of associations embodied in the ABC system (Kaplan and Anderson, 2007). Associations, linkages between activities and cost objects, are defined in the early stages of implementation of an ABC system. The use of a TDABC system simplifies ABC (Kaplan & Anderson, 2007; Mortaji et al., 2013). The implementation of TDABC requires less time and less money compared to the implantation of ABC (Moretaji et al., 2013).

A third generation ABC, which was recently proposed is referred to as fuzzy time-driven activity-based costing (FTDABC). FTDABC was proposed in an effort to further simplify the application of ABC. The FTDABC methodology allows for incorporation of “fuzzy numbers”, estimates used as time drivers, blocks of time that influence costs (Mortaji et al., 2013).

In an effort to illustrate TDABC, Cooper and Kaplan (2011) presented an example. In a traditional costing system, the cost of the sterilizing a cardiac procedure tool kit would be significantly greater than the cost of the sterilizing a knee replacement tool kit because the cost of each tool kit is calculated based on the dollar amount of the actual cash reimbursement received for each procedure. Reimbursement from a third party payor (the government or an insurance company) for a cardiac procedure is far greater than the reimbursement for a knee replacement procedure. In contrast, the cost of sterilizing a cardiac procedure tool kit would be significantly less than the cost of

sterilizing a knee replacement tool kit using ABC because the cost is based on the activities (time and resources) required to complete the sterilization process. Both the cost of the sterilizing the cardiac procedure tool kit and the cost of the sterilizing the knee replacement procedure tool kit is more accurate when ABC is used because the cost is based on the resources consumed (Cooper & Kaplan, 2011). This examples reinforces the idea of a simplified ABC methodology.

The perceived difficulties noted in the implementation of TDABC were addressed in the proposed TDABC methodology; a significant decrease in implementation time associated with extensive time studies and the identification of cost pools (Basuki, 2014). TDABC systems are less complicated to implement than ABC systems, more integrated with enterprise resource planning (ERP) systems, less expensive to maintain, can be used in nearly any industry, and are easily scalable when changes occur within the organization of the firm (Kaplan & Anderson, 2007). TDABC is well-suited to firms in the service industry because the basis for overhead allocations (assignments of indirect costs to cost objects) is based upon the time required to complete a task (Basuki, 2014). Adopters of TDABC report that TDABC is significantly easier to design and implement compared to ABC, and that TDABC can be easily fully and quickly integrated into existing enterprise resource planning (ERP) systems. The use of TDABC systems helps management identify inefficiencies in operations, and facilitates accurate resource consumption expectations. The scalability of TDABC systems may facilitate a firm's expansion or contraction (Kaplan & Anderson, 2007).

The literature suggests that refinements in the ABC methodology, including TDABC and FTDABC, leads to the production of cost data that is more accurate and

more reliable than cost data produced using traditional costing systems (Basuki, 2014). FTDABC is a methodology proposed as an improvement to TDABC in that the time estimates needed in the TDABC methodology can be estimated using triangulation methods relevant to other organizational data and variable (Mortaji et al., 2013). In response to continuous improvement initiatives, a modified ABC methodology has been proposed; performance-focused ABC (PFABC), an ABC methodology that uses service time as opposed to resource allocation as a basis for the allocation of indirect costs (Chea, 2011). Research, theoretical and empirical, related to TDABC, fuzzy time-driven activity-based costing, and PFABC is limited.

TDABC systems have been implemented successfully in service firms; healthcare organizations specifically, surgical centers and cancer centers. The use of TDABC systems in healthcare accounting allows members of management to calculate costs as a function of the cost of time in units as associated with providing a service or a procedure. A “standard”, anticipated cost for a service or a procedure, may be compared to a billed cost in an effort to control costs. In the future, TDABC systems and fuzzy time-driven activity-based costing systems may or may not be deployed across healthcare organizations because the time to provide a service or procedure may not be strongly, positively correlated with the costs associated with providing a service or a procedure (Dyas et al., 2015). Research in the management accounting literature may lead to the adoption or lack of adoption of TDABC and FTDABC. The term ABC will used all-inclusively hereafter to describe the original ABC methodology proposed in the 1980s, TDABC, fuzzy time-driven activity-based costing, PFABC.

***Activity-based costing in the service sector.*** Even though the ABC methodology was first introduced in manufacturing firms, ABC can also be used in service firms (Chea, 2011). The use of ABC should not be confined to the manufacturing sector (Hussain & Gunasekaran, 2001). The principles of ABC are relevant and useful within the service industry as well as in the manufacturing sector. Service firms face the need to reduce the costs associated with providing services (Chea, 2011). Theoretical and empirical research related to costing practices in organizations has historically been confined to manufacturing firms rather than service firms (Chea, 2011; Terzioglu & Chan, 2013). Most empirical research related to costing practices is related to the manufacturing firms, even though service firms, including healthcare organizations, represent approximately 75% of the gross domestic profit (GDP) (Terzioglu & Chan, 2013). However, evidence in the management accounting literature suggests that service firms, firms providing a service rather than a product, should adopt, implement, and use ABC in order to realize the identified benefits associated with the use of ABC (Chea, 2011).

Adoption of ABC in service firms was observable in the late 1990s and the early 2000s (White et al., 2015). The use of ABC systems is common in service firms including retail and commercial banks, insurance companies, investment banks, transportation services firms. Those firms successfully adopting ABC systems share organizational commonalities: the desire to adopt an ABC emanated from within the organization, the need to determine the accurate cost of cost objects, the degree to which employees prescribe to the usefulness of the ABC methodology, and the degree to which



the adoption of ABC was considered to be an important priority within the organization (Chea, 2011).

The benefits of using ABC, including the improved quality of cost data, improved cost control, and increased profits of the firm can be realized by all service firms (Kennedy, 2001). Hospitals and hospital systems (groups of hospitals being managed as one organization) adopting ABC can improve the quality of cost data and reduce the costs associated with providing healthcare services (Lawson, 2005). Improving the quality of care consist of two initiatives: improving patient outcomes *and* decreasing costs (Kaplan & Anderson, 2007). Quality in healthcare is important to stakeholders (Hovlid, 2010). The benefits of implementing changes in healthcare organizations' traditional costing systems include decreased costs and improvements in patient outcomes (Padvanini, 2014). By improving the quality associated with providing services and decreasing costs, a firm is able to gain a competitive advantage (Kalicanin & Knezevic, 2013). The use of ABC in healthcare organizations also leads to improvements in the quality of managerial decisions related to the pricing of product lines (groups of related services) (Gonzalez, Quesada, & Mack, 2005). The adoption, implementation, and use of ABC improves the competitiveness of service firms as well as manufacturing firms (Dubihlela & Rundora, 2014).

***The activity-based costing initiative in the healthcare organizations.*** ABC should be adopted in hospital accounting in order to improve the quality of cost data, improve cost management practices, develop quality improvement initiatives, and enable management to better understand business operations (Lawson, 2005). The need for the adoption of ABC in healthcare organization is urgent due to the fact that healthcare

spending in the United States as a percentage of gross domestic product (GDP) increased year-over-year from 7.0% in 1970 to 17.4% in 2013 (Centers for Medicaid and Medicare Services, 2015). The costs associated with providing healthcare services is increasing at three times the rate of inflation (Chandra, Kumar, & Ghildayal, 2011).

Estimates predict that total expenditures related to healthcare in the United States will increase by \$621,000,000,000 by the year 2022 as the result of the implantation of the provisions prescribed by the Affordable Care Act (Cuckler et al., 2013). Hospitals will continue to struggle with meeting increasing demands for services with limited resources available (Popesko et al., 2012). The increasing costs associated with providing care has led to increased pressure for healthcare managers to find ways to reduce costs and provide care in more efficient and effect ways (Lawson, 2005; Taylor & Nayak, 2012). In the future, the ability to offer healthcare in the United States will depend upon a firm's ability to management and reduce the costs associated with providing care (Chandra et al., 2011). Managerial decisions in healthcare organizations should be based on improvements in the quality and accuracy of cost data (Cannavacciuolo, Illario, Ippolito, & Ponsiglione, 2015) made possible by the adoption, implementation, and use of ABC.

Kaplan et al. (2014), as part of increased accountability in healthcare organizations, began a study the implementation of ABC in healthcare organizations in 2010, stating that ABC is, indeed, a superior methodology compared to traditional costing methodologies in healthcare. Cost accounting systems should be used strategically within healthcare organizations in as part of strategic initiatives designed to enable organizations to improve the quality of their services a low cost (Lawson, 2005).

*Managerial implications of adopting ABC in healthcare organizations.* Evidence in the implementation and use of ABC in healthcare organizations suggests that the ABC methodology is a significant improvement over traditional costing methodologies because ABC provides relevant, accurate information to managers. By using ABC, the quality of managerial decisions is improved. Because of improvements in the quality of cost information, members of management are able to reduce costs and improve patient outcomes; these not mutually exclusive objectives. Managerial decisions in healthcare are driven by a pervasive assumption that leaders in healthcare organizations must continue to improve the value of the services the organization offers. Value is defined as reduced cost and improved patient outcomes (Kaplan & Witkowski, 2014).

*Cost management as continuous improvement using abc in healthcare.* As the cost of providing healthcare services increases, healthcare firms must improve the reliability of cost data (Mercier and Naro, 2014). Healthcare organizations must move towards stringent control over the costs associated with providing services. Cost accounting systems enable healthcare organizations to improve cost control (Lawson, 2005). A cost accounting system should enable members of management to better manage costs and develop continuous improvement initiatives within a healthcare organization (Ramsey, 1994).

The literature presents opposing views on the definition of true costs in relation to the delivery of healthcare services. Historically, the costs associated with delivering services has been measured by focusing on the amount of reimbursement (cash) derived from a service or a procedure rather than the costs associated with the resources consumed during the delivery of that procedure or service (Kaplan & Porter, 2011).

In healthcare organizations, traditional costing systems produce inaccurate cost data, which leads to poor cost management practices. Leaders in healthcare organizations are now required to carefully manage the costs associated with services as part of each firm's strategic initiative to earn an adequate profit (Kapić, 2014). By decreasing costs, managers are able to develop a competitive advantage for the firm in the marketplace (Kalicanin & Knezevic, 2013).

Evidence in the management accounting literature suggests that accurate and reliable cost information is especially important in healthcare organizations. Globally, the rising cost of healthcare is a concern for stakeholders. One of the problems faced by healthcare organizations is that costing practices vary significantly across organizations. The use of inaccurate cost data by healthcare providers leads the over-costing or under-costing of services (Chapman, Kern, & Laguecir, 2014). Costing systems in healthcare organizations should be used as tools which allow healthcare managers to reduce cost at the departmental level and organizational-wide. However, many hospitals do not use costing information effectively as a means to improving managerial processes within the organization (Popesko et al., 2012).

The potential consequences associated with the use of inaccurate cost data may continue to be a significant problem for healthcare providers. Inaccurate cost data may lead to decreases in future reimbursement from payors including governmental payors and private payors (insurance companies). Reductions in reimbursement from payors may, subsequently, impact healthcare providers' willingness and ability to provide care (Kaplan & Witowski, 2014). Accurate cost measurement and effective cost management are practices contributing to the success or failure of each healthcare organization (Onat,

Anitsal, & Anitsal, 2014). Costing practices in healthcare organizations are important because both improved patient outcomes and the costs associated with providing improved patient outcomes will become increasingly important in the future (Porter et al., Pablo, & Lee, 2013). Improvements in patient outcomes as well as the practice of improved cost management may impact healthcare organizations' ability to survive and thrive in the future (Padovani, Orelli, Young, 2014).

Despite the need for accurate cost data, most costing systems in healthcare organizations do not satisfy the needs of information users (Campanale et al, 2014). Practitioners in healthcare accounting state that they suffer because of inaccurate cost information. Historically, healthcare organizations have allocated costs based on hospital *charges*, the amounts billed to payors, rather than costs. The practice of assigning total costs to services based on charges rather than costs contributes to the production of inaccurate cost data (Kaplan & Witowski, 2014). Healthcare organizations should adopt, implement, and use ABC in order to realize the benefits of the use of ABC, which include improved cost management and increases in profits (Mercier & Naro, 2014).

In the United States, healthcare organizations are feeling intensified pressure from payers, including governmental payors and insurance companies, to identify and control the costs associated with providing care. Medicare and Medicaid programs continue to decrease reimbursement rates for service provided. Simultaneously, the demand for care by the patient population is increasing as previously uninsured patients now have access to care (Kaplan et al., 2014). Healthcare providers must be able to identify and reduce the costs associated with providing care while maintaining and improving patient outcomes; improved outcomes at reduced cost (Porter, 2010; Porter et al., 2013).

The accounts employed in healthcare accounting are feeling increased pressure to provide accurate cost data to member of management in healthcare organizations as healthcare providers strive to improve the cost accountability. The federal government and private insurance companies are capping or limiting the amounts that healthcare organizations receive in terms of payment for healthcare services at a time when the number of insured Americans is increasing due to recent legislation (Kaplan et al., 2014). Kaplan and Porter (2011) offered insight into the increased need for improved cost management by healthcare providers: an aging population, new advanced treatment options, pressure from third-party payors in the form of decreased reimbursements, and declining fiscal responsibility of patients. Evidence in the literature suggests that there is almost no understanding of the true of costs associated with the delivery of healthcare services (Kaplan and Porter, 2011). This study will contributes to the theoretical understanding of contingency factors that affect the adoption, implementation, and use of ABC systems.

Cost increases within healthcare organizations are driven by industry environmental factors within the sector. In hospitals, reimbursement from governmental programs, including Medicaid and Medicare, and private insurance companies has decreased while the costs associated with providing care have increased significantly. The costs associated with providing care have increased, in part, due to increases in the costs associated with technology, shortages in the labor supply of licensed medical professionals, the increasing costs of governmental regulatory compliance, the cost of lawsuits, and other variables (Robinson, 2011).

Recent improvements in the technology associated with accounting information systems have led to renewed interest in ABC as a preferred costing methodology in healthcare accounting (Dyas et al., 2015). Studies suggest that low adoption rates of ABC within organizations includes the existence of the following organizational contingency factors: resistance to change in management practices and the costs of implementation (Cannavacciuolo, Illario, Ippolito, & Ponsiglione, 2015).

### **Research and Theories in Management Accounting**

Accounting scholars should identify the most important issues in practice and use theoretical research opportunities to address those identified important issues (Kaplan, 2011). Theory in research *and* in practice explains phenomena and defines variables (Svensson, 2013). In the management accounting literature, ABC is one of the most researched topics (White et al., 2015). An understanding of theories cited in the management accounting literature is relevant to this study.

A firm's application and use of management accounting activities, including practices related to the adoption of costing systems, may be explained by theories (Gong & Tse, 2009). Accounting academics and accounting practitioners do not always agree on the value of academic accounting theory (Wacker, 1998). If academic accounting research (theoretical) is to remain relevant to accounting practitioners, academic accounting theory should contribute to accounting practice (application) (Miller & Bahason, 2010). Accounting academics have a unique opportunity to contribute to accounting practice in that they can engage in reflection on current professional accounting practices and offer feedback (Chapman and Kern 2013).

Accounting researchers should reconsider the importance of normative accounting theory and the potential of normative research as it might contribute to accounting policy (Miller & Bahson, 2010). A significant amount of contemporary accounting research is characterized as positive research (Smith, 2011, p. 20). If accounting researchers are to engage in normative research, they must be mindful of what Miller and Bahson (2010) explain as a goal of the researcher to guide members of management and external auditors to improve the quality of information; an example of potential theoretical contributions to the practice of accounting. In fact, has been argued that the absence of academic contributions to normative accounting theory, the practice of accountancy has been harmed (Miller & Bahson, 2010).

**Normative and descriptive theory in management accounting.** In research related to business, theories help us understand behaviors within organizations, offer structure, and define relationships (Svensson, 2013). Research in business, including research in management accounting, helps stakeholders solve problems, understand relationships between variables, and contributes to knowledge (Smith, 2011, p. 1).

Business researchers consider themselves to be borrowers of theory from other disciplines (Corley & Geioio, 2011). And, accountants often look to other disciplines for theory: psychology, sociology, economics, and finance (Smith, 2010, 36). Every top-tier academic journal in business requires a description each paper's contribution to theory (Corley & Geioio, 2011). In accordance, theories cited in the management accounting literature are examined below.

In accounting research, normative accounting theory should explain what should be done in practice rather than what is being done in practice. And, normative



accounting theory should provide a theoretical framework for identifying weaknesses in practice that should be improved. In contrast, descriptive theories of accounting, described as positive, describe what is actually being done in practice (Smith, 2011, p. 36). This study contributes to normative theory in that the benefits of ABC relevant to hospital accounting will be investigated. Specifically, this study contributes to descriptive theory in that the adoption, implementation, and use of ABC as related to hospital CFOs' beliefs about the perceived efficacy of ABC will be examined based on current practice.

**Contingency theory in the management accounting literature.** Since the 1960s, contingency theory is cited frequently in the management accounting literature related to ABC. Contingency theory serves as the underlying framework in management accounting research (Islam & Hu, 2012; Chenhall, 2003; Otley, 1980). Contingency theory is used to explain how contingency factors impact managerial decisions such as the implementation of technology and other firm-specific decisions (Islam and Hu, 2012).

The contingency theory of managerial accounting was presented by Hayes (1977). The contingency theory framework in the management accounting literature explains why management accounting systems vary between firms (Otley, 1980; Innes & Mitchell, 1990; Chapman, 1997). The contingency theory of management accounting suggested that the accounting system adopted by a firm may be influenced by contingency factors; variables observable within the firm *and* external to the firm (Hayes, 1977).

Contingency theory suggests that no pre-defined organizational structure is suitable for every organization. Organizations should be designed based on internal and

external variables that impact the firm. Every firm is different, and every firm is impacted by contingency factors. Outcomes of a firm, which are associated with organizational design, are affected by contingency factors and “fit” of the design of the firm in alignment with contingency factors (Islam & Hu, 2012; Gong & Tse, 2009). Successful organizations implement organizational structures that represent the best fit between contextual variables and the organization (Gong & Tse, 2009).

The design of management accounting systems in practice has been influenced by contingency theory (Anderson & Lanen, 1999; Simon, 2007). Anderson and Lanen frame the design of management accounting systems in the context of variables such as external factors, internal facts, and the design of the costing systems (1999). The proper design of a firm’s management accounting systems and costing methodology is based upon the organization’s response to external and internal factors in an effort to improve performance. Contingency theory in relation to management accounting implies that an organization’s financial performance is a function of the fit between the structure of the accounting system and contingency factors in the organization. Accounting scholars argue that the theory of constraints calls for the abandonment of traditional costing methods for ABC methods (Simon, 2007), the premise for research related to the shift from traditional costing methods to ABC in effort to improve financial performance.

Within the contingency theory framework, identified contingency factors include economic constraints, competition in the marketplace, the size of an organization, and the firm’s industry (Waweru et al., 2014). Additional contingency factors have been identified: culture and the external environment (Islam & Hu, 2012). Contingency theory also suggests that technology is a contingency factor in organizations (Otley, 1980;

Waweru et al., 2014). In addition, the nature of tasks performed within an organization have been identified as contingency factors impacting organizational decisions (Hayes, 1977). Other identified contingency factors influencing changes in management accounting systems have been identified: the fear of change, a lack of accounting expertise, and poor internal communication Hopwood, 1990; Innes & Mitchell, 1995).

Managers make choices about innovations within organizations based on beliefs about efficiencies and adopt innovative systems that will enable them to achieve organizational goals. In accordance with contingency theory, performance gaps, differences between the ability to achieve organizational objectives and the ability to accomplish these objectives, contribute to the adoption of innovations (Al-Omiri, 2012). ABC systems represent significant innovative systems (Chapman & Kern, 2013).

Research in the management accounting literature related to the adoption, implementation, and use of ABC in hospital accounting is limited. This study, which will examine contingency factors related to the adoption, implantation, and use of ABC in hospital accounting, advances the management accounting literature related to ABC in the context of contingency theory by examining hospital CFOs' beliefs (contingency factors) about the efficacy of the use of ABC. An understanding of the relationships between contingency factors related to the adoption, use, and implementation of ABC in hospital accounting will advance the contingency theory in the managerial accounting literature by moving towards a "contingency theory of management accounting"; a true management accounting theory as opposed to research in management accounting that is explained *by* contingency theory. Other than Lawson's (2005) study, which is related to healthcare financial managers' beliefs about ABC in the state of New York, studies

related to decision-makers' beliefs about ABC as contingency factors in hospital accounting (specifically) is limited.

