AN INVESTIGATION INTO THE CURRENT MANAGEMENT ACCOUNTING PRACTICES AND THE CONTINGENT ASPECTS THAT HAVE PROMPTED SAUDI AND NON-SAUDI MANUFACTURING FIRMS TO ADOPT OR NOT ADOPT MODERN MANAGEMENT ACCOUNTING SYSTEMS: THE CASE OF THE EASTERN PROVINCE OF SAUDI ARABIA

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Abstract

This research has investigated the current application of management accounting practices in Saudi and non-Saudi manufacturing firms that operate in the Eastern Province of Saudi Arabia, and the internal and external contingent aspects that prompted these firms to adopt or not to adopt advanced management accounting practices.

In order to achieve the aforementioned aims, a mixed methodology was used, with a questionnaire survey and semi-structured interviews being used as instruments for collecting the required data. Three types of statistical analysis were used (descriptive, bivariate and multivariate) to analyse the data obtained from the returned questionnaires (158 out of 260).

Analysis of the descriptive parts of the questionnaires has shown that Saudi and non-Saudi manufacturing firms are still loyal to their traditional management accounting practices, such as the extensive use of one accounting system for several purposes, traditional allocation methods, traditional decision-making tools, standard costing systems, traditional budgeting, and traditional financial measures. At the same time, the analysis has shown that there is slow move toward adopting new trends in management accounting among these firms, mainly due to satisfaction with traditional management accounting practices and a lack of relevant skill regarding the advanced management accounting practices.

The bivariate results have shown that adoption of advanced management accounting practices by Saudi and non-Saudi manufacturing firms is subject to certain contingent aspects, such as perceived environmental uncertainty, competition, size and firm strategy, but not product range or number. The same statistical test has shown that there is a partial relationship between the extent of adoption of advanced management accounting practices, culture, and advanced manufacturing technologies.

The results of the multivariate test have shown that adoption of advanced management accounting practices by Saudi and non-Saudi manufacturing firms is related to only three predictors, which are size, number of products, and prospector strategy.

Theoretical analysis of the interviews has revealed that adoption of advanced management accounting practices is due to perceived environmental uncertainty, price and quality competition, size, number of products, culture, and firm strategy, but not advanced manufacturing technology. Also, analysis of the interviews has confirmed the descriptive finding regarding the heavy use of traditional management accounting practices.

The research concludes by emphasising that the case of the Eastern Province of Saudi Arabia follows the mainstream in regards to the limited acceptance of advanced management accounting practices and the fact that adoption of these practices is due to certain internal and external contingent drivers.

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List of Abbreviations

ABC	Activity-Based Costing
ABB	Activity-Based Budgeting
ABM	Activity-based management
AMA	Advanced Management Accounting Practices or Systems
AMTs	Advanced Manufacturing Technologies
APP.D	Appendix D
ARR	Accounting Rate of Return
BF system	Backflush Costing System
BSC	Balanced Scorecard
CEO	Chief Executive Officer
CA	Contingency Approach
CIM	Computer-Integrated Manufacturing
CIMA	The Charted Institute of Management Accountants
CVP analysis	Cost-Volume-Profit analysis
DAT	Design and Administrative Technology
DCF	Discounted Cash Flow
ERP	Enterprise Resource Planning
FMs	Financial Performance Measures
GCC countries	Gulf Corporation Council countries
IAOT	Innovative-Administrative and Operation Technology
IR	Industrial Revolution
IRR	Internal Rate of Return
JIT	Just-In-Time (production)
KMO	Kaiser-Meyer-Olkin
MACS	Management Accounting and Control System
MAS(s)	Management Accounting System(s)
MCS	Management Control System
MRP	Material Requirement Planning
MRPII	Manufacturing Resources Planning
NFMs	Non-financial Performance Measures
NIE	New Institutional Economic Perspective
NIS	New Institutional Sociology Perspective
NPV	Net Present Value
PCA	Principle-component Analysis
PEU	Perceived Environmental Uncertainty
OIE	Old Institutional Economic Perspective
OT	Operational Technology
ROI	Return on Investment
ROS	Return on Sales
SA	Saudi Arabia
SC	Standard Costing System
TC	Target Costing
TMA	Traditional Management Accounting Practices or Systems
TQM	Total Quality Management
VBM	Value-Based Management
WTO	World Trade Organisation

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Declaration

I herby declare that I am the sole author of this thesis and all work in this thesis was done by myself, and it has not previously been presented by someone else or accepted for a higher degree.

