

Activity Based Costing in New Zealand

An investigation of users and non-users of ABC and the differences relating to strategy, satisfaction, complexity, perceived advantages and performance, as well as the importance of support in the New Zealand firm environment.

Sarah Moll

A dissertation submitted as a partial requirement for the degree of BCom(Hons) at the University of Otago, Dunedin, New Zealand

17th October 2005

Abstract

This dissertation explores Activity-Based Costing (ABC) in the New Zealand firm environment. A questionnaire is distributed to users and non-users of ABC, in order to determine the differences between these two groups in relation to the perceived advantages of ABC, organisational complexity, satisfaction with costing, and performance. The influence of top management support and whether a particular strategy is evident is also examined in relation to ABC users.

The results indicate that ABC users or those considering an ABC adoption have a more optimistic perception of advantages realised from ABC than non-users. No particular strategy is employed by ABC users and it also apparent that not all companies consider ABC to be tied to their competitive strategy. It is also found that not all elements of complexity necessarily precede an ABC adoption. A significant difference in satisfaction with costing is indicated between ABC users and non-users who are considering or have considered and rejected ABC. Similarly, a statistically significant difference is found between the performance of ABC users and non-users when it is indicated that the benefits of ABC outweighed the costs.

The results suggest that ABC is beneficial in the New Zealand firm environment. Exploring the extent of implementation and influences such as size and industry in future research will add to the understanding of ABC in the New Zealand firm environment.

Acknowledgements

The following dissertation would not have been possible without the help and support of numerous individuals.

I would firstly like to thank my supervisor, Ralph Adler, for volunteering his time and effort towards this dissertation. Thank-you for helping to turn my ideas into reality throughout the course of this year. Thank-you also to the accounting department for providing us with sustenance, as well as offering support, ideas and a fantastic environment in which to study accounting with honours.

A special thank-you to Miranda Patrick for providing inspirational enthusiasm for this topic and for giving me a starting point for understanding and exploring ABC in New Zealand. Thank-you also to all of the companies throughout New Zealand who completed my survey. Without your help, the results of this study would not have been possible.

I would like to thank my Mum for her eternal enthusiasm, devotion and support provided over my time at university, and my Dad, Sister and friends for also supporting me through these past four years. Thank-you to my flatmates and special thanks of course to Stu for your unmatched understanding and for your company and encouragement through the best and worst times of this year.

Thank-you to my accounting honours class. Although craziness, stress and copious amounts of sugar will have produced some interesting dissertations, the 4.25 escapades made long days fly by and significantly improved my athletic abilities. I cannot wait to see you all in Hawaii.

Table of Contents

ABSTRACT	ii
ACKNOWLEDGMENTS	iii
INDEX OF TABLES	vii
CHAPTER 1: INTRODUCTION.....	1
Chapter Overview	
1.1 Background	2
1.2 Introduction	2
1.3 Purpose	3
1.4 Motivation	3
1.5 Importance and Contributions	3
1.6 Overview	4
CHAPTER 2: THEORY CONSTRUCTION	5
Chapter Overview	
2.1 Activity-Based Costing	6
2.2 Activity-Based Costing Purpose	6
2.3 Benefits	8
2.4 Underutilisation	10
2.5 Organisational Characteristics	11
2.5.1 Resources	11
2.5.2 Complexity	13
2.5.3 Strategy	14
2.5.4 Size	15
2.5.5 Satisfaction	15
2.5.6 Literature Summary	16
CHAPTER 3: CONCEPTUAL FRAMEWORK.....	17
Chapter Overview	
3.1 Schematic Diagram	18
3.2 Hypothesis Development	18
3.2.1 Perceived Advantages	18
3.2.2 Complexity	19
3.2.3 Satisfaction	20
3.2.4 Influence on Adoption	20
3.2.5 Strategic Orientation	21
3.2.6 Support	21
3.2.7 Performance	22

CHAPTER 4: RESEARCH DESIGN.....	23
Chapter Overview	
4.1 Design Selection	24
4.2 Survey Construction	24
4.2.1 Definitions Provided.....	25
4.2.2 Perceived Advantages	25
4.2.3 Organisational Complexity.....	25
4.2.4 Satisfaction.....	26
4.2.5 Strategic Orientation	26
4.2.6 Performance	27
4.2.7 Other Questions.....	28
4.3 Survey Instrument.....	28
4.3.1 Pilot Testing and Questionnaire Authorisation	29
4.4 Sample Selection.....	29
4.4.1 Sample Selection Bias	32
4.5 Questionnaire Distribution.....	32
CHAPTER 5: DATA AND RESULTS ANALYSIS	34
Chapter Overview	
5.1 Response Analysis	35
5.1.1 Non-response Bias	35
5.2 Preparation of Data.....	36
5.2.1 Missing Values.....	37
5.3 Hypothesis Testing	38
5.3.1 Statistical Analyses.....	38
5.3.2 Assumption Testing.....	38
5.3.3 Validity and Reliability.....	40
5.3.4 Testing Hypothesis 1	42
5.3.5 Testing Hypothesis 2	46
5.3.6 Testing Hypothesis 3	48
5.3.7 Testing Hypothesis 4	49
5.3.8 Testing Hypothesis 5	50
5.3.9 Testing Hypothesis 6	51
5.3.10 Testing Hypothesis 7	54

CHAPTER 6: DISCUSSION AND CONCLUSION	56
Chapter Overview	
6.1 Discussion and Implications of Results.....	57
6.2 Limitations	60
6.2.1 Sample Related	60
6.2.2 Survey Related.....	60
6.3 Future Research	61
REFERENCES	63
APPENDICES	70
TABLE OF APPENDICES	71
APPENDIX A: Survey Instrument	72
APPENDIX B: Cover Letter.....	80
APPENDIX C: Ethical Approval.....	81
APPENDIX D: Follow-up Letter.....	82
APPENDIX E: Non-response Bias	83
Part I – ABC Users.....	83
Part II – ABC Non-Users.....	86
APPENDIX F: Coding Summary	88
Part I – Promoters of ABC	88
Part II – Functional Background of Respondent	88
Part III – Age Category	88
APPENDIX G: Data Summary Statistics	89
APPENDIX H: Tests for Normality	93
Part I – Descriptive Analysis	93
Part II – Shapiro-Wilk Normality Testing.....	104
APPENDIX I: Strategy.....	109
Part I – Strategy Position.....	109
Part II – Strategy Factors Importance	109
APPENDIX J: Cronbach’s Alpha.....	110
APPENDIX K: Perceived Advantages	111
Part I – Descriptive Statistics	111
Part II – Differences between ABC users and non-users.....	112
APPENDIX L: Correlations of Dynamics of ABC and Success	113

Index of Tables

TABLE 1: Ranks of perceived advantages for ABC users and non-users	43
TABLE 2: Perceived advantages difference between ABC users and non-users	44
TABLE 3: Perceived advantages ranked by mean: ABC users and non-users	44
TABLE 4: Perceived advantages ranked by mean: ABC non-users	45
TABLE 5: Perceived advantages ranked by mean: ABC users	45
TABLE 6: Difference between perceived advantages for ABC non-users	45
TABLE 7: Difference between perceived advantages for ABC users	46
TABLE 8: Ranks of complexity for ABC users and non-users	47
TABLE 9: Complexity difference between ABC users and non-users	47
TABLE 10: Ranks of satisfaction with costing system for ABC users and non-users (A)	48
TABLE 11: Satisfaction difference between ABC users and non-users (A)	48
TABLE 12: Ranks of satisfaction with costing system for ABC users and non-users (B)	49
TABLE 13: Satisfaction difference between ABC users and non-users (B)	49
TABLE 14: Classification table of predictive capabilities.....	50
TABLE 15: Hosmer and Lemeshow test.....	50
TABLE 16: Strategy categories	50
TABLE 17: Strategy Chi square test.....	51
TABLE 18: Rank of function support for ABC.....	51
TABLE 19: Difference in support from functions.....	52
TABLE 20: Dynamics of ABC ranked by mean	52
TABLE 21: Difference between top management support and other factors	53
TABLE 22: Difference in performance for ABC users and non-users	54
TABLE 23: Ranks of performance for ABC users and non-users.....	54
TABLE 24: Difference in performance for ABC users and non-users (A).....	55

Chapter One:

Introduction

Chapter Overview

This chapter provides a background and introduction to the dissertation. The purpose of the research is outlined, and the motivation for this particular work is explained. Finally, the importance and contributions of this study are noted, followed by an overview of the layout of the remainder of the dissertation.

1.1 Background

Organisations have been under increasing pressure to adapt to the changing business environment. Escalating over the past two decades, various management accounting techniques have been introduced in order to enhance this adaptation in fundamental areas of the organisation. As an alternative costing system to traditional volume-based costing, Activity-Based Costing (ABC) has been one of these initiatives.

ABC has been a contentious issue in the management accounting literature ever since its promotion by Kaplan and Cooper in the 1980's. This has stimulated a debate as to whether the costing system provides advantages over traditional systems when applied in practice.

1.2 Introduction

Despite the declared benefits of ABC (see Bouwman & Cagwin, 2002; Chenhall & Langfield-Smith, 1998a; Clarke & Mullins, 2001; Cooper & Kaplan, 1991) adoption rates have been low (Innes, Mitchell, & Sinclair, 2000). This has prompted research to determine characteristics that promote adoption, the influence of disadvantages, and why ABC appears to be incompatible with certain environments. While strategy, support, perceived advantages, satisfaction and complexity have been explored in various environments, confusion still exists around some of these relationships and the extent to which they actually influence an ABC adoption. Similarly, no clear association between ABC and firm performance has been indicated.

1.3 Purpose

As a result of the inconclusive evidence in the previous literature, the following dissertation investigates the use of ABC in New Zealand. In particular, the purpose is to identify differences in organisational characteristics between a group of firms with more than 500 employees using ABC and not using ABC. Furthermore, differences in performance between ABC users and non-users are investigated. It is hoped that such research is able to shed light on ABC in the New Zealand firm environment.

1.4 Motivation

The importance of ABC has been phenomenal in management accounting, reflected by its presence in many academic journals. It has grown not only as a replacement for traditional costing methods, but as a management technique that enables decision making from “an informed and objective basis” (Rafiq and Garg, 2002, p. 5). However, research in New Zealand has not illustrated a clear picture of the nature and understanding of ABC in New Zealand, with few studies exploring little more than rates of adoption (Cotton, Jackman, & Brown, 2003). World-wide, researchers are attempting to comprehend the paradox of ABC “if ABC has demonstrated benefits, why are more firms not actually employing it?” (Gosselin, 1997, p. 106). This generates the need to address similar issues in New Zealand and to ensure that any misconceptions are corrected.

1.5 Importance and Contributions

Research in this area at this time is paramount. Criticisms are apparent that in relation to management accounting topics such as ABC, educators perceive a higher importance and relevance than practitioners (Tan, Fowler, & Hawkes, 2004). Evident in New Zealand,

these findings question the ability of these techniques to be applied in practice, and therefore question ABC's importance and relevance overall.

This research will be an important addition to the understanding of ABC from a New Zealand perspective. This study may give an indication of the characteristics of firms adopting ABC, as well as the key factors that have prevented similar firms from adopting. Contributions will also be made to the literature that has attempted to determine the association between ABC and firm performance. This information will help to solve the mystery of a system that has dominated journals and been promoted at educational institutions, but whose praise has not been matched through the means of implementation into organisations (Tan et al., 2004).

This research will be particularly important for exploring factors that have not been examined in the New Zealand environment but that have produced interesting and conflicting results world-wide.

1.6 Overview

The following dissertation is structured as follows. Chapter Two contains a review of relevant literature relating to ABC, while Chapter Three identifies specific relationships of the variables selected to be examined. Chapter Four details the research design, including the sample selection and survey construction. Chapter Five explores the results of the research undertaken. A discussion of the results is provided in Chapter Six, as well as the implications of these results. Finally, limitations of this study are identified and directions for future research are explored.

Chapter Two:

Theory Construction

Chapter Overview

This chapter explores arguments from the literature on various aspects relating to ABC. Firstly, the purpose of ABC is outlined, followed by the debate regarding the benefits it provides. This chapter is concluded with the apparent underutilisation of ABC, followed by an exploration into the literature that has attributed the underutilisation to many organisational characteristics.

2.1 Activity-Based Costing

Forms of ABC have existed as early as the 1940's in the shape of 'activity accounting' (Kiani & Sangaladji, 2003). However, ABC as we know it grew to become a well known concept in the 1980's when introduced into the Journal of Cost Management by its creators, Cooper and Kaplan (Dodd & Lavelle, 2002; Kiani & Sangaladji, 2003).

This method of costing allocates overhead costs to products based on actions that cause costs to occur (McCabe, McKendrick, & Keenan, 2004). In the initial stages, activities that are responsible for overhead cost consumption are established and costs that are consumed by these activities are identified. Following this, cost drivers are established to assign the activity costs to individual products or services. This process allows costs to be traced to products depending on the individual activities that they consume (Cooper, 1988, cited in Ittner, Lanen and Larcker, 2002).

2.2 Activity-Based Costing Purpose

ABC was promoted at this time of introduction as a method for reducing the inaccuracies experienced with traditional costing systems that arise from prevalent technology and competition (Dodd and Lavelle, 2002). The perceived downside to these traditional systems is the use of a single cost driver for assigning overhead costs to products. As a result, this costing fails to account for the changes occurring to cost structures in the modern business environment, where direct labour is no longer accounting for the majority of a products cost (Khanna, 2002). Khanna (2002) argues that the primary failings of traditional costing systems are the inability to provide useful feedback or understand and allocate overhead costs. Traditional systems also have the potential inability to account for the size and diversity of products, as a larger or more complex item that may produce more

revenue, may also consume a larger than presumed overhead cost (Doyle, 2002). Brewer, Brownlee II and Juras (2003) argue that these issues have the potential to reduce a company's overall profitability. In hindsight this may appear obvious, but the founders of ABC believe that, "most companies do not recognise that their traditional costing systems provide unreliable and distorted cost information until their profitability and competitiveness have deteriorated" (Cooper and Kaplan, 1988, cited in Bidanda et al, 2003, p. 6).

As a result of traditional costing inaccuracies, it was apparent that a costing technique with a more adequate level of accuracy was required (Khanna, 2002). As ABC assigns indirect costs to products, services and customers depending on the actual usage of resources, proponents of ABC argue that this system fits the requirement.

ABC was initially developed as a result of the evident increasing overhead costs in manufacturing firms, sourcing many of the traditional costing inaccuracies (Hussain & Gunasekaran, 2001; Swenson & Barney, 2001). The majority of literature has explored the application of ABC in these environments, and numerous studies have noted that the use of ABC in the manufacturing sector is still predominant (Bidanda et al., 2003; Cheatham & Cheatham, 1996; Clarke & Mullins, 2001; Ittner et al., 2002; Johnson, 2002; Sievanen & Tornberg, 2002). However, one of the greatest misconceptions about ABC is that the system is not applicable to service organisations (Compton, 1996). On the contrary, the utility of ABC has expanded beyond the manufacturing role, branching to improve the accuracy of non-manufacturing costs, as well as enabling profitability analysis for customers and other business functions (Chenhall & Langfield-Smith, 1999). As a result, research exploration has extended to the use, importance and effectiveness of ABC in non-manufacturing firms across a wide range of industries.

ABC is argued to be of similar importance in the service sector due to the need to reduce the costs of services for retaining competitive capabilities (Clarke & Mullins, 2001). Even without the existence of competition, there is also the need for an ABC system to enable comparison to benchmarks, measurement of performance and the enhancement of a quality focus (Klein, 2003). The applicability of ABC to these areas, and to all organisations in general, is attributed to the universal existence of activities (Kennedy & Affleck-Graves, 2001). As a result, the utilisation of ABC has been evident in areas such as database marketing (Doyle, 2002), the financial industry (Dodd & Lavelle, 2002; Hussain & Gunasekaran, 2001; Innes & Mitchell, 1995) the healthcare industry (Lee & Nefcy, 1997; West & West, 1997) telecommunications, transport, wholesale and distribution and information services sectors (Kennedy & Affleck-Graves, 2001).

2.3 Benefits

The use of ABC in manufacturing and non-manufacturing firms is advocated to be advantageous. For example, research has suggested that ABC increases the accuracy of cost allocation to products (Clarke & Mullins, 2001; Cooper & Kaplan, 1991; Ittner et al., 2002), resulting in “a more detailed picture of the true costs and activities of individuals” (Diekmann & Kocakulah, 2001, p. 5). With the ability to see products with a higher consumption of overhead costs, potentially consuming more costs than originally realised, improved perceptions of a products’ profitability can be attained. It is also suggested that greater processing of cost information and subsequent realisation of accurate and relevant cost measurements are beneficial for making sound decisions and consequently taking appropriate actions (Hicks, 2005). Mitchell (1994) also advocates that decision making is enhanced by the cost information that ABC provides, as new types of information are able to be viewed (Mitchell, 1994).

Literature has also suggested, however, that ABC adoption does not bring these benefits. Datar and Gupta (1994) argue that ABC does not increase accuracy, and that in some cases ABC can cause product cost measurement errors to occur. Similarly, accuracy can be threatened by the introduction of complexity, especially in relation to the identification of cost drivers or the definition of activities (Clarke & Mullins, 2001; Homburg, 2001; Sievanen & Tornberg, 2002). It has also been suggested that relevant costs for decision making are not always obtained, as underlying assumptions need to be accurate for this advantage to exist (Noreen, 1991). However, the arguments against the benefits of ABC are shadowed by the potential that still exists to reduce the more evident traditional costing inaccuracies.

Arguably the most debated advantage of ABC is whether or not the use of the advanced management technique improves firm performance. Many studies have concluded that there is no relationship between ABC use and superior firm value, (Bromwich & Bhimani, 1989; Gordon & Silvester, 1999; Innes & Mitchell, 1990) despite the fact that the ultimate aim of ABC is promoted as the improvement of profits (Cooper & Kaplan, 1992). However, the overall results relating to this relationship have been mixed.

Kennedy and Affleck-Graves (2001) claim that the mixed result relating to the ABC-performance relationship is a result of the failure to compare adopting and non-adopting firms. A contrast of those who adopted and those who did not adopt the system suggested that “the introduction of ABC techniques improves firm performance” (Kennedy & Affleck-Graves, 2001, p. 5). Similarly, Ittner, Lanen and Larker (2002) found that ABC use is positively related to enhanced performance, providing higher quality levels and improvements in cycle time that ultimately lead to cost reductions. Other measures of firm performance have also been explored, indicating the existence of a positive relationship

between ABC and Return on Investment, especially when other initiatives such as Just in Time are used (Bouwman & Cagwin, 2002).