In this study, contingency theory served as an underlying framework, a possible explanation to questions related to the adoption of ABC. An ABC system may not be a good fit for every healthcare organization. Even though this study research was not conducted in order to test contingency theory, the study will contribute to contingency theory in the management accounting literature by examining relationships between contingency factors related to the adoption, implementation, and use of ABC.

**Agency theory in the management accounting literature.** Agency theory is often cited in the management accounting literature. Agency theory explains the relationships between organization and individuals. Individuals engage in diverse tasks assigned to them in accordance with the directives prescribed by organizations (Baiman, 1990). The underlying assumption in agency theory is that agents make decisions with their individual self-interests in mind (Argryis, 1973). When agents' values and ideals do not align with the values and ideals of the firm, an agency problem exists (Gong & Tse, 2009).

Agency theory provides a theoretical framework for explaining, in part, why hospital CFOs may or may not choose to adopt, implement, and use ABC. Agency theory may explain the congruence or non-congruence of actions of agents in relation to the goals of owners in hospital settings. Agency theory, when considered in the context of this study, may be of use in explaining the attitudinal contingency factors associated with the adoption of ABC in hospital accounting. If hospital CFOs acting as agents

believe that the use of ABC is beneficial to organizations but fail to implement ABC, an agency problem may exist.

**The theory of constraints in accounting literature.** The theory of constraints suggests that improving performance within an organization requires a step-by-step methodology in which problems are assessed, alternative courses of action are developed, and courses of action are implemented (Taylor & Churchwell, 2004). Goldratt proposed the theory of constraints, a theory that states that organizations often do not reach excellence in performance because members of management fail to identify the real problems in the organization and therefore make decisions that are inconsistent with the organization's goals (1992). The theory of constraints identifies new ways to solve performance problems and introduces new ways of identifying problems in organizations (Goldratt, 1992). The theory of constraints implies that members of management should develop and implement decision processes that aid in the identification of problems and then successfully allow for the implementation of the best management accounting system for the organization (Bula, 2004).

Organizational-problem solving is based, in part, on the theoretical framework embodied in the theory of constraints. The theory suggests that management should focus on the entire organization as a system (Perkins and Stovall, 2011; Taylor and Nyak, 2012). The theory of constraints suggests that for any group of individual systems, one constraint, defined as a weakest link, can impede the success of the entire organization. Success, in the context of the theory of constraints, is measured in terms of throughput in the short-term. Throughput is the profit derived from the sale of one unit of product or service times the number of units sold, ignoring fixed costs. Fixed costs are assumed to

be long-term costs in the theory of constraints, and are thus irrelevant to short-term success (Taylor and Nyak, 2012).

The theory of constraints is related to short-term improvements rather than long-term improvements (Naor, Bernardes, & Coman, 2013). The theory of constraints is applicable to problem solving in organizations that have longstanding problems (Tang, 2012). The theory of constraints has been described as a brilliant story of the production capacity and profitability (Aghili, 2011).

Contingency theory, agency theory, and the theory of constraints provide a lens through which contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting occurs or does not occur. This study contributes to the management accounting literature related to ABC in hospital accounting by providing a basis for the development of a theoretical framework for the adoption of ABC. Because ABC has been implemented practice, this study is relevant to practitioners in hospital accounting because healthcare financial managers' attitudes and beliefs about the efficacy of the use of ABC in hospital settings will be examined.

### **The Activity-Based Costing Paradox**

Beginning in the 1980s, academics and consultants encouraged the adoption, implementation, and use of ABC (Geri & Ronen, 2005). Adoption rates of ABC in manufacturing firms in the United States, Australia, and the United Kingdom varied significantly in the 1990s; from 10% to 56% (Baird et al., 2004). Even though academics and professionals promoted the adoption of ABC heavily during the 1980s and 1990s, adoption rates remained low throughout the 1990s (Innes et al., 2000). No increasing trend in adoption rates of ABC across industries is evident as of 2015 (White et al.,

Anistal, 2015). Studies conducted since the 1990s suggest adoption rates of ABC ranging from less than 15% of firms studied to nearly 50% of firms surveyed across countries and across industries (Al-Omiri, 2012). In 2006, the majority of firms surveyed continued to use traditional costing systems rather than ABC systems (Pierce and Brown, 2006). The evidence suggests that ABC systems have not been widely adopted (Pierce and Brown, 2006).

Gosselin (1997) described the phenomenon known as the ABC Paradox; low adoption rates of ABC even though evidence in the management accounting literature supports adoption. Despite evidence in the management accounting literature suggesting the superiority of the use of ABC compared to the use of traditional costing systems, adoption rates in the United States and abroad remain low (White et al., 2015).

**Adoption rates.** Adoption rates for ABC in healthcare organizations are affected by the need for extensive amounts of data and data management in the implantation and use stage an ABC initiative. Global adoption rates across industries (manufacturing firms, financial services firms, and service provides) remain low (White et al., 2015). Reasons for non-adoption include a lack of expertise in the use of ABC systems, weaknesses in information systems technology, resistance to change, and limited need to adopt ABC due to minimal competition in the specific industry (Al-Omiri, 2011). In a survey conducted in 2014, management accountants rated the importance of the use of ABC and the actual usage lower than the importance and use of traditional cost accounting systems (McLellan, 2014). Low adoption rates of ABC globally may be due, in part, to the failure of educational institutions to adequately teach the principles of ABC as a superior costing methodology (White, Anistal, & Anistal, 2015).

Because adoption rates remain low in 2015 (White, Anistal, & Anistal, 2015), leaders in a firm may be reluctant to adopt ABC because leaders in other organizations operating in a similar industry have not adopted ABC; “the fashion perspective” or “the fad perspective” (Al-Omiri, 2012). An organization’s strategy may influence the adoption or non-adoption of ABC (Gosselin, 1997). Firms often adopt innovative technology systems in response to a desire to conform to accepted conventions, or norms, and to appear legitimate compared to peer firms (DiMaggio & Powell, 1983; Meyer & Rowan, 1997).

No conclusive evidence explains the low adoption rates of ABC across organizations or between manufacturing and non-manufacturing firms (Al-Omiri, 2012). In healthcare organizations, the need to stringently control costs would, at first, seem to drive a significantly high adoption rates of ABC. While the initial interest level for the adoption of ABC in healthcare organizations was high in the 1980s, actual adoption has been far less than expected (Lawson, 2005). Low adoption rates of ABC in healthcare accounting is attributed, in part, to the extensive need for data expertise in the use of ABC (Lawson, 2005). Even though there is a widespread belief in the efficacy of ABC systems, the implementation of an ABC system is an expensive, timely undertaking (Canby, 1995). Recent developments in accounting information systems and computer technology have led to renewed interests in the use of ABC in healthcare accounting (Dyas et al., 2015).

**Opposition to the use of activity-based costing.** Not all studies suggests that the implementation and use of ABC solves the problems associated with the use of inadequate costing systems. Members of management may describe the implementation



of ABC as time-consuming and inefficient because of the nature of ABC; data gathering, assigning of costs to activity pools, and the measurement of activities (Huang, Chen, Chiu, & 2014). The use of ABC is limited in terms of the degree to which improvements can be realized because neither the theory nor application of the principles of ABC includes a discussion of managements' controllability of costs and activities affecting costs (Tsai et al., 2010). ABC is a complicated costing system, which relies on many cost drivers (activities that influence costs) (Ratnatunga, 2012).

The implantation of a new management accounting system, such as ABC, is difficult for many firms, especially healthcare providers, because of behavioral paradigms such as users' resistance to change (Podovini et al., 2014). An ABC system can be a complex, costly system (Ratnatunga, 2012; Lelkes & Deis, 2013). Even though opponents of the use of ABC believe that an ABC system is far from superior in relation to traditional costing systems; ABC is simply more complicated but not superior (Geri & Ronen, 2005). The adoption of ABC is costly and labor-intensive (Adeoti, 2014). Firms may not recognize improvements in the quality of managerial decision making after the adoption, implementation, and use of ABC (Mansor et al., 2012). Critics of the ABC methodology believe that the perceptions related to the perceived superiority of ABC systems over traditional costing systems is flawed in that the assumption of a linear relationship between activities and costs is not necessarily a correct assumption. Therefore, according to opponents of ABC systems, the ABC methodology is based on incorrect assumptions (Geri & Ronen, 2005). The perception of possible difficulties involved in the adoption, implementation, and use of ABC may lead members of

management to conclude that non-adoption is preferred to adoption of ABC (Mortaji et al., 2013).

The adoption, implementation, and use of ABC can be a strain on a firm in terms of the depletion of resources (Lawson, 2005). Members of management in firms choosing not to adopt ABC have stated that they are satisfied with the use of traditional costing systems and do not feel the need to consider the proposed benefits of adopting an ABC system (Khalid, 2005; Lawson, 2005; Al-Omiri, 2012). Members of management may lack the rational ability and technical expertise to choose and implement superior technologies (Al-Omiri, 2012). The difficulties associated with identifying activities presumed to influence total costs is also a major obstacle for members of management in the implementation of ABC. Employees' resistance often affects the ABC adoption decision (Moisello, 2012).

Firms attempting to adopt and implement an ABC system often fail because of difficulties in identifying the appropriate activities pools and cost drivers associated with costing. Members of management in firms attempting to adopt an ABC have noted that the implementation of ABC is labor intensive and, therefore expensive. ABC systems may be too complicated in terms of identifying cost drivers and applying the ABC methodology. Firms considering the adoption, implementation, and use of ABC should study the feasibility of the ABC project prior to launching the project (Chea, 2011).

### **Summary**

ABC was introduced in the mid-1980s in response to the wide-spread use of traditional, irrelevant costing systems (Kaplan, 1984). The adoption, implementation, and use of ABC leads to significant benefits for the adopting firm: improvements in the

quality of strategic planning, increases in profits, and the creation operational process improvements (Khalid, 2005; White, Anistal, & Anistal, 2015). The adoption, implementation, and use of ABC also leads to improved quality in cost data, increased understanding of business processes, increased transparency in the components of costs (cost structure), and the elimination of non-value-added activities within the organization (Kalicanin & Knezevic, 2014).

Although evidence in the managerial accounting literature suggests that firms should adopt ABC, adoption rates remain low; a phenomenon known as the ABC Paradox (Gosselin, 1997; White et al., 2015). No conclusive evidence explains the ABC Paradox. However, most costing systems used in healthcare organizations do not satisfy the needs of information users even though members of management need accurate cost data (Campanale et al, 2014).

Healthcare organizations should adopt, implement, and use ABC in order to realize the benefits of the use of ABC, which include improved cost management and increases in profits (Mercier & Naro, 2014). Lawson (2005) stated that beginning in the early 1990s, the use of ABC transitioned from use in manufacturing firms to use in service-based firms. The belief that healthcare firms could benefit from the implementation of ABC became accepted (Lawson, 2005; Kaplan et al., 2014). Even though the adoption of ABC may significantly impact decisions made by healthcare firms, healthcare managers have not adopted ABC at a high rate (Eden, Lay, & Maingot, 2006; Carmo & Padovani, 2012).

A healthcare organization's ability to manage costs is directly related to the organization's ability to produce accurate and reliable cost data (Kaplan et al., 2014).

There is a strong, positive correlation between managements' ability to decrease the costs associated with providing products and services and the quality of managerial decisions (Kapić, 2014). Traditional costing systems in healthcare organizations fail to provide accurate and reliable cost data, which leads to poor pricing decisions and impedes financial performance (Kaplan & Portor, 2011). The accuracy of cost data and the quality of costing systems significantly impact managerial decisions within firms (Kapić, 2014). An understanding of the contingency factors associated with low adoption rates of ABC in hospital accounting will contribute to an understanding of the underlying causes of the ABC Paradox in hospital accounting.

The application of the ABC methodology is not standardized (Chea, 2011). This study examines relationships between contingency factors related to the adoption, implementation, and use of ABC in an effort to advance the management accounting literature related to ABC in hospital accounting, contribute to a the continuing development of the contingency theory of management accounting, and contribute to the development of a conceptual framework for the adoption of ABC in hospital accounting. An understanding of the relationships between contingency factors related to ABC in hospital accounting will contribute to the theory and practice of management accounting.

### Chapter 3: Research Method

This study is a quantitative, survey-based study of attitudinal contingency factors associated with the adoption, implementation, and use of ABC in hospital accounting. The following contingency factors were measured on a survey instrument, which includes Likert-type questions (rating scale questions): hospital CFOs' degree of belief about the efficacy of ABC to impact the quality of cost data, hospital CFOs' degree of belief about the efficacy of ABC to impact the quality of cost control practices, hospital CFOs' degree of belief about the efficacy of ABC to impact the development of process improvement initiatives, and hospital CFOs' degree of belief about the efficacy of ABC to assist members of management in understanding business operations. The use of surveys is effective in managerial accounting research when researchers want to measure participants' beliefs (Van der Stede, 2014; Smith, 2011, p. 54).

#### Research Questions

The central research question is, "What is the relationship between contingency factors related to the adoption, implementation, and use of ABC in hospital accounting? The study examined hospital CFOs' beliefs about the efficacy of the use of ABC in hospital accounting in an effort to understand how relationships between attitudinal contingency factors influence the adoption, implementation and the use of ABC systems in hospital accounting.

**Q1.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted ABC (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**Q2.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**Q3.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**Q4.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**Q5.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices?

**Q6.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices?

**Q7.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about

the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes?

**Q8.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives?

**Q9.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices?

**Q10.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices?

**Q11.** What is the relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data?

### **Hypotheses**

**H10.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an

attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted?

**H1<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H2<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H2<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H3<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H3<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.



**H4o.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H4i.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H5o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

**H5i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

**H6o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

**H6i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

**H7o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

**H7i.** There a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

**H8o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

**H8i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a

hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

**H9o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H9i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10i.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H11o.** There is no statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

**H11i.** There is a statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

The following will be explained this chapter: research methods and design, the population, the sample, the survey instrument, the variables, assumptions, limitations, delimitations, and ethical assurances.

### **Research Methods and Design**

Data was gathered using a survey from Lawson's (2005) study found in Appendix A using an electronic survey method, SurveyMonkey. Written permission to use the survey questions is on file. Dependent variables (variables 1, 2, 3, and 4 in Table 1) and the independent variables were measured using Likert-type, ordered, defined-answer questions. The survey instrument was distributed to 1,278 hospital CFOs whose contract information is included in a purchased database of current contact information (1,345

contact e-mail addresses included in the database less 67 invalid contact e-mail addresses included in the database). The survey instrument was available to respondents for thirty days. A statement of confidentiality was included with invitation to participant in the voluntary survey. SurveyMonkey anonymity settings were reviewed and document prior to distribution of the survey. All electronic data will be stored on a secure server and all paper data will be store in locked, secure areas.

### **Population**

The population and sample included the names and e-mail addresses of 1,345 hospital CFOs in a vetted hospital industry database. The contact database was purchased from ProspectCloud, a for-profit provider of industry contact information. The population included the e-mail addresses of hospital CFOs from a cross section of hospitals in the United States in terms of hospital size (based on the number of employees), location (urban, suburban, or rural), and taxation status (for-profit and not-for-profit).

Of the 1,345 invitations for survey participation sent, 67 invitations “bounced” back (were not successfully delivered); a total survey population of 1,278 valid e-mail addresses for hospital CFOs from a cross section of hospital CFOs from the United States (1,345 total contract e-mails included in the purchased database less 67 invalid e-mail addresses included in the database).

### **Sample**

The American Medical Association states that there are 5,724 hospitals in the United States (Fast Fact on US Hospitals, n.d.). The population of 5,724 represents hospitals may be operated independently and may be part of multiple hospital groups or

management companies. Hospital groups share common services such as accounting. No published data on the exact number of hospital groups which exist in the United States is identifiable.

The sample size was be 1,278 hospital CFOs, which is equal to the number of valid records (contacts) in the database directory of hospital CFOs. Given the total population of individual hospitals in the United States and the fact that most individual hospitals are part of hospital systems, it is reasonable to assume that a population and sample of 1,278 hospital CFOs were appropriate for this study. The population and sample of survey participants, hospital CFOs, is relevant to this study because hospital CFOs typically have significant influence in decisions related to the adoption, implementation, and use of managerial accounting systems including the use of ABC.

### **Instrument**

Data was collected on an electronic version of Lawson's (2005) mail survey (Appendix A), which was used in published studies in both 1994 and 2004. Written permission to use the survey instrument was granted by Lawson in November 2015. The survey was be distributed electronically using an e-mail program, SurveyMonkey, in accordance with guidelines of Northcentral University.

### **Operational Definition of Variables**

The survey instrument includes ordinal Likert-type questions designed to assess attitudinal contingency factors related to hospital CFOs' beliefs about the efficacy of the use of ABC from strongly agree (1) to strongly disagree (7). The survey instrument also includes ordinal Likert-type questions about commonly-used hospital indices: hospital size based on the number of employees, hospital location (urban, suburban, or rural), and

hospital taxation status (for-profit or not-for-profit). Hospital characteristics, including hospital size, location, and taxation status impact the costs associated with providing care (Hsu, 2011).

Table 1  
*Dependent Variables (Attitudinal Contingency Factors Related to the Use of ABC (N = 27))*

Dependent Variable	Hospital CFOs' degree of belief about the efficacy of ABC to	Independent or Dependent in each Mann-Whitney U test?
1	Improve the quality of cost data	Dependent
2	Improve the cost control practices	Dependent
3	Lead to the creation of process improvement initiatives	Dependent
4	Improve managements' understanding of business processes	Dependent

Dependent Variables 1, 2, 3, and 4 are ordinal variable because each represents an attitudinal contingency factor measured by a Likert-type question with ordered answers.

**The degree of belief about the efficacy of ABC to improve the quality of cost data from Table 1 (Dependent Variable 1) (Ordinal).** “ABC systems provide more useful product cost information than conventional accounting systems”; 1 (strongly agree), 2 (agree), 3 (somewhat agree), 4 (neither agree nor disagree), 5 (somewhat disagree), 6 (disagree), and 7 (strongly disagree).

**The degree of belief about the efficacy of ABC to improve the cost control from Table 1 (Dependent Variable 2) (Ordinal).** “The primary benefit of ABC is to

control costs”; 1 (strongly agree), 2 (agree), 3 (somewhat agree), 4 (neither agree nor disagree), 5 (somewhat disagree), 6 (disagree), and 7 (strongly disagree).

**The degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives from Table 1 (Dependent Variable 3) (Ordinal).**

“ABC systems provide more useful information for process improvement programs than conventional accounting systems”; 1 (strongly agree), 2 (agree), 3 (somewhat agree), 4 (neither agree nor disagree), 5 (somewhat disagree), 6 (disagree), and 7 (strongly disagree).

**The degree of belief about the efficacy of ABC to improve managements’ understanding of business processes from Table 1 (Dependent Variable 4) (Ordinal).**

“The use of an ABC system would help us understand our operations better than a conventional accounting system”; 1 (strongly agree), 2 (agree), 3 (somewhat agree), 4 (neither agree nor disagree), 5 (somewhat disagree), 6 (disagree), and 7 (strongly disagree).

The following ordinal independent variables will be measured on Likert-type questions for all respondents in the sample and for the following independent variables: size (number of employees; 1=<25 employees, 2=between 25 and 50 employees, 3=between 51 and 100 employees, 4=between 101 and 500 employees, 5=501 and 1,000 employees, and 7=>5,000 employees), location (urban=1, suburban=2, and rural=3), and taxation status (1=for-profit and 2=not-for-profit).