Ibrahim Khalid A. Al-Meaidi Signed……..

Date:……..

Statement of Copyright

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Dedication

To the memory of my father,

and to my mother, my wife and my children

Chapter One: Introduction

1.1 Research Background

Since the early 1980s, there has been a substantial amount of research dealing with management accounting, particularly in Western countries. Generally, this research has passed through three stages. First of all, management accounting was charged with lagging behind developments occurring in the business arena, and some Western academics and practitioners grasped the nettle and announced that management accounting was in trouble and facing a real crisis (Johnson and Kaplan, 1987). The essence of that crisis, as Johnson and Kaplan deemed, was that the body of management accounting had remained unchanged and retained its loyalty to the traditional management accounting (TMA) systems that had been introduced decades previously. Hence, during the second stage of the research, innovations were suggested as a remedy to resolve this crisis. During this stage several advanced management accounting (AMA) systems were introduced as alternatives to the TMA systems, such as activity-based costing/budgeting/management (ABC/B/M), target costing (TC), balanced scorecards (BSC), total quality management (TQM), value-based management (VBM), just-in-time (JIT) and others.

Since the appearance of these new systems, studies have been undertaken to investigate whether practitioners have responded by adopting the innovations in management accounting or are still relying on the TMA systems. However, before reviewing some of these studies it is necessary to mention that these investigations have in general been of two types. The first type concentrated on studying the

diffusion or adoption of a particular AMA system (micro-investigation), while the second concentrated on investigating a group of AMA systems (macro-investigation). For example, Emore and Ness (1991) investigated changes in the costing systems used by 70 US manufacturing firms. Their findings exposed that the adoption of advanced manufacturing technology as a response to the intensity of the competition within the US environment motivated more than 50% of the surveyed firms to make significant changes to their accounting systems. At the same time, this change was not completely led to dislodge the use of TMA systems within US firms. For example, several of the surveyed firms are still relying on one accounting system that services their financial goals. Additionally, they found that the use of traditional allocation methods (e.g. direct labour hours/costs and machine hours) for allocating overhead costs was still prevalent. Furthermore, the study indicated that although there was a rapid growth in the usage of advanced manufacturing technology in the US, the actual adoption of ABC was rare (see also Shim and Larkin, 1994).

Waldron and Everett (2004) investigated whether or not the arrival of the new millennium had motivated US managers of manufacturing firms to adopt AMA systems. They found that around 78% of the firms were still heavily reliant on the standard costing system. With regard to the usage of some of the modern costing systems, they reported that only 20% and 22% were using ABC and backflush costing systems, respectively. Additionally, the percentage use of other AMA systems spanned between 19% (cost of quality reporting) and 1% (life cycle costing). Waldron and Everett found contingent aspects prompted some US firms to adopt AMA systems such as competition, firm size, product diversity, and production complexity.

It is clear from these studies that there is only limited acceptance of AMA systems in the US although it is considered the birthplace of most of these systems. The UK does not differ greatly from the US regarding the adoption of AMA systems. For example, a series of studies regarding the adoption of the ABC system in particular was undertaken by Innes and Mitchell (1991, 1995) and Innes *et al*. (2000), which revealed that the rate of adoption was no more than 21% at best. In the first study, Innes and Mitchell (1991) targeted CIMA members perhaps because this group is highly knowledgeable about new trends in management accounting while the focus in the latter two studies was on the largest UK firms and this focus may satisfy the size element which is considered part of the contingency theory.