2.4 Underutilisation

Although proponents have claimed that ABC can reduce the cost allocation inaccuracies associated with traditional costing, as well as providing benefits such as improved performance, the literature suggests that ABC has been greatly underutilised in the last two decades of its development. Exploration of this underutilisation has been extensive, with research attempting to determine the rate of ABC adoption, whether adoption trends are apparent, and the geographical locations in which the technique has been evident.

Not long after ABC was introduced, survey results suggested that few firms had experimented with the new technique. Evidence during the early 1990's illustrated adoption rates ranging from approximately 10% of firms in the UK and Ireland to 14% in Canada (Armitage & Nicholson, 1993; Clarke, 1992; Innes & Mitchell, 1991). Later in the same decade, studies suggested that many firms were still using traditional costing systems, and that an approximate 20% adoption of ABC was apparent (Innes et al., 2000; Sulaiman, Ahmad, & Alwi, 2004). Research in the UK in 1995 and 1999 showed that the consideration of ABC and actual adoption dropped, while reported rejections of ABC increased over four years between two studies that looked at ABC adoption (Innes et al., 2000). A replication of this study in New Zealand in 2003 highlighted similar adoption levels to those found in the UK, reinforcing the overall lack of ABC adoption relative to the number of firms still using traditional costing systems (Cotton et al., 2003).

Evidence in various countries in Asia has suggested that ABC has had an even lower rate of adoption. Rates as low as 2% have been evident for Chinese partner firms and State Owned Enterprises in one particular recent survey (Sulaiman et al., 2004). Low adoption and consideration rates similar to these over the decades has given rise to the belief that ABC is just a ‘fad’ or bandwagon effect (Bjorenak & Mitchell, 2002; Innes et al., 2000).

However, evidence from the literature exploring ABC adoption has indicated more of a promising trend in some countries. Despite only a 4% adoption in 1998 (Rahman, Rahman, Tew, & Omar, 1998), 28% of respondents to a survey in Malaysia in 2002 had adopted ABC (Sulaiman, Ahmad, & Alwi, 2002). Similarly, in the United States of America (USA), survey results showed that 86% were using traditional costing systems in 1996 (Cheatham & Cheatham, 1996), whereas a more recent study illustrated that 52% of respondents were implementing some stage of ABC in 2003 (Kiani & Sangaladji, 2003). This trend was also evident in Australia, where Chenhall and Langfield-Smith (1998a) found that an increasing number of firms were adopting ABC.

Despite some evidence of increasing trends, it is still apparent that adoption of ABC is surprisingly low given the proposed associated benefits of the phenomenon. This has prompted research to extensively explore factors which are influencing or associated with the adoption or non-adoption of ABC.

2.5 Organisational Characteristics

2.5.1 Resources

The availability of sufficient resources for the ABC initiative is one factor that has been illustrated as critical for an ABC adoption (Clarke & Mullins, 2001; Cotton & Jackman,

2002; Innes et al., 2000; Kiani & Sangaladji, 2003). Resources include adequate funding and time as well as the availability of employees necessary for understanding and implementing an effective ABC system (Clarke & Mullins, 2001; Diekmann & Kocakulah, 2001). These costs of adopting ABC, and further maintenance costs after adoption, have been viewed as ultimately outweighing the benefits of an ABC adoption and are portrayed by many to be a barrier to adoption (Dearman & Shields, 2001; Sievanen & Tornberg, 2002).

However, one contradiction to the need for excessive resources in an ABC adoption is the evidence of adoption in smaller firm environments. Hicks (1997) argues that it is a perceived lack of adequate resources that prevents firms from adopting ABC. It is evident, however, that the availability of some resources are still needed for ABC, even when scaled to fit smaller organisations (Bidanda et al., 2003).

Top management play an important role in relation to the availability of these resources. The commitment and support of top management has emerged in the literature as a key factor evident in an ABC adoption (Brown, Booth, & Giacobbe, 2004; Clarke & Mullins, 2001; Cotton et al., 2003; Diekmann & Kocakulah, 2001; Kiani & Sangaladji, 2003; Krumwiede, 1997). This top management support is argued to be critical due to the ability of managers to focus resources into the adoption process and to help motivate those who are resistant to the operation of the system (Shields, 1995). This position, however, may be threatened by management's incentives to maximise their own wealth. Recent evidence suggests that if managers perceive that ABC will impair bonus or compensation achievement, the support for the system is not likely to be strong (Fennema, Rich, & Krumwiede, 2005).

Similar to the support of management, an ‘internal champion’ is thought to be crucial for promoting the adoption and implementation of ABC. The existence of an employee internal to the firm to stimulate ABC adoption has been recognised as an asset in the adoption process (Brown et al., 2004; Krumwiede & Roth, 1997). This employee can also be beneficial to educate and coordinate staff for the ABC initiative (Brewer et al., 2003). However, employee turnover can impact on the extent of this influence, as the loss of a key player in the implementation of ABC may lead to a return to traditional ‘out of date’ practices (Hicks, 1997).

2.5.2 Complexity

In the literature exploring ABC, firm complexity has been suggested as a factor associated with adoption (Bouwman & Cagwin, 2002; Dearman & Shields, 2001). Firms with ‘higher complexity’ are believed to have a greater need for more accurate cost allocation that is harder to achieve with traditional costing systems. For example, in an extreme scenario, to allocate overhead costs to a simple individual product or service, no complex allocation system is required. Consequently, low complex firms do not have the same need for more advanced techniques such as ABC (Gupta & Galloway, 2003).

The complexity-ABC relationship has been attributed to firm size, where it is argued that smaller firms generally have fewer or less diversity in products and services and hence do not experience the same allocation issues (Cinquini, Collini, Marelli, Quagli, & Silvi, 1999; Hughes & Gjerde, 2003). Consequently, it is advocated that these firms do not require more advanced costing techniques. However, this relationship is contradicted by evidence illustrating necessary and successful adoption of ABC in smaller; potentially still complex, firm environments (Bidanda et al., 2003).

2.5.3 Strategy

Many academic journals have explored the strategic focus employed by companies to achieve a competitive advantage over competitors (Gartman, 2005). Advanced management techniques, such as ABC, are adopted in order to achieve employed strategies, especially in situations where a relative advantage may be obtained (Brown et al., 2004). Research has attempted to ascertain which particular strategies precede this ABC adoption.

Gosselin (1997) analysed the strategic focus of organisations adopting ABC in relation to Miles and Snow's (1978) organisational types; defenders, prospectors, analysers and reactors. The results of the study suggested that organisations competing through innovation and product and marketing development were more inclined to be open to the adoption of new techniques to improve processes and information (Gosselin, 1997). From these findings, in relation to Porter's generic strategies (cost leadership and differentiation) it would appear that firms employing a differentiation oriented strategy would be likely to adopt ABC. This conclusion is supported by Krumwiede and Jordan (1998) who examined a group of adopters and non-adopters and found an indication of a quality and price focus, respectively.

However, research has suggested that firms who follow a low price, or cost leadership strategy will also benefit from an ABC environment, due to the ability to enhance cost effectiveness in relation to supplier relationships and decision making (Chenhall & Langfield-Smith, 1998b). Cinquini et al. (1999) argue that cost based strategies are likely to receive benefits from ABC adoption as a result of the cost management abilities that are evident. However, Cinquini et al. (1999) also suggest that companies following differentiation strategies will obtain an enhanced understanding of profit and differentiation costs.

2.5.4 Size

The association between ABC and firm size has been explored in several research studies (Askarany & Smith, 2003; Brown, Booth, & Giacobbe, 2001; Innes et al., 2000; Krumwiede, 1998). It is generally accepted that larger firms adopt ABC as they are more likely to possess a combination of the factors mentioned previously; resources, support and firm complexity (Cinquini et al., 1999). However, as mentioned in relation to many of the factors discussed, the reality and necessity of these associations are contradicted by ABC adoption in small firms. Despite the fact that the majority of research on ABC is conducted in larger firms, small firms are believed to be just as able to adopt and experience benefits from adopting ABC (Bidanda et al., 2003; Davies & Sweeting, 1993). Research has even indicated that larger firms are more likely to experience barriers to ABC than smaller firms (Davies & Sweeting, 1993).

2.5.5 Satisfaction

It is evident that another factor influencing adoption of ABC is the dissatisfaction with the current costing system. Swenson (1995) aimed to determine whether firms experienced an increase in satisfaction when changing from traditional costing to ABC. The results indicated that satisfaction increased in at least one of the variables explored. This suggests that after adopting ABC, the satisfaction with costing will be higher than firms who have yet to adopt (Swenson, 1995).

However, an issue that arises with the satisfaction-ABC relationship is the possibility that satisfaction is negatively associated with ABC adoption. If satisfaction is high with the current costing system, few incentives will be evident to initiate adoption.

2.5.6 Literature Summary

Despite the extensive literature that has explored various aspects and characteristics of ABC over the last two decades, contradictory evidence is still apparent and many questions are yet to be asked in the New Zealand firm environment. The following chapter will outline the expected relationships in New Zealand in relation to the variables explored in the literature.

Chapter Three:

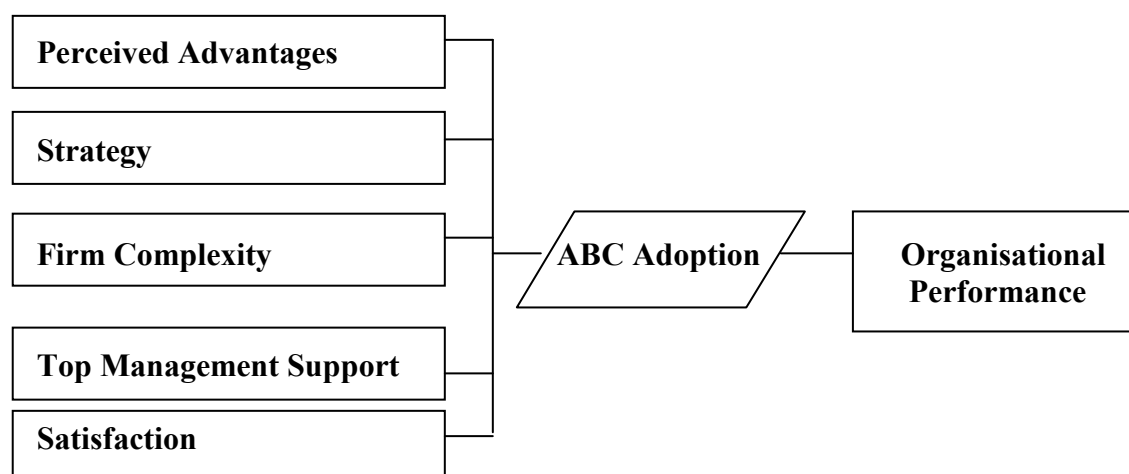
Conceptual Framework

Chapter Overview

The following chapter outlines the predicted relationships developed from the literature described in the previous chapter. Following a schematic diagram of the relationships, each of the variables is identified and their respective predictions are described.

3.1 Schematic Diagram

The previous chapter outlined key factors related to ABC that have emerged from the literature over the past two decades. The following section explores the relationships between these factors as conceptualised in the diagram below.



3.2 Hypothesis Development

3.2.1 Perceived Advantages

The literature has identified various advantages that are suggested as being realised subsequent to the adoption of ABC. Despite the arguments against the existence of these benefits, many of the papers that suggest contrary outcomes of ABC adoption do not specifically examine those companies who have experienced an adoption. For example, Datar and Gupta (1994) found no increase in accuracy from ABC adoption, using a model for determining measurement errors. In comparison, survey based studies that have specifically explored whether ABC improves accuracy have found different conclusions to this model approach (Clarke & Mullins, 2001).

Evidence has also suggested that companies who have not adopted ABC do not perceive that advantages can be realised from ABC adoption due to a lack of understanding of the system (Clarke & Mullins, 2001). Companies adopting ABC are more likely to have explored the costs and benefits before the adoption decision, or may believe that these benefits have been experienced. Conversely, firms still using traditional costing systems may have concluded that these benefits do not exist, and therefore that there is no advantage to adoption. Consequently, a difference is generally apparent between the perceived advantages of ABC by non-users and users of the system (Clarke & Mullins, 2001). This leads to the following hypothesis:

Hypothesis 1 (H₁): *ABC users will associate higher perceived benefits with ABC than non-users.*

3.2.2 Complexity

The literature has suggested that a positive relationship exists between firm complexity and ABC. However, the use of ABC in smaller organisations generates questions regarding this relationship, as it is generally believed that these firms do not have the same complexity or subsequent need for advanced techniques (Cinquini et al., 1999).

However, complexity can still be evident in smaller firms and similarly, larger firms may not have high levels of complexity. This poses the following hypothesis:

Hypothesis 2 (H₂): *ABC users will have greater levels of complexity than non-users.*

3.2.3 Satisfaction

It is apparent that satisfaction with the costing system used is related to an ABC adoption. The direction of this relationship, however, is more difficult to determine. Although evidence has shown that firms have a higher satisfaction with their costing system after adoption, it is also evident that a reason for non-adoption may be a high satisfaction with the costing system employed.

However, it is likely that non-adopting firms will be composed of companies who have considered or are considering adoption. These firms will potentially be experiencing lower satisfaction, prompting the exploration into ABC. From this suggestion, the following hypothesis is developed:

Hypothesis 3 (H₃): *ABC users will report higher levels of satisfaction with their organisations costing system than non- users.*

3.2.4 Influence on Adoption

The above variables, as indicated by the literature, lead to an ABC adoption. Although causality is difficult to show, the evidence is intuitively suggestive of an embracing hypothesis as follows:

Hypothesis 4 (H₄): *Perceived advantages, complexity and satisfaction will influence an ABC adoption.*

3.2.5 Strategic Orientation

The literature relating to the strategic focus of companies adopting ABC has been conflicting. The association between ABC and a cost leadership strategy is implied due to the nature of ABC, and the enhancement of cost understanding that it can bring. This cost focussed nature is reinforced by the literature exploring advantages of ABC, ultimately suggesting that costs can be more accurate, and potentially reduced with the use of ABC, allowing more competitive pricing opportunities (Ittner et al., 2002).

However, the literature also suggests an association between ABC and differentiation type strategies, due to innovation and marketing improvement possibilities that result from information provided by the ABC system. The literature is also suggestive of the quality improvement abilities of ABC (Ittner et al., 2002), consistent with differentiation type strategies. This generates the following hypothesis:

Hypothesis 5 (H₅): *ABC users will not employ a particular strategy.*

3.2.6 Support

The existence of top management support or a member of the organisation who is willing to promote the adoption attempt is believed to be key for an ABC adoption. Other functions in the organisation, however, may not be able to exercise the same power in relation to the ABC initiative. These other functions, therefore, potentially play a more participatory role, rather than a promotional one. This leads to the creation of the following hypothesis:

Hypothesis 6 (H₆): *The support of top management will be higher than other functions during the design and implementation of ABC.*

3.2.7 Performance

Conclusions from research exploring the relationship between the adoption of ABC and firm performance have been mixed. However, the literature identifying the numerous benefits that are realisable with an ABC adoption is suggestive that some overall improvement in performance may result. Thus the following hypothesis is created:

Hypothesis 7 (H₇): *ABC users will have greater levels of performance than non-users*

Chapter Four:

Research Design

Chapter Overview

This chapter explores the design of the research undertaken. The selection of the research method is justified and a description of the characteristics of the questionnaire, its construction and subsequent testing is provided. The sample selection process is also explained, and following this, the questionnaire distribution is outlined.

4.1 Design Selection

Many different approaches to research have been utilised for the examination of ABC. Although some authors have performed case study analyses, in order to obtain a comprehensive understanding of firms' experiences with ABC, the findings do not enable generalisation to the wider population. Specific aspects of ABC have also been examined through the use of event studies, however, limitations of this method have included the difficulty in specifying an event date, and the possibility of bias in the computation of abnormal returns over extended periods (Kennedy & Affleck-Graves, 2001).

Although not without limitations, the questionnaire method was selected for this research in order to test the hypotheses detailed in Chapter Three. The use of a questionnaire allows distribution to a wider number of companies, enabling a more indicative view of the use and non-use of ABC in New Zealand.

4.2 Survey Construction

No single survey instrument exists testing the particular hypotheses developed for this study. Consequently, a survey instrument was constructed based on a composition of instruments used in past research on different aspects of ABC, or other organisational characteristics (see Appendix A for survey instrument). The following section explores the construction of the instrument in more detail, with specific reference to each of the specific survey parts.

4.2.1 Definitions Provided

Brief definitions were provided to ensure that respondents had a consistent understanding of terms when completing the survey. The survey commenced with a definition of ABC, compiled from academic research (see Appendix A for survey instrument). Based on this definition, respondents were required to determine whether they have or have not used ABC. Although it has been argued that these firms may not be using a true ABC system and will have different perceptions of what ABC involves, this approach is argued as acceptable and has been adopted by other research studies for determining ABC firms (Kennedy & Affleck-Graves, 2001; Kiani & Sangaladji, 2003; Malmi, 1999). The other definition provided relates to the cost and differentiation strategies. These definitions are taken from the original strategy instrument created by Govindarajan and Fisher (1990).

4.2.2 Perceived Advantages

In order to determine whether ABC users perceive that greater benefits will be realised in comparison to non-users, an extract of Clarke Hill and Stevens (1999) survey was implemented. In this survey, respondents indicated their agreement with statements of the benefits that ABC provides on a 5-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree”. The reliability of this instrument is indicated by its use and adaptation in other survey instruments addressing ABC and perceived advantages (Clarke & Mullins, 2001; Cotton et al., 2003).

4.2.3 Organisational Complexity

Many research studies have explored organisational complexity in relation to ABC adoption. Swenson (1995) employed a survey instrument capturing different elements of

complexity. This instrument is adopted for this study. Respondents were asked to rate on 5-point Likert scales the complexity relating to production and operational processes as well as the frequency of product or service major design changes. Additions were made to this instrument for the purposes of this research to capture other aspects of complexity¹. Similar alterations were made by Cinquini *et al.* (1999), who used level of competition and product variety to address additional components of complexity, increasing the reliability of this measure of complexity. This use also reinforces the reliability of the instrument.

4.2.4 Satisfaction

The satisfaction that respondents indicated with costing was determined using an element of Swenson's survey (1995), also subsequently employed by Cagwin and Bouwman (2002). This instrument asks respondents to indicate satisfaction with their: method for calculating product or service costs, performance measurement and information provision for direct cost reduction, on a scale ranging from "Dissatisfied" to "Very satisfied".