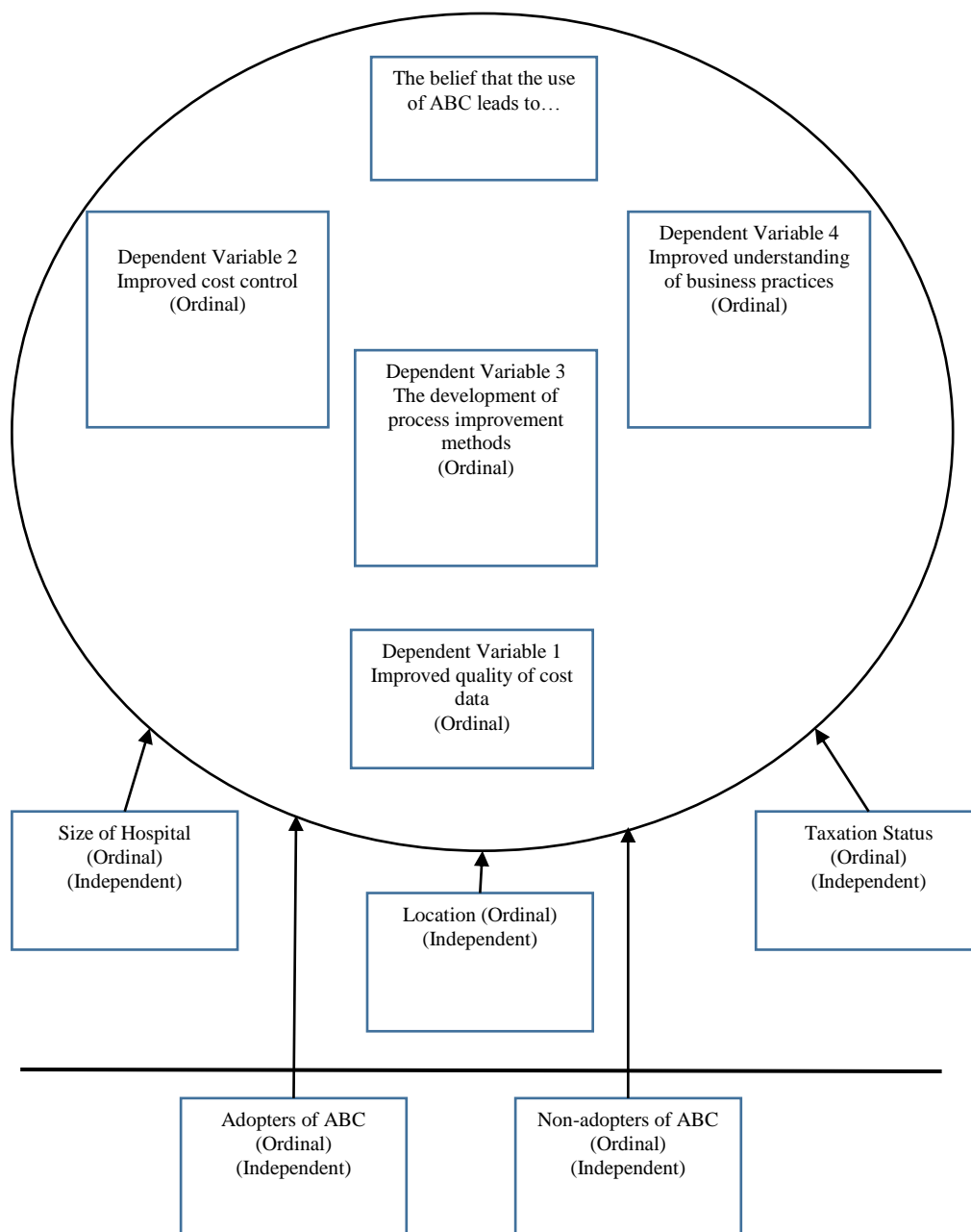


Figure 1 Variables

### Data, Collection, Processing, and Analysis

The survey method often yields “fruitful” results in management accounting research (Van der Stede, 2014). The use of surveys is appropriate when researchers want to measure participants’ beliefs (Smith, 2011, p. 54). This survey-based study was

developed with accepted research conventions in mind. Any survey instrument should be long enough to gather sufficient data, yet short enough for participants to complete (Smith, 2011, p. 120). Using rating scale questions is an efficient method for analyzing data (Shank, 2012). Data was collected on Lawson's (2005) survey (Appendix A). The survey was be distributed electronically using an e-mail program, SurveyMonkey, in accordance with guidelines of Northcentral University. Data was be analyzed using the statistical program SPSS.

Using a 95% confidence interval and  $\alpha=.05$ , a series of Mann-Whitney U tests were used to evaluate the differences in scores on Likert-type questions related to each of the dependent ordinal variables (Variables 1, 2, 3, and 4 in Table 1) between each of the independent ordinal variable with two participant groups: adopters of ABC and non-adopters of ABC.

A series of Kendall's tau-b correlation tests was used to measure the relationship between each ordinal dependent variable listed in Table 1 (Variable 1, Variable 2, Variable 3, and Variable 4) and every other ordinal dependent value (Variable 1, Variable 2, Variable 3, and Variable 4).

In addition, a Kruskal-Wallis test was be used to measure the relationship between hospital demographic variables (hospital size, location, and taxation status) (ordinal independent) on Variable 1 (ordinal dependent) listed in Table 1.

### **Assumptions**

A series of Mann-Whitney U tests were used to analyze data based on the following assumption: the existence of at least one dependent variable and one independent variable. In addition, the independent variable consist of two categorical,

independent groups. Histograms created from data output in this study are similarly shaped in compliance with the assumptions for a Mann-Whitney test; Figure B22, Figure B23, Figure B24, and Figure B25 in Appendix B.

Kendall's tau-b correlational tests were used to analyze data based on the following assumptions: two ordinal variables and a monotonic relationship between the two variables; either the variables increase together or one increases while the other decreases. A scatterplot was created to plot one variable against the other, and then visually inspected for monotonicity. Monotonic relationships were tested using scatterplots, which are presented in Appendix B.

A Kruskal-Wallis test was used to analyze differences in an attitudinal contingency factor score on a Likert scale (ranked, ordinal) between groups (hospital location, size, and taxation status) with the following assumptions: ordinal dependent variables, ordinal independent variables (hospital demographic information), and independence of observations, which is satisfied by the fact an organization can only be described by one location, one size, and one taxation status.

Hospital CFOs are assumed to exercise significant influence in choosing management accounting systems. Respondents are assumed to answer questions included on survey instrument honestly. Organizational factors not influence respondents' answers, which are assumed to be based on each hospital CFO's beliefs. A statement of anonymity will be included with the survey. The assumption is made that only the hospital CFO will answer the survey questions; the hospital CFO has not assigned the task to someone within the organization who does not have influence in the ABC adoption decision.

## Limitations

Academics should be mindful of imperfections in research design, which are inherent. Limitations include the possibility of questionable validity. The validity of a study may be affected by imperfect research design (Cooper & Schindler, 2011, p. 14). External validity is, in part, related to the process of selecting participants for a study. Internal validity is related, in part, to the knowledge and expertise of participants (Coughlan, Cornin, & Ryan, 2009). A discussion of the delimitation related to validity in this study is presented in the next section.

In this study, the identification of potential participants and the inclusion or exclusion of potential participants was a limitation. The American Medical Association states that there are 5,724 hospitals in the United States (Fast Fact on US Hospitals, n.d.). The total population of 5,724 represents hospitals that may be operated as stand-alone facilities *or* as part of multiple hospital groups. Some hospitals or hospital groups may be operated under management contracts; external outsourcing of labor including management functions. Hospital groups may share common services such as accounting. No published data on the exact number of hospital groups or hospital management companies operating in the United States is identifiable. Therefore, the total number of hospital CFOs in the United States is undeterminable.

Statistical limitations may exist in this study. When using Mann-Whitney U tests (non-parametric), a determination of distributions is important. If similar shaped distributions in each ordinal dependent variable are observed, differences in *median* (not mean) scores for the two groups (independent ordinal variables) (adopter or non-adopter) can be determined. If similar shaped distributions in each ordinal dependent variable are

not observed, differences in median scores cannot be determined (Mann-Whitney U test in SPSS, n.d.) In this study, differences in median scores for the two groups are important in assessing differences in attitudinal contingency factors related to ABC.

In consideration of the use of Kendall's tau-b tests; if scores of attitudinal contingency factors fail the assumption of monotonic relationships (sets of scores increasing together or sets of scores in which one score increases while the other score decreases), Kendall's tau-b tests cannot be used (Kendall's Tau-b using SPSS Statistics, n.d.).

### **Delimitations**

The survey instrument used in this study was created by Lawson (2005) and used with permission. For this study, validity of the survey instrument was accepted because Lawson's (2005) study was published in a peer-reviewed academic journal.

The limitation related to the selection of potential participants in this study was addressed by purchasing a hospital industry database from ProspectCloud, a corporate provider of contact databases. The database included 1,345 e-mail addresses for a cross section of hospital CFOs in the United States. Of the 1,345 e-mail invitations sent, 67 invitations "bounced" back and were not valid. E-mail invitations to participate in this study reach 1,278 potential participants.

The survey response rate was minimal despite extensive efforts. The availability of the survey time period (in days) was extended from 30 days to nearly 40 days. Repeated requests and repeated reminders were sent to potential respondents (at least 8 reminders to all potential participants and additional reminders those contacted by telephone). The survey time period ended with final, extensive attempts to reach nearly

150 hospital CFOs via telephone (documented in research notes). A central “call center” location was established and staffed over a three-day call period. Most calls were answered by administrative assistants; “gatekeepers” for hospital CFOs (executives). Where possible, voicemail messages were recorded for potential respondents followed by the electronic distribution of additional reminders.

Limitations related to the use of Mann-Whitney tests and Kendall’s tau-b tests in this study were addressed by using histograms and scatter plots to ensure compliance with assumptions; Figure B22, Figure B23, Figure B24, and Figure B25 in Appendix B.

### **Ethical Assurances**

The electronic survey distribution included an assurance of respondent anonymity. Before the survey was distributed, the SurveyMonkey settings for anonymity were reviewed and documented. The documentation will be maintained and filed. All data will be stored securely in accordance with electronic privacy guidelines. This survey was conducted in compliance with all ethical guidelines prescribed by Northcentral University and the American Psychological Association related to treatments of subjects, honesty, faithful representation of research and findings, and transparency. All NCU Institutional Review Board (IRD) guidelines and policies were observed.

### **Summary**

This study examined relationships between ordinal dependent contingency factors and between ordinal independent groups (hospital size, location, taxation status, and ABC adoption status (adopters or non-adopters)). The relationships between each ordinal independent variable and each ordinal dependent variable were examined using a series of Mann-Whitney U tests. Each ordinal dependent variable was compared to every other

ordinal dependent variable using a series of Kendall's tau-b tests, which measures associations. Data was analyzed using a 95% confidence interval and  $\alpha=.05$ .

The study contributes to the continuing development of the contingency theory of management accounting in relation to ABC in hospital accounting. The role of attitudinal contingency factors associated with the ABC Paradox in hospital accounting was considered. The study contributes to the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting.

## Chapter 4: Findings

### Evaluation of Findings

The purpose of this quantitative, survey-based study is to examine the relationships between attitudinal contingency factors introduced in Lawson's (2005) study related to the adoption, implementation, and use of ABC in hospital accounting in an effort to understand Gosselin's (1997) ABC Paradox; low adoption rates of ABC despite evidence in the management accounting literature which suggests that healthcare organizations should adopt ABC (Cooper & Kaplan, 1992; Kaplan, 1984; Kaplan & Porter, 2011). This study is important to accounting scholars and practitioners in that an understanding of the ABC Paradox in hospital accounting may be beneficial to the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting.

A theoretical framework related to ABC in hospital accounting will be impacted by an understanding of variables (contingencies) influencing the adoption, implementation, and use of ABC. Contingencies impact accounting systems (Hayes, 1977), and the Contingency Theory is the theoretical framework for research in managerial accounting (Islam & Hu, 2012; Chenhall, 2003; Otley, 1980). A firm's adoption of a specific accounting system is best explained by theories (Gong & Tse, 2009). The Contingency Theory explains why cost accounting systems differ between organizations (Otley, 1980; Chapman, 1997).

The purpose of this chapter is to present the findings of this study. The chapter is arranged around the research questions and hypotheses. The chapter begins with a discussion of the variables in the study, a presentation of a summary of the relationships



between the research questions and the hypotheses in this study, a discussion of the statistical tests used in this study, and the results (the response rate, the adoption rate of ABC in this study, and a presentation of the results of each test). Key points are summarized in the conclusion.

### **Results and Evaluations of Findings by Hypotheses**

The results of this quantitative, survey-based study are presented below. The variables used in the study are listed below in Table 2.

Table 2  
*Variables*

Ordinal variable	Dependent or independent?	Measured on survey instrument using
Hospital CFOs' degree of belief about the efficacy of ABC to improve cost control practices	Dependent	7-point Likert scale
Hospital CFOs' degree of belief about the efficacy of ABC to improve managements' understanding of business processes	Dependent	7-point Likert scale
Hospital CFOs' degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives	Dependent	7-point Likert scale
Hospital CFOs' degree of belief about the efficacy of ABC to improve the quality of cost data	Dependent	7-point Likert scale
Adopter of ABC or Non-Adopter (yes or no)	Independent	2-point Likert scale
Hospital size (defined) based on number of employees (demographic)	Independent	7-point Likert scale
Hospital location (defined) based on urban, suburban, or rural (demographic)	Independent	3-point Likert scale
Hospital taxation status based on for-profit or not-for-profit (demographic)	Independent	2-point Likert scale

**The relationships between questions, hypotheses, and tests used.** The relationships that exists between questions, hypotheses, and statistical tests performed are presented below in Table 3.

Table 3 Hypotheses and Related Tests  
*Relationships of Questions to Hypotheses and Related Statistical Test in this Study*

Question	Related Hypothesis	SPSS Statistical Test
1	1	Mann-Whitney U test
2	2	Mann-Whitney U test
3	3	Mann-Whitney U test
4	4	Mann-Whitney U test
5	5	Kendall's tau-b test
6	6	Kendall's tau-b test
7	7	Kendall's tau-b test
8	8	Kendall's tau-b test
9	9	Kendall's tau-b test
10	10	Kendall's tau-b test
11	11	Kruskal-Wallis test

**Statistical tests used in this study.** All variables in this study are classified as non-parametric (ranked, ordinal). Non-parametric statistical tests were used to analyze data in this study because each variable is classified as an ordinal variable. A series of Mann-Whiney U tests, a series of Kendall's tau-b tests, and a Kruskal-Wallis test were used.

A Mann-Whitney U test is the non-parametric equivalent of an independent t-test (Field, 2009, p. 345). In this study, Mann-Whitney U tests were used to test for

differences in ranked Likert scale scores related to hospital CFOs' degrees of belief about the efficacy of ABC between two groups: adopters of ABC and non-adopters of ABC.

Use of the Mann-Whitney U test is appropriate for two-sample situations (Smith, 2011, p. 57).

Kendall's tau-b is the non-parametric equivalent of Spearman's coefficient (Field, 2009, p. 181). In this study, Kendall's tau-b tests were used to measure correlations between hospital CFOs' beliefs about the efficacy of the use of ABC (attitudinal contingency factors). Kendall's tau-b was chosen for this study rather than Kendall's tau-a, because Kendall's tau-b can be used with tied ranks (Field, 2009, p. 182). Kendall's tau-b (not Kendall's tau-a) can be run in SPSS.

The Kruskal-Wallis test is the non-parametric equivalent of a one-way independent ANOVA and is used to test for differences between several groups (Field, 2009, p. 559). Use of the Kruskal-Wallis test is appropriate for multiple sample situations (Smith, 2011, p. 57). In this study, a Kruskal-Wallis test was used to test for differences in Likert scale scores related to CFOs' beliefs about the efficacy of the use of ABC (attitudinal contingency factors) between several independent groups: hospital size based on number of employees, hospital size (urban, suburban, rural), and hospital taxation status (for-profit, not-for-profit).

**Response rate.** The response rate for this study is low despite exhaustive attempts to collect data (documented). In total, 38 participants of the 1,278 valid e-mail invitations distributed electronically were submitted by participants (1,345 e-mail addresses included in the purchased database less 67 invalid e-mail addresses included in the survey) hospital CFOs from a cross section of hospital CFOs from the United States

(1,345 total contract e-mails included in the purchased database less 67 invalid e-mail addresses included in the database). Of the 38 opened and submitted surveys, 27 surveys were usable.

A usable survey for this study is defined as a survey returned with answers to every question related to each variable measured in this study. In anticipation of future research related to ABC (beyond this study), *all* questions from Lawson's (2005) were included in the electronic version of the survey used in this study even though this study only examines the variables defined in Table 2. If a respondent answered each question related to a variable measured in this study, the survey was defined as "usable". The 27 usable surveys from the sample of 1,278 hospital CFOs represents a 2.1% response rate. Lawson's (2005) survey instrument was used with written permission.

The electronic survey was made available to all hospital CFOs in the sample via electronic invitations beginning at 8 a.m. Eastern Standard Time (EST) May 18, 2016. The survey remained opened and available through midnight June 22, 2016. A total of 8 reminders were sent during the time the survey was open and available.

Beginning June 20, 2016 and ending June 23, 2016, approximately 150 potential participants from the database (non-responders) were called with a request to participate in the survey in an effort improved the response rate. The survey time period concluded with final, extensive attempts to reach nearly 150 hospital CFOs via telephone (documented in research notes); a central "call center" location was established and staffed over a three-day call period. Resulting telephone conversations with hospital CFOs were minimal. Most calls were answered by administrative assistants; "gatekeepers" for hospital CFOs (executives). When possible, a voicemail message

requesting a response to the survey was recorded followed immediately by an e-mail message reiterating the importance of the study. Of the 150 potential respondents called between June 20, 2016 and Jun 23, 2016, a total of 5 participants submitted usable surveys.

**Respondents' adoption rate of ABC and the ABC paradox.** Because the purpose of this quantitative, survey-based study is to examine the relationships between attitudinal contingency factors related to ABC in hospital accounting in an effort to understand Gosselin's (1997) ABC Paradox, the adoption rate of ABC by participants in this study is important. The phenomenon, the ABC Paradox, exists due to low adoption rates of ABC despite literary evidence suggesting the importance of the adoption (Gosselin, 1997). Evidence suggests that the ABC Paradox is evident in the healthcare sector (Lawson, 2005).

In this study, a total of 3 hospital CFOs indicated that leaders in their organization had adopted ABC while a total of 24 indicated that leaders in their organization had not adopted ABC; 11.1% adopters and 89.9% non-adopters. The low adoption rate in this study support's the low adoption rate of 16% in Lawson's (2005) study; the ABC Paradox phenomena. Data supporting the calculation of the ABC adoption rate for respondents in this study is presented in Figure 2 in Appendix B.

**Tests of hypotheses using Mann-Whiney tests.** Hypothesis 1, Hypothesis 2, Hypothesis 3, and Hypothesis 4 were tested using a series of Mann-Whitney tests. The findings, which are discussed in detail in the next chapter, are summarized in Table 4.

Table 4  
*Summary of Mann-Whitney U Tests Used to Test Hypothesis 1, Hypothesis 2, Hypothesis 3, and Hypothesis 4 (N = 27)*

Hypothesis	<i>U</i>	<i>p</i>	Result
1	18.5	.187	Fail to reject null
2	21.5	.278	Fail to reject null
3	25.5	.437	Fail to reject null
4	25.0	.437	Fail to reject null

**Hypothesis 1.** A Mann-Whitney U test was used to examine the difference in scores on a 7-point Likert scale question measuring the following attitudinal contingency factor: hospital CFOs' degree of belief about the efficacy of ABC to improve the quality of cost data between adopters and non-adopters of ABC. Response data is presented in Figure B2 in Appendix B. The related questions and hypothesis is presented below followed by the findings.

**Q1.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**H1o.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H11.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

One of the most cited benefits of the use of ABC is an improvement in the quality of cost data (McGowan, 1998). High quality cost data is important for every firm (Soubi, 2014). Most organizations need to improve the quality of the cost data produced (Al-Omiri, 2011). A Mann-Whiney U test indicated that hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost data was not significantly different for adopters of ABC ( $Mdn = 1.0$ ) than for non-adopters of ABC ( $Mdn = 2.0$ ),  $U = 18.5$ ,  $p = .187$ . As a result of these findings, the following conclusion applies to Hypothesis 1 in this study: fail to reject the null hypothesis. This finding is important because evidence in the management accounting literature suggests that the use of ABC leads to the improved quality of cost data (Ibrahim & Saheem, 2013) and the use of ABC enables members of management to control distortions (inaccuracies) in costs (Joseph & Betrivel, 2012).

Supporting documentation for this finding is presented in the following figures in Appendix B: Figure B2, Figure B3, and Figure B4. Figure B2 is respondents' response data to the related question on the survey instrument, Figure B3 is the output from SPSS for the Mann-Whitney test, and Figure B4 is the output from SPSS for the median between the two groups: adopters and non-adopters.

In the statement of findings above, the median, as opposed to the mean, is used in reporting for the Mann-Whitney U test because data in this study is ordinal in value;



ranked data. Examination of the mean is irrelevant. This statement also applies to the Mann-Whitney tests permed for hypotheses 1, 2, and 3.

**Hypothesis 2.** The use of ABC leads to improved cost control activities within organizations (Khalid, 2005; White et al., 2015). Hypothesis 2 was tested using a Mann-Whitney U test to evaluate any difference in scores on a 7-point Likert scale question related to following attitudinal contingency factor: hospital CFOs' degree of belief about the efficacy of ABC to improve cost control practices between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**Q2.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**H2o.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H2i.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve cost control practices (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted. Figure B6 in Appendix B is a presentation of the SPSS output from the Mann-Whitney test.