Scapens *et al*. (2003) explored the current management accounting practices between 1995 and 2000 and the anticipated changes in these practices during the first five years of the new century among UK firms (differing in size and industry). Based on data collected by triangulation methods (e.g. eight cases studies, 12 field visits, and questionnaires) they found some TMA systems such as budgeting and variance analysis were (and will continue to be) among top management accounting practices in the UK. At the same time, they reported the emphasis on strategic management accounting and rolling budgeting systems as flourishing at the beginning of the new millennium due to the heavy use to modern information technology and accounting software. Scapens *et al.* concluded their study by pointing out that TMA systems will not lose their durability in the near future in the UK but managers will continue to use AMA systems side-by-side with traditional ones. It is clear from this study that some contingent aspects may drive change in MAS but that it is not necessary for this change to be radical.

Moving from Western studies to the East, Smith *et al*. (2008) studied the diffusion of advanced manufacturing technologies (AMTs) and AMA practices among Malaysian industrial companies. Their analysis shows that the extent of adopting AMTs is only correlated with the size of the firm but not with the extent of adopting AMA practices. In other words, 77%, 73% and 53% of Malaysian firms indicated they never or rarely used JIT, TC, and ABC/M, respectively. In contrast, 53% of these companies indicated that they always or often used the TQM system. Smith *et al*. (2008) concluded the heavy use of the TQM system in Malaysia could be due to the location of Malaysia because TQM is a Japanese technique and as the countries are geographically close this particular system has transferred quickly from one to the other.

It is clear from the aforementioned studies that the adoption of AMA systems is not widespread among organisations globally, which affirms the assertion made by some Western scholars in the past regarding the loyalty of organisations to their TMA systems. Langfield-Smith (2008) commented on the low adoption rate of AMA systems by pointing out that these new systems have simply influenced the language of the business world rather than the practice.

Hence, some researchers have begun to undertake in-depth investigations into this international phenomenon by focusing on the drivers that motivate organisations to adopt or not adopt AMA systems, which is considered as the third stage of research in management accounting. During this stage, researchers have used several perspectives such as the institutional, cultural, fad and fashion, and other perspectives to explain the lag between the innovations in management accounting and their adoption. Some

of these frameworks (institutional and cultural), however, do not provide a broad explanation for this lag while the fad and fashion perspective may be suitable only for studying innovation in uncertain environments.

However, there is a volume of literature asserting that the adoption or non-adoption of AMA systems is subject to certain contingent circumstances. For example, Ax *et al*. (2008) have examined the effect of market competition and concluded that environmental uncertainty impacted on whether or not the Swedish manufacturing firms studied had adopted TC. Their results show that only 14 of the 57 companies have adopted TC and that these are all considered to be large firms. They further found there to be a positive relationship between the intensity of market competition and the adoption of TC while the opposite applied to the relationship between perceived environmental uncertainty and the adoption of TC. For this reason, Ax *et al*. concluded their study by emphasising that the adoption of TC in Sweden is a result of certain contingent aspects. Although Ax *et al*. (2008) found nothing to indicate that perceived environmental uncertainty had affected the rate of adoption of some of the modern systems in Sweden, other researchers have found there to be a positive relationship between perceived environmental uncertainty and the broadness of the scope of the management accounting system (MAS) (Daft *et al*., 1988; Haka, 1987; Chenhall and Morris, 1986; Govindarajan, 1984; Gul and Chia, 1994).

Other researchers have found there to be an explicit relationship between the design of the MAS or the extent of adoption of AMA systems and certain contingent aspects such as the size of the organisation (Hoque and James,2000; Brown *et al*., 2004; Al-Omiri and Drury, 2007), product diversity (Cinquini *et al*., 2008; Drury and Tayles,

2005; Abernethy *et al*., 2001), the level of automation within the firm (Smith *et al*., 2008; Isa and Foong, 2005; Joshi, 2001), culture (Baird *et al*., 2004; Brewer, 1998) and strategies (Cadez and Guilding, 2008; Jusoh and Parnell, 2008; Gosselin, 2005). The contingency perspective has therefore been adopted as the guidance for conducting this research.