4.2.5 Strategic Orientation

The literature relating to different strategies adopted by organisations has been plentiful, with Miles & Snow (1978) and Porter (1980) standing out with categorisations that have been widely accepted. While Miles and Snow's typologies consist of defenders, prospectors, analysers and reactors, Porter classifies strategies into three generic types: cost leadership, differentiation, and focus. Although various strategic categorisations have been applied in research, Porter's strategic breakdowns are used for the purposes of this study due to their overlapping nature with other strategy typologies (Eonsoo, Dae-il, & Stimpert, 2004).

¹ Questions relating to the number of products/services and the level of competition were added.

Govindarajan and Fisher's (1990) particular approach to capturing strategic focus of responding firms was employed. This instrument initially asks respondents to indicate the percentage of the firm's activities that relate to cost leadership or differentiation strategies. Values of -1.00 and +1.00 are subsequently assigned to cost leadership strategies and differentiation strategies, respectively, and a weighted average is calculated in order to determine the position of a firm in relation to the two strategies on a continuum between -1.00 and +1.00.

This instrument has been extensively employed in research, allowing a reasonable level of reliability to be assumed. The construct validity of this instrument can also be determined through the sections that follow the initial strategic determination. This will be explored in greater detail in Chapter Five Section 5.3.3.

4.2.6 Performance

A self-assessed rating of importance and achievement has been employed for determining performance, as created by Govindarajan and Gupta (1985). Although self-ratings of performance are argued to be subjective, they are still frequently used in research. Evidence suggests that self-ratings of performance are highly correlated with other performance measures when the respondent is guaranteed anonymity and has a clear idea of the research purpose (Heneman, 1974). These conditions were met in this study (see Appendix B for survey cover letter).

Respondents were asked to rate the importance of 16 performance measures on a Likert-type scale ranging from "Not Important" to "Extremely Important". Following this, perceptions of performance achievement relative to competitors on the same 16 measures

were obtained. This allows for the creation of a performance index that acknowledges the differing performance goals of companies². Due to the inapplicability of some of the measures of performance in the original instrument used by Govindarajan and Gupta (1985) to some of the not for profit organisations included in the study, other performance measures were obtained. The performance aspects measured were indicated as important by literature in this area³ (Dixon, Nanni, & Vollmann, 1990; Kaplan & Norton, 1992).

4.2.7 Other Questions

Other aspects of the survey relating to adopters and non adopters of ABC included the support of functions, dynamics of ABC and the position of non-adopters. These aspects were determined through the use of instruments employed by Swenson (1995), Cagwin and Bouwman (2002) and Kennedy and Affleck-Graves (2001), respectively.

Finally, demographic information questions were included to determine characteristics of the respondent completing the survey. Questions included number of years and current position at the company as well as the categorised age of the respondent.

4.3 Survey Instrument

The survey instrument consisted of four back to back A4 pages, separated into four sections. While ensuring that valuable questions were not eliminated, the questionnaire length was minimised due to the noted association between survey length and response rate (Smith, Olah, Hansen, & Cumbo, 2003). Although the compressed four back to back pages may still appear extensive, respondents were only required to answer the certain sections of

² This index is calculated by multiplying each performance importance element by its respective performance achievement rating.

³ These include elements of customer, internal business, financial, innovative and learning and external measures (see survey instrument in Appendix A for variables used).

the survey that applied to their situation, resulting in a maximum three and a half pages to complete for users of ABC. Part One of the instrument contained the questions relating to all organisations, whether or not ABC had been adopted. Part Two contained the questions relating specifically to the use of ABC, while Part Three related specifically to those companies who had not adopted ABC. Finally, Part Four contained demographic information relating to the respondent of the survey (see Appendix A for survey instrument). This layout ensured that the most valuable questions for the study were positioned as close to the beginning of the instrument as possible.

4.3.1 Pilot Testing and Questionnaire Authorisation

Pilot testing of the instrument was conducted. This aimed to ensure that the constructed survey instrument was sufficiently clear and understandable, and that a realistic estimate of how long survey completion would take was given. The pilot testing candidates consisted of half a dozen employees from PricewaterhouseCoopers in Auckland, who were encouraged to raise any queries experienced while completing the survey. The general response from the pilot testing was positive and resulted only in minor changes in wording and layout in the survey. The time taken for the pilot testing candidates to complete the survey was approximately 15 minutes. Following this, clearance from the Department of Accountancy and Business Law Ethics Committee was obtained, provided that minor changes were made to the cover letter of the survey instrument (see Appendix C for ethical approval).

4.4 Sample Selection

Due to the nature of this research, and the desire to determine differences between ABC users and non-users for many of the hypotheses developed, two samples were required.

Previous research on ABC has continuously highlighted low rates of ABC adoption. Consequently, in order to ensure that a sufficient number of ABC adopters were in the sample, a list of ABC adopting firms was obtained. This list was provided by an Auckland Branch of an Australian Consulting firm for management accounting in New Zealand and Australia. It was noted that due to the nature of this consulting firm, and the services it provides, that this sample of firms was likely to be relatively large by New Zealand standards. As expected, all except for two of the 20 firms from this sample had over 500 employees⁴. Despite potentially excluding many small firms through this selection process, it is of particular interest to determine the differences between ABC users and non-users of two similarly sized samples.

The second sample was randomly selected from the electronic version of the ‘NZ Business Who’s Who?’, a database that has been used previously in management accounting literature for sample selection (Hoque, 2000). The random selection was made from the bracket of all firms with over 500 employees listed on this database⁵. The use of this data source and the specific group within it, attempted to select comparatively sized companies for the second sample⁶, while reducing potential bias, as all of the firms from the first sample were listed in this section on the same database.

Firms from all industries were included in the selection. The exclusion of specific sectors of the economy risks the elimination of interesting data, as the obtained list of ABC users

⁴ Although 500 employees does not always constitute a large firm in relation to overseas research (Innes et al., 2000; Kiani & Sangaladji, 2003), these firms are considered large for New Zealand standards (Askarany & Smith, 2003).

⁵ Firms with more than 500 employees form the largest bracket of number of employees on the “New Zealand Business Who’s Who?” with the smallest number of firms at the time of sample selection. Conversely, the majority of firms fell between the 1-10 employees bracket. This further reinforces the small nature of New Zealand businesses.

⁶ Employee size has been used in other studies exploring ABC as a determinant of organisational size (Cinquini et al., 1999). This measure is argued to change less frequently than other volatile size categorisations (Forsyth and Fuller, 1995, cited in Askarany & Smith 2003).

were from various different industries. This is consistent with the development of the literature as identified in Chapter Two Section 2.2.

Random number generation was used in order to randomly select the second sample of companies from the database. If the random number generation resulted in the selection of a company that was already included in the first sample, the next company on the list was selected. Due to the fact that it was unknown whether the firms selected in the second sample were ABC adopters or non-adopters, 78 additional companies were selected. This accommodated for the occurrence of unknown ABC adopters and helped to ensure that each sample contained a sufficient and similar number of firms.

All of the companies were contacted by telephone, in order to identify an employee with the appropriate knowledge and ability to complete the survey. On initial contact, a request was made to speak with an accounting manager. However, if the accounting manager knew of a position or person in the organisation that would have a greater understanding of the survey topic area, referral to that person was accepted. This ensured the appropriate selection of an employee to complete the survey. Contacting each company by telephone also obtained verbal commitment of the respondent to complete the survey and gave an opportunity for personal assurance of confidentiality of the survey responses. Overall, this aimed to reduce the low response rate often experienced in survey research methods. Out of the 98 companies phoned, 12 stated that they did not want to partake in the survey. The main reasons for not wanting to participate included time constraints and the inappropriateness of the survey to the company.

4.4.1 Sample Selection Bias

Sample selection bias is evident due to the obtained list of ABC users, resulting in a selection that was not entirely random. However, this bias was a necessary trade-off to enable the comparison of ABC users and non-users, without which insufficient ABC respondents may have prohibited statistical analysis (Rosenthal & Rosnow, 1991). It is recognised, however, that the ABC users obtained in the listing may not be representative of the population of ABC users.

4.5 Questionnaire Distribution

The questionnaire was distributed by mail, personally addressed to the organisational member who had given verbal commitment on the telephone to participate in the survey. Each mailed envelope included a copy of the survey, cover letter, postcard and a return envelope. The cover letter outlined the purpose of the survey, as well as assuring anonymity of the responses (see Appendix B for cover letter). Contact details were provided for the author of the dissertation, the supervisor and a member of the University's Ethics Committee.

The creation of a postcard aimed to help monitor which companies had responded while ensuring that the individual responses remained anonymous. Respondents were asked to complete the postcard by selecting whether they had or had not completed the survey, indicating reasons for non-completion if appropriate. This postcard was then returned separately to the survey. Both the postcard and provided return envelope were prepaid to minimise incentives for non-response.

Eighty six surveys were mailed to companies from 25th of June to the 3rd of July. A follow-up cover letter and another copy of the survey and postcard were sent to non respondents one month following the initial mail out (see Appendix D for follow-up letter). This aimed to further improve the response rate. The response characteristics and non-response bias will be discussed in the following chapter.

Chapter Five

Data and Results Analysis

Chapter Overview

This chapter examines the responses to the questionnaire and investigates non-response bias. The preparation of the data is outlined, and the assumptions to relevant statistical tests explored. Following this, validity and reliability testing is performed and the hypothesis testing is undertaken.

5.1 Response Analysis

Fifty five completed surveys were received. Responses from a further eight respondents, who noted reasons for non completion of the questionnaire were also received. This produced an overall response rate of 75%, and a usable response rate of 64%.

A 64% response rate is relatively high in comparison to other studies that have examined aspects of ABC (Clarke & Mullins, 2001; Cotton et al., 2003). This can be partly attributed to the initial phone contact with each respondent, as previous research has attributed low response rates to incorrect targeting of respondents. Low response rates have also been attributed to the general lack of interest in this type of research (Clarke & Mullins, 2001). In contrast, the results of this study suggest an element of interest from respondents, with 31 out of the 55 respondents requesting a summary of the survey results after the completion of the research.

The majority of the responses were completed by management accountants, financial controllers and managers. Ages of respondents ranged from under 30 to above 50 years of age, with the largest proportion of respondents falling between 30-40 years of age. Average work experience was five years in the company in total, and three years in the current position.

5.1.1 Non-response Bias

Non-response bias is a critical issue in social science research. Although the ultimate method for reducing non-response bias is to increase the number of respondents, this is only possible to a certain degree (Armstrong & Overton, 1977). Late respondents have also been viewed as surrogates of non-respondents (Miller & Smith, 1983). For this

reason, it is necessary to identify methods of ensuring that non-response bias will not affect this study.

Different approaches can be taken in order to test non-response bias. Firstly, the high response rate of 74% could be relied on as an indication that the possibility of non-response bias is minimal. Although this may give some indication of negligible non-response bias, it is still desirable to explore other alternatives to ensure that this bias is not evident. Another approach would be a comparison of responses from the first and second mailing. The number of responses from the second mailing was minimal⁷, and other research has concluded that this creates grounds for not continuing with this type of non-response bias testing⁸. However, it is acknowledged that this test should still be performed to identify the existence of any non-response bias. Kruskal-Wallis tests were performed to compare responses from the early and late respondents (see Appendix E for non-response bias testing). Out of the 135 variables tested for non-response bias, including 60 variables for non-ABC users and 75 for ABC users, 18 variables, or 13.3% in total produced significant results. Although the variances observed in a minimal number of variables should not influence the results of this research, the significant differences are noted as a potential limitation of this research.

5.2 Preparation of Data

The preparation of data involved the elimination of non-usable responses. One response was removed from the analysis due to a respondent completing the questionnaire based on experiences with ABC in a different company. Two other responses were removed due to

⁷ Seven surveys were received in total subsequent to the second mailing; four ABC users and three ABC non-users. Forty eight were received in total in the initial mailing.

⁸ Tan, Fowler, and Hawkes (2004) received 60 responses in the initial mailing compared to nine in the follow-up mailing.

the inappropriateness of the responses for this research⁹. Data was entered on receipt of surveys, and re-checked when all surveys had been received. This procedure was undertaken to reduce data entry errors.

Out of the 52 usable responses, 23 companies were identified as currently using ABC while 29 were not. Respondents were coded according to current use or non-use of ABC. This enables the results of the hypotheses testing to be attributed to the use or non-use of ABC¹⁰.

The majority of the data in this study was collected through the use of Likert-type scales. These scales were coded for statistical analysis with numbers corresponding to those provided on the questionnaire. Other questions were coded in order to enable the use of the responses for statistical analysis. Yes/No questions were coded with 1 and 0, respectively, while functional background, number of years since ABC adoption, age, position and number of years at the company were coded appropriately based on the responses to the questions (refer to Appendix F for a coding summary and Appendix G for a summary of data).

5.2.1 Missing Values

Missing values were evident in some of the responses. There are many methods that can be used in order to manage missing values. Despite popularity as a method for replacing missing values, mean values were not created due to the indication from evidence of a downward bias estimation of covariance and variance as a result of using this substitution method (Roth & Switzer-III., 1999). Pairwise deletion was used when conducting

⁹ These two responses included a company currently introducing ABC and consequently unable to answer either sections of the survey and a respondent who had answered all sections of the questionnaire, and it was not ascertainable whether they were in fact currently using ABC, or had used ABC in the past.

¹⁰ From this point forward, those companies categorised as using ABC will be referred to as ABC users, while those who are not currently using ABC will be referred to as ABC non-users.

statistical tests in order to remove missing values from the analysis. This method ensures that a minimal amount of data is excluded from the analysis.

5.3 Hypothesis Testing

5.3.1 Statistical Analyses

SPSS-13 was used for conducting the statistical analyses. This program is believed to be the “easiest to use for the most widely used statistical techniques” (Harvard-MIT, n.d.).

The majority of the hypotheses identified in Chapter Three require a comparison between ABC users and non-users, or between individual questions answered by one of the groups. These types of analyses would require either a parametric test of the difference between means, such as an independent samples t-test (or related samples t-test), or a non-parametric test equivalent. Certain assumptions must be met before using the parametric tests, including the use of interval scale data, homogeneity of variances, and normality of data. These assumptions are explored below.

5.3.2 Assumption Testing

Parametric tests require the use of interval scale data. Although the categories in Likert scales have a rank order, it cannot be assumed that the distance between the ranks is equal. As a result, the data collected through the use of Likert scales is considered to be ordinal in nature. This poses many questions regarding calculating the mean and standard deviation for conducting parametric statistical tests. However, it has been debated that well constructed Likert scales have equal values between categories. McCall (2001) notes that at the dissertation stage of research, it is often suggested to proceed with summed and

averaged Likert scores, despite the ordinal nature, as this approach is normally apparent in the literature. However, it is also suggested that caution should be taken and that awareness of limitations is necessary.

Another assumption fundamental to be met for the required parametric tests is the homogeneity, or equality, of variances. This assumption is tested when particular SPSS tests are performed. If the Levene's statistic is significant¹¹, this assumption is violated, and the equal variances not assumed section is to be explored.

Parametric tests also require that data is normally distributed. One guideline for assessing this normality is through the exploration of the skewness and kurtosis statistics. An initial visual scan of the descriptive statistics indicates that very few of the variables appear to be normally distributed (see Appendix H Part I for descriptive analysis of normality). However, it is also desirable to perform formal tests of normality to confirm the visual appearance of the data.

The Shapiro-Wilk test is an effective measure for testing for normality. This is particularly applicable to this study as evidence has suggested that the Shapiro-Wilk test is the most powerful of the statistical normality tests, no matter the distribution or sample size (Mendes & Pala, 2003). If this test produces small values of the calculated statistic, W , the results indicate that the data deviates from normality. The closer that the statistic is to 1.0, the greater the normality of the distribution, as will be indicated by the significance value¹². The results of this test confirm the initial analysis of the descriptive statistics, clearly

¹¹ In this case the significance value will be less than .05.

¹² In this case, the significance value will be greater than .05.

identifying the existence of non-normal data (refer to Appendix H Part II for Shapiro-Wilk normality testing).

Due to the breaches of the data type and normality parametric assumptions, non-parametric tests are deemed appropriate for this research. Non-parametric tests do not rely on the same stringent assumptions and are more appropriate for smaller sample sizes (Siegel & Castellan-Jr, 1988). The non-parametric tests adopted for testing each of the hypotheses will be identified and explained in the hypothesis testing below.

5.3.3 Validity and Reliability

Due to the construction of an instrument for the purposes of this survey, it is important to determine the extent of validity and reliability that the instrument has in relation to this particular study. Key aspects of the instrument are examined below in relation to these attributes.

The strategy instrument, taken from Govindarajan and Fisher's (1990) survey, includes measures to ensure construct validity¹³. The first of these measures asks respondents to rate their business position relative to leading competitors in certain areas: product/service selling price, percentage sales spent on R&D, product/service quality, brand image and product/service features. The responses are then analysed to determine whether an appropriate correlation with the constructed strategy index is apparent. As these aspects should be relatively important for a company employing a differentiation strategy, and the constructed strategy index assigns a value of 1.0 to this strategy, a positive correlation with

¹³ Minor changes were made to this instrument before its implementation into this study. Where questions related to "product", "service" was added to include the service related organisations in the study. Not applicable options were also provided due to the nature of the organisations in the study.

the strategy index is expected. The non-parametric Spearman rank-order correlation coefficient test is appropriate for determining the correlation between the variables. The summary statistic results presented in Appendix I Part I illustrate that four of the strategy position variables are significantly positively correlated. The exception is product/service selling price, which produces an insignificant negative correlation. The positive correlations with the strategy index reinforce the validity of the instrument.

The second method in this instrument for assessing construct validity asks respondents to determine the importance of ten competitive methods on a 5-point Likert scale, ranging from “Not Important” to “Extremely Important”. Five of these competitive methods are expected to correlate negatively with the strategy index indicating a cost leadership strategy¹⁴ and five are expected to correlate positively with the strategy index indicating a differentiation focussed strategy¹⁵.

The results of the Spearman rank-order correlation coefficient test show that, as expected, most of the differentiation type strategic factors correlate positively with the strategy index with the exception of advertising¹⁶. Similarly, most of the cost leadership strategic factors correlate negatively with the strategy index, with the exception of the procurement of raw materials and innovation in manufacturing processes¹⁷ (refer to Appendix I Part II for the strategy importance correlations). The results further illustrate the validity of the instrument.

¹⁴ The cost leadership strategy variables include competitive pricing, operating efficiency, cost reduction, procurement of raw materials and innovation in manufacturing processes. The negative correlation is expected as a result of the -1.00 assigned to these strategies in the creation of the index.

¹⁵ The differentiation strategy variables include new product/service development, brand identification, product/service differentiation, innovation in marketing techniques and methods and advertising.

¹⁶ This variable produces an insignificant negative correlation.

¹⁷ These variables produce insignificant positive correlations.