Hospital CFOs' degree of belief about the efficacy of the use of ABC to improve cost control practices was not significantly different for adopters of ABC ( $Mdn = 2.0$ )

than for non-adopters of ABC ( $Mdn = 3.0$ ),  $U = 21.5$ ,  $p = .278$ . As a result of these findings, the following conclusion applies to Hypothesis 2 in this study: fail to reject the null hypothesis.

This finding is important in consideration of evidence in the management accounting literature; the use of ABC leads to improved cost control (Clark et al., 1999; Hussain et al., 1998). Supporting documentation for this finding is presented in the following figures in Appendix B: Figure B5, Figure B6, and Figure B7. Figure B5 is respondents' response data to the related question on the survey instrument, Figure B6 is the output from SPSS for the Mann-Whitney test, and Figure B7 is the output from SPSS for the median between the two groups: adopters and non-adopters.

**Hypothesis 3.** Evidence in the management accounting literature suggests that the use of ABC leads to the creation of process improvement initiatives (Khalid, 2005; White et al., 2015). Hypothesis 3 was tested using a Mann-Whitney U test to examine any difference in scores on a 7-point Likert scale question related to following attitudinal contingency factor: hospital CFOs' degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**Q3.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**H3<sub>0</sub>.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H3<sub>1</sub>.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

A Mann-Whiney U test indicated that hospital CFOs' degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives (an attitudinal contingency factor) was not significantly different for adopters of ABC ( $Mdn = 3.0$ ) and for non-adopters of ABC ( $Mdn = 2.0$ ),  $U = 25.5$ ,  $p = .437$ . As a result of these findings, the following conclusion applies to Hypothesis 3 in this study: fail to reject the null hypothesis. This finding is important because the use of ABC should enable an organization to develop process improvement initiatives (Ramsey, 1994).

Supporting documentation for this finding is presented in the following figures in Appendix B: Figure B8, Figure B9, and Figure B10. Figure B8 is respondents' response data to the related question on the survey instrument, Figure B9 is the output from SPSS for the Mann-Whitney test, and Figure B10 is the output from SPSS for the median between the two groups: adopters and non-adopters.

**Hypothesis 4.** Use of an ABC system typically allows members of management within an organization to better understand the organization's business processes and business operations (White et al., 2015; Khalid, 2005). Hypothesis 3 was tested using a

Mann-Whitney U test to examine the difference in scores on a 7-point Likert scale question related to the following attitudinal contingency factor: hospital CFOs' degree of belief about the efficacy of ABC to lead to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**Q4.** What is the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to lead to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted (adopters) and hospitals where ABC has not been adopted (non-adopters)?

**H4o.** There is no statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

**H4i.** There is a statistically significant difference between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve managements' understanding of business processes (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted.

A Mann-Whitney U test indicated that hospital CFOs' degree of belief about the efficacy of ABC to lead to improve managements' understanding of business processes (an attitudinal contingency factor) was not significantly different for adopters of ABC ( $Mdn = 1.0$ ) and non-adopters of ABC" ( $Mdn = 2.0$ ),  $U = 25.0$ ,  $p = .437$ . As a result of these findings, the following conclusion applies to Hypothesis 4 in this study: fail to reject the null hypothesis. This finding is important to both accounting scholars and

accounting practitioners because the use of ABC should enable an organization to improve the design and functionality of their business processes (White et al., 2015).

Supporting documentation for this finding is presented in the following figures in Appendix B: Figure B11, Figure B12, and Figure B13. Figure B11 is respondents' response data to the related question on the survey instrument, Figure B12 is the output from SPSS for the Mann-Whitney test, and Figure B13 is the output from SPSS for the median between the two groups: adopters and non-adopters.

**Tests of hypotheses using Kendall's tau-b tests.** Contingencies can impact accounting systems (Hayes, 1977). Hypothesis 5, Hypothesis 6, Hypothesis 7, Hypothesis 8, Hypothesis 9, and Hypothesis 10 were tested using a series of Kendall's tau-b tests. The findings are summarized in Table 5. A detailed discussion of each hypothesis test appears after Table 5.

Table 5 Kendall's tau-b Results  
*Associations (Correlations) (Hypotheses 5, 6, 7, 8, 9 and 10) Kendall's tau-b) (N = 27)*

Variable	1	2	3	4
1. Hospital CFOs' degree of belief about the efficacy of ABC to improve the quality of cost data	—	.548**	.211	.625**
2. Hospital CFOs' degree of belief about the efficacy of ABC to improve cost control practices	.548**	—	.388*	.521**
3. Hospital CFOs' degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives	.211	.388*	—	.343*
4. Hospital CFOs' degree of belief about the efficacy of ABC to improve managements' understanding of business processes	.625**	.521**	.343*	—

Note. \* $p < .05$ . \*\*  $p < .01$

The strength of a correlation may be evaluated by the effect size:  $\pm .1$  indicates a small effect,  $\pm .3$  indicates a medium effect, and  $\pm .5$  indicates a large effect (Field, 2009, p. 173). Correlations between the following variables in Table 5 indicate large effects: 1 to 2, 1 to 4, and 2 to 4. Correlations between the following variables in Table 5 indicate medium effects: 2 to 3 and 3 to 4. Correlations between the following variable in Table 5 indicates a small effect: 1 to 3.

A summary of  $p$  values is presented in Table 6.

Table 6 Kendall's tau-b Results  
*Significance of Associations (Correlations) (Hypotheses 5, 6, 7, 8, 9 and 10) Kendall's tau-b (N = 27)*

Variable	1	2	3	4
1. Hospital CFOs' degree of belief about the efficacy of ABC to improve the quality of cost data	—	$p = .001$	$p = .213$	$p = .000$
2. Hospital CFOs' degree of belief about the efficacy of ABC to improve cost control practices	$p = .001$	—	$p = .024$	$p = .002$
3. Hospital CFOs' degree of belief about the efficacy of ABC to lead to the creation of process improvement initiatives	$p = .213$	$p = .024$	—	$p = .042$
4. Hospital CFOs' degree of belief about the efficacy of ABC to improve managements' understanding of business processes	$p = .000$	$p = .002$	$p = .042$	

The results of Kendall's tau-b tests are presented below and are organized by each question and the related hypothesis.

**Q5.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices?

**H5<sub>0</sub>.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief

about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

**H51.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices.

The use of an ABC leads to improvements in the quality of cost data (Ibrahim & Saheem, 2013) and leads to improved cost management (Khalid, 2005; White et al., 2015). In this study, the efficacy of the use of ABC to improve the quality of cost data was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices,  $r = .548, p < .01$ . As a result of these findings, the following conclusion applies to Hypothesis 5 in this study: reject the null hypothesis.

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in Figure B14 in Appendix B. The data suggests that if a hospital CFO has a high degree of belief about the efficacy of the use of ABC to improve the quality of cost data, then the hospital CFO may also have a high degree of belief about the efficacy of the use of ABC to improve cost control practices. This finding supports evidence in the management accounting literature related to the use of ABC; the use of ABC improves the quality of cost data (Egbuiké, 2013) and improves cost control activities (Clark et al., 1999).



**Q6.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices?

**H6<sub>0</sub>.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

**H6<sub>1</sub>.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices.

Evidence in the management accounting literature suggests that the use of ABC improves the quality of cost data (Egbuikwe, 2013) and leads to the creation of process improvement initiatives (Khalid, 2005; White et al., 2015). In this study, the efficacy of the use of ABC to improve the quality of cost data was not significantly related to the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives,  $r = .211, p > .05$ . As a result of these findings, the following conclusion applies to Hypothesis 6 in this study: fail to reject the null hypothesis.

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in B15 in Appendix B. The data suggests that if a hospital CFO has a high degree of belief about the efficacy of the use of ABC to improve the quality of cost data, then the hospital CFO may or may not have a high degree of belief about the efficacy of the use of ABC to improve cost control practices. An understanding of the relationship between these two attitudinal contingency factors is important to the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting because contingency variables may significantly impact the use of accounting systems (Hayes, 1977).

**Q7.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes?

**H7<sub>0</sub>.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

**H7<sub>1</sub>.** There a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data and the degree of

a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes.

The use of ABC is thought to improve the quality of cost data (Ibrahim & Saheem, 2013) and lead to improved understanding of an organization's business processes (Khalid, 2015; White et al., 2005). The efficacy of the use of ABC to improve the quality of cost data was significantly related to the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes,  $r = .625$ ,  $p < .01$ . As a result of these findings, the following conclusion applies to Hypothesis 7 in this study: reject the null hypothesis.

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in B16 in Appendix B. The data suggests that if a hospital CFO has a high degree of belief about the efficacy of the use of ABC to improve the quality of cost data, then the hospital CFO may have a high degree of belief about the efficacy of the use of ABC to lead to improvements in managements' understanding of business processes. Additional analysis is presented in the next chapter.

**Q8.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives?

**H8o.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a

hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

**H8<sub>1</sub>.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives.

The degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives,  $r = .388$ ,  $p < .05$ . As a result of these findings, the following conclusion applies to Hypothesis 8 in this study: reject the null hypothesis. Evidence in the management accounting literature suggests that the use of ABC leads to improved cost control practices and the development of process improvement initiatives (Khalid, 2005; White et al., 2015). The findings in this study support evidence in the literature.

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in B17 in Appendix B. The data suggests that if a hospital CFO has a high degree of belief about the efficacy of the use of ABC to improve cost control practices, then the hospital CFO may have a high degree of belief about the efficacy of the use of ABC' lead to the creation of process improvement initiatives.

**Q9.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of hospital CFOs' belief about

the efficacy of the use of ABC to improve managements' understanding of business practices?

**H9<sub>0</sub>.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H9<sub>1</sub>.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

The degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices,  $r = .521, p = < .01$ . As a result of these findings, the following conclusion applies to Hypothesis 9 in this study: reject the null hypothesis. This finding supports evidence in the management accounting literature which suggests that the use of ABC leads to improvements in cost management practices and improvements in understanding of a firm's business practices and operations (Khalid, 2005; White et al., 2015).

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in B18 in Appendix B. The data suggests that if a

hospital CFO has a high degree of belief about the efficacy of the use of ABC to improve cost control practices, then the hospital CFO may also have a high degree of belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**Q10.** What is the relationship between the following attitudinal contingency factors related to ABC: the degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices?

**H10<sub>0</sub>.** There is no statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**H10<sub>1</sub>.** There is a statistically significant relationship between the following attitudinal contingency factors related to ABC: the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives and the degree of a hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

The degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices,  $r = .343, p < .05$ . As a result of these findings, the

following conclusion applies to Hypothesis 10 in this study: reject the null hypothesis. The finding in this study supports the findings of Khalid (2005) and White et al. (2015); the use of ABC leads to the creation of process improvement initiatives and improved understanding of business operations and processes.

Supporting documentation, which includes output from SPSS for this non-parametric correlation, is presented in B19 in Appendix B. The data suggests that if a hospital CFO has a high degree of belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives, then the hospital CFO may also have a high degree of belief about the efficacy of the use of ABC to improve managements' understanding of business practices.

**Q11.** What is the relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data?

**H11<sub>0</sub>.** There is no statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

**H11<sub>1</sub>.** There is a statistically significant relationship between hospital demographic variables (hospital size, location, and taxation status) and the following attitudinal contingency factor related to ABC: hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data.

Hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost information (an attitudinal contingency factor) was not significantly affected by different hospital locations (urban, suburban, or rural),  $H(3) = 2.33, p = .135$ , or different sizes based on number of employees (defined groupings),  $H(7) = 6.00, p = .199$ . As a result of these findings, the following conclusion applies to Hypothesis 11 in this study: fail to reject the null hypothesis. This finding is important because contingency factors may affect the adoption, implementation, and use of accounting systems (Hayes, 1977).

All respondents in this survey reported a "not-for-profit" taxation status. So, analysis of this this attitudinal contingency factor based on different taxation statuses (for-profit versus not-for-profit) is not possible in this study.

Data supporting the above statement of findings is presented in Figure B18 and B19 in Appendix B. Figure B20 is the SPSS output for the Kruskal-Wallis test "hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data" grouped by hospital location (urban, suburban, and rural). Figure B21 in Appendix B is the SPSS output for the Kruskal-Wallis test "hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data" grouped by hospital size based on number of employees (defined groups). The data suggests that hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data does not differ between urban or rural hospitals in this study. (No hospital CFO described their hospital as suburban.) The data also suggests that hospital CFOs' belief about the efficacy of the use of ABC to improve the quality of cost data does not differ between hospitals of



different sizes based on number of employees. The use of number of employees as a metric is common in healthcare organizations (Lawson, 2005).

### **Summary**

The findings in this study support evidence in the management accounting literature, which suggests that healthcare financial managers believe in the efficacy of ABC (Lawson, 2005). The management accounting literature suggests that the use of ABC leads to improvements in the quality of cost data (Ibrahim & Saheem, 2013). High-quality (accurate) cost data is important to the success of every firm (Soubi, 2014) because accurate cost data may significantly impact a firm's strategy and quality improvement initiatives (Swenson, 1995). Managerial decisions are dependent upon high-quality cost data (Adeoti & Valverde, 2014). The use of ABC also leads to improvements in cost management activates, the creation of process improvement initiatives, and improved understanding of business operations and business practices (Khalid, 20015, White et al., 2015).

This study examines the attitudinal contingency factors associated with the adoption, implementation, and use of ABC. Contingencies affect the adoption, implementation, and use of accounting systems (Hayes, 1977). Degrees of belief about the efficacy of the use of ABC in relation to contingency factors may contribute to the existence of a phenomenon known the ABC Paradox (Lawson, 2005), which was first proposed by Gosselin (1977).

A series of Mann-Whitney U tests were used to test Hypothesis 1, Hypothesis 2, Hypothesis 3, and Hypothesis 4 be identifying any statistically significant differences in ranked (ordinal) scores for the hospital CFOs' degree of belief about the efficacy of the

use of ABC in hospital accounting between two groups, adopters of ABC and non-adopters of ABC. For the four attitudinal contingency factors (defined in Table 2) analyzed between adopters and non-adopters, ranked (ordinal) scores were not significantly different between groups.

The measure of association (correlation) between the four attitudinal contingency factors as related to Hypothesis 5, Hypothesis 6, Hypothesis 7, Hypothesis 8, Hypothesis 9, and Hypothesis 10 suggests that three of the four attitudinal contingency factors evaluated in this study are significantly related to each other as presented in Table 5. Hospital CFOs' belief in the efficacy of the use of ABC to lead to improved quality in cost data is significantly related to hospital CFOs' belief in the efficacy of the use of ABC to lead to improved cost control and improved understanding of business processes. Hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to improved cost control is significantly related to hospital CFOs' degree of belief about the hospital CFOs' degree of belief of ABC to improve cost control practices and lead to improved understanding of business processes. Hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to process improvement initiatives is was significantly related to hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to improvements in business processes. Of the four attitudinal contingency factors measured in this study, which were first proposed as contingency factors by Lawson (2005), only one pair if attitudinal contingency factors was not significantly related; hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to improved quality of cost data and lead to process improvement initiatives. The findings in this study move beyond Lawson's (2005) study because associations (correlations) *between*

the four attitudinal contingency factors were examined in this study using a series of Kendall's tau-b tests.

In this study, hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to the improved quality of cost data was not significantly different between hospitals grouped by the demographic variables assessed in this study: hospital size based on number of employees (defined groupings), hospital location (urban, suburban, or rural), or taxation status. Ranked (ordinal) scores on the Likert scale for the attitudinal contingency factor did not differ significantly between groups. Findings will be discussed further in the next chapter. The findings support evidence in the management accounting literature which suggests that the use of ABC improves the quality of cost data (Ibrahim & Saheem, 2013) and enables members of management to control distortions of costs (Joseph & Vetrivel, 2012). The use of ABC also leads to improved cost management practices, the development of process improvements initiatives, and improvements in understanding of business operations and practices (Khalid, 2005; White et al., 2015). The findings in this study also support evidence in the management accounting literature related Gosselin's (1997) ABC Paradox. The ABC Paradox persists in the healthcare industry (Lawson, 2005).

## Chapter 5: Implications, Recommendations, and Conclusions

The ABC Paradox in hospital accounting is examined in this study. The phenomenon known as the ABC Paradox suggests that organizations have failed to adopt ABC systems (Gosselin, 1997). Firms should adopt ABC systems in order to remain competitive (Chapman & Kern, 2013; Cooper & Kaplan, 1991). However, adoption rates in most industries, including healthcare, remain low (White et al., 2015; Yazadiffar et al., 2012). The problem is that the relationships between attitudinal contingency factors, beliefs about the efficacy of ABC related to the adoption, implementation, and use of ABC in hospital accounting, have not been examined extensively. Subsequent to Lawson's (2005) study on ABC in the healthcare industry (not specific to hospitals), the research on the use of ABC in the industry is minimal.

The purpose of this quantitative, survey-based study is to examine the relationships between attitudinal contingency factors related to the adoption, implementation, and use of ABC in hospital accounting in an effort to understand low adoption rates and move towards a theoretical framework for the adoption, implementation of ABC in hospital accounting. Three decades after the introduction of the ABC methodology, adoption rates of ABC remain low (White et al., 2015). Minimal research related to the use of ABC in hospital accounting exists. The phenomena known as the ABC Paradox persists in healthcare organizations (Lawson, 2005).

The findings explained in this chapter are related to questions and hypotheses about the adoption, implementation, and use of ABC within cost accounting systems. The ABC methodology, a costing methodology used as part of an organization's cost accounting system, was developed in response to perceived inaccuracies in traditional

costing systems and increased indirect costs arising from advancements in manufacturing technology (Cooper & Kaplan, 1998). Cost accounting systems are sub-systems of management accounting systems. The information produced from cost accounting systems significantly influences managerial decisions, which impact the operations and the success of an organization (Geri & Ronen, 2005). Organizations choose to adopt, implement, and use costing methodologies, including ABC, in order to determine product cost and service cost (Mortaji, Bagherpour, & Mazdeh, 2013).

### **Implications**

Contingency factors related to ABC are examined in this study. The success or failure of the implementation of an ABC system may be related to contingency factors; variables that influence the adoption of and use of an ABC system (Velmurugan, 2010). The questions and hypotheses in this study are related to gaining an understanding of relationships between the attitudinal contingency factors associated with the use of ABC in hospital accounting, which were measured by scores on the Likert scale in questions reflecting hospital CFOs' degrees of belief about the efficacy of ABC. A summary of the research findings is presented below arranged by hypothesis. A detailed discussion of implications of the findings supported by the management accounting literature is presented in the sections titled "Implications related to the purpose and problem" and "Significance of the implications and findings".

In this study, hospital CFOs' degree of belief about the efficacy of ABC were measured; attitudinal contingency factors first examined in relation to healthcare organizations in Lawson's (2005) study. No significant differences in attitudinal contingency factors between two groups, adopters of ABC and non-adopters of ABC,

were found. Associations (correlations) of large, medium, and small effect sizes were discovered between three of the four attitudinal contingency factors examined in this study. Degrees of belief about an important attitudinal contingency factor, the quality of cost data, did not differ between hospital demographic groups; hospitals in different locations, hospitals of different sizes, and hospitals of different taxation statuses. These findings support the existence of a phenomenon known as Gosselin's (1997) ABC Paradox.

The Contingency Theory forms the theoretical foundation of this study. Theories explain phenomena (Svensson, 2013). This study contributes to the continuing development of a contingency theory of management accounting as proposed by Hayes (1977) and discussed in detail in this chapter in the sections titled "Implications related to the purpose and problem" and "Significance of the implications and findings". This evidence in this study will be useful in the development of a theoretical framework for the adoption of ABC in hospital accounting. The development of this framework may be contingent, in part, upon an understanding of the attitudinal contingency factors associated with the use of ABC in hospital accounting. Contingencies may significantly affect an organization's adoption, implementation, and use of an accounting system (Hayes, 1977).

The findings presented in this chapter contribute to the management accounting literature in that an understanding of attitudinal contingency factors related to ABC may contribute to the further development of the contingency theory of management accounting. The literature related to ABC and beliefs about ABC in the healthcare sector are minimal, last seen in Lawson's (2005) study. Lawson's (2005) study was an

examination of the adoption rates of ABC in cross section of healthcare entities in the state of New York. Participants were healthcare financial managers from *many* types of healthcare organizations. Participants in this study are from hospitals; a study designed to address the gaps in the literature related to the impact of attitudinal contingency factors, beliefs, related to ABC in hospital accounting.