1.2 Motivation for the Research

Dekmejian (2003) pointed out that the Saudi political system is a very authoritarian regime due to the absence of democracy. Therefore, the essence of this radical system was under scrutiny after the calamity of 11th September 2001.

During the last decade of the 20th century, Saudi Arabia (SA) has witnessed some political reforms, such as the establishment of the first Saudi parliament (consultative council) and appointing the regional government in order to mimic Western democracy. Kapiszewski (2006) argued that political activities which occurred in SA should not be seen as real steps toward practising democracy in that country because the consultative council is not allowed to make radical change in the Saudi government or authority and its decisions and the regional government decisions must be approved by the King or his deputy (see also Nehme, 1995). On the other hand, Aba-Namay (1993) pointed out that the Saudi political system was completely static before 1990 due to the absence of a written constitution. However, the growing pressure from the Saudi liberal party during that time pushed the Saudi political system one step forward toward adopting change.

According to Lacroix (2004), SA is an Islamic country that depends for its government upon cooperation between the traditional Islamists (conservative party) and the Saudi authority. In other words, the conservative party legitimates the Saudi authority due to its adherence to Islamic principles. However, the catastrophe of September 11th, 2001 puts rigorous internal (liberal party) and external (Washington DC) pressure on the Saudi authority to eliminate or restrain the power of the traditional Islamists. As a consequence of this contingent pressure, Islamo-Liberal

reformists appeared and led the country to be more open toward Western culture. The new party has cooperated with the Saudi authority to make socioeconomic reforms through adopting a modest strategy that neither supports extremism nor follows liberalism. As a result of adopting this strategy, more political reforms appeared in SA. For example, the Saudi authority organised the first partial municipal elections in 2003. Additionally, this brought about an improvement in women's rights, such as appointing a few highly qualified women to the Saudi cabinet and in the consultative council. Jreisat (2006) stated the share of Arab women in the political system in their countries is still limited due to the views of Arab men regarding gender equality. However, since 2005, the Saudi government has taken steps to enhance gender equality such as giving men and women the same chance to complete their studies in Western countries and allowing men and women to study or work in the same environment (Al-Zaydi, 2009).

According to Abbas (1999), SA has faced several socioeconomic challenges during the last two decades since the pervious century, due to the rapid speed of globalisation and the decline of oil prices. Hence, the Saudi government has formulated clear long-term strategies mainly to: (a) enhance the quality of life of Saudi and non-Saudi citizens and provide more job opportunities and training programmes, (b) diversify natural resources and move the national economy from an oil-based to a knowledge economy, (c) increase the level of female participation in the Saudi economy, and (d) achieve balanced growth among all regions in SA (Ministry of Economic and Planning, 2005).

Al-Dosary *et al.* (2006) pointed out that despite the Saudisation programme (replacement of foreign labour by Saudi nationals) adopted by the Saudi government since the mid-1980s, controlling unemployment is still a big problem in SA and the rate has remained high (11%). According to the Saudi Ministry of Economic and Planning (2005), since the Saudi government always supports the private sector through offering it soft loans, low tax, and other breaks, the government asked the private sector to participate in solving unemployment. In other words, the Saudi government marketed unemployment as a national problem that required cooperation between the public and private sectors. In the most recent development plan (2005-2009) the Saudi government has drawn up long-term plans regarding the unemployment problem which aims to reduce the dependence on foreign labour to 0% by the end of 2024.

Mellahi (2007) stated that the Saudi government, the private sector, and Saudi citizens are all responsible for the problem of unemployment. According to Mellahi, since 1980, the number of jobs offered by public and private sectors to Saudi citizens has been limited compared to the rapid growth in the Saudi population which finally led to, and aggravated, unemployment in SA. However, as Mellahi indicated, the most important factor that prevents solving the unemployment problem in SA is that most Saudi citizens regard working in the private sector as an insecure job, while the private sector is not willing to pay the high wages of domestic labour. Therefore, Mellahi (2007) deems the problem of unemployment will continue unless the Saudi government issues clear rules regarding determining the minimum level of wages within the private sector.