Factor analysis is another method that can be employed for determining construct validity for this part of the strategy instrument. However, it is not recommended that factor analyses are conducted on sample sizes with fewer than fifty cases (Darlington, n.d.). As a result of the insufficient sample size, and as the previous testing illustrates adequate validity of the instrument, this analysis is not conducted.

Another aspect of the survey subject to reliability testing is the performance instrument. The instrument used for measuring organisational performance has been influential in research (Walters, 2003). However, some of the variables adapted from Kaplan and Norton (1992) and Dixon, Nanni, & Vollmann (1990) in order to capture not for profit organisations within the instrument may have reduced the reliability. Consequently, calculations were performed to determine Cronbach's alpha for the performance elements. The results illustrated in Appendix J indicate high Cronbach's alpha values for the performance importance and performance achievement variables.

Due to the nature of the other questions in the survey instrument, no other testing can be performed. However, the individual reliability and validity of the instruments illustrated in Chapter Four allows hypothesis testing to continue with confidence that the overall instrument contains adequate validity and reliability.

5.3.4 Testing Hypothesis 1

The Mann-Whitney Wilcoxon test for the difference between two groups was used to determine whether ABC users illustrated a greater agreement with statements regarding the realisation of advantages from an ABC adoption. This test uses ranks of the cases, and subsequent summations of the rank orders, to determine whether a difference between the

two groups is evident. The mean ranks presented in Table 1 indicate that, as predicted, the agreement is higher for ABC users than non-users.

Table 1 Ranks of perceived advantages for ABC users and non-users

	Question 1	N	Mean Rank	Sum of Ranks
More Accurate Profitability Analysis	No ABC	29	23.48	681.00
	ABC	23	30.30	697.00
	Total	52		
Insight into Cost Causation	No ABC	29	24.57	712.50
	ABC	23	28.93	665.50
	Total	52		
Better Cost Control and Management	No ABC	29	22.29	646.50
	ABC	23	31.80	731.50
	Total	52		
Understanding of Cost Reduction Opportunities	No ABC	29	23.60	684.50
	ABC	23	30.15	693.50
	Total	52		
Decision Making	No ABC	29	22.88	663.50
	ABC	23	31.07	714.50
	Total	52		
Information for pricing	No ABC	29	24.57	712.50
	ABC	23	28.93	665.50
	Total	52		

Table 2 illustrates that the difference between the two groups is significant at the 5% level for the agreement that ABC gives more accurate profitability analysis, provides better understanding for cost reduction opportunities, and improves managerial decision making¹⁸. The results also indicate that the difference between ABC users and non-users is significant at the 1% level for the provision of better cost control and cost management. Although the tests suggest that the agreement that insight into cost causation and information for product/service costing and pricing between the two groups is not significantly different, these results only just fall outside the significance test boundaries of 10%.

¹⁸ Due to the directional hypothesis, a one-tailed test is appropriate.

Table 2 Perceived advantages difference between ABC users and non-users ^a

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for costing and pricing
Mann-Whitney U	246.000	277.500	211.500	249.500	228.500	277.500
Wilcoxon W	681.000	712.500	646.500	684.500	663.500	712.500
Z	-1.908	-1.205	-2.516	-1.779	-2.229	-1.243
Asymp. Sig. (1-tailed)	.028**	.114	.006***	.0375**	.013**	.107

a Grouping Variable: Question 1

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Overall, the findings support the hypothesis that the perceived advantages of ABC are higher for users of ABC than non-users.

When exploring the responses in greater detail, it is apparent that in total, respondents rated the highest average level of agreement with the statement that ABC provides insight into cost causation (see Table 3 below).

Table 3 Perceived advantages ranked by mean: ABC users and non-users

	N	Minimum	Maximum	Mean	Std. Deviation
Cost Causation	52	2	5	4.02	.700
Information for pricing	52	2	5	3.98	.671
Profitability Analysis	52	2	5	3.94	.725
Cost Reduction	52	2	5	3.88	.704
Decision Making	52	1	5	3.79	.750
Cost Control and Management	52	2	5	3.63	.841
Valid N (Listwise)	52				

When separated into their respective groups, ABC non-users had the highest average level of agreement with the cost causation insight advantage, while ABC users rated both insight into cost causation and the ability of ABC to provide more accurate profitability analysis as the most beneficial from an ABC adoption (see Tables 4 and 5).

Table 4 Perceived advantages ranked by mean: ABC non-users

	N	Minimum	Maximum	Mean	Std. Deviation
Cost Causation	29	2	5	3.90	.817
Information for pricing	29	2	5	3.86	.789
Profitability Analysis	29	2	5	3.76	.830
Cost Reduction	29	2	5	3.72	.797
Decision Making	29	1	5	3.59	.867
Cost Control and Management	29	2	5	3.38	.903
Valid N (Listwise)	29				

Table 5 Perceived advantages ranked by mean: ABC users

	N	Minimum	Maximum	Mean	Std. Deviation
Profitability Analysis	23	3	5	4.17	.491
Cost Causation	23	3	5	4.17	.491
Information for pricing	23	3	5	4.13	.458
Cost Reduction	23	3	5	4.09	.515
Decision Making	23	3	5	4.04	.475
Cost Control and Management	23	2	5	3.96	.638
Valid N (Listwise)	23				

A visual analysis of the means illustrated in Tables 4 and 5 above indicates that there could potentially be a greater difference between the highest and lowest ranked advantages for non-users than ABC users. A repeated measures Wilcoxon Signed Ranks test is performed to determine whether a difference is apparent. The results of this test presented in Tables 6 and 7 below illustrate that there is a statistical difference between the highest and lowest perceived advantage of both groups.

Table 6 Difference between perceived advantages for ABC non-users

	Information for pricing - Cost Causation	Cost Causation - Profitability Analysis	Cost Reduction - Cost Causation	Decision Making - Cost Causation	Cost Control and Management - Cost Causation
Z	-.378 ^a	.000 ^b	-.707 ^a	-.832 ^a	-1.387 ^a
Asymp. Sig. (1-tailed)	.3525	.500	.240	.2025	.083*

a Based on positive ranks.

b The sum of negative ranks equals the sum of positive ranks.

* Significant at the 10% level

Table 7 Difference between perceived advantages for ABC users

	Cost Causation - Profitability Analysis	Information for pricing - Profitability Analysis	Cost Reduction - Profitability Analysis	Decision Making - Profitability Analysis	Cost Control and Management - Profitability Analysis
Z	-1.027 ^a	-.791 ^a	-.250 ^b	-.994 ^b	-2.021 ^b
Asymp. Sig. (1-tailed)	.1525	.2145	.4015	.16	.0215**

a Based on negative ranks.

b Based on positive ranks.

* Significant at the 10% level

**Significant at the 5% level

Further analyses were conducted in order to find out more about the non-users of ABC and their perceptions of advantages associated with ABC. Non-using firms were separated into their respective positions on ABC; whether they were considering, had considered and rejected, or had not considered the system. Initial descriptive analyses were then conducted. The results indicate that firms' considering an ABC adoption all agree or strongly agree that all advantages can be realised with an ABC adoption. Firms not considering ABC or those who had considered and rejected its adoption had much lower agreement's, as indicated by ranges and means (see Appendix K Part I for descriptive statistics). Further Mann-Whitney Wilcoxon tests were also performed to determine the difference in perceptions between ABC users and non-users when separated into these categories (refer to Appendix K Part II for summary results). The results indicate that ABC users and those considering ABC do not have significantly different perceptions regarding advantages resulting from ABC. Conversely, many of the differences in perceived advantages for ABC users and those who have considered and rejected or not considered ABC were significantly different.

5.3.5 Testing Hypothesis 2

The Mann-Whitney Wilcoxon test was applied to determine whether there the complexity of ABC users is higher than non-users. The results of this test illustrated in Tables 8 and 9

below suggest that there are differences between the two groups in relation to some aspects of complexity.

Table 8 Ranks of complexity for ABC users and non-users

	Question 1	N	Mean Rank	Sum of Ranks
Productional/Operational Processes	No ABC	29	23.48	681.00
	ABC	23	30.30	697.00
	Total	52		
Frequency of Design Changes	No ABC	28	24.96	699.00
	ABC	23	27.26	627.00
	Total	51		
Number of Products/Services	No ABC	28	28.86	808.00
	ABC	23	22.52	518.00
	Total	51		
Level of Competition	No ABC	29	29.34	851.00
	ABC	22	21.59	475.00
	Total	51		

Table 9 Complexity difference between ABC users and non-users^a

	Processes	Design Changes	Number of Products/Services	Competition
Mann-Whitney U	246.000	293.000	242.000	222.000
Wilcoxon W	681.000	699.000	518.000	475.000
Z	-1.672	-.565	-1.605	-1.900
Asymp. Sig. (1-tailed)	.0475**	.286	.0545*	.0285**

a Grouping Variable: Question 1

* Significant at the 10% level

**Significant at the 5% level

Although the test illustrates that production/operational process complexity is significantly higher for ABC users than non-users, not all of the relationships are as predicted. Contrary to the hypothesised relationship, the level of industry competition and number of products/services are significantly greater for non-users of ABC than for ABC users at the 5% and 10% level of significance, respectively. There is no significant difference between

the users and non-users of ABC in relation to the frequency of major product/service design changes.

5.3.6 Testing Hypothesis 3

The Mann-Whitney Wilcoxon test was used to determine whether the satisfaction with the costing system is higher for users of ABC than non-users. By exploring the results in Tables 10 and 11, it is apparent that, consistent with the hypothesis, the satisfaction is significantly higher for users than non-users for the method for calculating product and service costs. The other two satisfaction variables, although higher for ABC users than non-users, are not statistically different.

Table 10 Ranks of satisfaction with costing system for ABC users and non-users (A)

	Question 1	N	Mean Rank	Sum of Ranks
Method for Calculating Costs	No ABC	28	20.50	574.00
	ABC	20	30.10	602.00
	Total	48		
Performance Measurement Systems	No ABC	28	22.93	642.00
	ABC	19	25.58	486.00
	Total	47		
Cost Reduction Information	No ABC	27	21.57	582.50
	ABC	19	26.24	498.50
	Total	46		

Table 11 Satisfaction difference between ABC users and non-users (A)^a

	Calculating Costs	Performance Measurement	Cost Reduction Information
Mann-Whitney U	168.000	236.000	204.500
Wilcoxon W	574.000	642.000	582.500
Z	-2.571	-.713	-1.256
Asymp. Sig. (1-tailed)	.005***	.238	.1045

a Grouping Variable: Question 1

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Further analysis is conducted to determine the difference in satisfaction between ABC users and non-users who were considering or had considered and rejected ABC. The results illustrated in Tables 12 and 13 below indicate that there is a significant difference in satisfaction for all three of the variables.

Table 12 Ranks of satisfaction with costing system for ABC users and non-users (B)

	Question 1	N	Mean Rank	Sum of Ranks
Method for Calculating Costs	No ABC	14	11.79	165.00
	ABC	20	21.50	430.00
	Total	34		
Performance Measurement Systems	No ABC	13	13.88	180.50
	ABC	19	18.29	347.50
	Total	32		
Cost Reduction Information	No ABC	13	13.81	179.50
	ABC	19	18.34	348.50
	Total	32		

Table 13 Satisfaction difference between ABC users and non-users (B)^a

	Calculating Costs	Performance Measurement	Cost Reduction Information
Mann-Whitney U	60.000	89.500	88.500
Wilcoxon W	165.000	180.500	179.500
Z	-3.051	-1.431	-1.451
Asymp. Sig. (1-tailed)	.001***	.0765*	.091*

a Grouping Variable: Question 1

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

5.3.7 Testing Hypothesis 4

A logistic regression is performed to determine whether the variables explored above can predict an adoption or non-adoption of ABC. Although the existence of high correlations between variables prevents the ability to determine which factors are more effective at

predicting adoption or non-adoption of ABC, the combined predictive capabilities of all of the variables in the model are presented below in Table 14. A Hosmer and Lemeshow test is performed to determine the goodness of fit of this model. The high significance value produced by this test, illustrated in Table 15, indicates that the model is adequate for predicting the use or non-use of ABC.

Table 14 Classification table of predictive capabilities^a

Observed			Predicted		
			Question 1		Percentage Correct
			No ABC	ABC	
Step 1	Question 1	No ABC	24	3	88.9
		ABC	6	13	68.4
		Overall Percentage			80.4

^a The cut value is .500

Table 15 Hosmer and Lemeshow test

Step	Chi-square	df	Sig.
1	7.544	7	.375

5.3.8 Testing Hypothesis 5

The calculated strategy index (refer to Appendix G for summary statistics) was utilised in order to determine whether ABC companies employ particular strategies. To conduct this analysis, the extreme 26% cost leadership and differentiation companies were selected and categorised into two groups. A non-parametric Chi Squared Test was then performed. Consistent with the hypothesis, the results produced in Tables 16 and 17 below indicate that there is no particular observed strategic focus consistently employed by ABC users.

Table 16 Strategy categories

	Observed N	Expected N	Residual
Cost Leadership	6	5.5	.5
Differentiation	5	5.5	-.5
Total	11		

Table 17 Strategy Chi square test

	Strategy Categories
Chi-Square ^a	.091
df	1
Asymp. Sig.	.763

a 0 cells (.0%) have expected frequencies less than 5.
The minimum expected cell frequency is 5.5.

5.3.9 Testing Hypothesis 6

An initial investigation into the descriptive statistics is undertaken to ascertain characteristics about the support given to users of ABC by different functions in the organisation. By exploring the summary statistics presented in Table 18, it is apparent that, inconsistent with Hypothesis 4, the support from corporate finance in the design and implementation of ABC is higher than support from other functions.

Table 18 Rank of function support for ABC

	N	Minimum	Maximum	Mean	Std. Deviation
Corporate Finance	20	2	4	3.20	.768
Top Management	20	2	4	3.00	.795
Production Management	13	1	4	2.46	.877
Design Engineering	13	1	4	2.23	.927
Manufacturing Engineering	9	1	3	2.11	.782
Plant Manager	10	1	3	2.10	.876
Marketing	14	1	3	1.86	.864
Valid N (Listwise)	8				

A repeated measures Wilcoxon Signed Rank Test is used to examine the differences in responses to the support of various functions. The results indicate that although top management were not perceived as providing the highest support during the design and implementation of ABC, this support was significantly higher than the other functions (see Table 19).

Table 19 Difference in support from functions

	Top Management - Design Engineering	Top Management - Manufacturing Engineering	Top Management - Production Management	Top Management - Plant Manager	Marketing - Top Management
Z	-2.401	-2.041	-1.552	-2.414	-3.169
Asymp. Sig. (2-tailed)	.016**	.041**	.121	.016**	.002***
Asymp. Sig. (1-tailed)	.008***	.0205**	.0605*	.008***	.001***

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

The extent of support from top management is reinforced by the responses to Question 15 of the survey instrument relating to the dynamics of ABC (see Appendix A for survey instrument). The average agreement that top management support ABC actively ranks at the top of the seven elements of this section, as presented in Table 20. The belief that management provided support in the form of adequate resources for ABC efforts is also indicated by these results.

Table 20 Dynamics of ABC ranked by mean

	N	Minimum	Maximum	Mean	Std. Deviation
Top Management	23	2	5	3.96	.878
Benefit exceeded Cost	23	2	5	3.78	.795
Resources	23	1	5	3.57	1.237
Consensus about Objectives	23	1	5	3.52	.994
Tied to Strategy	22	1	5	3.32	1.129
Linked to Competitive Strategy	21	1	5	3.14	1.153
Adequate Training	23	1	5	2.96	.928
Valid N (Listwise)	21				

All of the dynamics of ABC factors received an average response higher than three, with the exception of the belief that adequate training was provided for using ABC. A comparison was conducted between the responses to determine whether top management

support is considered to be significantly greater than the other factors relating to the dynamics and use of ABC. The results illustrated in Table 21 suggest that support from top management is considered to be significantly higher than the other factors, with the exception that the benefit of ABC exceeded the cost.

Table 21 Difference between top management support and other factors

	Resources - Top Management	Tied to Strategy - Top Management	Consensus about Objectives - Top Management	Adequate Training - Top Management	Linked to Competitive Strategy - Top Management	Benefit exceeded Cost - Top Management
Z	-2.008 ^a	-2.725 ^a	-2.332 ^a	-3.508 ^a	-2.859 ^a	-.954 ^a
Asymp. Sig. (2- tailed)	.045**	.006***	.020***	.000***	.004***	.340

a Based on positive ranks.

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

To find out more about the support given to the ABC adoption, it would be desirable to conduct further tests to determine the impact of the support factors on the success of the ABC initiative. Regression would typically be used for this type of analysis; however, to conduct a regression analysis, certain assumptions must be met. A minimum of five cases per independent variable is required for a regression analysis. As this question only relates to ABC users, the number of cases is minimal and this criterion is not met.

Consequently, correlation analysis was performed to determine the association between the dynamics of ABC and the success of the initiative. The results illustrate that top management support, tying ABC to the competitive strategies of the business unit and the benefit of ABC exceeding the cost are positively correlated with the success of the ABC initiative (See Appendix L for correlations of dynamics of ABC with ABC success).

5.3.10 Testing Hypothesis 7

The created performance index allows the comparison of the performance of ABC users and non-users. The results of the Mann-Whitney Wilcoxon test presented in Table 22 below suggest that there is no difference in the performance score for ABC users and non-users.

Table 22 Difference in performance for ABC users and non-users ^a

	Performance Index
Mann-Whitney U	116.500
Wilcoxon W	392.500
Z	-.368
Asymp. Sig. (1-tailed)	.3565

a Grouping Variable: Question 1

Further tests were conducted to determine whether selecting respondents who agreed or strongly agreed with Question 15 that “The benefit had exceeded the cost” of the ABC initiative would influence this result. The results of the Mann-Whitney Wilcoxon test presented in Tables 23 and 24 below illustrate that those firms who indicated that the benefit of ABC exceeded the cost have a significantly higher performance level to non-users of ABC at the 10% level of significance.

Table 23 Ranks of performance for ABC users and non-users

	Question 1	N	Mean Rank	Sum of Ranks
Performance Index	No ABC	23	16.11	370.50
	ABC	12	21.63	259.50
	Total	35		

Table 24 Difference in performance for ABC users and non-users (A)

	Performance Index
Mann-Whitney U	94.500
Wilcoxon W	370.500
Z	-1.512
Asymp. Sig. (1-tailed)	.0655*

* Significant at the 10% level

Additional tests also explored the performance result in relation to the number of years that a company had been using ABC. However, there was no indication of a difference in performance for non-users of ABC and those who have been using ABC for more than two years.

Chapter Six:

Discussion and Conclusion

Chapter Overview

This chapter concludes the research dissertation. A discussion of the results is provided and their implications examined. Following this, limitations of the research relating to the sample and survey are detailed. Finally, avenues for future research are suggested, of which exploration will be beneficial to the understanding of ABC in New Zealand.