This study is important to hospital accounting in relation to the ABC Paradox, a term used to describe the failure of organizations to adopt ABC (Gosselin, 1997). Evidence in the research suggests that ABC should be used as a management tool and should be adopted by healthcare organizations (Cooper & Kaplan, 1991). An examination of attitudinal contingency factors, measures of belief about the use of ABC, in hospital accounting is important in the management accounting literature and the practice of management accounting in hospitals.

**Research questions and hypotheses.** The central research question in this study is, “What is the relationship between contingency factors related to the adoption, implementation, and use of ABC?” Because costing systems should enable organizations to improve cost efficiency and engage in the practice of continuous improvement (Ramsey, 1994), an understanding of these attitudinal contingency factors is important to both accounting scholars engaged in management accounting research and accounting practitioners who use costing systems. The attitudinal contingency factors examined in this study were proposed in relation to the adoption of ABC in healthcare organizations by Lawson (2005). In Lawson’s (2005) study, degrees of belief about the efficacy of the use of ABC by healthcare financial managers (not specific to hospitals) working in the

State of New York were measured and analyzed. The participants in this study are hospital CFOs from across the United States.

An understanding of the relationships between attitudinal contingency factors related to the adoption, implementation, and use of ABC may contribute to an understanding of a phenomenon described by Gosselin (1997) as the ABC Paradox; low adoption rates of ABC despite literary evidence which indicates that adoption of ABC improves the quality of costing information. The ABC Paradox is evident across industries (White et al., 2015). An examination of the attitudinal contingency factors associated with the low adoption rates of ABC in hospital accounting is important because ABC is a management tool that can be used to reduce the total costs associated with providing services (Joseph & Vetrivel, 2012).

In this study, attitudinal contingency factors (four) were measured on a 7-point Likert scale (ranked, ordinal). Differences in scores between groups (adopters and non-adopters) (ordinal) and hospital demographics indices (location, size, and taxation status) (ordinal) were analyzed using a series of Mann-Whitney U tests, Kendall's tau-b tests, and a Kruskal-Wallis test. Research questions and related hypotheses are listed in chapter 1 and chapter 3. The research questions and the hypotheses were developed in consideration of literary evidence which indicates that the use of ABC may lead to organizational improvements (Cooper & Kaplan, 1998). Decades after the introduction of ABC principles, adoption rates for ABC remain low (White et al., 2015).

**Implications of findings for question 1 and hypothesis 1.** Evidence in the management accounting literature suggests that the use of ABC leads to the production of cost data that is more accurate than cost data prepared using traditional costing systems



(Cooper, 1998; Argyris & Kaplan, 1994). Question 1 and hypothesis 1 (as listed in chapters 1, 3, and 4) are related to the relationship between hospital CFOs' degree of belief in the efficacy of the use of ABC to improve the quality of cost data (an attitudinal contingency factor) between hospitals where ABC has been adopted and hospitals where ABC has not been adopted ABC (non-adopters). The relationship between the use of ABC and quality of cost data is important because ABC was proposed as a possible solution to managers' reliance on poor-quality, inaccurate cost data (Kaplan, 1984). ABC was proposed in an effort to minimize the distortion of costs in traditional costing systems (Al-Basteki & Ramadan, 1994).

A Mann-Whitney U test was performed in order to evaluate Likert scale scores for hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost data between two groups: hospitals where ABC has been adopted and hospitals where ABC has not been adopted. Hospital CFOs rated their level of agreement from "strongly agree" to "strongly disagree" on a 7-point Likert scale. Because answers are classified as ordinal (ranked), medians between the two groups (adopters and non-adopters) were examined rather than means.

A Mann-Whitney U test indicated that "hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost data" was not significantly different for "adopters of ABC" ( $Mdn = 1.0$ ) than for "non-adopters of ABC" ( $Mdn = 2.0$ ),  $U = 18.5$ ,  $p = .187$ . The results of the Mann-Whitney test are summarized in Table 6. Assumptions about the Mann-Whitney U tests are discussed in chapter 3, and Figure B24 and B25 in Appendix B.

Table 6  
*Summary of Mann-Whitney U Test (Hypothesis 1) (N = 27)*

ABC efficacy and	<i>U</i>	<i>P</i>	Result
Cost data quality	18.5	.187	Fail to reject the null

Findings are also summarized in Figure 2.

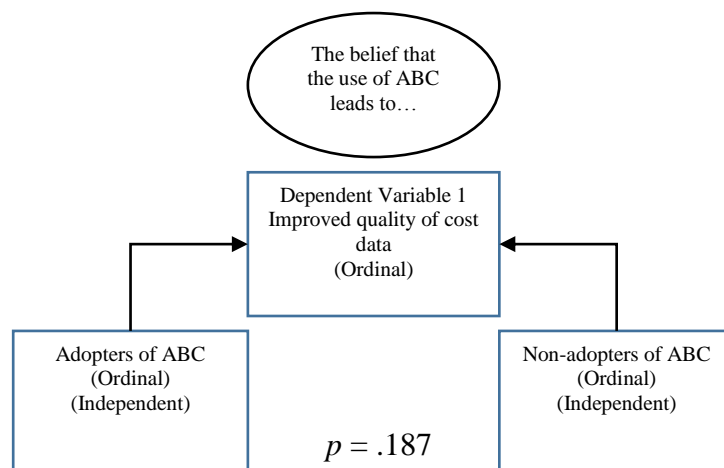


Figure 2 Adopters vs. Non-Adopters (Hypothesis 1)

Because  $p = .187$ , there is no significant difference in scores between groups. So, the attitudinal contingency factor measured in hypothesis 1 may not be affected by the fact that leaders in an organization have or have not adopted ABC. Since scores do not differ between groups (reverse logic applied), the evidence also suggests that the measured attitudinal contingency factor may or may not impact the decision to adopt, implement, and use an ABC system rather than a conventional accounting system. This finding is an important indicator in understanding the ABC Paradox in hospital accounting as described by Gosselin (1997). As a result of these findings, the following conclusion applies to Hypothesis 1 in this study: fail to reject the null hypothesis.

In consideration of the ranked scores of hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost information considered in the

aggregate (for both adopters and non-adopters combined), hospital CFOs *do*, in fact, believe in the efficacy of the use of ABC to improve the quality of cost data. This evidence supports the findings of Lawson (2005).

**Implications of findings for question 2 and hypothesis 2.** In hypothesis 2, hospital CFOs' degree of belief about the use of ABC to improve cost control practices is measured on a 7-point Likert scale from "strongly agree" (1) to "strongly disagree" (7). Traditional costing systems (non-ABC systems) do not allow healthcare organizations to practice stringent cost control (Lawson, 2005). One of the proposed benefits of the use of ABC is an improvement in cost control practices (Khalid, 2005; White et al., 2015).

Hospital CFOs' degree of belief about the efficacy of the use of ABC to improve cost control practices was not significantly different for adopters of ABC ( $Mdn = 2.0$ ) than for non-adopters of ABC ( $Mdn = 3.0$ ),  $U = 21.5$ ,  $p = .278$ .

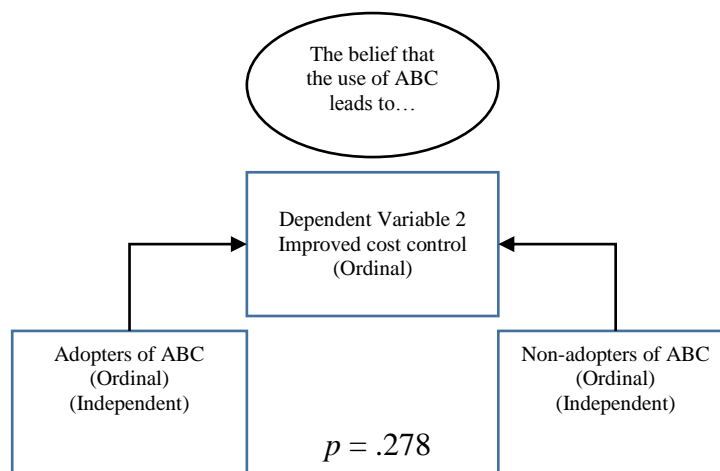


Figure 3 Adopters vs. Non-Adopters (Hypothesis 2)

As a result of these findings, the following conclusion applies to Hypothesis 2 in this study: fail to reject the null hypothesis. The data suggests that hospital CFOs in adopting organizations most often rated their degree of belief with this attitudinal

contingency factor as “agree” while hospital CFOs in non-adopting organizations most often rated their degree of belief with this attitudinal contingency factor as “somewhat agree” with a non-significant difference.

Both adopters and non-adopters believed in the efficacy of the use of ABC to impact the improvement of cost control activities in hospitals. This evidence supports the evidence in Lawson’s (2005) study, which indicated that leaders in healthcare organizations (not hospital-specific) believed in the efficacy of the use of ABC to improve cost control activities. Evidence in the management accounting literature indicates that the quality of cost control activities is improved by the use of ABC (Clark et al., 1999; Hussain et al., 1998).

Because there was no significant difference in hospital CFOs’ degree of belief about the efficacy of the use of ABC to influence cost control activities between adopters and non-adopters,  $p = .278$ , hospital CFOs’ degree of belief about this contingency factor may not be greatly influenced by the fact that leaders in the organization have or have not adopted ABC, and the organization’s decision to adopt ABC may or may not be greatly influenced by hospital CFOs’ degree of belief.

Table 7  
*Summary of Mann-Whitney U Test (Hypothesis 2) (N = 27)*

ABC efficacy and	<i>U</i>	<i>P</i>	Result
Cost control	21.5	.278	Fail to reject null

This finding is important because ABC was proposed in an effort provide information that is useful to members of management in cost control (Al-Basteki & Ramadan, 1994). Healthcare organizations must implement stringent cost control

measures in order to provide low-cost healthcare services as the quality of healthcare improves (Lawson, 2005).

**Implications of findings for question 3 and hypothesis 3.** Question 3 and hypothesis 3 is related to hospital CFOs' belief about the efficacy of the use of ABC to lead to process improvement initiatives measured on a 7-point Likert scale from "strongly agree" to "strongly disagree" between adopters and non-adopters of ABC. In the management accounting literature, evidence suggests that the use of ABC may lead to the creation and improvement of process improvement initiatives (Khalid, 2005; White et al., 2015).

In this study, hospital CFOs' belief about the efficacy of the use of ABC to lead to process improvement initiatives was not significantly different for "adopters of ABC" ( $Mdn = 3.0$ ) than for "non-adopters of ABC" ( $Mdn = 2.0$ ),  $U = 25.5$ ,  $p = .437$ .

Table 8 Hypothesis 3 Test

*Summary of Mann-Whitney U Test (Hypothesis 4) (N = 27)*

ABC efficacy and	<i>U</i>	<i>P</i>	Result
Process improvement initiatives	25.5	.437	Fail to reject null

As a result of these findings, the following conclusion applies to Hypothesis 3 in this study: fail to reject the null hypothesis. The evidence suggests that there is no significant difference between median scores related to this attitudinal contingency factor for adopters compared to non-adopters of ABC. The degree of belief about the use of ABC to lead to the development of process improvements is important to the adoption, implementation, and use of ABC (Lawson, 2005).

The evidence suggests that hospital CFOs' degree of belief about the efficacy of the use of ABC to influence process improvement initiatives may not be greatly influenced by the organization's adoption of ABC or failure to adopt ABC. Similarly, if there adoption or lack of adoption of ABC does not greatly influence this attitudinal contingency factor, the contingency factor may not influence the adoption of ABC within the organization; an important consideration in the development of a theoretical framework for the adoption of ABC.

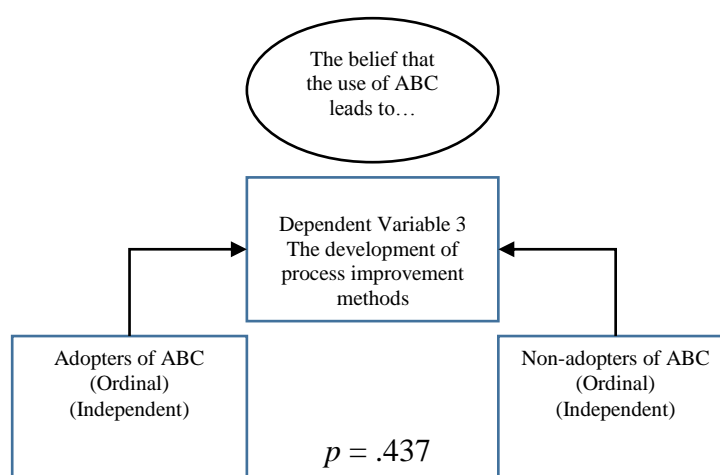


Figure 4 Adopters vs. Non-Adopters (Hypothesis 3)

In the aggregate, both adopters and non-adopters rated their degrees of belief about the efficacy of the use of ABC to lead to process improvements as “strongly agree” or “agree” as presented Figure B8 in Appendix 2. This evidence is supportive of previous findings, which suggests that the use of ABC systems leads to the development of process improvement initiatives (Lawson, 2005; Cooper & Kaplan, 1992; Popesko et al., 2012).

**Implications of findings for question 4 and hypothesis 4.** In hypothesis 4, hospital CFOs' degree of belief about the efficacy of the use of ABC to lead to improved understanding of business processes between adopters of ABC and non-adopters of ABC

was assessed. The use of ABC systems should lead to improvements in managements' understanding of business operations and business processes (Khalid, 2005; White et al., 2015). Results of a Mann-Whitney test suggests that there is no significant difference between ordinal (ranked) scores for adopters and non-adopters.

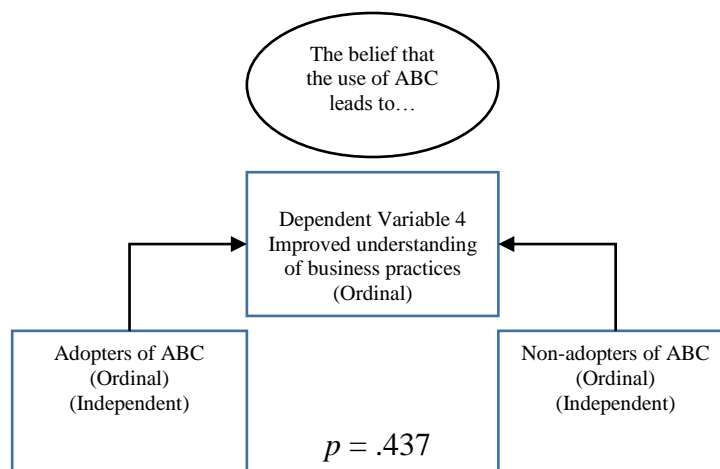


Figure 5 Adopters vs. Non-Adopters (Hypothesis 4)

Hospital CFOs' belief about the efficacy of the use of ABC to lead to improved understanding about business processes was not significantly different for "adopters of ABC" ( $Mdn = 3.0$ ) than for "non-adopters of ABC" ( $Mdn = 2.0$ ),  $U = 25.5$ ,  $p = .437$ . The results are summaries in Table 9.

Table 9 Hypothesis 4 Test

Summary of Mann-Whitney U Test (Hypothesis 4) (N = 27)

ABC efficacy and	<i>U</i>	<i>P</i>	Result
An understanding of business operations	25.0	.437	Fail to reject null

Both adopters and non-adopters of ABC indicated that they either strongly agreed or agreed that the use of ABC systems leads to improved understanding of their firms' business operations as presented in Figure B11 in Appendix B. The finding in this study

supports evidence in the management accounting literature indicating that the use of ABC should lead to the improved design and functionality of business processes (Lawson, 2005; White et al., 2015).

**Hypotheses 5 through 10 and Kendall's tau-b tests.** Contingencies may affect the adoption, implementation, and use of accounting systems within organizations (Hayes, 1977). The hypotheses in this study were tested using a series of Kendall's tau-b tests to measure the association (correlations) between each contingencies (attitudinal contingency factors) listed in Table 5 in chapter 4. The associations between these contingency factors were examined in an effort to understand the possible inclusion or possible exclusion of each contingency factor in a theoretical framework for the adoption of ABC in hospital accounting. The development of a theoretical framework is consistent with contingency theory; firms will adopt the cost accounting system that meets the firm's needs (Gond & Tse, 2009).

Contingency factors will become elements of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting. The success or failure of an ABC implementation project may be related to contingency factors (Velmurugan, 2010). An understanding of the contingency factors will contribute to the development of the framework. This study examines the relationships *between* contingency factors associated with degrees of belief about the efficacy of the use of ABC. Lawson's (2005) study examined degree of belief about the efficacy of the use of ABC and the contingency factors examined in this study, but did not present the results of an examination of correlations *between* contingency factors. An understanding of the relationships between contingency factors may assist accounting scholars in the



development of the contingency theory of management accounting, which was first proposed by Hayes (1977).

The results of Kendall's tau-b tests arranged by hypotheses are summarized below followed by detailed discussion of implications of the findings, which are presented in the sections titled "Implications related to the purpose and problem" and "Significance of the implications and findings".

**Implications of findings for question 5 and hypothesis 5.** An understanding of contingency factors may be important to the success of an ABC system implementation (Velmurugan, 2010). The efficacy of the use of ABC to improve the quality of cost data was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve cost control practices,  $r = .548, p < .01$ .

As a result of these findings, the following conclusion applies to Hypothesis 5 in this study: reject the null hypothesis.

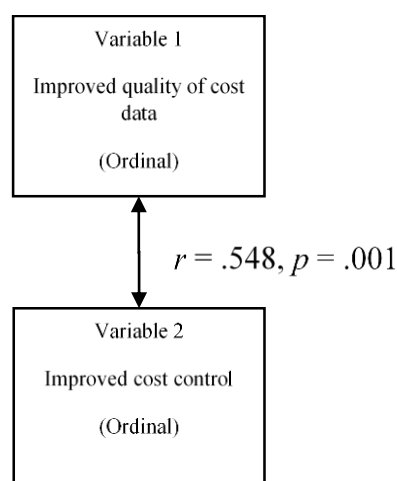


Figure 6 Correlation (Hypothesis 5)

When ABC was proposed as an important cost accounting methodology in the mid-1980s, the idea that the use of ABC improves the quality of cost data was cited as

one of the most prominent benefits of the use of ABC (Ibrahim & Saheen, 2013). The use of ABC also enables firms to significantly improve cost control (cost management) practices within the organization (Khalid, 2005; White et al., 2015).

The findings presented in Figure 6 suggest a large effect size, which means that the two variables examined in hypothesis 5 are strongly related. This finding is consistent with Lawson's (2005) findings. The correlation is observed, but causation cannot be inferred. Additional analysis is presented in the sections titled "Implications related to the purpose and problems" and "Significance of the implications of findings" in this chapter. The positive correlation between the two attitudinal contingency factors assessed in hypothesis 5 supports the findings of Jarrar et al. (2007); there is a positive relationship between behavioral variables (contingency factors) associated with the adoption, implementation, and use of ABC.

**Implications of findings for question 6 and hypothesis 6.** In this study, the efficacy of the use of ABC to improve the quality of cost data was not significantly related to the degree of a hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement practices,  $r = .211, p > .05$ . As a result of these findings, the following conclusion applies to Hypothesis 6 in this study: fail to reject the null hypothesis.

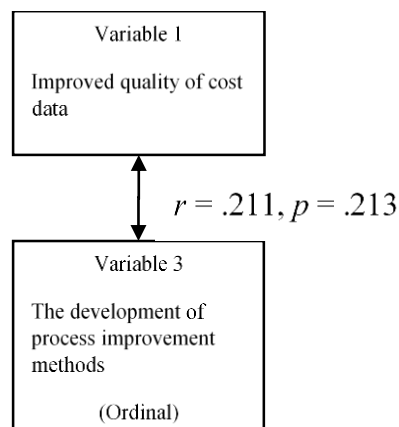


Figure 7 Correlation (Hypothesis 6)

The use of ABC enables firm to produce cost data that is more reliable than cost data produced using traditional (non-ABC) cost data (Ibrahim & Saheem, 20013). The use of ABC also enables firms to create process improvement initiatives (Khalid, 2005; White et al., 2015). So, an understanding of the relationship between hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost data and lead to the creation of process improvements is important in consideration of the development of a theoretical framework for the adoption, implementation, and use of ABC in hospital accounting. The findings in this study contradict evidence in the literature related to the use of ABC to produce high-quality cost data and develop process improvement initiatives; the production of accurate cost data enables an organization to develop quality improvement (process improvement) initiatives (Swenson, 1995).