SA joined the World Trade Organisation (WTO) at the end of 2005 and according to Ramady (2005) this joining led SA to liberalise its market and reduce economic constraints. Therefore, Spencer (2010) stated both Saudi and foreign investors have equal chance to win Saudi government contracts at present.

Examples mentioned above reveal that some internal and external aspects pushed SA to adopt change in its political and economical systems. Accounting practices in general might be affected by this modern mode in this country, so studying innovation and its drivers in management accounting can be seen as fruitful topics, especially in a conservative culture such as that in SA. The current research seeks to study innovation or change in management accounting systems among Saudi and non-Saudi manufacturing companies that operate in the Eastern Province of SA.

Noticeably, there is a dearth of studies investigating the application of management accounting in SA. After carrying out a careful review of the database of the British Library and the King Fahad Library (located in SA), it was established that only two comprehensive pieces of research have been carried out regarding management accounting in SA.

Based on qualitative data extracted from 18 Saudi and joint venture companies (JVCs), Alnamri (1993) studied variations in levels of sophistication of management accounting systems between both groups. His finding shows that the JVCs used broad management accounting information in their decision-making processes and used more sophisticated management control systems (MCSs) compared to Saudi-owned companies. To make that clear, Alnamri found that the variation between both groups

was due to the effects of some contingent aspects (for example, size, technology, environment and management philosophy). Additionally, Alnamri found education, social and cultural aspects to be the most important aspects which led Saudi firms to not adopt modern MCSs. For that reason, he concluded his study by emphasising that contingency perspective might be relevant for studying innovation in management accounting systems in SA.

Alebaishi (1998) studied management accounting practices among medium-sized and large Saudi industrial firms and the drivers that motivated these firms to adopt both TMA and some AMA techniques. Although he focused on three modern systems (ABC, JIT and life cycle costing), he concluded that there was still a heavy reliance on TMA systems in SA. Furthermore, the results of the regression analysis used by Alebaishi reveal size of the firm, market competition, and company levels of export sales were the drivers that motivated some companies to adopt TMA and AMA systems.

Both Al-Mulhem (2002) and Al-Saeed (2005) surveyed the diffusion of the ABC system in SA and found evidence that the practice had been adopted by some Saudi large firms. Interestingly, the common drivers that motivated Saudi firms to adopt ABC, as reported by both researchers, were the product diversity and size of the firm. Based on these findings, it is not unfair to say that some contingent aspects are considered cornerstones for adopting innovation.

Al-Twaijry *et al*. (2003) used institutional theory (isomorphism perspective) for studying the development of internal audit in SA. The researchers utilised a mixed

approach for collecting their data (questionnaire survey, structured and unstructured interviews). Their results reveal that only a few large firms have an internal auditing department, and this may give an indication as to the importance of some contingent aspects (such as size) for adopting modern accounting practices within organisations. Al-Twaijry *et al*. found the absence of a coercive role from the state, and the power of Saudi culture was the driver which motivated the majority of Saudi firms to not adopt internal auditing department.

Based on this final conclusion, we may say that the contingent perspective may give a wider explanation compared to an institutional one, regarding the drivers which motivated some Saudi and non-Saudi manufacturing firms to adopt, or not to adopt, innovation in management accounting.

It is clear from the findings of the management accounting studies presented above that there has been no large-scale study into the applications of management accounting in SA since the beginning of the new millennium, apart from those that focused on the ABC system. The present research contributes to management accounting studies in several ways:

1. The previous researchers who studied management accounting in SA have all used one instrument for collecting their data (questionnaire or structured interview) except Alebaishi who used questionnaire survey and structured interview. However, this research adopts a mixed approach (questionnaire and semi-structured interview) in order to enhance the literature of mixed methodology in management accounting. Here, it is important to mention that

the researcher does not attempt to downgrade other methodologies, but he deems that using semi-structured interview side-by-side with the questionnaire instrument will give the interviewees chance to express their opinions freely about the issues being investigated, which in turn will enrich the interpretation of the research findings.