6.1 Discussion and Implications of Results

This study set out to explore ABC in New Zealand firms. In particular, the research attempted to determine the relationship between certain organisational characteristics and ABC by conducting a comparative analysis of users and non-users of this costing system. Furthermore, the impact of ABC on organisational performance was examined in the New Zealand firm environment.

Consistent with prior research by Clarke and Mullins (2001), the results are supportive of the first hypothesis, indicating that users of ABC have a more promising and optimistic perception of the advantages associated with ABC than non-users. This is also apparent for companies considering an adoption. In contrast, those who have considered and rejected ABC appeared to have the most negative perceptions of ABC advantages, followed closely by those who have not considered ABC. Although this may be a result of a greater exploration in-to the expected costs and benefits preceding the decision to adopt, this may also be an indication that those using ABC are subsequently realising these advantages.

Analysis of the responses suggested that on average, all respondents had the highest agreement that ABC allowed greater insight into cost causation. The difference in perceived advantages for users and non-users beyond this point potentially illustrates that non-users of ABC do not understand that this greater cost causation insight can consequently allow other advantages to be realised.

The results of the second hypothesis were somewhat inconsistent with previous literature relating to organisational complexity. Although ABC users reported higher operational process complexity, the results indicated that ABC non-users had more products and

services, as well as a more intensively competitive industry. This indicates that only some elements of complexity are suggestive of the need for an ABC adoption. The results also illustrate the varying complexity that is apparent in similarly sized large firms, further suggesting that an ABC and complexity relationship cannot be attributed to firm size, without making significant assumptions about the levels of complexity in some large organisations.

Despite the evidence suggesting that ABC users realise benefits from ABC, and replace their traditional costing system with a superior one, the prediction that satisfaction with costing would be greater for users than non-users did not produce all of the predicted results. However, it is evident that non-users of ABC who are considering or have considered and rejected ABC have a significantly lower satisfaction with costing than ABC users. ABC non-users who have not considered ABC adoption may potentially already have an adequate level of satisfaction with the costing system which they employ, therefore reducing the need to implement ABC. A lack of understanding may also be evident in these firms of the additional knowledge that could be acquired if ABC is employed.

The results from the fifth hypothesis testing add interesting insight into the nature of ABC in New Zealand. No particular competitive strategy is evident for ABC users. It is also apparent that some firms do not agree that ABC is tied to competitive strategy. This has implications for research attempting to connect ABC to a particular strategic focus. This also sheds light on the contradictory evidence that has been produced in the literature.

Consistent with the literature, the support of top management is evident in an ABC adoption. However, contrary to the hypothesis, top management are not perceived as providing the greatest amount of support relative to other functions. Furthermore, the lack

of training evident is slightly contradictory to the perceived role of the support of management in the ABC adoption process. Although in theory management are believed to have the ability to channel adequate resources to the adoption and promote understanding firm-wide, the indication from the responses was that this is not the case. However, overall top management support is still significantly greater than most of the other organisational functions. This top management support is also positively associated with the success of the ABC initiative, potentially indicative of its importance in the ABC process. Furthermore, the existence of overall support for ABC is reinforced by the identifiable ABC champion present in the majority of the ABC users' companies.

The results do not initially support the hypothesis that ABC firms realise higher performance than non-ABC firms. However, users who perceive that the benefits of the initiative outweigh the costs have a significantly higher performance than non-users. This result illustrates that ABC may in fact be a technique beneficial in the New Zealand firm environment. This has important implications for New Zealand firms, particularly those who are considering an ABC adoption. This also has implications for firms who may still have misconceptions regarding the applicability of ABC to their organisation.

The adoption of ABC, however, may still be in process for New Zealand firms. The results of this study indicate that 66% of firms using ABC adopted the technique in the past five years. This is consistent with the literature indicating recent increasing trends in ABC adoption, and displays the possibility that ABC may have a greater influence in New Zealand over the next few years. This also has implications for the literature noting that the focus on ABC in educational institutions is not reflected in practice. The evidence indicates that promoters of ABC, predominantly holders of tertiary education qualifications, are now applying this knowledge to the business environment.

6.2 Limitations

Despite the impact of the results, and the implications that they suggest, the results must be approached with caution due to limitations of this study.

6.2.1 Sample Related

The difficulties in testing for non-response due to the number of responses received in the second mail out pose a limitation for this study. Consequently, although it is believed that the number of variables producing significant results is minimal, it cannot be completely assured that non-response bias does not affect this research.

Although the response rate for this survey was high relative to similar studies that have explored ABC, the sample size was still low. As well as reducing the power of some of the statistical tests performed this also reduces the generalisability of the research.

Sample selection bias is also a limitation of this research. As mentioned in Chapter Four, this bias arose as a trade-off to ensure that a sufficient number of ABC companies were included in the sample. This was believed to be beneficial for this research. However, it is acknowledged that the list of ABC users obtained may not be representative of the population.

6.2.2 Survey Related

The compilation of a survey for this research may result in lower validity and reliability than using a pre-constructed and tested instrument. Although steps were taken to ensure

that the instrument had adequate levels of both of these characteristics, this still poses a limitation on this study.

Another limitation evident is that the survey does not examine the extent of the implementation of ABC into the organisation. This creates questions regarding how influential the ABC system may be on aspects such as organisational performance. Different perceptions of what is classed as 'ABC' may also pose similar threats. Due to the fact that respondents are left to decide whether they believe the system they are using is ABC or not, the numbers of firms who actually use an ABC system is likely to be lower due to optimistic or generous responses.

6.3 Future Research

Many questions still remain regarding the adoption of ABC, as researchers continue their attempt to truly understand the place for the system in the business environment. Areas that this study was not able to explore may provide fruitful avenues for future research.

An analysis of ABC in smaller firms would be a beneficial area of future research. If research indicates that firm size is indicative of an ABC adoption, this may suggest that ABC will never be fully appreciated in the New Zealand small firm environment.

A case study analysis of small or large firms may also be beneficial, in order to explore the implementation in New Zealand firms, and how this compares to similar companies overseas. Exploring the extent of implementation may also give greater insight into the influence of ABC on aspects such as firm performance. Furthermore, from the responses obtained, an investigation into the industries of adopting and non-adopting firms may be

beneficial to examine whether the misconceptions about ABC's applicability to non-manufacturing firms is widespread.

Overall, future research should attempt to uncover the true extent of ABC's impact on New Zealand firms. Will ABC continue to be rejected in practice by companies with a lack of understanding of its true benefits? Or will it obtain recognition for its capabilities as a costing system and consequently make a significant impact on firms in New Zealand and world-wide.

References

- Armitage, H. M., & Nicholson, R. (1993). Activity based costing: a survey of Canadian practice. *CMA Magazine, Supplement*.
- Armstrong, J. S., & Overton, T. S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research, 14*, 396-402.
- Askarany, D., & Smith, M. (2003). *The Relationship between Technological Innovation, Activity Based Costing and Business Size*. Retrieved 15th September, 2005, from <http://proceedings.informingscience.org/IS2003Proceedings/docs/110Askar.pdf>
- Bidanda, B., Nachtmann, H., Needy, K. L., Roztock, N., & Warner, R. C. (2003). Implementing activity-based costing systems in small manufacturing firms: A field study. *Engineering Management Journal, 15*(1), 3-11.
- Bjorenak, T., & Mitchell, F. (2002). The development of activity-based costing journal literature 1987-2000. *The European Accounting Review, 11*(3), 481-508.
- Bouwman, M., & Cagwin, D. (2002). The association between activity-based costing and improvement in financial performance. *Management Accounting Research, 13*, 1-39.
- Brewer, P., Juras, P., & Brownlee-II, R. (2003). Global Electronics, Inc.: ABC implementation and the change management process. *Issues in Accounting Education, 18*(1), 49-69.
- Bromwich, M., & Bhimani, A. (1989). Management accounting: evolution not revolution. *Chartered Institute of Management Accountants, London*.
- Brown, D., Booth, P., & Giacobbe, F. (2001). *Organisational influences, ownership and the adoption of activity-based costing in Australian firms*. Paper presented at the Accounting Association of Australia and New Zealand Annual Conference, Auckland New Zealand.
- Brown, D., Booth, P., & Giacobbe, F. (2004). Technological and organizational influences on the adoption of activity-based costing in Australia. *Accounting and Finance, 44*, 329-356.
- Cheatham, C., & Cheatham, L. (1996). Redesigning Cost Systems: Is standard costing obsolete? *Accounting Horizons, 10*(4), 23-32.
- Chenhall, R., & Langfield-Smith, K. (1998a). Adoption and benefits of management accounting practices: an Australian study. *Management Accounting Research, 9*(1), 19.

- Chenhall, R., & Langfield-Smith, K. (1998b). The relationship between strategic priorities, management techniques and management accounting: An empirical investigation using a systems approach. *Accounting Organisations and Society*, 23(3), 243.
- Chenhall, R., & Langfield-Smith, K. (1999). The implementation of innovative management accounting systems. *Australian Accounting Review*, 9(3), 37-47.
- Cinquini, L., Collini, P., Marelli, A., Quagli, A., & Silvi, R. (1999). *A survey on cost accounting practices in Italian large and medium size manufacturing firms*. Paper presented at the 22nd annual congress of the European Accounting Association, Bordeaux, France.
- Clarke, P. (1992). *Management Accounting Practices and Techniques in Irish Manufacturing Firms*. Paper presented at the 15th Annual Congress of the European Accounting Association, Madrid, Spain.
- Clarke, P., Hill, N., & Stevens, K. (1999). Activity-based costing in Ireland: barriers to, and opportunities for change. *Critical Perspectives on Accounting*, 10, 443-468.
- Clarke, P., & Mullins, T. (2001). Activity based costing in the non-manufacturing sector in Ireland: A preliminary investigation. *Irish Journal of Management*, 22(2), 1-18.
- Compton, T. R. (1996). Implementing activity-based costing. *The CPA Journal*, 66(3), 20.
- Cooper, R., & Kaplan, R. (1988). Measure Cost Right: Make the Right Decisions. *Harvard Business Review*, September-October, 96-102.
- Cooper, R., & Kaplan, R. S. (1991). Profit Priorities from Activity-Based Costing. *Harvard Business Review*, May-June, 130-135.
- Cooper, R., & Kaplan, R. S. (1992). Activity-based systems: Measuring the costs of resource usage. *Accounting Horizons*, 6(3), 1-12.
- Cotton, B., & Jackman, S. (2002). Activity based costing: Not as "easy as ABC". *Chartered Accountants Journal of New Zealand*, 81(4), 35.
- Cotton, B., Jackman, S., & Brown, R. (2003). Note on a New Zealand replication of the Innes et al. UK activity-based costing survey. *Management Accounting Research*, 14, 67-72.
- Darlington, R. B. (n.d.). *Factor Analysis*. Retrieved 15th September, 2005, from <http://comp9.psych.cornell.edu/Darlington/factor.htm>
- Datar, S., & Gupta, M. (1994). Aggregation, specification and measurement errors in product costing. *The Accounting Review*, 69(4), 567-592.

- Davies, R., & Sweeting, B. (1993). Accounting and business performance. *Accountancy*, 112, 89-95.
- Dearman, D., & Shields, M. (2001). Cost knowledge and cost-based judgement performance. *Journal of Management Accounting Research*, 13, 1-18.
- Diekmann, D., & Kocakulah, M. (2001). Implementing activity-based costing (ABC) to measure commercial loan profitability. *The Journal of Bank Cost & Management Accounting*, 14(2), 3-15.
- Dixon, J. R., Nanni, A. J., & Vollmann, T. E. (1990). *The new performance challenge emasuring operations for world class competition*. Homewood: Business One Irwin.
- Dodd, D., & Lavelle, W. (2002). ABC spells improved performance. *High Volume Printing*, 20(6), 20-29.
- Doyle, S. (2002). Software review: Is there a role for activity-based costing (ABC) in database marketing. *Journal of Database Marketing*, 10, 175-180.
- Eonsoo, K., Dae-il, N., & Stimpert, J. (2004). Testing the applicability of porter's generic strategies in the digital age: A study of Korean cyber malls. *Journal of Business Strategies*, 21(1), 19-46.
- Fennema, M., Rich, J., & Krumwiede, K. (2005). Asymmetric effects of activity-based costing system cost reallocation. *Advances in Accounting Behavioral Research*, 8, 167-187.
- Gartman, C. (2005). Opportunities and competitive advantages for the future. *Franchising World*, 37(6), 27-29.
- Gordon, & Silvester. (1999). Stock market reactions to ABC adoptions. *Journal of Accounting and Public Policy*, 18(3), 229-251.
- Gosselin, M. (1997). The effect of strategy and organisational structure on the adoption and implementation of activity-based costing. *Accounting Organisations and Society*, 22(2), 105.
- Govindarajan, V., & Fisher, J. (1990). Strategy control systems and resource sharing: Effects on business unit performance. *Academy of Management Journal*, 33(2), 259.
- Govindarajan, V., & Gupta, A. K. (1985). Linking Control Systems to Business Units Strategy: Impact on Performance. *Accounting, Organizations and Society*, 4(1), 51-66.

- Gupta, & Galloway, K. (2003). Activity-based costing/management and its implications for operations management. *Technovation*, 23, 131–138.
- Gupta, & Govindarajan, V. (1984). Business unit strategy, managerial characteristics and business unit effectiveness at strategy implementation. *Academy of Management Journal*, 27, 24-41.
- Harvard-MIT. (n.d.). *Harvard-MIT data center's guide to SPSS*. Retrieved 23rd September, 2005, from http://data.fas.harvard.edu/projects/SPSS_Tutorial/spsstut.shtml
- Heneman, H. (1974). Comparisons of self and superior ratings of managerial performance,. *Journal of Applied Psychology*, 59, 638-642.
- Hicks, D. (1997). Impediments to adopting ABC at smaller organisations. *Cost Management Update*(74), 1-3.
- Hicks, D. (2005). Good decisions require good models: Developing activity-based solutions that work for decision makers. *Cost Management*, 19(3), 32.
- Homburg, C. (2001). A note on optimal cost driver selection in ABC. *Journal of Management Accounting Research*, 12, 197-205.
- Hoque. (2000). JIT production, automation, cost allocation practices and importance of cost information: An empirical investigation in New Zealand based manufacturing organisations. *British Accounting Review*, 32(2), 133.
- Hughes, S. B., & Gjerde, K. A. P. (2003). Do different cost systems make a difference? *Management Accounting Quarterly*, 5(1), 22.
- Hussain, M. M., & Gunasekaran, A. (2001). Activity-based cost management in financial services industry. *Managing Service Quality*, 11(3), 213-224.
- Innes, J., & Mitchell, F. (1990). Activity-based costing: A review with case studies. *Chartered Institute of Management Accountants, London*.
- Innes, J., & Mitchell, F. (1991). Activity-based costing: a survey of CIMA members. *Management Accounting*, 28, 30.
- Innes, J., & Mitchell, F. (1995). A survey of activity-based costing in the UK's largest companies. *Management Accounting Research*, 6, 137-153.
- Innes, J., Mitchell, F., & Sinclair, D. (2000). Activity based costing in the UK's largest companies: A comparison of 1994 and 1999 survey results. *Management Accounting Research*, 11, 349-362.

- Ittner, C., Lanen, W. N., & Larcker, D. (2002). The association between Activity-based costing and manufacturing performance. *Journal of Accounting Research*, 40, 711-726.
- Johnson, T. H. (2002). A former management accountant reflects on his journey through the world of cost management. *Accounting History*, 7, 9-21.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. *Harvard Business Review*, January-February, 71-79.
- Kennedy, T., & Affleck-Graves, J. (2001). The impact of activity-based costing techniques on firm performance. *Journal of Management Accounting Research*, 13, 19-46.
- Khanna, V. (2002). Learn the ABC of business. *Businessline*, 1.
- Kiani, R., & Sangaladji, M. (2003). An empirical study about the use of the ABC/ABM models by some of the Fortune 500 largest industrial corporations in the USA. *Journal of American Academy of Business*, 3(1), 174-190.
- Klein, J. (2003). Activity-based costing and benchmarking: A tandem for quality-oriented governments. *The Journal of Government Financial Management.*, 52(3), 50.
- Krumwiede, K. (1997). ABC adoption hits a new high, but is ABC worth implementation costs? *Cost Management Update*(71), 1-4.
- Krumwiede, K. (1998). The implementation stages of activity-based costing and the impact of contextual and organisational factors. *Journal of Management Research*, 10, 239-277.
- Krumwiede, K., & Jordan, W. (1998). Results of 1998 survey on cost management practices--Part I: ERP implementation going strong. *Cost Management Update*(93), 1-4.
- Krumwiede, K., & Roth, H. P. (1997). Implementing information technology innovations: The activity-based costing example. *Advanced Management Journal*, 62(4), 4-14.
- Lee, J. Y., & Nefcy, P. (1997). The anatomy of an effective HMO cost management system. *Management Accounting*, 78(7), 49-54.
- Malmi, T. (1999). Activity-based costing diffusion across organizations: An exploratory empirical analysis of Finnish firms. *Accounting, Organizations and Society*, 24, 649-672.
- McCabe, B., McKendrick, J., & Keenan, J. (2004). Best value in Scottish local authorities – As simple as ABC? *Journal of Finance and Management in Public Services*, 2(2), 43.

- McCall, C. (2001). *An empirical examination of the likert scale: some assumptions, development, and cautions*. Paper presented at the 80th Annual CERA Conference, Tahoe, CA.
- Mendes, M., & Pala, A. (2003). Type I error rate and power of three normality tests. *Pakistan Journal of Information and Technology*, 2(2), 135-139.
- Miles, R. E., & Snow, C. C. (1978). *Organizational strategy, structure and process*. New York: McGraw-Hill.
- Miller, L., & Smith, K. (1983). Handling nonresponse issues. *Journal of Extension*, 21(5), 45-50.
- Mitchell, F. (1994). A commentary on the applications of activity-based costing. *Management Accounting Research*, 5(3-4), 261-277.
- Noreen, E. (1991). Conditions under which activity-based costing systems provide relevant costs. *Journal of Management Accounting Research*, 3, 159-168.
- Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: Free Press.
- Rahman, I. K. A., Rahman, A. Z. A., Tew, Y. H., & Omar, N. (1998). A survey on management accounting practices in Malaysian manufacturing companies. *Management Accounting Practices Paper 3, Concurrent session IC, International Management Accounting Conference, National University of Malaysia, Selangor*.
- Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioural research: Methods and data analysis* (2nd ed.). Boston: McGraw-Hill.
- Roth, P. L., & Switzer-III., F. S. (1999). *Missing Data: Instrument-level heffalumps and item-level woozles*. Retrieved September 20th, 2005, from http://aom.pace.edu/rmd/1999_RMD_Forum_Missing_Data.htm
- Shields, M. D. (1995). An empirical analysis of firms' implementation experiences with activity-based costing. *Journal of Management Accounting Research*, 7, 148.
- Siegel, S., & Castellan-Jr, N. J. (1988). *Nonparametric statistics for the behavioural sciences* (2nd edition ed.). Singapore: McGraw-Hill.
- Sievanen, M., & Tornberg, K. (2002). Process-based costing: The best of activity-based costing. *AACE International Transactions*, 151-156.
- Smith, R., Olah, D., Hansen, B., & Cumbo, D. (2003). The effect of questionnaire length on participant response rate: A case study in the U.S. cabinet industry. *Forest Products Journal*, 53(11/12), 33.