The findings presented in Figure 7 suggest a small effect size, which means that the two variables examined in hypothesis 6 are not strongly related. This finding contradicts Lawson's (2005) study, which included participants from many types of healthcare organizations. Additional analysis is presented in the sections titled

“Implications related to the purpose and problems” and “Significance of the implications of findings” in this chapter.

**Implications of findings for question 7 and hypothesis 7.** The efficacy of the use of ABC to improve the quality of cost data was not significantly related to the degree of a hospital CFOs’ belief about the efficacy of the use of ABC to better understand business practices,  $r = .211, p = .000$ . As a result of these findings, the following conclusion applies to Hypothesis 6 in this study: fail to reject the null hypothesis.

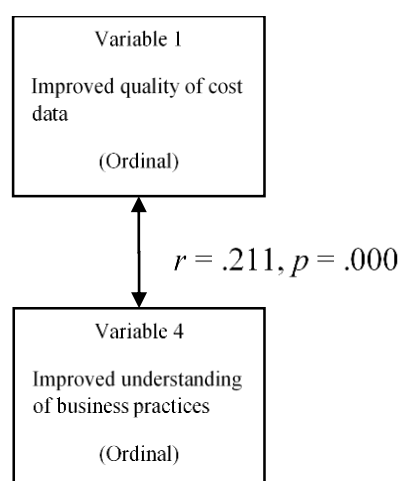


Figure 8 Correlation (Hypothesis 7)

The use of ABC enables firms to improve the quality of cost data (compared to the use of traditional cost systems) by highlighting distortions in costs (Joseph & Vetrivel, 2012). The use of ABC also enables firms to better understand the firm’s business operations and processes (Khalid, 2005; White et al., 2015).

A small effect size is observed between the two variables in Figure 8 (hypothesis 7). The variables examined in hypothesis 7 are not strongly related. The findings contradict the findings of Jarrar et al. (2007), which suggests that there is a strong

relationship between behavioral variables (contingency factors) associated with the adoption, implementation, and use of ABC.

The sections titled “Implications related to the purpose and problems” and “Significance of the implications of findings” include additional analysis.

**Implications of findings for question 8 and hypothesis 8.** The use of ABC enables firms to improve the quality of cost data and understand the firm’s business operations and processes (Khalid, 2005; White et al., 2015).

In this study, the degree of hospital CFOs’ belief about the efficacy of the use of ABC to improve cost control practices was significantly related to the degree of hospital CFOs’ belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives,  $r = .388$ ,  $p < .05$ . As a result of these findings, the following conclusion applies to Hypothesis 8 in this study: reject the null hypothesis.

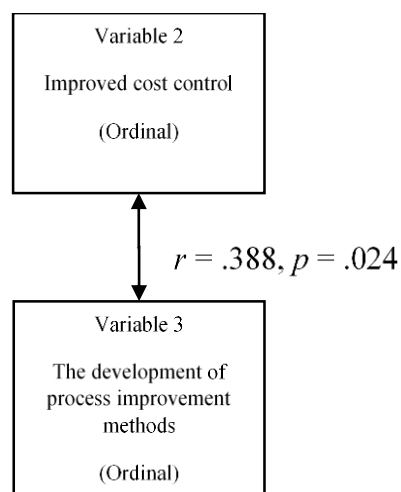


Figure 9 Correlation (Hypothesis 8)

**Implications of findings for question 9 and hypothesis 9.** The degree of hospital CFOs’ belief about the efficacy of the use of ABC to improve cost control

practices was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices,  $r = .521, p = < .01$ . As a result of these findings, the following conclusion applies to Hypothesis 9 in this study: reject the null hypothesis.

The findings in this study support the findings of Khalid (2005) and White et al. (2015); the use of ABC leads to improved cost control and an improved understanding of business processes and business operations.

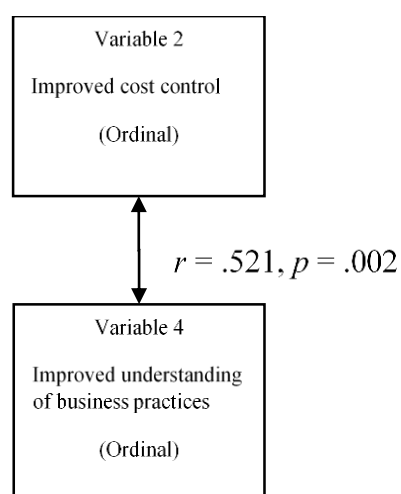


Figure 10 Correlation (Hypothesis 9)

The findings presented in Figure 10 suggest a small effect size, which means that the two variables examined in hypothesis 9 are strongly related. Implications are discussed further later in this chapter.

**Implications of findings for question 10 and hypothesis 10.** The use of ABC leads to improvements in the design of business processes (White at al., 2015). The use of ABC allows members of management to focus on process improvement initiatives (Cooper & Kaplan, 1992). These process improvement initiatives are made possible

because the use of ABC allows managers to focus on value-added activities (Birmson & Anto, 1994).

The degree of hospital CFOs' belief about the efficacy of the use of ABC to lead to the creation of process improvement initiatives was significantly related to the degree of hospital CFOs' belief about the efficacy of the use of ABC to improve managements' understanding of business practices,  $r = .343, p < .05$ . As a result of these findings, the following conclusion applies to Hypothesis 10 in this study: reject the null hypothesis.

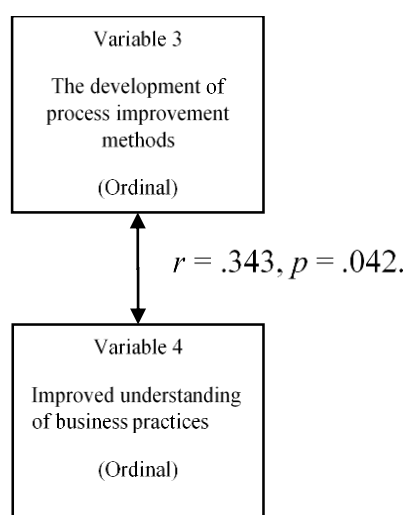


Figure 11 Correlation (Hypothesis 11)

**Implications of findings for question 11 and hypothesis 11.** Question 11 and hypothesis 11 are related to hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost data grouped according to hospital demographics: hospital location, hospital size, and hospital taxation status. The quality of cost data produced by organizations is important to the financial success of the firm (Soubi, 2014). The production of accurate, high-quality cost data is critical in the development of organizational strategy (Swenson, 1995). The quality of managerial decisions related to

the organization improves when the quality of cost data improves (Adeoti & Valverde, 2014).

Hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost information (an attitudinal contingency factor) was not significantly affected by different hospital locations (urban, suburban, or rural),  $H(3) = 2.33, p = .135$ , or different sizes based on number of employees (defined groupings),  $H(7) = 6.00, p = .199$ . Small effect sizes were observed. All participants in this study are from hospitals classified as "not-for-profit" hospitals. So, differences between hospitals grouped by taxation statuses could not be assessed.

As a result of these findings, the following conclusion applies to Hypothesis 11 in this study: fail to reject the null hypothesis. The results are summarized in Figure 12.



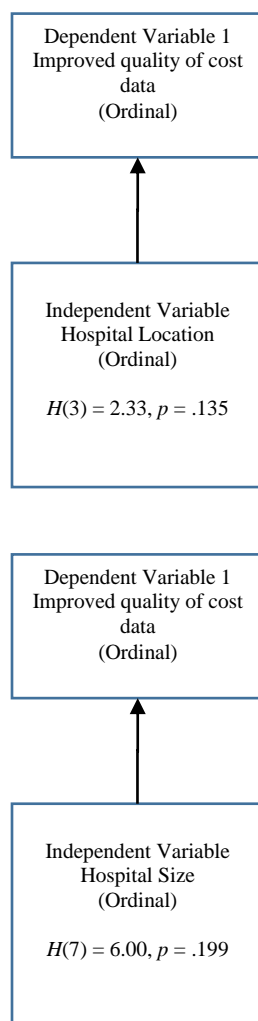


Figure 12 Correlation (Hypothesis 11)

One of the important tenants of the contingency theory in the management accounting literature is that firms adopt their management accounting systems, which include cost accounting systems, in response to the needs of an organization (Otley, 1980; Chapman, 1997). The findings related to hypothesis 11 in this study seem to either contradict the tenants of contingency theory, or suggest that hospital CFOs degree of belief about the efficacy of the use of ABC to improve the quality of cost data may not be

an important determinant in the “adopt” versus “non-adopt” decision within an organization.

**Limitations and impact on the study.** The survey response rate was low, less than 3%, as discussed in the section titled “Results and Evaluations of Findings by Hypotheses” in chapter 4. Possible causes of this limitation include the fact that hospital CFOs are “c-suite executives”, those individuals considered to be executives of the firm. In response to this limitation, the survey time period was extended from 30 days to nearly 40 days. In addition, repeated requests and repeated reminders were sent to potential respondents. The survey time period concluded with final, extensive attempts to reach nearly 150 hospital CFOs via telephone (documented in research notes); a central “call center” location was established and staffed over a three-day call period. Resulting real-time (live\_ telephone calls with hospital CFOs were minimal. Most calls were answered by administrative assistants; “gatekeepers”. Where possible, voicemail messages were left for potential respondents, followed by additional survey e-mail reminders. The low response rate resembles the nature of the ABC Paradox proposed by Gosselin (1997) in that hospital CFOs may consider the ABC methodology to be a low priority within their executive responsibilities, even though hospital CFOs are most likely extensively involved in the selection of a managerial cost accounting system.

The anonymity of each participant was identified as a potential limitation of this study early in the research process, which could have led to possible participants' hesitation to participate. In accordance with NCU guidelines, policies, and procedures, steps were taken to ensure anonymity. Answers to the electronic survey was distributed with anonymity of all respondents' identifying information including e-mail address, IP

addresses, and all other identifying information. Survey distribution settings for anonymity were verified before invitations were sent. Documentation of anonymity settings will be stored securely with collected data in compliance with all NCU guidelines.

**Implications related to the problem and purpose.** This study advances the literature in the context of the central question and the problem in this study by presenting the results of tests of hypotheses. The management accounting literature suggests that hospital CFOs' degree of belief about the efficacy of the use of ABC to improve the quality of cost information is important (Cooper & Kaplan, 1998). The quality of cost data is important to every organization (McGowan, 1998; Soubi, 2014). Because of the importance of this attitudinal contingency factor, this factor would be included in a theoretical framework for the adoption of ABC in hospital accounting.

**Significance of the implications and findings.** This study examines the attitudinal contingency factors associated with ABC. Contingencies within organizations affect choices about the organization's accounting systems (Hayes, 1977). This study is significant in terms of contributions to management accounting theory and management accounting practice. In consideration of Gosselin's (1997) ABC Paradox, the adoption rate of ABC among respondents is an important metric. In this study, an 11.1% adoption rate was observed, which supports a 16.6% adoption rate found across the healthcare industry (not hospital-specific) (Lawson, 2005). The finding in this study supports the findings of White et al. (2015); low adoption rates persists. The calculation of the adoption rate in this study is presented in Figure 2 in Appendix B.

Attitudinal contingency factors related to the adoption, implementation, and use of ABC in hospital accounting are examined in this study. The examination of the relationships between attitudinal contingency factors, which, in accounting practice may be related to decisions related to the adoption, implementation, and use of ABC in hospitals, accentuates the need for first understanding why ABC is or is not adopted, and then suggesting the future of ABC in hospital accounting. Contingency factors related to ABC in healthcare organizations were examined by Lawson (2005). The findings in this study support Lawson's (2005) findings; healthcare financial managers believe in the efficacy of the use of ABC. An understanding of contingencies in management accounting is important because contingency theory is the underlying framework for managerial accounting research (Islam & Hu, 2012; Chenhall, 2003; Otley, 1980).

As a result of this study, accounting scholars may move towards the development and the acceptance of a theoretical framework for the adoption of ABC because the findings in this study help to define relationships between contingency factors. The development of such a framework will contribute towards a new theory; the contingency theory of management accounting first proposed by Hayes (1977). This study may prompt additional research related to attitudinal contingency factors. The success or failure of an ABC implementation project may be impacted by contingency factors (Velmurugan, 2010). If accounting scholars and management accounting practitioners understand the attitudinal contingency factors examined by Lawson (2005) related to ABC in hospital accounting, the future of the adoption, implementation, and use of ABC may continue to be framed in both the management accounting literature and the practice of management accounting.

**Contributions to the literature.** This study highlights the need for accounting scholars to understand the variables, attitudinal contingency factors related to the adoption, implementation, and use of ABC in hospital accounting, accounting scholars may be able to explain why leaders in organizations have or have not adopted ABC despite the theoretical evidence found in the literature in support of the use of ABC (Chapman & Kern, 2013; Cooper & Kaplan, 1991). Outcomes of a firm, which are associated with organizational design, are affected by contingency factors and “fit” of the design of the firm in alignment with contingency factors (Islam & Hu, 2012; Gong & Tse, 2009). Successful organizations implement organizational structures that represent the best fit between contextual variables and the organization (Gong & Tse, 2009).

In this study, the importance of the use of ABC to control costs, an attitudinal contingency factor, is stressed. The urgency of cost control is a consideration that should prompt healthcare organizations to adopt ABC as a cost management tool (Lawson, 2005). Accounting scholars may then be able to continue to advance the management accounting literature into a full, robust body of work that improves the understanding of the history of ABC and frames the future of ABC in the management accounting literature. A full, robust body of management accounting literally related to ABC in hospital accounting may continue to lead to the development and widespread acceptance of new accounting theory including contributions to contingency theory, which frames firm-specific organizational behavior.

Contingency theory is the underlying framework in this study. The design of management accounting systems in practice has been influenced by contingency theory (Anderson & Lanen, 1999; Simon, 2007). Anderson and Lanen frame the design of

management accounting systems in the context of variables such as external factors, internal facts, and the design of the costing systems (1999). The proper design of a firm's management accounting systems and costing methodology is based upon the organization's response to external and internal factors in an effort to improve performance. Contingency theory in relation to management accounting implies that an organization's financial performance is a function of the fit between the structure of the accounting system and contingency factors in the organization. Accounting scholars argue that the theory of constraints calls for the abandonment of traditional costing methods for ABC methods (Simon, 2007), the premise for research related to the shift from traditional costing methods to ABC in effort to improve financial performance.

### **Recommendations**

This study highlights the need for theoretical and empirical research in management accounting related to ABC in hospital accounting. When ABC was proposed in the mid-1980s, interest in ABC as a management tool was high (Lawson, 2005). The findings in this study suggests that attitudinal contingency factors are related, which supports the findings of Jarrar et al. (2007); the belief that behavior variables impact the adoption, implementation, and use of ABC. The ABC Paradox, first proposed by Gosselin (1977), remains unexplained in hospital accounting.

Recent changes in accounting information systems, which are driven by advances in technology, has led to renewed interest in ABC (Dyas et al., 2015). In an effort to move towards a widely-accepted theoretical framework for the adoption, implementation, and use of ABC, scholars interested in management accounting should consider both theoretical and empirical research related to ABC in the context of the following: the

implications of the use or lack of use of ABC on financial accounting (reporting of revenues, expenses, and profits), the impact of the use of ABC on financing decisions, (the use of debt including the issuance of bonds), the impact of ABC on public confidence in the financial vitality of healthcare organizations, and the impact accounting education in ABC on the theory and practice of management accounting. This study may contribute to a renewed interest in management accounting research related the adoption, implementation, and use of ABC in healthcare organizations in response to the work of Lawson (2005).

Theoretical and empirical research related to second-generation ABC is suggested in response to proposed modifications in ABC methodologies. A “simplified” ABC methodology, time-driven activity-based costing (TDABC), was proposed by Kaplan and Anderson (2007). The TDABC methodology was proposed in an effort to address perceived inefficiencies of ABC (Basuki, 2014; Mortaji et al., 2013; Adeoti & Valverde, 2014). Proposed variations in the technical aspects of the use of ABC lead to the development of TDABC, a methodology designed to minimize the challenges and obstacles associated with the implementation and use of ABC (Mortaji et al., 2013). The renewed interest in in ABC, which has been impacted by changes in technology (Dyas et al., 2015) may lead to additional research in TDABC.

### **Conclusions**

This study was designed to measure attitudinal contingency factors related to the adoptions, implementation, and use of ABC in hospital accounting in response to the existence of a phenomenon known and the ABC Paradox, which was proposed by

Gosselin (1997). ABC was introduced in the mid-1980s in response to the wide-spread use of traditional, irrelevant costing systems (Kaplan, 1984; Cooper, 1988).

In the management accounting literature, evidence suggests that organizations should adopt ABC systems. Managers across industries generally believe that the use of ABC leads to the production of cost data that is superior; more accurate and more reliable than cost data that is produced using traditional costing systems (Cooper & Kaplan, 1992). ABC has been described as one of the most significant innovations in management accounting (Chapman and Kern, 2013). The use of traditional costing systems leads to the production of inaccurate costs (Sveenson, 1985; Grondskis & Sapkauskience, 2011; Chea, 2011). Yet, adoption rates of ABC remain low (White et al., 2015).

Contingency theory is the underlying theoretical framework of this study. The design of management accounting systems in practice has been influenced by contingency theory (Anderson & Lanen, 1999; Simon, 2007). The contingency theory framework in the management accounting literature explains why management accounting systems vary between firms (Otley, 1980; Innes & Mitchell, 1990; Chapman, 1997). This study contributes to the continuing development of the contingency theory of managerial accounting, the theoretical foundation of managerial accounting research, was presented by Hayes (1977) in that relationships between attitudinal contingency factors related to ABC are examined.

An understanding of relationships between attitudinal contingency factors related to ABC may lead to additional theoretical and empirical research in ABC and second generation ABC. Recent improvements in the technology associated with accounting information systems have led to renewed interest in ABC as a preferred costing



methodology in healthcare accounting (Dyas et al., 2015). In the context of the management accounting literature, the study advances contingency theory and contributes to the future development of the contingency theory of management accounting. Theory in research *and* in practice explains phenomena and defines variables (Svensson, 2013). Research in business, including research in management accounting, helps stakeholders solve problems, understand relationships between variables, and contributes to knowledge (Smith, 2011, p. 1). A firm's application and use of management accounting activities, including practices related to the adoption of costing systems, may be explained by theories (Gong & Tse, 2009).

In this study, adoption rates of ABC in hospital accounting support the existence of the ABC Paradox. No significant differences in hospital CFOs' degrees of belief about the efficacy of the use of ABC were found between organizations where ABC has been adopted and organizations where ABC has not been adopted. The evidence suggests that hospital CFOs believe in the efficacy of the use of ABC to influence the following attitudinal contingency factors: improve the quality of cost data, improve cost management practices, lead to process improvement initiatives, and improve managers' understanding of business processes. Three of the four attitudinal contingency factors examined are significantly related. These findings advance the management accounting literature related to ABC by explaining relationships between attitudinal contingency factors related to ABC. An understanding of these relationships contributes to contingency theory and the continuing development of the contingency theory of management accounting. An understanding of the relationships between attitudinal

contingency factors related to ABC also contributes to the development of a conceptual framework for the adoption, implementation, and use of ABC in hospital accounting.

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## Appendix A: Survey Instrument

Please answer questions 1 through 12 regarding your **CURRENT** accounting system. If your organization has adopted some form of **Activity Based Costing/Management (ABC/M)** system, answer the questions with regard to the **CONVENTIONAL** accounting system your organization used prior to ABC/M implementation.

Please indicate your level of agreement with each of the following statements.

	Strongly Agree	Agree	Some- what Agree	Neither Agree nor Disagree	Some- what Disagree	Disagree	Strongly Disagree
1. Our current accounting system does NOT provide all of the information required for managerial decision making.							
2. There is a need for an improved cost system to support managerial decision making.							
3. Our current accounting system provides accurate and useful service or product costing information.							
4. Our department has achieved considerable operational improvements, which are not reflected in your current financial reports.							
5. It is difficult to determine the cost of the various activities performed in our organization using information provided by your current accounting system							
6. Our current accounting system is useful for customer/ patient billing.							
7. Actual costs are accurately reflected in customer/patient billing.							
8. Improvement in service or product costing information would give our organization a competitive advantage.							

9. Our current accounting system provides information useful in guiding process improvement efforts.

10. Improvement in tracing the costs of activities performed would facilitate process improvement efforts.

Strongly Agree	Agree	Some-what Agree	Neither Agree nor Disagree	Some-what Disagree	Disagree	Strongly Disagree

11. Has your organization implemented quality improvement programs?

Yes;  No

12. If yes, what types of programs have you implemented?

Customer Service;  Internal Staff;  Vendor;  Other (Please Describe) \_\_\_\_\_

13. Which (if any) of the following tools and techniques does your organization currently use, or has used in the past? For each tool, please indicate your level of agreement with the statement:

“[tool] was important in driving our organization towards achieving its vision.”