2. All previous researchers have either focused on one particular AMA system (Al-Mulhem, 2002; Al-Saeed) or limited the number of these new systems (Alnamri, 1993; Alebaishi, 1998). Contrary to those studies, the current research investigates 13 AMA systems including those investigated by Alebaishi. The researcher included ten more AMA systems in the current study because there is no study covering them to the best of his knowledge.
3. All previous management accounting studies undertaken in SA have taken Johnson and Kaplan's (1987) criticism of TMA practices at face value without clarifying the arguments surrounding it. However, this research covers the reaction of some Western management accounting scholars to Johnson and Kaplan's theory in order to shed light on arguments both for and against Johnson and Kaplan's perspective (see next chapter).
4. Since the mid-1980s, some Anglo-Saxon scholars suggested that firms should use more than one accounting system (Kaplan, 1988). Also, Johnson and Kaplan (1987) believe using simple allocation bases (e.g. blanket rate, labour costs/hours, etc) and the full product costs method in decision-making is no longer relevant for today's business environment. Since previous studies undertaken in SA do not explore these issues and most studies related to these issues were undertaken in Western countries, the researcher believes it is time to investigate them.

5. The areas of transfer pricing and performance evaluation have received much attention, mainly in the West. Since the position related to these two areas is still unexplored in SA, the researcher tries to contribute in the literature of management accounting by bringing evidence from the non-Anglo-Saxon environment regarding the use or non-use of this system.
6. Despite Alebaishi (1998) basing his study upon contingency theory, he used only four contingent aspects (size, type of industry, competition and company levels of export sales) for studying the relationship between these aspects and the adoption of management accounting systems (TMA and AMA) by Saudi manufacturing firms. However, one purpose of conducting this research is studying the relationship between six contingent aspects (environmental uncertainty, competition, size, technology, culture and firm strategy) and the extent of adopting AMA systems by Saudi and non-Saudi manufacturing companies. It is necessary to mention here that some contingent aspects (e.g. size and competition) are included in the current study because these aspects are considered as main aspects in the contingency perspective. Also, Alebaishi (1998) used one measure (total assets) for studying the relationship between the size and the number of adopting TMA and AMA systems while the current research applies three measures for clarifying this relationship (number of employees, total revenues and total assets). Moreover, three types of competition (market, price and quality) are used by Alebaishi for studying the relationship between competition and the number of adopting TMA and AMA systems while this study adopts four types of competition (bidding for purchase or inputs, competition for manpower, quality competition and price competition).

Recent studies suggest that adopting innovation should be viewed by managers within organisations as a strategic decision for maintaining their firms' competitiveness (Langfield-Smith, 2008; Otley, 2008). This research therefore covers this area, which has hitherto been ignored. It is hoped that this work will contribute to the discipline of management accounting by presenting theoretical and empirical evidence derived from a developing country (SA), and establishing whether the case of the Eastern Province of SA is in line with the mainstream regarding the slow pace of adopting AMA systems or whether there are some surprises.

1.3 The Scope of the Research

This research aims to:

(a) Investigate the current management accounting practices of Saudi and non-Saudi manufacturing firms operating in the Eastern Province of Saudi Arabia and report the results of this investigation in order to establish whether these practices are in line with the mainstream regarding the continuous heavy reliance on TMA systems or not. The first part of this research therefore is a descriptive study.

(b) Explore the internal and external contingent aspects that influence the decisions of Saudi and non-Saudi manufacturing companies operating in the Eastern Province of the Saudi Arabia regarding whether or not to adopt AMA systems.

1.4 Business Environment and Research Setting

The Eastern Province is considered to be the largest region of SA, and has therefore been chosen as the place for conducting this research. There follows a brief discussion of the other reasons for selecting this particular area of SA.