- Sulaiman, M., Ahmad, N. N., & Alwi, N. (2002). Management accounting practices in Malaysia: a survey of the industrial and consumer products sectors. *Unpublished research report International Islamic University, Kuala Lumpur, Malaysia.*
- Sulaiman, M., Ahmad, N. N., & Alwi, N. (2004). Management accounting practices in selected Asian countries: A review of the literature. *Managerial Auditing Journal*, 19(4), 493.
- Swenson, D. (1995). The benefits of activity-based cost management to the manufacturing industry. *Journal of Management Accounting Research*, 7, 167.
- Swenson, D., & Barney, D. (2001). ABC/M: Which companies have success? *The Journal of Corporate Accounting & Finance*, 12(3), 35.
- Tan, L. M., Fowler, M. B., & Hawkes, L. (2004). Management accounting curricula: striking a balance between the views of educators and practitioners. *Accounting Education*, 13(1), 51-67.
- Walters, A. (2003). *Key performance measurement references*. Retrieved 10th September, 2005, from <http://www.som.cranfield.ac.uk/som/research/centres/cbp/pma/Pmrefs.htm>
- West, T. D., & West, D. (1997). Applying ABC to health care. *Management Accounting*, 78(8), 22-33.

Appendices

Table of Appendices

APPENDIX A: Survey Instrument.....	72
APPENDIX B: Cover Letter	80
APPENDIX C: Ethical Approval.....	81
APPENDIX D: Follow-up Letter	82
APPENDIX E: Non-response Bias	83
Part I – ABC Users	83
Part II – ABC Non-Users	86
APPENDIX F: Coding Summary.....	88
Part I – Promoters of ABC	88
Part II – Functional Background of Respondent	88
Part III – Age Category.....	88
APPENDIX G: Data Summary Statistics.....	89
APPENDIX H: Tests for Normality.....	93
Part I – Descriptive Analysis.....	93
Part II – Shapiro-Wilk Normality Testing.....	104
APPENDIX I: Strategy	109
Part I – Strategy Position	109
Part II – Strategy Factors Importance.....	109
APPENDIX J: Cronbach’s Alpha	110
APPENDIX K: Perceived Advantages.....	111
Part I – Descriptive Statistics	111
Part II – Differences between ABC users and non-users.....	112
APPENDIX L: Correlations of Dynamics of ABC and Success.....	113

Appendix A – Survey Instrument

SECTION ONE

Activity Based Costing (ABC)

ABC is a technique that “identifies the costs of specific activities based on their use of resources” (Doyle, 2002, p.1). The cumulative cost of each activity is then traced to products or services that make that activity necessary. By doing this, ABC recognises the causal relationship of cost drivers to activities (Kennedy & Affleck Graves, 2001).

1. Has your firm ever used ABC techniques?
(please circle) **Yes** **No**

2. Irrespective of whether you have or have not used ABC, please provide your perceptions of the following by circling the most appropriate level of agreement/disagreement:

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
ABC gives more accurate profitability analysis.	1	2	3	4	5
ABC improves insight into cost causation.	1	2	3	4	5
ABC provides better cost control and cost management.	1	2	3	4	5
ABC provides better understanding of cost reduction opportunities.	1	2	3	4	5
ABC improves managerial decision making.	1	2	3	4	5
ABC provides more accurate cost information for product/service costing and pricing.	1	2	3	4	5

3. Irrespective of whether you have or have not used ABC, please answer the following:

**Not
Complex** **Moderately
Complex** **Very
Complex**

Production/operational processes in your company are:	1	2	3	4	5
	Rarely		Sometimes		Frequently
Products/services or major design changes are introduced:	1	2	3	4	5
	Few		Some		Many
In terms of products and services, your company has:	1	2	3	4	5
	Limited		Moderate		Intense
Competition in your industry is:	1	2	3	4	5

4. How important does your organisation rate the following measures of performance?
Please indicate by circling the most appropriate level of importance below:

	Not Important		Important		Extremely Important
Sales volume	1	2	3	4	5
On time delivery	1	2	3	4	5
Cash flow	1	2	3	4	5
Competitor monitoring	1	2	3	4	5
Market share	1	2	3	4	5
Return on investment	1	2	3	4	5
New product/service introduction	1	2	3	4	5
Time to process activities	1	2	3	4	5
Customer satisfaction	1	2	3	4	5
Productivity of labour	1	2	3	4	5
Profile with the community	1	2	3	4	5
Cost reduction	1	2	3	4	5
Cost	1	2	3	4	5
Customer monitoring	1	2	3	4	5
Employee safety	1	2	3	4	5
Quality	1	2	3	4	5

5. How well do you believe your organisation has currently performed compared to your competitors with respect to the following performance indicators?

	Below Average		Average		Above Average
	1	2	3	4	5
Sales volume	1	2	3	4	5
On time delivery	1	2	3	4	5
Cash flow	1	2	3	4	5
Competitor monitoring	1	2	3	4	5
Market share	1	2	3	4	5
Return on investment	1	2	3	4	5
New product/service introduction	1	2	3	4	5
Time to process activities	1	2	3	4	5
Customer satisfaction	1	2	3	4	5
Productivity of labour	1	2	3	4	5
Profile with the community	1	2	3	4	5
Cost reduction	1	2	3	4	5
Cost	1	2	3	4	5
Customer monitoring	1	2	3	4	5
Employee safety	1	2	3	4	5
Quality	1	2	3	4	5

6. Please indicate the percentage of your business' accomplishments (ie. sales, services provided, or some other relevant outcome measure) achieved by use of the two key competitive strategy alternatives below. For example, 70% and 30%.

%

a) Overall Cost Leadership: the focus is to achieve low cost relative to competitors _____

b) Differentiation: the focus is to create something that is perceived as unique through superior product features, customer service, brand image, and/or performance _____

Total 100

7. For each of the following areas, please assess your business' position relative to your leading competitors.

	Significantly Lower					Significantly Higher			
	1	2	3	4	5	6	7	N/A	
Product/service selling price	1	2	3	4	5	6	7	N/A	
% Sales spent on R&D	1	2	3	4	5	6	7	N/A	
Product/service quality	1	2	3	4	5	6	7	N/A	
Brand image	1	2	3	4	5	6	7	N/A	
Product/service features	1	2	3	4	5	6	7	N/A	

8. Different firms choose different methods to compete, reflecting their differing strengths, target methods, and chosen strategy of the firm. Most firms selectively emphasise those factors that top management feels best underscore its chosen strategy. Please indicate how important each of the following competitive methods is to your overall business strategy.

	Not so Important					Extremely Important		
	1	2	3	4	5	6	7	N/A
New product/service development	1	2	3	4	5	6	7	N/A
Brand identification	1	2	3	4	5	6	7	N/A
Competitive pricing	1	2	3	4	5	6	7	N/A
Operating efficiency	1	2	3	4	5	6	7	N/A
Cost reduction	1	2	3	4	5	6	7	N/A
Product/service differentiation	1	2	3	4	5	6	7	N/A
Procurement of raw materials	1	2	3	4	5	6	7	N/A
Innovation in marketing techniques and methods	1	2	3	4	5	6	7	N/A
Innovation in manufacturing processes	1	2	3	4	5	6	7	N/A
Advertising	1	2	3	4	5	6	7	N/A

If you are currently using ABC, or have used it in the past five years, please proceed to Section Two. If you are not currently using ABC or have not used ABC in the past five years, please proceed to Section Three.

SECTION TWO

Please answer if you have used ABC in the past five years

9. When was ABC first adopted in your organisation?

10. What was the driving force behind the decision to implement ABC?

11. From what functional background did the person who promoted the adoption come from?

12. What was his/her educational qualification and from where did he/she graduate?

13. What was the level of support from the following functions during the design and implementation of ABC?

	No Support	Some Support	Good Support	Very Good Support
Design engineering	1	2	3	4
Manufacturing engineering	1	2	3	4
Production management	1	2	3	4
Plant manager	1	2	3	4
Top management	1	2	3	4
Marketing	1	2	3	4
Corporate finance	1	2	3	4

14. Why do you think ABC works at your company and what factors do you believe made adoption possible?

15. Based on your organisation's experiences with ABC, please comment on the following issues:

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
ABC receives active support from top management	1	2	3	4	5
Management has provided adequate resources to ABC efforts	1	2	3	4	5
ABC is tied to the competitive strategies of the business unit	1	2	3	4	5
There has been consensus about the objectives of ABC	1	2	3	4	5
Adequate training was provided for using ABC	1	2	3	4	5
ABC is strongly linked to our competitive strategy	1	2	3	4	5
The benefit of ABC has exceeded the cost	1	2	3	4	5

16. After implementing ABC, how satisfied are you with your:

	Dissatisfied	Needs Improvement	Seems Reasonable	Very Satisfied
Method for calculating product and service costs?	1	2	3	4
Performance measurement systems?	1	2	3	4
Ability to provide information for direct cost reduction efforts?	1	2	3	4

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
Overall your ABC initiative has been successful	1	2	3	4	5

Please proceed to Section Four.

SECTION THREE

Please answer this section if you have NOT used ABC in the past five years.

17. Into which of the following categories does your company fall and why? Please circle.

Category			Why?
a) We have considered using ABC techniques and rejected them	Yes	No	_____

b) We are currently considering using ABC techniques	Yes	No	_____

c) We have not considered ABC techniques	Yes	No	_____

18. How satisfied are you with your business unit's:

	Dissatisfied	Needs Improvement	Seems Reasonable	Very Satisfied
Method for calculating product and service costs?	1	2	3	4
Performance measurement systems?	1	2	3	4
Ability to provide information for direct cost reduction efforts?	1	2	3	4

Please proceed to Section Four.

SECTION FOUR

19. Age

Under 30

30-40

40-50

50+

20. How long have you been working for your company?:

a. Current job

b. Another job within the company

21. What is your current position in your company?

THANK YOU FOR COMPLETING THIS SURVEY

Yours Sincerely,

Sarah Moll

Appendix B – Cover Letter

UNIVERSITY
of
OTAGO



Te Whare Wānanga o Ōtāgo

«AddressBlock»

«GreetingLine»

Thank you for taking the time to talk to me on the phone the other day. As discussed, I am a fourth year student at the University of Otago, currently conducting research for my accounting honours dissertation. I am studying the uses of Activity Based Costing in New Zealand and am hopeful these findings will prove useful for management practice here in New Zealand.

I would be extremely grateful if you could spare about 15 minutes to complete the enclosed survey. The ability to achieve a satisfactory response rate is crucial to the successful completion of my honours project and therefore the completion of my university degree.

Please know that all reported findings will be at the aggregate level and will not be specific to any person or organisation. My supervisor and I will be the only ones with access to the data.

A prepaid postcard has been enclosed with the survey. As this postcard includes details of those who have responded and the survey does not, it will allow me to determine who has completed the survey while ensuring that each survey remains anonymous.

This project has been reviewed and approved by the Department of Accountancy and Business Law Ethics Committee. Should at any point you decide to change your mind about participating or have any questions about this project, please feel free to contact Garry Witte of the University's Ethics Committee, my supervisor Professor Ralph Adler, or myself. Contact details for each of us are provided below.

Thank you for taking the time to complete my survey. Please return it as soon as possible in the prepaid envelope provided. I look forward to receiving your response.

Yours sincerely,

Sarah Moll

Sarah Moll

Department of Accountancy and Business Law
University of Otago
Molsa684@student.otago.ac.nz

Ralph Adler

Department of Accountancy and Business Law
University of Otago
PO Box 56
Dunedin

Gary Witte

Manager, Academic Committees
University of Otago
PO Box 56
Dunedin

Appendix C – Ethical Approval

Professor Ralph Adler
Department of Accountancy and Business Law
University of Otago

11 June 2005

Dear Ralph and Sarah

The Ethics Committee has received and reviewed your application for ethical approval submitted to the Department of Accountancy and Business Law Ethics Committee, in respect to your research:

Title of Research: Activity Based Costing in New Zealand

The Departmental Ethics Committee has considered your application and has given clearance for the research to proceed subject to the following:

1. In order to inform the respondents, the cover letter and follow up should mention the inclusion of the post card, its purpose, and the related process for guaranteeing anonymity.
2. Your letter indicates that the University's Ethics Committee has reviewed the application. In this case that is not true, as the Departmental Ethics Committee will be giving approval. Please adjust the wording in both your cover letter and the follow-up letter. For example: "This proposal has been reviewed and approved by the Department of Accountancy and Business Law Ethics Committee on behalf of the Head of Department."
3. Your letter indicates that the respondents can contact the University's Ethics Committee for information. I contacted Gary Witte and he said you may do so, if he is sent a copy of the final documents prior to the onset of the study.
4. Please refer to the "Key Issues For Category B Ethics Applications", which accompanies the application for the following:
 - a. Inform the participants they are free to withdraw from the study at any time without any disadvantage (Item 1).
 - b. Add a comment to inform participants who will have access to the data (Item 5).
5. Please take care in the written description of your results. Since the study relates to a small sample, where you identified approximately 20 of the companies, it is critical to ensure that no company is identifiable in any written description.
6. Consider the statement in both letters relative to the length of time for completion of the questionnaire, as it may be insufficient.
7. Although not strictly an ethical issue, you did not mention pilot testing. Pre-testing is strongly suggested for such items as length of time for completion (Item 13).

The project will be formally registered in the Department and the University of Otago Academic Registrar will be advised in due course.

Yours sincerely

Departmental Ethics Committee
Marilyn Waldron, Ros Whiting, David Sim, Elena Poletti

Appendix D – Follow-up Letter

UNIVERSITY
of
OTAGO



Te Whare Wānanga o Otago

«AddressBlock»

«GreetingLine»

I am a fourth year student at the University of Otago, currently conducting research for my Accounting Honours Dissertation. I am studying the uses and applications of Activity Based Costing in New Zealand. Recently I sent you a survey asking you for your help in completing it. If you have already completed this survey, thank-you for your valued response.

I would be extremely grateful if you could spare the time to complete this survey (I am enclosing another survey with this letter just in case you misplaced the earlier one). A satisfactory response rate is crucial to the successful completion of my honours project, and furthermore, the completion of my degree.

This survey should take approximately 15 minutes to complete. Please know that all reported findings will be at the aggregate level and not be specific to any organisation.

A prepaid postcard has been enclosed with the survey. As this postcard includes details of those who have responded and the survey does not, it will allow me to determine who has completed the survey while ensuring that each survey remains anonymous.

This project has been reviewed and approved by the Department of Accountancy and Business Law Ethics Committee on behalf of the Head of Department. If you have any questions about this project, either now or in the future, please feel free to contact University's Ethics Committee, my supervisor, or me at the details below.

Yours sincerely,

Sarah Moll

Sarah Moll

Department of Accountancy and Business Law
University of Otago
Molsa684@student.otago.ac.nz

Ralph Adler

Department of Accountancy and Business Law
University of Otago
PO Box 56
Dunedin

Gary Witte

Manager, Academic Committees
University of Otago
PO Box 56
Dunedin

Appendix E – Non-response Bias

Part I - ABC Users

Perceived advantages difference between early and late response^{a,b}

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Chi-Square	.101	.101	.000	.626	.029	.319
df	1	1	1	1	1	1
Asymp. Sig.	.751	.751	1.000	.429	.866	.572

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Complexity difference between early and late response^{a,b}

	Processes	Design Changes	Number of Products/ Services	Competition
Chi-Square	.146	.000	.569	.154
df	1	1	1	1
Asymp. Sig.	.702	1.000	.451	.695

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Performance importance difference between early and late responses^{a, b}

	Sales Volume- imptc	On Time Delivery- imptc	Cash Flow- imptc	Competitor Monitoring- imptc	Market Share- imptc	Return on Investment- imptc	New Product/Service Introduction- imptc	Time to Process Activities- imptc
Chi-Square	.049	7.609	.537	.094	.327	.426	.662	4.254
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.824	.006	.464	.760	.568	.514	.416	.039

	Customer Satisfaction- imptc	Productivity of Labour- imptc	Profile with the Community- imptc	Cost Reduction- imptc	Cost- imptc	Customer Monitoring- imptc	Employee Safety- imptc	Quality- imptc
Chi-Square	.313	2.766	.265	1.007	1.087	.481	.457	.030
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.576	.096	.607	.316	.297	.488	.499	.863

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Performance position difference between early and late responses^{a,b}

	Sales Volume	On Time Delivery	Cash Flow	Competitor Monitoring	Market Share	Return on Investment	New Product/Service Introduction	Time to Process Activities
Chi-Square	.716	.073	1.404	.050	1.684	.025	.233	.143
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.397	.787	.236	.823	.194	.875	.630	.705

	Customer Satisfaction	Productivity of Labour	Profile with the Community	Cost Reduction	Cost	Customer Monitoring	Employee Safety	Quality
Chi-Square	.176	1.140	.003	.275	.135	.108	1.243	.708
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.675	.286	.958	.600	.713	.743	.265	.400

a Kruskal Wallis Test

b Grouping Variable: Question 1

Strategy position difference between early and late responses^{a,b}

	Product/Service Selling Price	% Sales on R&D	Product/Service Quality	Brand Image	Product/Service Features
Chi-Square	.158	.138	2.264	2.110	.479
df	1	1	1	1	1
Asymp. Sig.	.691	.710	.132	.146	.489

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Strategy importance difference between early and late responses^{a,b}

	New Product/Service Development	Brand Identification	Competitive Pricing	Operating Efficiency	Cost Reduction
Chi-Square	.134	1.355	.312	.012	2.593
df	1	1	1	1	1
Asymp. Sig.	.714	.244	.577	.911	.107