Tool	Don't/ Didn't Use	Strongly Agree	Agree	Some-what Agree	Neither Agree nor Disagree	Some-what Disagree	Disagree	Strongly Disagree
Benchmarking								
Target Costing								
Pay for Performance								
6 Sigma								
Reengineering								
Performance Management								
Activity Based Costing/Mgmt.								
Total Quality Management								
Theory of Constraints								
Budgeting								
Break-even Analysis								
Scorecarding								
Strategic Planning								
Economic Profit (EP)								

Please answer questions 14 through 29 regarding activity based costing/management (ABC/M).

14. Are you familiar with activity based costing/management?

Yes;  No;  Somewhat (If no, please go to question 30)

Please indicate your level of agreement with each of the following statements.

	Strongly Agree	Agree	Some-what Agree	Neither Agree nor Disagree	Some-what Disagree	Disagree	Strongly Disagree
15. Use of an activity based costing system would help us understand our operations better than a conventional accounting system.							
16. Activity based costing systems provide more useful product costing information than conventional accounting systems							
17. ABC/M systems provide more useful information for process improvement programs than conventional accounting systems.							
18. ABC/M systems should be implemented as stand-alone systems which exist parallel to existing cost accounting systems.							
19. The primary benefit of ABC/M is to control cost.							

20. Does your organization currently use activity based costing/management?

Yes;  No;  Unsure (If yes, please go to question 25)

21. Did your organization previously use activity based costing/management?

Yes;  No;  Unsure (If yes, please go to question 24)

22. Is your organization considering implementing an ABC/M system?

Yes;  No;  Unsure

23. If you have heard of or assessed ABC/M, but have not adopted it, what are the reasons?

- We do not have the types of products/services or competitive environment that would benefit from an ABC/M system.
- The costs to design and implement an ABC/M system are prohibitive.
- We would need to create new systems for data capture and processing.
- We would not be able to obtain all the data necessary to implement ABC/M.
- ABC/M systems are too complex.
- We would have too many problems identifying activity-cost pools and drivers.
- There is no senior management commitment to a tool such as ABC/M.
- ABC/M would be too disruptive.
- We would have too many problems in gaining acceptance of the ABC/M system from managers.
- ABC/M is limited in its ability to explain cost variability.
- ABC/M is limited in its ability to assist cost control.
- We don't use ABC/M, however, we perform Activity Analysis to determine our value added and non-value activities.
- Other (please specify): \_\_\_\_\_

Please go to question 30



## Appendix B: Supporting Documentation (Findings)

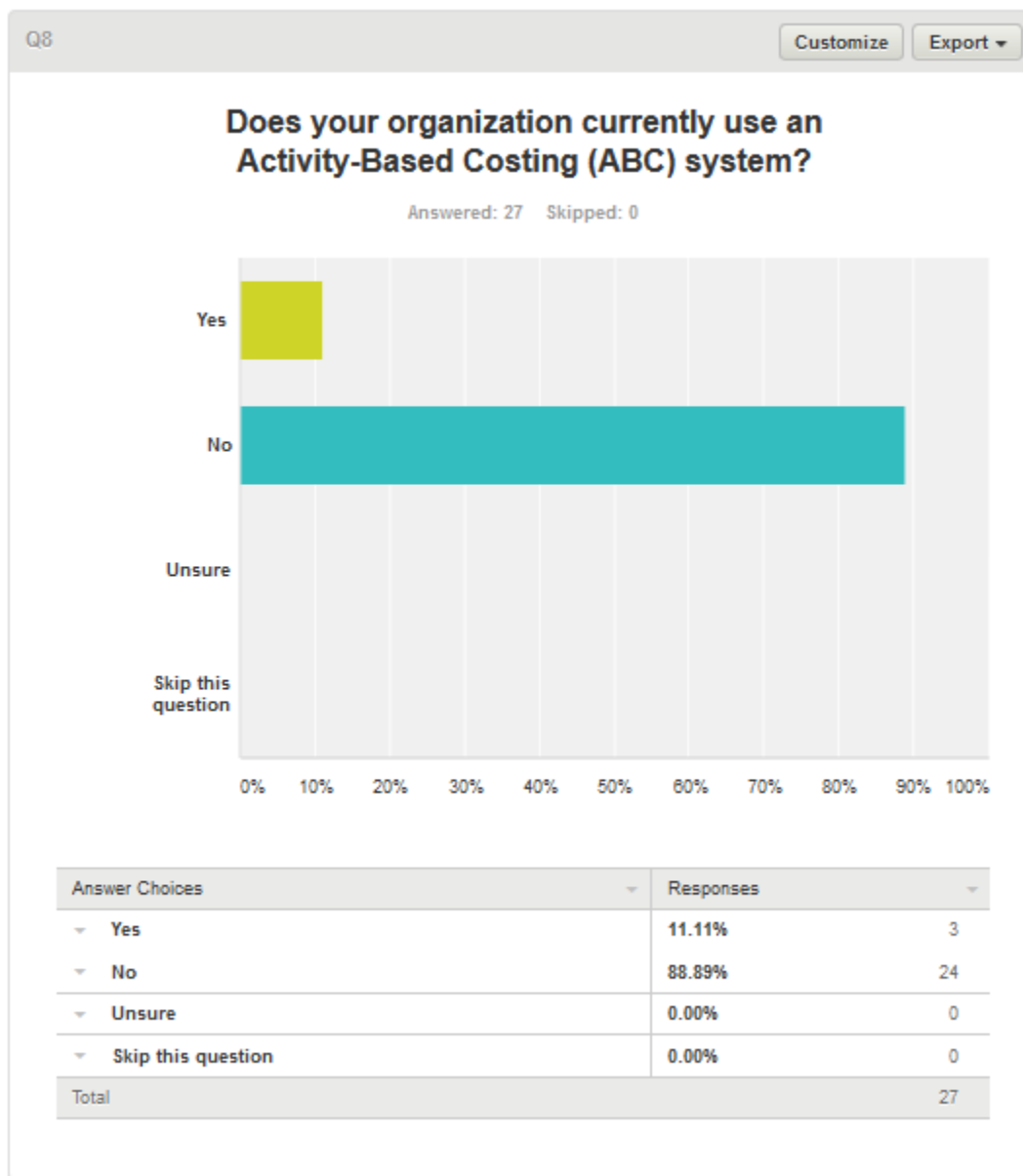


Figure B1 Adopters versus Non-Adopters

Note: “Yes” = “adopter of ABC” and “No” = “non-adopter of ABC”

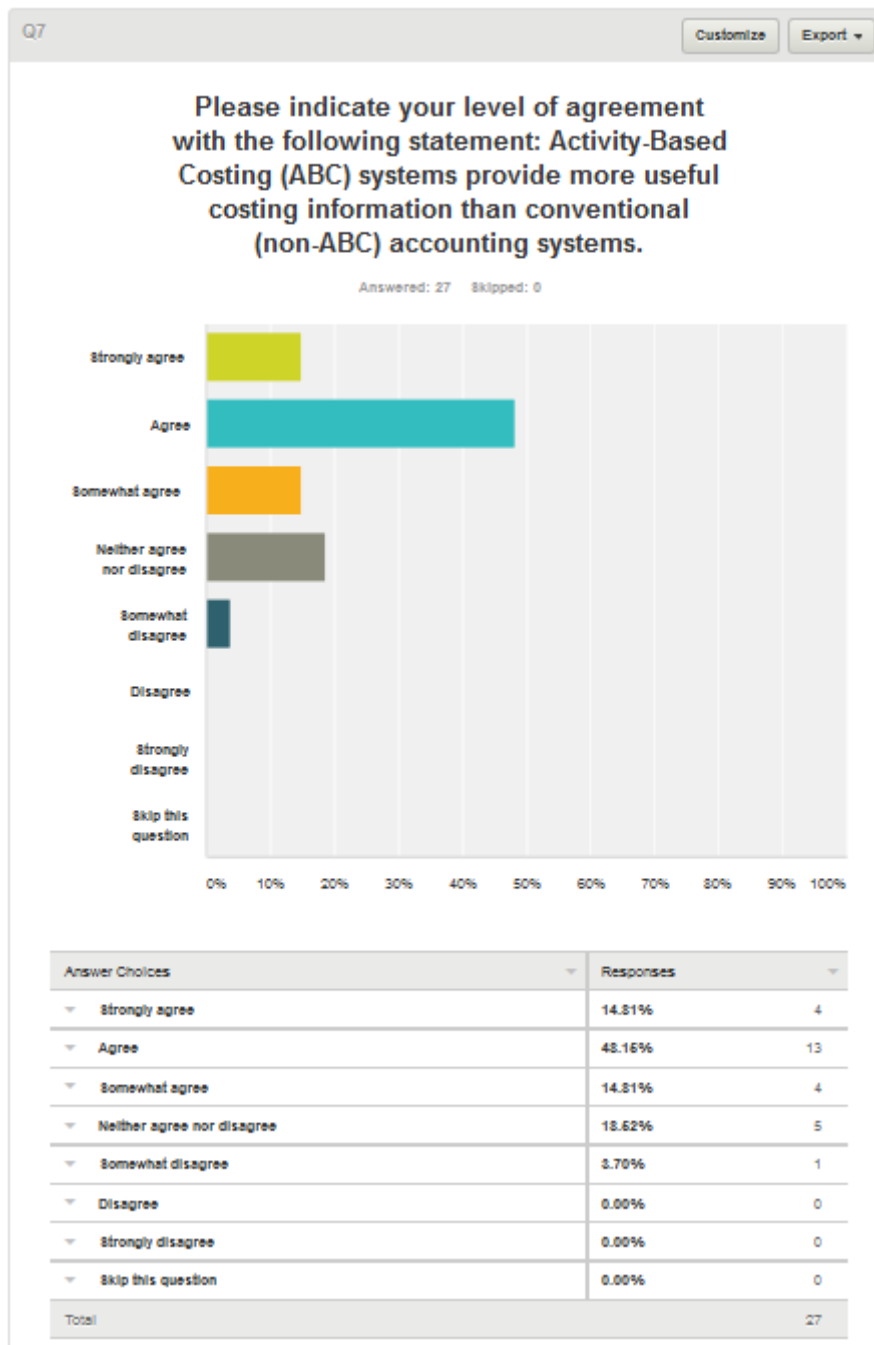


Figure B2 Hypothesis 1

Note: Question responses

### Mann-Whitney Test

Ranks				
Does your organization currently use an Activity-Based Costing (ABC) system?		N	Mean Rank	Sum of Ranks
Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Yes	3	8.17	24.50
	No	24	14.73	353.50
	Total	27		

### Test Statistics<sup>a</sup>

	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.
Mann-Whitney U	18.500
Wilcoxon W	24.500
Z	-1.442
Asymp. Sig. (2-tailed)	.149
Exact Sig. [2*(1-tailed Sig.)]	.187 <sup>b</sup>

a. Grouping Variable: Does your organization currently use an Activity-Based Costing (ABC) system?

b. Not corrected for ties.

Note: “Yes” = “adopter of ABC” and “no” = “non-adopter of ABC”.

The default setting for significance in SPSS for the Mann-Whitney U test is “Asymptotic”. The “Exact” setting, as opposed to the “Asymptotic” setting, is superior when using a small sample (Field, 2009, p. 547). The “Exact Sig. is used for this study where  $N = 27$ .

Figure B3 Hypothesis 1

Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.

Yes	N	Valid	3
		Missing	0
Median			1.0000
No	N	Valid	24
		Missing	0
Median			2.0000

Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.

Does your organization currently use an Activity-Based Costing (ABC) system?			Frequency	Percent	Valid Percent	Cumulative Percent
Yes	Valid	Strongly agree	2	66.7	66.7	66.7
		Somewhat agree	1	33.3	33.3	100.0
		Total	3	100.0	100.0	
No	Valid	Strongly agree	2	8.3	8.3	8.3
		Agree	13	54.2	54.2	62.5
		Somewhat agree	3	12.5	12.5	75.0
		Neither agree nor disagree	5	20.8	20.8	95.8
		Somewhat disagree	1	4.2	4.2	100.0
		Total	24	100.0	100.0	

Note: "Yes" = "Adopter" of ABC and "No" = "Non-Adopter" of ABC

Figure B4 Hypothesis 1

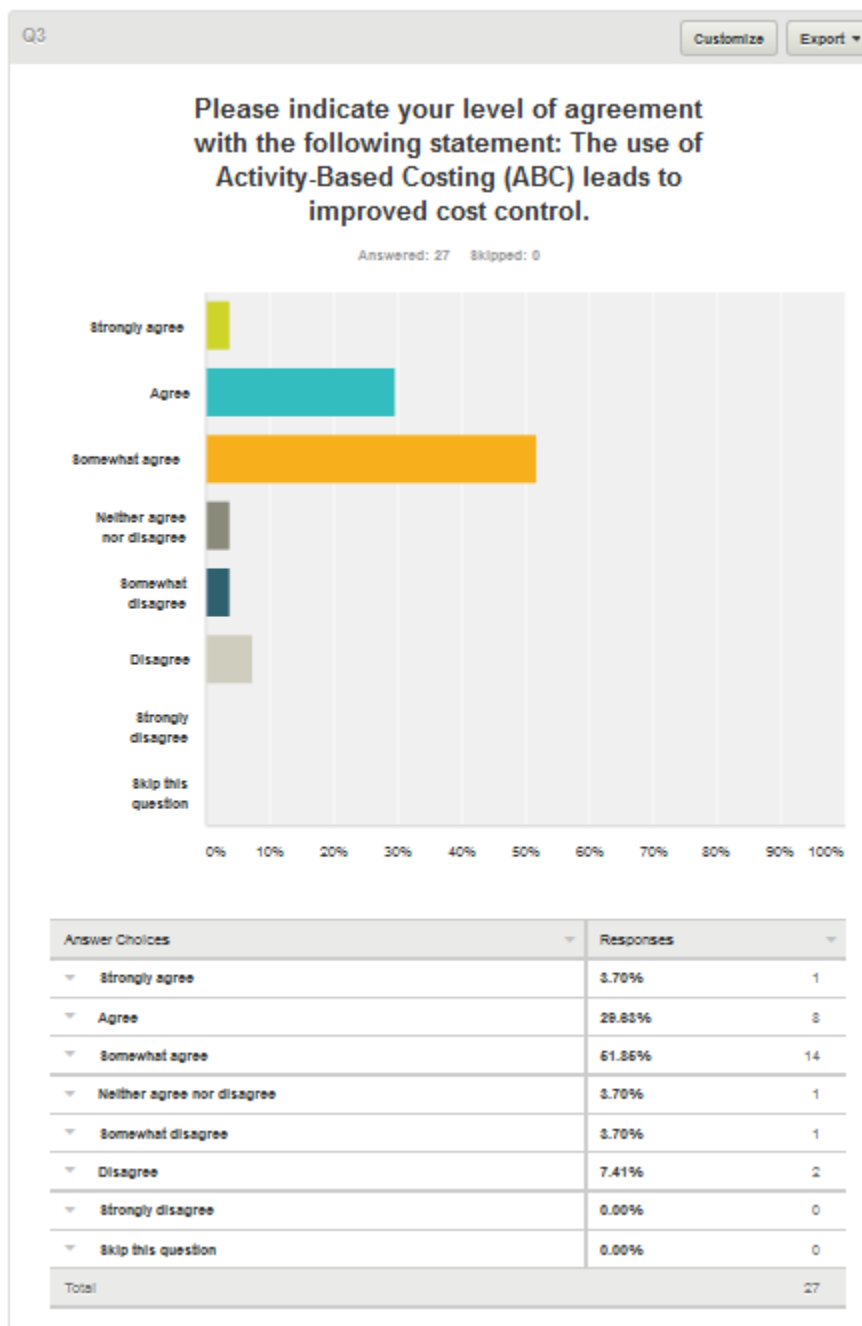


Figure B5 Hypothesis 2

## Mann-Whitney Test

Ranks					
		Does your organization currently use an Activity-Based Costing (ABC) system?	N	Mean Rank	Sum of Ranks
Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Yes		3	9.17	27.50
	No		24	14.60	350.50
	Total		27		

### Test Statistics<sup>a</sup>

	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.
Mann-Whitney U	21.500
Wilcoxon W	27.500
Z	-1.224
Asymp. Sig. (2-tailed)	.221
Exact Sig. [2*(1-tailed Sig.)]	.278 <sup>b</sup>

a. Grouping Variable: Does your organization currently use an Activity-Based Costing (ABC) system?

b. Not corrected for ties.

Note: “Yes” = “Adopter” of ABC and “No” = “Non-Adopter” of ABC; 3 firms are Adopters and 24 firms are Non-Adopters. The median is used in reporting for the Mann-Whitney U test because this is ranked data; examination of the mean is irrelevant because the values assigned on the Likert scale are ordinal rankings rather than true means.

Figure B6 Hypothesis 2

## Frequencies

Statistics			
Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.			
Yes	N	Valid	3
		Missing	0
	Median		2.0000
No	N	Valid	24
		Missing	0
	Median		3.0000

Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.

Does your organization currently use an Activity-Based Costing (ABC) system?		Frequency	Percent	Valid Percent	Cumulative Percent
Yes	Valid	Agree	2	66.7	66.7
		Somewhat agree	1	33.3	33.3
		Total	3	100.0	100.0
No	Valid	Strongly agree	1	4.2	4.2
		Agree	6	25.0	29.2
		Somewhat agree	13	54.2	83.3
		Neither agree nor disagree	1	4.2	87.5
		Somewhat disagree	1	4.2	91.7
		Disagree	2	8.3	100.0
		Total	24	100.0	100.0

Figure B7 Hypothesis 2

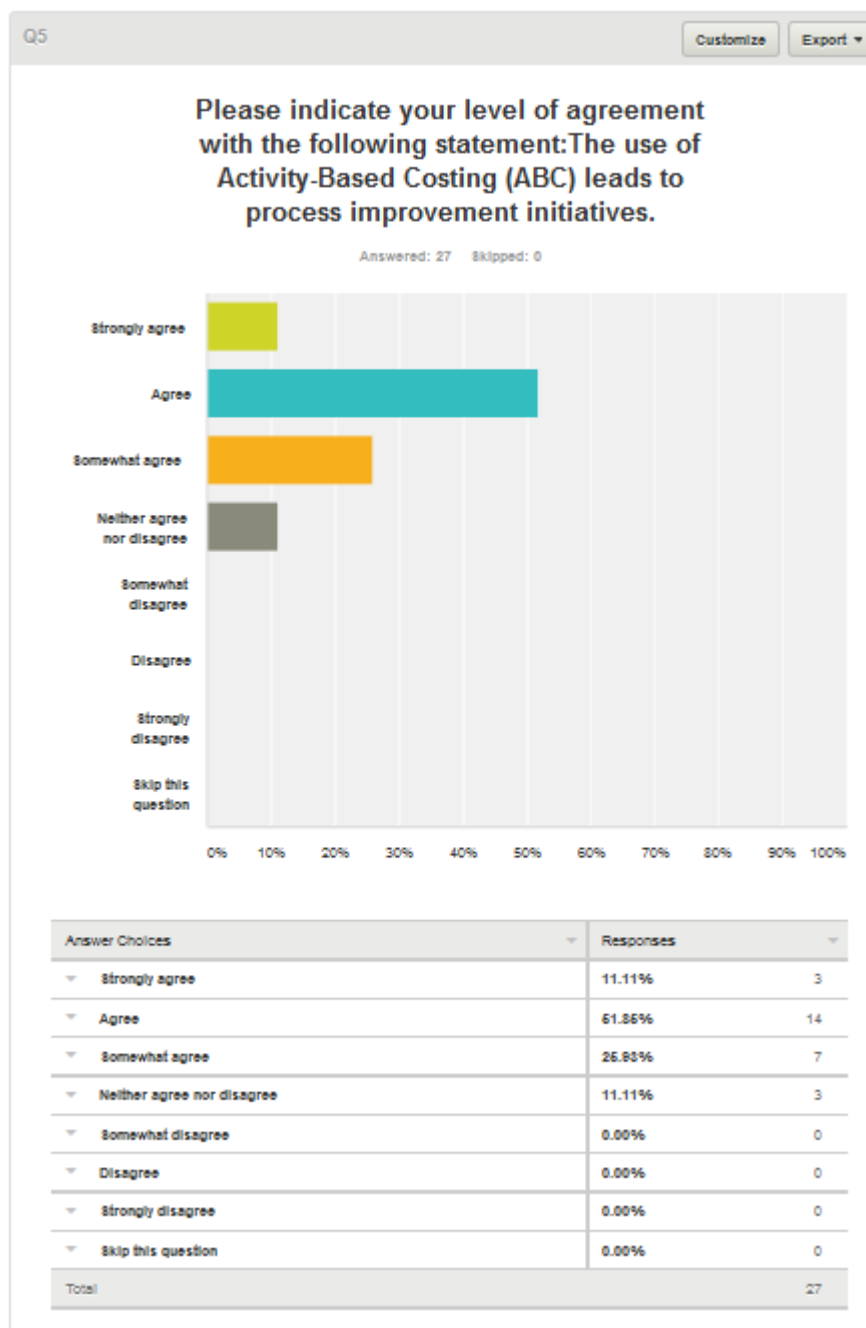


Figure B8 Hypothesis 3



### Mann-Whitney Test

Ranks				
Does your organization currently use an Activity-Based Costing (ABC) system?		N	Mean Rank	Sum of Ranks
Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.	Yes	3	17.50	52.50
	No	24	13.56	325.50
	Total	27		

### Test Statistics<sup>a</sup>

	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.
Mann-Whitney U	25.500
Wilcoxon W	325.500
Z	-.883
Asymp. Sig. (2-tailed)	.377
Exact Sig. [2*(1-tailed Sig.)]	.437 <sup>b</sup>

a. Grouping Variable: Does your organization currently use an Activity-Based Costing (ABC) system?

b. Not corrected for ties.