	Product/Service Differentiation	Procurement of Raw Materials	Innovation in Marketing Tech. & Methods	Innovation in Manufacturing Processes	Advertising
Chi-Square	3.364	1.336	.548	3.751	2.661
df	1	1	1	1	1
Asymp. Sig.	.067	.248	.459	.053	.103

a Kruskal Wallis Test

b Grouping Variable: Question 1

Support differences between early and late responses^{a,b}

	Design Engineering	Manufacturing Engineering	Production Management	Plant Manager	Top Management	Marketing	Corporate Finance
Chi-Square	3.813	2.100	.401	.034	.495	2.753	.371
df	1	1	1	1	1	1	1
Asymp. Sig.	.051	.147	.526	.854	.482	.097	.542

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Dynamics of ABC difference between early and late responses^{a,b}

	Top Management	Resources	Tied to Strategy	Consensus about Objectives	Adequate Training	Linked to Competitive Strategy	Benefit exceeded Cost
Chi-Square	2.982	.299	.564	.600	.030	1.674	.192
df	1	1	1	1	1	1	1
Asymp. Sig.	.084	.584	.453	.439	.864	.196	.662

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Satisfaction and success difference between early and late responses^{a,b}

	Calculating Costs	Performance Measurement	Cost Reduction Information	Success
Chi-Square	.931	.238	1.319	.621
df	1	1	1	1
Asymp. Sig.	.335	.626	.251	.431

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Part II - ABC Non-Users

Perceived advantages difference between early and late responses^{a,b}

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Chi-Square	.234	.014	1.683	.495	.097	.059
df	1	1	1	1	1	1
Asymp. Sig.	.629	.906	.195	.482	.756	.809

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Complexity difference between early and late responses^{a,b}

	Processes	Design Changes	Number of Products/ Services	Competition
Chi-Square	.203	.036	.000	1.104
df	1	1	1	1
Asymp. Sig.	.653	.849	1.000	.293

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Performance importance difference between early and late responses^{a,b}

	Sales Volume-imptc	On Time Delivery-imptc	Cash Flow-imptc	Competitor Monitoring-imptc	Market Share-imptc	Return on Investment-imptc	New Product/Service Introduction-imptc	Time to Process Activities-imptc
Chi-Square	2.842	1.324	.326	.000	.160	.274	.000	2.156
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.092	.250	.568	1.000	.689	.601	1.000	.142

	Customer Satisfaction-imptc	Productivity of Labour-imptc	Profile with the Community-imptc	Cost Reduction-imptc	Cost-imptc	Customer Monitoring-imptc	Employee Safety-imptc	Quality-imptc
Chi-Square	3.598	2.793	1.811	3.874	4.902	4.500	3.074	4.613
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.058	.095	.178	.049	.027	.034	.080	.032

a Kruskal Wallis Test

b Grouping Variable: Question 1

Performance position difference between early and late responses^{a,b}

	Sales Volume	On Time Delivery	Cash Flow	Competitor Monitoring	Market Share	Return on Investment	New Product/Service Introduction	Time to Process Activities
Chi-Square	5.880	1.137	.663	.896	1.874	.045	.181	.549
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.015	.286	.416	.344	.171	.833	.671	.459

	Customer Satisfaction	Productivity of Labour	Profile with the Community	Cost Reduction	Cost	Customer Monitoring	Employee Safety	Quality
Chi-Square	.796	.055	.120	1.515	2.029	2.995	1.123	1.442
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.372	.814	.729	.218	.154	.084	.289	.230

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Strategy position difference between early and late responses^{a,b}

	Product/ Service Selling Price	% Sales on R&D	Product/ Service Quality	Brand Image	Product/ Service Features
Chi-Square	.240	.850	.174	.020	.869
df	1	1	1	1	1
Asymp. Sig.	.624	.357	.676	.887	.351

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Strategy importance difference between early and late responses^{a,b}

	New Product/ Service Development	Brand Identification	Competitive Pricing	Operating Efficiency	Cost Reduction
Chi-Square	.008	.900	.000	.291	.018
df	1	1	1	1	1
Asymp. Sig.	.930	.343	1.000	.590	.893

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

	Product/ Service Differentiation	Procurement of Raw Materials	Innovation in Marketing Tech. & Methods	Innovation in Manufacturing Processes	Advertising
Chi-Square	.008	.911	.339	.394	.728
df	1	1	1	1	1
Asymp. Sig.	.930	.340	.560	.530	.393

Satisfaction with costing difference^{a,b} between early and late responses

	Calculating Costs	Performance Measurement	Cost Reduction Information
Chi-Square	.179	.490	.089
df	1	1	1
Asymp. Sig.	.672	.484	.766

a. Kruskal Wallis Test

b. Grouping Variable: Question 1

Appendix F: Coding Summary

Part I – Promoters of ABC

- 1 Finance
- 2 Accounting
- 3 Management
- 4 Other (industry, programme production, information technology and professional engineering)

Part II - Functional Background of Respondent

- 1 Accountant
- 2 Financial Analyst
- 3 Management Accountant
- 4 Financial Reporting Manager
- 5 Group/Financial Controller
- 6 Financial Accountant
- 7 Chief Financial Officer
- 8 Finance Manager
- 9 Other (company secretary, operations director, customer services).

Part III - Age Category

- 1 Under 30
- 2 30-40
- 3 40-50
- 4 50+

Appendix G- Data Summary Statistics

Perceived advantages summary statistics

		Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
N	Valid	52	52	52	52	52	52
	Missing	0	0	0	0	0	0
Mean		3.94	4.02	3.63	3.88	3.79	3.98
Minimum		2	2	2	2	1	2
Maximum		5	5	5	5	5	5

Complexity summary statistics

		Processes	Design Changes	Number of Products/Services	Competition
N	Valid	52	51	51	51
	Missing	0	1	1	1
Mean		3.33	3.04	3.88	3.35
Minimum		1	1	1	1
Maximum		5	5	5	5

Performance importance summary statistics

		Sales Volume-imptc	On Time Delivery-imptc	Cash Flow-imptc	Competitor Monitoring-imptc	Market Share-imptc	Return on Investment-imptc	New Product/Service Introduction-imptc	Time to Process Activities-imptc
N	Valid	49	50	51	49	49	51	51	50
	Missing	3	2	1	3	3	1	1	2
Mean		3.90	4.08	3.82	3.02	3.39	3.80	3.24	3.50
Minimum		1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5

		Customer Satisfaction-imptc	Productivity of Labour-imptc	Profile with the Community-imptc	Cost Reduction-imptc	Cost-imptc	Customer Monitoring-imptc	Employee Safety-imptc	Quality-imptc
N	Valid	51	51	51	50	49	51	52	51
	Missing	1	1	1	2	3	1	0	1
Mean		4.39	3.71	3.71	3.72	3.84	3.80	4.19	4.20
Minimum		1	1	1	1	3	1	2	2
Maximum		5	5	5	5	5	5	5	5

Performance position summary statistics

	Sales Volume	On Time Delivery	Cash Flow	Competitor Monitoring	Market Share	Return on Investment	New Product/Service Introduction	Time to Process Activities
N Valid	44	46	46	44	44	47	46	46
Missing	8	6	6	8	8	5	6	6
Mean	3.98	3.78	3.76	3.34	3.84	3.66	3.46	3.33
Minimum	3	2	2	1	2	2	1	2
Maximum	5	5	5	5	5	5	5	5

	Customer Satisfaction	Productivity of Labour	Profile with the Community	Cost Reduction	Cost	Customer Monitoring	Employee Safety	Quality
N Valid	46	46	47	46	46	47	48	47
Missing	6	6	5	6	6	5	4	5
Mean	3.72	3.28	3.74	3.33	3.43	3.51	3.81	3.87
Minimum	2	1	2	1	2	1	2	2
Maximum	5	5	5	5	5	5	5	5

Strategy position summary statistics

	Product/Service Selling Price	% Sales on R&D	Product/Service Quality	Brand Image	Product/Service Features
N Valid	40	35	42	42	40
Missing	12	17	10	10	12
Mean	4.65	4.23	5.10	5.57	5.13
Minimum	2	0	3	1	3
Maximum	7	7	7	7	7

Strategy importance summary statistics

	New Product/Service Development	Brand Identification	Competitive Pricing	Operating Efficiency	Cost Reduction
N Valid	47	46	46	46	46
Missing	5	6	6	6	6
Mean	3.62	3.85	3.70	4.22	3.93
Minimum	1	1	1	2	2
Maximum	5	5	5	5	5

	Product/Service Differentiation	Procurement of Raw Materials	Innovation in Marketing Tech. & Methods	Innovation in Manufacturing Processes	Advertising
N Valid	45	33	43	34	43
Missing	7	19	9	18	9
Mean	3.60	3.21	3.19	2.97	2.98
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5

Support summary statistics

	Design Engineering	Manufacturing Engineering	Production Management	Plant Manager	Top Management	Marketing	Corporate Finance
N Valid	13	9	13	10	20	14	20
Missing	10	14	10	13	3	9	3
Mean	2.23	2.11	2.46	2.10	3.00	1.86	3.20
Minimum	1	1	1	1	2	1	2
Maximum	4	3	4	3	4	3	4

Dynamics and use of ABC summary statistics

	Top Management	Resources	Tied to Strategy	Consensus about Objectives	Adequate Training	Linked to Competitive Strategy	Benefit exceeded Cost
N Valid	23	23	22	23	23	21	23
Missing	0	0	1	0	0	2	0
Mean	3.96	3.57	3.32	3.52	2.96	3.14	3.78
Minimum	2	1	1	1	1	1	2
Maximum	5	5	5	5	5	5	5

Satisfaction with costing

	Calculating Costs	Performance Measurement	Cost Reduction Information
N Valid	48	47	46
Missing	4	5	6
Mean	2.71	2.70	2.74
Minimum	2	2	2
Maximum	4	4	4

Success

N Valid	21
Missing	31
Mean	3.81
Minimum	1
Maximum	5

Performance Index

N Valid	43
Missing	9
Mean	228.37
Minimum	89.00
Maximum	355.00

Strategy Index

N	Valid	46
	Missing	6
Mean		.1378
Minimum		-1.00
Maximum		.90

Non-users of ABC

		Considered and Rejected	Considering	Not Considered
N	Valid	29	29	29
	Missing	0	0	0
Minimum		0	0	0
Maximum		1	1	1

Appendix H – Tests for Normality

Part I - Descriptive Analysis

Perceived Advantages

Question 1			Statistic	Std. Error
Profitability Analysis	No ABC	Mean	3.76	.154
		Skewness	-.711	.434
		Kurtosis	.363	.845
	ABC	Mean	4.17	.102
		Skewness	.467	.481
		Kurtosis	.903	.935
Cost Causation	No ABC	Mean	3.90	.152
		Skewness	-.645	.434
		Kurtosis	.425	.845
	ABC	Mean	4.17	.102
		Skewness	.467	.481
		Kurtosis	.903	.935
Cost Control and Management	No ABC	Mean	3.38	.168
		Skewness	-.238	.434
		Kurtosis	-.846	.845
	ABC	Mean	3.96	.133
		Skewness	-1.117	.481
		Kurtosis	3.710	.935
Cost Reduction	No ABC	Mean	3.72	.148
		Skewness	-.353	.434
		Kurtosis	-.001	.845
	ABC	Mean	4.09	.107
		Skewness	.170	.481
		Kurtosis	1.290	.935
Decision Making	No ABC	Mean	3.59	.161
		Skewness	-.815	.434
		Kurtosis	1.719	.845
	ABC	Mean	4.04	.099
		Skewness	.164	.481
		Kurtosis	2.289	.935
Information for pricing	No ABC	Mean	3.86	.147
		Skewness	-.679	.434
		Kurtosis	.661	.845
	ABC	Mean	4.13	.095
		Skewness	.595	.481
		Kurtosis	1.886	.935

Complexity

	Question 1		Statistic	Std. Error
Processes	No ABC	Mean	3.07	.216
		Skewness	-.289	.434
		Kurtosis	-.344	.845
	ABC	Mean	3.65	.278
		Skewness	-.546	.481
		Kurtosis	-.734	.935
Design Changes	No ABC	Mean	2.93	.272
		Skewness	-.027	.441
		Kurtosis	-1.227	.858
	ABC	Mean	3.17	.224
		Skewness	.108	.481
		Kurtosis	-.408	.935
Number of Products/Services	No ABC	Mean	4.14	.228
		Skewness	-1.514	.441
		Kurtosis	1.613	.858
	ABC	Mean	3.57	.294
		Skewness	-.626	.481
		Kurtosis	-.779	.935
Competition	No ABC	Mean	3.66	.278
		Skewness	-.874	.434
		Kurtosis	-.690	.845
	ABC	Mean	2.95	.298
		Skewness	-.143	.491
		Kurtosis	-1.228	.953

Performance Importance

Question 1			Statistic	Std. Error
Sales Volume-imptc	No ABC	Mean	3.96	.242
		Skewness	-1.438	.448
		Kurtosis	1.433	.872
	ABC	Mean	3.82	.234
		Skewness	-.797	.491
		Kurtosis	.474	.953
On Time Delivery-imptc	No ABC	Mean	4.07	.206
		Skewness	-1.170	.448
		Kurtosis	1.152	.872
	ABC	Mean	4.09	.177
		Skewness	-.175	.481
		Kurtosis	-1.607	.935
Cash Flow-imptc	No ABC	Mean	3.96	.221
		Skewness	-.673	.441
		Kurtosis	-.480	.858
	ABC	Mean	3.65	.205
		Skewness	-.783	.481
		Kurtosis	1.138	.935
Competitor Monitoring-imptc	No ABC	Mean	3.00	.220
		Skewness	.000	.448
		Kurtosis	-.376	.872
	ABC	Mean	3.05	.290
		Skewness	-.089	.491
		Kurtosis	-.988	.953
Market Share-imptc	No ABC	Mean	3.37	.234
		Skewness	-.509	.448
		Kurtosis	-.287	.872
	ABC	Mean	3.41	.333
		Skewness	-.432	.491
		Kurtosis	-1.375	.953
Return on Investment-imptc	No ABC	Mean	4.11	.226
		Skewness	-1.476	.441
		Kurtosis	1.585	.858
	ABC	Mean	3.43	.225
		Skewness	-.528	.481
		Kurtosis	.730	.935
New Product/Service Introduction-imptc	No ABC	Mean	3.18	.219
		Skewness	-.065	.441
		Kurtosis	-.678	.858
	ABC	Mean	3.30	.203
		Skewness	-.361	.481
		Kurtosis	.218	.935
Time to Process Activities-imptc	No ABC	Mean	3.41	.202
		Skewness	-.061	.448
		Kurtosis	-.214	.872
	ABC	Mean	3.61	.196
		Skewness	.194	.481
		Kurtosis	-.893	.935

Performance Importance continued

	Question 1		Statistic	Std. Error
Customer Satisfaction-imptc	No ABC	Mean	4.39	.139
		Skewness	-.796	.441
		Kurtosis	-.655	.858
	ABC	Mean	4.39	.206
		Skewness	-2.146	.481
		Kurtosis	5.432	.935
Productivity of Labour-imptc	No ABC	Mean	3.64	.172
		Skewness	-.458	.441
		Kurtosis	1.192	.858
	ABC	Mean	3.78	.166
		Skewness	-.167	.481
		Kurtosis	-.241	.935
Profile with the Community-imptc	No ABC	Mean	3.50	.227
		Skewness	-.138	.441
		Kurtosis	-1.020	.858
	ABC	Mean	3.96	.231
		Skewness	-.788	.481
		Kurtosis	-.634	.935
Cost Reduction-imptc	No ABC	Mean	3.78	.187
		Skewness	-.866	.448
		Kurtosis	1.224	.872
	ABC	Mean	3.65	.184
		Skewness	.355	.481
		Kurtosis	-.918	.935
Cost-imptc	No ABC	Mean	3.85	.143
		Skewness	.251	.456
		Kurtosis	-1.004	.887
	ABC	Mean	3.83	.162
		Skewness	.324	.481
		Kurtosis	-1.220	.935
Customer Monitoring-imptc	No ABC	Mean	3.93	.162
		Skewness	-.236	.441
		Kurtosis	-.771	.858
	ABC	Mean	3.65	.214
		Skewness	-.864	.481
		Kurtosis	.761	.935
Employee Safety-imptc	No ABC	Mean	4.17	.186
		Skewness	-.826	.434
		Kurtosis	-.593	.845
	ABC	Mean	4.22	.217
		Skewness	-1.003	.481
		Kurtosis	-.321	.935
Quality-imptc	No ABC	Mean	4.29	.161
		Skewness	-.994	.441
		Kurtosis	.274	.858
	ABC	Mean	4.09	.177
		Skewness	-.175	.481
		Kurtosis	-1.607	.935

Performance Position

	Question 1		Statistic	Std. Error
Sales Volume	No ABC	Mean	3.92	.146
		Skewness	.125	.472
		Kurtosis	-.912	.918
	ABC	Mean	4.05	.198
		Skewness	-.104	.512
		Kurtosis	-1.786	.992
On Time Delivery	No ABC	Mean	3.76	.176
		Skewness	-.286	.464
		Kurtosis	-.427	.902
	ABC	Mean	3.81	.164
		Skewness	.337	.501
		Kurtosis	-1.053	.972
Cash Flow	No ABC	Mean	3.69	.164
		Skewness	.217	.456
		Kurtosis	-.768	.887
	ABC	Mean	3.85	.182
		Skewness	.296	.512
		Kurtosis	-1.399	.992
Competitor Monitoring	No ABC	Mean	3.29	.127
		Skewness	.891	.472
		Kurtosis	1.376	.918
	ABC	Mean	3.40	.222
		Skewness	-.585	.512
		Kurtosis	.533	.992
Market Share	No ABC	Mean	3.75	.138
		Skewness	-.577	.472
		Kurtosis	.959	.918
	ABC	Mean	3.95	.198
		Skewness	.104	.512
		Kurtosis	-1.786	.992
Return on Investment	No ABC	Mean	3.88	.178
		Skewness	-.104	.456
		Kurtosis	-1.123	.887
	ABC	Mean	3.38	.244
		Skewness	.330	.501
		Kurtosis	-1.202	.972
New Product/Service Introduction	No ABC	Mean	3.20	.141
		Skewness	-.307	.464
		Kurtosis	4.292	.902
	ABC	Mean	3.76	.181
		Skewness	-.082	.501
		Kurtosis	-.474	.972
Time to Process Activities	No ABC	Mean	3.20	.115
		Skewness	.000	.464
		Kurtosis	-.024	.902
	ABC	Mean	3.48	.178
		Skewness	.084	.501
		Kurtosis	-.218	.972