Note: “Yes” = “Adopter” of ABC and “No” = “Non-Adopter” of ABC; 3 firms are Adopters and 24 firms are Non-Adopters. The median is used in reporting for the Mann-Whitney U test because this is ranked data; examination of the mean is irrelevant because the values assigned on the Likert scale are ordinal rankings rather than true means.

Figure B9 Hypothesis 3

## Frequencies

### Statistics

Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.

Yes	N	Valid	3
		Missing	0
Median			3.0000
No	N	Valid	24
		Missing	0
Median			2.0000

Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.

Does your organization currently use an Activity-Based Costing (ABC) system?	Frequency	Percent	Valid Percent	Cumulative Percent	
Yes	Valid	Agree	1	33.3	33.3
		Somewhat agree	2	66.7	66.7
		Total	3	100.0	100.0
No	Valid	Strongly agree	3	12.5	12.5
		Agree	13	54.2	66.7
		Somewhat agree	5	20.8	87.5
		Neither agree nor disagree	3	12.5	100.0
		Total	24	100.0	100.0

Figure B10 Hypothesis 3

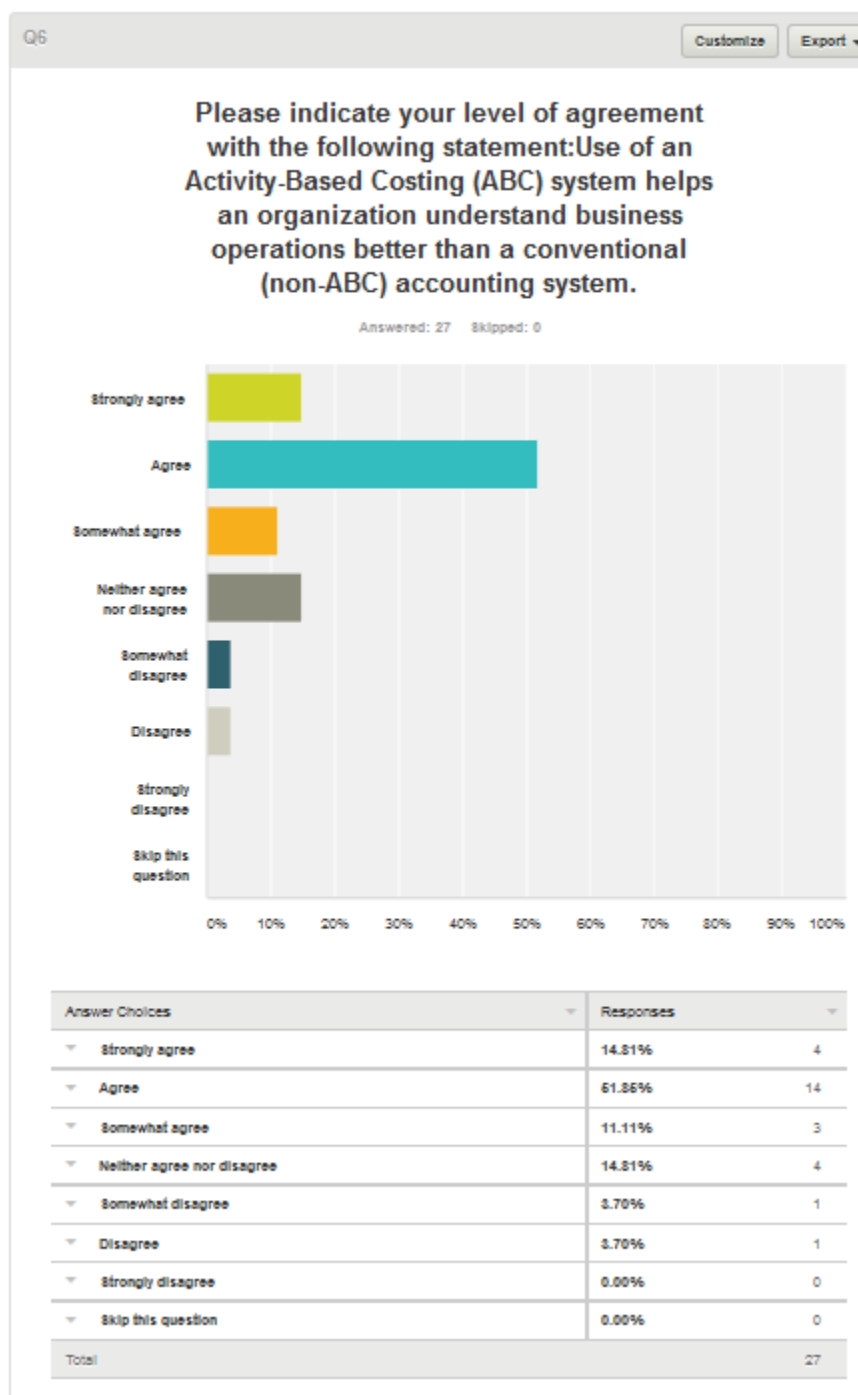


Figure B11 Hypothesis 4

### Mann-Whitney Test

		Ranks		
Does your organization currently use an Activity-Based Costing (ABC) system?		N	Mean Rank	Sum of Ranks
Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.	Yes	3	10.33	31.00
	No	24	14.46	347.00
	Total	27		

Test Statistics <sup>a</sup>	
	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.
Mann-Whitney U	25.000
Wilcoxon W	31.000
Z	-.918
Asymp. Sig. (2-tailed)	.358
Exact Sig. [2*(1-tailed Sig.)]	.437 <sup>b</sup>

a. Grouping Variable: Does your organization currently use an Activity-Based Costing (ABC) system?

b. Not corrected for ties.

Note: “Yes” = “Adopter” of ABC and “No” = “Non-Adopter” of ABC; 3 firms are Adopters and 24 firms are Non-Adopters. The median is used in reporting for the Mann-Whitney U test because this is ranked data; examination of the mean is irrelevant because the values assigned on the Likert scale are ordinal rankings rather than true means.

Figure B12 Hypothesis 4

**Statistics**

Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.

Yes	N	Valid	Missing	3	0
					1,000.0
					2,000.0

Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.

Does your organization currently use an Activity-Based Costing (ABC) system?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes				
Valid				
Strongly agree	2	66.7	66.7	66.7
Somewhat disagree	1	33.3	33.3	100.0
Total	3	100.0	100.0	
No				
Valid				
Strongly agree	2	8.3	8.3	8.3
Agree	14	58.3	58.3	66.7
Somewhat agree	3	12.5	12.5	79.2
Neither agree nor disagree	4	16.7	16.7	95.8
Disagree	1	4.2	4.2	100.0
Total	24	100.0	100.0	

Figure B13 Hypothesis 4

### Nonparametric Correlations

Correlations				
			Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.
Kendall's tau_b	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 27	.548** .001 27
	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Correlation Coefficient Sig. (2-tailed) N	.548** .001 27	1.000 . 27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Figure B14 Hypothesis 5

## Nonparametric Correlations

Correlations			Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.
Kendall's tau_b	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 27	.211 .213 27
	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.	Correlation Coefficient Sig. (2-tailed) N	.211 .213 27	1.000 . 27

Figure B15 Hypothesis 6

### Nonparametric Correlations

Correlations				
			Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.
Kendall's tau_b	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Correlation Coefficient	1.000	.625**
		Sig. (2-tailed)	.	.000
		N	27	27
	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.	Correlation Coefficient	.625**	1.000
		Sig. (2-tailed)	.000	.
		N	27	27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Figure B16 Hypothesis 7



### Nonparametric Correlations

Correlations				
			Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.
Kendall's tau_b	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 27	.388* .024 27
	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.	Correlation Coefficient Sig. (2-tailed) N	.388* .024 27	1.000 . 27

\*. Correlation is significant at the 0.05 level (2-tailed).

Figure B17 Hypothesis 8

### Nonparametric Correlations

Correlations				
			Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.
Kendall's tau_b	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to improved cost control.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 27	.521** .002 27
	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.	Correlation Coefficient Sig. (2-tailed) N	.521** .002 27	1.000 . 27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Figure B18 Hypothesis 9

### Nonparametric Correlations

Correlations				
			Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.
Kendall's tau_b	Please indicate your level of agreement with the following statement: The use of Activity-Based Costing (ABC) leads to process improvement initiatives.	Correlation Coefficient Sig. (2-tailed) N	1.000 . 27	.343* .042 27
	Please indicate your level of agreement with the following statement: Use of an Activity-Based Costing (ABC) system helps an organization understand business operations better than a conventional (non-ABC) accounting system.	Correlation Coefficient Sig. (2-tailed) N	.343* .042 27	1.000 . 27

\*. Correlation is significant at the 0.05 level (2-tailed).

Figure B19 Hypothesis 10

### Kruskal-Wallis Test

Ranks			
Your organization's location is		N	Mean Rank
Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	Urban	4	8.88
	Rural	23	14.89
	Total	27	

Test Statistics <sup>a,b</sup>	
	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.
Chi-Square	2.233
df	1
Asymp. Sig.	.135

a. Kruskal Wallis Test  
b. Grouping Variable: Your organization's location is

Figure B20 Hypothesis 11

### Kruskal-Wallis Test

Ranks			
	Please indicate your organization's approximate number of employees.	N	Mean Rank
Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.	51 to 100	3	22.50
	101 to 500	13	14.00
	501 to 1,000	3	8.17
	1,001 to 5,000	7	13.29
	Greater than 5,000	1	11.00
	Total	27	

### Test Statistics<sup>a,b</sup>

	Please indicate your level of agreement with the following statement: Activity-Based Costing (ABC) systems provide more useful costing information than conventional (non-ABC) accounting systems.
Chi-Square	6.000
df	4
Asymp. Sig.	.199

Figure B21 Hypothesis 11

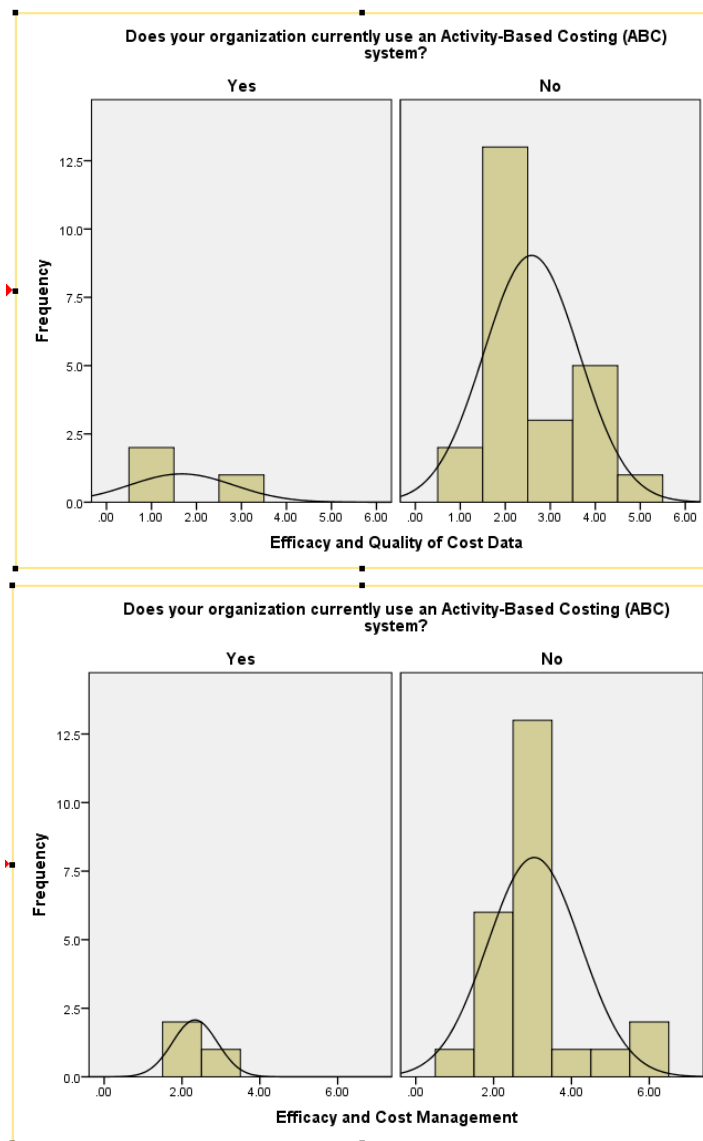


Figure B22 Mann-Whitney Assumptions

*Note.* Because  $N = 27$  (a small sample size) (3 adopters and 24 non-adopters), an evaluation of medians between adopters and non-adopters is assumed to be an appropriate measure of hospital CFOs' degree of belief about contingency factors. Accept assumption

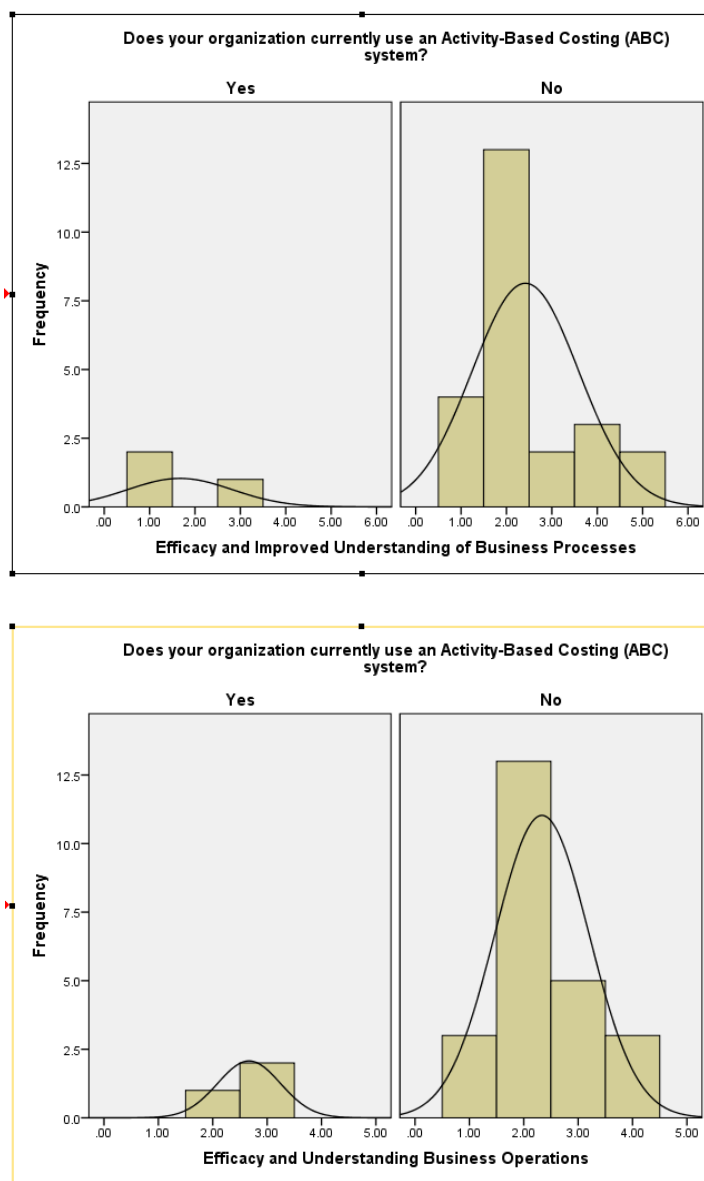
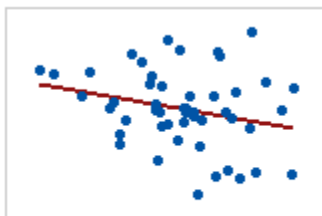


Figure B23 Mann-Whitney Assumptions

*Note.* Because  $N = 27$  (a small sample size) (3 adopters and 24 non-adopters), an evaluation of medians between adopters and non-adopters is assumed to be an appropriate measure of hospital CFOs' degree of belief about contingency factors. Accept assumption

Explanation of Monotonic Relationship between Two Variables (Kendall's tau-b):



Plot 3: Weak linear relationship

Linear relationships are also monotonic.

**Note:** from <http://support.minitab.com/en-us/minitab/17/topic-library/modeling-statistics/regression-and-correlation/basics/linear-nonlinear-and-monotonic-relationships/>

Tests of variables in this study:

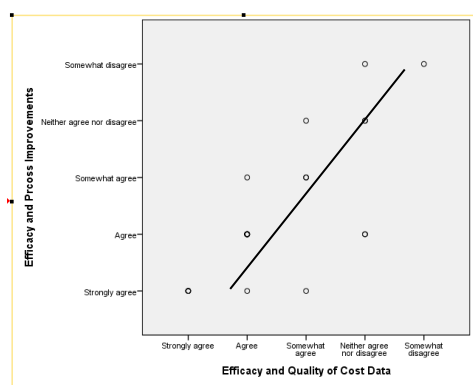
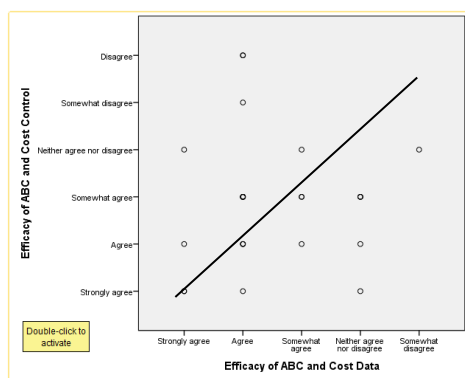


Figure B24 Kendall's tau-b Assumptions

*Note.* Ranked (ordinal) scores (degrees of belief) increase similarly. Assumption met



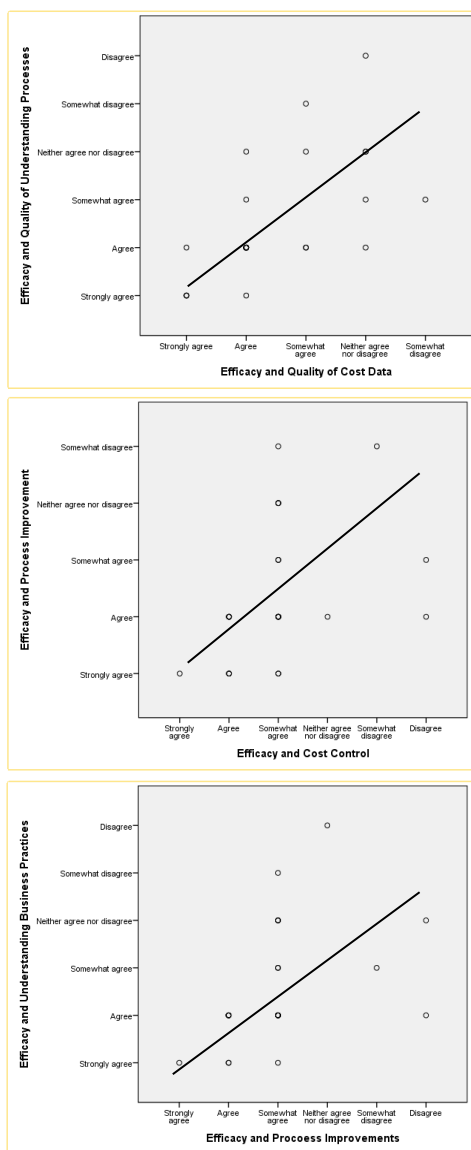


Figure B25 Kendall's tau-b Assumptions

*Note.* Ranked (ordinal) scores (degrees of belief) increase similarly. Assumption met