Performance Position continued

Question 1			Statistic	Std. Error
Customer Satisfaction	No ABC	Mean	3.68	.170
		Skewness	-.178	.464
		Kurtosis	-.384	.902
	ABC	Mean	3.76	.217
		Skewness	-.144	.501
		Kurtosis	-1.047	.972
Productivity of Labour	No ABC	Mean	3.40	.163
		Skewness	-.399	.464
		Kurtosis	2.327	.902
	ABC	Mean	3.14	.186
		Skewness	.239	.501
		Kurtosis	-.497	.972
Profile with the Community	No ABC	Mean	3.54	.177
		Skewness	.403	.456
		Kurtosis	-.710	.887
	ABC	Mean	4.00	.195
		Skewness	-.463	.501
		Kurtosis	-.554	.972
Cost Reduction	No ABC	Mean	3.36	.114
		Skewness	1.343	.464
		Kurtosis	1.036	.902
	ABC	Mean	3.29	.260
		Skewness	-.221	.501
		Kurtosis	-1.087	.972
Cost	No ABC	Mean	3.40	.115
		Skewness	-.282	.464
		Kurtosis	-.717	.902
	ABC	Mean	3.48	.214
		Skewness	-.103	.501
		Kurtosis	-.875	.972
Customer Monitoring	No ABC	Mean	3.62	.137
		Skewness	.703	.456
		Kurtosis	-.575	.887
	ABC	Mean	3.38	.189
		Skewness	-.876	.501
		Kurtosis	1.827	.972
Employee Safety	No ABC	Mean	3.81	.169
		Skewness	.020	.448
		Kurtosis	-1.016	.872
	ABC	Mean	3.81	.190
		Skewness	-.095	.501
		Kurtosis	-.742	.972
Quality	No ABC	Mean	3.85	.154
		Skewness	.287	.456
		Kurtosis	-1.279	.887
	ABC	Mean	3.90	.153
		Skewness	-.833	.501
		Kurtosis	1.964	.972

Strategy Position

	Question 1		Statistic	Std. Error
Product/Service Selling Price	No ABC	Mean	4.48	.207
		Skewness	-.239	.481
		Kurtosis	.518	.935
	ABC	Mean	4.88	.241
		Skewness	.260	.550
		Kurtosis	.131	1.063
% Sales on R&D	No ABC	Mean	4.00	.216
		Skewness	.000	.524
		Kurtosis	.356	1.014
	ABC	Mean	4.50	.483
		Skewness	-.507	.564
		Kurtosis	.316	1.091
Product/Service Quality	No ABC	Mean	5.17	.197
		Skewness	-.041	.472
		Kurtosis	.171	.918
	ABC	Mean	5.00	.229
		Skewness	.000	.536
		Kurtosis	.173	1.038
Brand Image	No ABC	Mean	5.61	.249
		Skewness	-.543	.481
		Kurtosis	-.646	.935
	ABC	Mean	5.53	.362
		Skewness	-1.385	.524
		Kurtosis	2.334	1.014
Product/Service Features	No ABC	Mean	5.08	.180
		Skewness	-.172	.472
		Kurtosis	-1.737	.918
	ABC	Mean	5.19	.319
		Skewness	.042	.564
		Kurtosis	-1.195	1.091

Strategy Importance

Question 1			Statistic	Std. Error
New Product/Service Development	No ABC	Mean	3.64	.215
		Skewness	-.941	.464
		Kurtosis	1.216	.902
	ABC	Mean	3.59	.243
		Skewness	-.776	.491
		Kurtosis	-.221	.953
Brand Identification	No ABC	Mean	4.08	.244
		Skewness	-1.504	.464
		Kurtosis	1.626	.902
	ABC	Mean	3.57	.272
		Skewness	-.777	.501
		Kurtosis	-.134	.972
Competitive Pricing	No ABC	Mean	3.88	.233
		Skewness	-.948	.464
		Kurtosis	.122	.902
	ABC	Mean	3.48	.255
		Skewness	-.458	.501
		Kurtosis	-.633	.972
Operating Efficiency	No ABC	Mean	4.12	.167
		Skewness	-.709	.464
		Kurtosis	.136	.902
	ABC	Mean	4.33	.144
		Skewness	-.474	.501
		Kurtosis	-.551	.972
Cost Reduction	No ABC	Mean	3.88	.176
		Skewness	-.546	.464
		Kurtosis	-.094	.902
	ABC	Mean	4.00	.169
		Skewness	.000	.501
		Kurtosis	-1.257	.972
Product/Service Differentiation	No ABC	Mean	3.80	.216
		Skewness	-.863	.464
		Kurtosis	.480	.902
	ABC	Mean	3.35	.254
		Skewness	-.543	.512
		Kurtosis	.257	.992
Procurement of Raw Materials	No ABC	Mean	3.44	.315
		Skewness	-.944	.536
		Kurtosis	-.216	1.038
	ABC	Mean	2.93	.316
		Skewness	-.397	.580
		Kurtosis	-.521	1.121

Strategy Importance continued

Question 1			Statistic	Std. Error
Innovation in Marketing Tech. & Methods	No ABC	Mean	3.30	.183
		Skewness	.219	.481
		Kurtosis	-.426	.935
	ABC	Mean	3.05	.266
		Skewness	-.313	.512
		Kurtosis	-.365	.992
Innovation in Manufacturing Processes	No ABC	Mean	3.00	.284
		Skewness	-.527	.550
		Kurtosis	-.285	1.063
	ABC	Mean	2.94	.315
		Skewness	-.073	.550
		Kurtosis	-.898	1.063
Advertising	No ABC	Mean	3.13	.262
		Skewness	-.116	.481
		Kurtosis	-.612	.935
	ABC	Mean	2.80	.313
		Skewness	.010	.512
		Kurtosis	-1.402	.992

Support for ABC

		Statistic	Std. Error
Design Engineering	Mean	2.23	.257
	Skewness	.211	.616
	Kurtosis	-.546	1.191
Manufacturing Engineering	Mean	2.11	.261
	Skewness	-.216	.717
	Kurtosis	-1.041	1.400
Production Management	Mean	2.46	.243
	Skewness	-.301	.616
	Kurtosis	-.336	1.191
Plant Manager	Mean	2.10	.277
	Skewness	-.223	.687
	Kurtosis	-1.734	1.334
Top Management	Mean	3.00	.178
	Skewness	.000	.512
	Kurtosis	-1.366	.992
Marketing	Mean	1.86	.231
	Skewness	.306	.597
	Kurtosis	-1.635	1.154
Corporate Finance	Mean	3.20	.172
	Skewness	-.372	.512
	Kurtosis	-1.131	.992

Dynamics of ABC

		Statistic	Std. Error
Top Management	Mean	3.96	.183
	Skewness	-.794	.481
	Kurtosis	.458	.935
Resources	Mean	3.57	.258
	Skewness	-.479	.481
	Kurtosis	-.921	.935
Tied to Strategy	Mean	3.32	.241
	Skewness	-.264	.491
	Kurtosis	-.760	.953
Consensus about Objectives	Mean	3.52	.207
	Skewness	-.674	.481
	Kurtosis	.613	.935
Adequate Training	Mean	2.96	.194
	Skewness	.092	.481
	Kurtosis	.006	.935
Linked to Competitive Strategy	Mean	3.14	.252
	Skewness	.128	.501
	Kurtosis	-.841	.972
Benefit exceeded Cost	Mean	3.78	.166
	Skewness	-.167	.481
	Kurtosis	-.241	.935

Satisfaction

Question 1			Statistic	Std. Error
Calculating Costs	No ABC	Mean	2.50	.121
		Skewness	.920	.441
		Kurtosis	-.089	.858
	ABC	Mean	3.00	.145
		Skewness	.000	.512
		Kurtosis	-.279	.992
Performance Measurement	No ABC	Mean	2.64	.128
		Skewness	.586	.441
		Kurtosis	-.615	.858
	ABC	Mean	2.79	.164
		Skewness	.336	.524
		Kurtosis	-.821	1.014
Cost Reduction Information	No ABC	Mean	2.63	.143
		Skewness	.739	.448
		Kurtosis	-.739	.872
	ABC	Mean	2.89	.169
		Skewness	.172	.524
		Kurtosis	-.998	1.014

Success of ABC Initiative

		Statistic	Std. Error
Success	Mean	3.81	.178
	Skewness	-2.082	.501
	Kurtosis	6.918	.972

Part II – Shapiro-Wilk Normality Testing**Perceived Advantages**

	Question 1	Shapiro-Wilk		
		Statistic	df	Sig.
Profitability Analysis	No ABC	.816	29	.000
	ABC	.659	23	.000
Cost Causation	No ABC	.834	29	.000
	ABC	.659	23	.000
Cost Control and Management	No ABC	.854	29	.001
	ABC	.699	23	.000
Cost Reduction	No ABC	.856	29	.001
	ABC	.691	23	.000
Decision Making	No ABC	.847	29	.001
	ABC	.649	23	.000
Information for pricing	No ABC	.821	29	.000
	ABC	.620	23	.000

Complexity

	Question 1	Shapiro-Wilk		
		Statistic	df	Sig.
Processes	No ABC	.900	29	.010
	ABC	.848	23	.003
Design Changes	No ABC	.884	28	.005
	ABC	.917	23	.059
# of Products/Services	No ABC	.730	28	.000
	ABC	.855	23	.003
Competition	No ABC	.787	29	.000
	ABC	.893	22	.022

Performance Importance

Question 1	Shapiro-Wilk			
	Statistic	df	Sig.	
Sales Volume-impct	No ABC	.753	27	.000
	ABC	.867	22	.007
On Time Delivery-impct	No ABC	.808	27	.000
	ABC	.787	23	.000
Cash Flow-impct	No ABC	.775	28	.000
	ABC	.874	23	.008
Competitor Monitoring-impct	No ABC	.916	27	.032
	ABC	.904	22	.036
Market Share-impct	No ABC	.894	27	.010
	ABC	.837	22	.002
Return on Investment-impct	No ABC	.747	28	.000
	ABC	.849	23	.003
New Product/Service Introduction-impct	No ABC	.922	28	.039
	ABC	.908	23	.036
Time to Process Activities-impct	No ABC	.895	27	.010
	ABC	.863	23	.005
Customer Satisfaction-impct	No ABC	.744	28	.000
	ABC	.664	23	.000
Productivity of Labour-impct	No ABC	.841	28	.001
	ABC	.865	23	.005
Profile with the Community-impct	No ABC	.887	28	.006
	ABC	.801	23	.000
Cost Reduction-impct	No ABC	.863	27	.002
	ABC	.832	23	.001
Cost-impct	No ABC	.806	26	.000
	ABC	.800	23	.000
Customer Monitoring-impct	No ABC	.858	28	.001
	ABC	.869	23	.006
Employee Safety-impct	No ABC	.777	29	.000
	ABC	.746	23	.000
Quality-impct	No ABC	.782	28	.000
	ABC	.787	23	.000

Performance Position

Question 1	Shapiro-Wilk			
	Statistic	df	Sig.	
Sales Volume	No ABC	.810	24	.000
	ABC	.772	20	.000
On Time Delivery	No ABC	.876	25	.006
	ABC	.803	21	.001
Cash Flow	No ABC	.851	26	.001
	ABC	.797	20	.001
Competitor Monitoring	No ABC	.744	24	.000
	ABC	.898	20	.038
Market Share	No ABC	.798	24	.000
	ABC	.772	20	.000
Return on Investment	No ABC	.848	26	.001
	ABC	.848	21	.004
New Product/Service Introduction	No ABC	.693	25	.000
	ABC	.872	21	.010
Time to Process Activities	No ABC	.744	25	.000
	ABC	.875	21	.012
Customer Satisfaction	No ABC	.877	25	.006
	ABC	.871	21	.010
Productivity of Labour	No ABC	.797	25	.000
	ABC	.871	21	.010
Profile with the Community	No ABC	.839	26	.001
	ABC	.857	21	.006
Cost Reduction	No ABC	.643	25	.000
	ABC	.888	21	.020
Cost	No ABC	.731	25	.000
	ABC	.884	21	.018
Customer Monitoring	No ABC	.759	26	.000
	ABC	.843	21	.003
Employee Safety	No ABC	.853	27	.001
	ABC	.871	21	.010
Quality	No ABC	.800	26	.000
	ABC	.777	21	.000

Strategy Position

		Shapiro-Wilk		
		Statistic	df	Sig.
Product/Service Selling Price	No ABC	.871	23	.007
	ABC	.921	17	.153
% Sales on R&D	No ABC	.912	19	.082
	ABC	.910	16	.117
Product/Service Quality	No ABC	.909	24	.034
	ABC	.920	18	.132
Brand Image	No ABC	.885	23	.013
	ABC	.826	19	.003
Product/Service Features	No ABC	.768	24	.000
	ABC	.905	16	.097

Strategy Importance

		Shapiro-Wilk		
		Statistic	df	Sig.
New Product/Service Development	No ABC	.846	25	.001
	ABC	.845	22	.003
Brand Identification	No ABC	.743	25	.000
	ABC	.873	21	.011
Competitive Pricing	No ABC	.837	25	.001
	ABC	.899	21	.033
Operating Efficiency	No ABC	.832	25	.001
	ABC	.774	21	.000
Cost Reduction	No ABC	.858	25	.003
	ABC	.815	21	.001
Product/Service Differentiation	No ABC	.868	25	.004
	ABC	.890	20	.026
Procurement of Raw Materials	No ABC	.808	18	.002
	ABC	.888	15	.062
Innovation in Marketing Tech. & Methods	No ABC	.880	23	.010
	ABC	.904	20	.049
Innovation in Manufacturing Processes	No ABC	.876	17	.028
	ABC	.921	17	.156
Advertising	No ABC	.907	23	.035
	ABC	.884	20	.021

Support for ABC

	Shapiro-Wilk		
	Statistic	df	Sig.
Design Engineering	.894	13	.110
Manufacturing Engineering	.838	9	.055
Production Management	.879	13	.069
Plant Manager	.805	10	.017
Top Management	.813	20	.001
Marketing	.786	14	.003
Corporate Finance	.800	20	.001

Dynamics of ABC

	Shapiro-Wilk		
	Statistic	df	Sig.
Top Management	.828	23	.001
Resources	.875	23	.008
Tied to Strategy	.909	22	.045
Consensus about Objectives	.888	23	.015
Adequate Training	.910	23	.041
Linked to Competitive Strategy	.915	21	.071
Benefit exceeded Cost	.865	23	.005

Satisfaction

	Question 1	Shapiro-Wilk		
		Statistic	df	Sig.
Calculating Costs	No ABC	.718	28	.000
	ABC	.793	20	.001
Performance Measurement	No ABC	.768	28	.000
	ABC	.802	19	.001
Cost Reduction Information	No ABC	.753	27	.000
	ABC	.814	19	.002

Success of ABC Initiative

	Shapiro-Wilk		
	Statistic	df	Sig.
Success	.667	21	.000

Appendix I - Strategy

Part I - Strategy Position

Strategy index and strategy position correlations

			Strategy Index	Product/Service Selling Price	% Sales on R&D	Product/Service Quality	Brand Image	Product/Service Features
Spearman's rho	Strategy Index	Correlation Coefficient	1.000	-.067	.386	.356	.206	.425
		Sig. (1-tailed)	.	.341	.011***	.010***	.095*	.003***
		N	46	40	35	42	42	40

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Part II - Strategy Factors Importance

Correlations between strategy index and importance of strategy factors

			Strategy Index	New Product/Service Development	Brand Identification	Product/Service Differentiation	Innovation in Marketing Tech. & Methods	Advertising
Spearman's rho	Strategy Index	Correlation Coefficient	1.000	.258	.147	.542	.048	-.112
		Sig. (1-tailed)	.	.042**	.168	.000***	.382	.241
		N	46	46	45	44	42	42

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Correlations between strategy index and importance of strategy factors

			Strategy Index	Competitive Pricing	Operating Efficiency	Cost Reduction	Procurement of Raw Materials	Innovation in Manufacturing Processes
Spearman's rho	Strategy Index	Correlation Coefficient	1.000	-.197	-.127	-.244	.005	.028
		Sig. (1-tailed)	.	.098*	.203	.053*	.488	.439
		N	46	45	45	45	32	33

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

Appendix J – Cronbach's Alpha

Performance Importance

Cronbach's Alpha	N of Items
.911	16

Performance Achievement

Cronbach's Alpha	N of Items
.926	16

Appendix K – Perceived Advantages

Part I – Descriptive Statistics

Considering ABC

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mean	4.20	4.40	4.20	4.20	4.40	4.20
Std. Deviation	.447	.548	.447	.447	.548	.447
Minimum	4	4	4	4	4	4
Maximum	5	5	5	5	5	5

Considered and Rejected ABC

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mean	3.44	3.89	3.11	3.56	3.44	3.78
Std. Deviation	.882	.928	.928	.882	1.130	.833
Minimum	2	2	2	2	1	2
Maximum	4	5	4	5	5	5

Not considered ABC

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mean	3.82	4.00	3.09	3.82	3.45	4.00
Std. Deviation	.874	.632	.831	.603	.688	.632
Minimum	2	3	2	3	2	3
Maximum	5	5	4	5	4	5

Part II – Differences between ABC users and non-users**Perceived advantages differences between considering ABC and ABC users**

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mann-Whitney U	56.500	45.500	47.500	52.000	39.000	54.000
Wilcoxon W	332.500	321.500	323.500	328.000	315.000	330.000
Z	-.080	-.914	-.791	-.436	-1.466	-.294
Asymp. Sig. (2-tailed)	.937	.361	.429	.663	.143	.769

Perceived advantages differences between considered and rejected and ABC users

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mann-Whitney U	57.500	89.000	51.500	66.000	68.500	81.500
Wilcoxon W	102.500	134.000	96.500	111.000	113.500	126.500
Z	-2.439	-.745	-2.580	-1.865	-1.792	-1.216
Asymp. Sig. (2-tailed)	.015	.456	.010	.062	.073	.224

Perceived advantages differences between not considered ABC and ABC users

	Profitability Analysis	Cost Causation	Cost Control and Management	Cost Reduction	Decision Making	Information for pricing
Mann-Whitney U	99.000	108.500	55.500	97.500	70.000	113.000
Wilcoxon W	165.000	174.500	121.500	163.500	136.000	179.000
Z	-1.226	-.829	-3.004	-1.332	-2.595	-.643
Asymp. Sig. (2-tailed)	.220	.407	.003	.183	.009	.520

Appendix L – Correlations of Dynamics of ABC and Success

Dynamics of ABC correlations

			Success	Top Management	Resources	Tied to Strategy
Spearman's rho	Success	Correlation Coefficient	1.000	.447	.260	.455
		Sig. (2-tailed)	.	.042**	.255	.044**
		N	21	21	21	20

			Success	Consensus about Objectives	Adequate Training	Linked to Competitive Strategy	Benefit exceeded Cost
Spearman's rho	Success	Correlation Coefficient	1.000	.138	.184	.178	.442
		Sig. (2-tailed)	.	.550	.426	.465	.045**
		N	21	21	21	19	21

* Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level