(a) The industrial history of the region

Oil was discovered in the Eastern Province of SA in 1936 by the Arabian American Oil Company (ARAMCO), and this has enabled other types of industry to flourish there. Many years after the discovery of oil, the Saudi Government (SG) established development plans for building an infrastructure for SA. Each plan was designed to cover the expected development projects for the following five years and the first of these began early in 1970. At that time, the oil revenues were the only source driving the developments in SA. However, during the first development plan the SG put schemes in place that were aimed at (a) diversifying the national income resources through investing in non-oil-industries, particularly in the Eastern Province and (b) encouraging the private sector to invest in all types of industry (Al-Dehailan, 2007). Currently, some of the manufacturing firms operating in the Eastern Province are major exporters, especially to the Gulf Cooperation Council (GCC) countries and parts of the Far East and Europe (Al-Sa'doun, 2001). Therefore, targeting companies located in the Eastern Province is useful because these companies may be keen to adopt AMA systems in order to maintain their competitiveness domestically and internationally, and also because of their long history compared to the newer firms located in the centre and west of SA.

(b) The education system in the region

The discovery of oil also stimulated the SG to open the first university based on Western practices mainly for the education of Saudi people in all types of engineering and business studies. ARAMCO, which has been solely owned by the SG since 1988, has contributed by spreading the US style of education and sending a large number of Saudi people mainly to the US and UK in order for them to receive a Western education. As the number of people graduating both at home and abroad increased year on year, the business language used within organisations was influenced and the English language has become the first language in some companies. It may be expected, therefore, that since a large number of the Saudis currently working in the manufacturing firms in the Eastern Province have received an education based on the Western style, some innovative ideas will have been taken up and implemented and it is for this reason also that this area has been targeted for the study.

(c) The multi-culturalism of the region

According to Idris (2007), the Eastern Province of SA is considered a multi-cultural society because people from other countries have lived in this area for many years. He mentions that some of these people work in top level management in companies located in this area, which could prove fruitful when studying certain contingent aspects, such as the style of management structure within organisations (the concentration of authority vs. the empowerment of authority).

1.5 Organisation of the Research Study

Chapter Two of this study presents an in-depth discussion of the alleged crisis in management accounting and the reaction of other researchers regarding it, and the criticisms leveled at all TMA systems.

Chapter Three provides an overview of the literature that has dealt with TMA systems in order to establish whether these systems are still dominant in practice or whether there has been a move toward adopting AMA systems. It is important to note that the selection of topics discussed in this chapter is based on the criticisms leveled at TMA systems.

Chapter Four begins by describing the innovations and their classifications. A discussion follows on the drivers that may or may not lead to adoption of an innovation in management accounting. The second part of the chapter looks at some well-known AMA systems, the arguments regarding them and how their adoption may be associated with certain contingent aspects.

Chapter Five discusses in detail the shortcomings of some of the frameworks used by other researchers for studying change in management accounting, and how the contingent perspective avoids these drawbacks and provides a broad explanation regarding decisions about adopting or not adopting AMA systems.

Chapter Six describes the design and methodology of the research. The first part mainly sheds light on the research problem and the contents of the research investigation, while the following part focuses mainly on the research methodology

and the selection of the research methods utilised for collecting the research data. Also, this chapter covers analysis of the first part of the questionnaires and the interviews.

Chapter seven presents the analysis of the second and third parts of the questionnaires.

Chapter eight covers two aspects. The first focuses on studying the direct relationship between the dependent variable and each independent variable utilising a correlation test. The second focuses on presenting analysis of the logistic regression. However, before conducting the logistic test, several statistical tests were performed (see Appendix D).

Chapter nine analyses the qualitative data collected from 20 companies through the semi-structured interviews. The major aims of this chapter are to gather detailed information about the application of management accounting practices within the interviewed firms and to study in depth the factual drivers that have prompted the interviewed firms to adopt or not adopt AMA practices.

Chapter ten provides the research conclusion, discussing the main findings of the quantitative and qualitative data analysis and suggesting some areas for future research.

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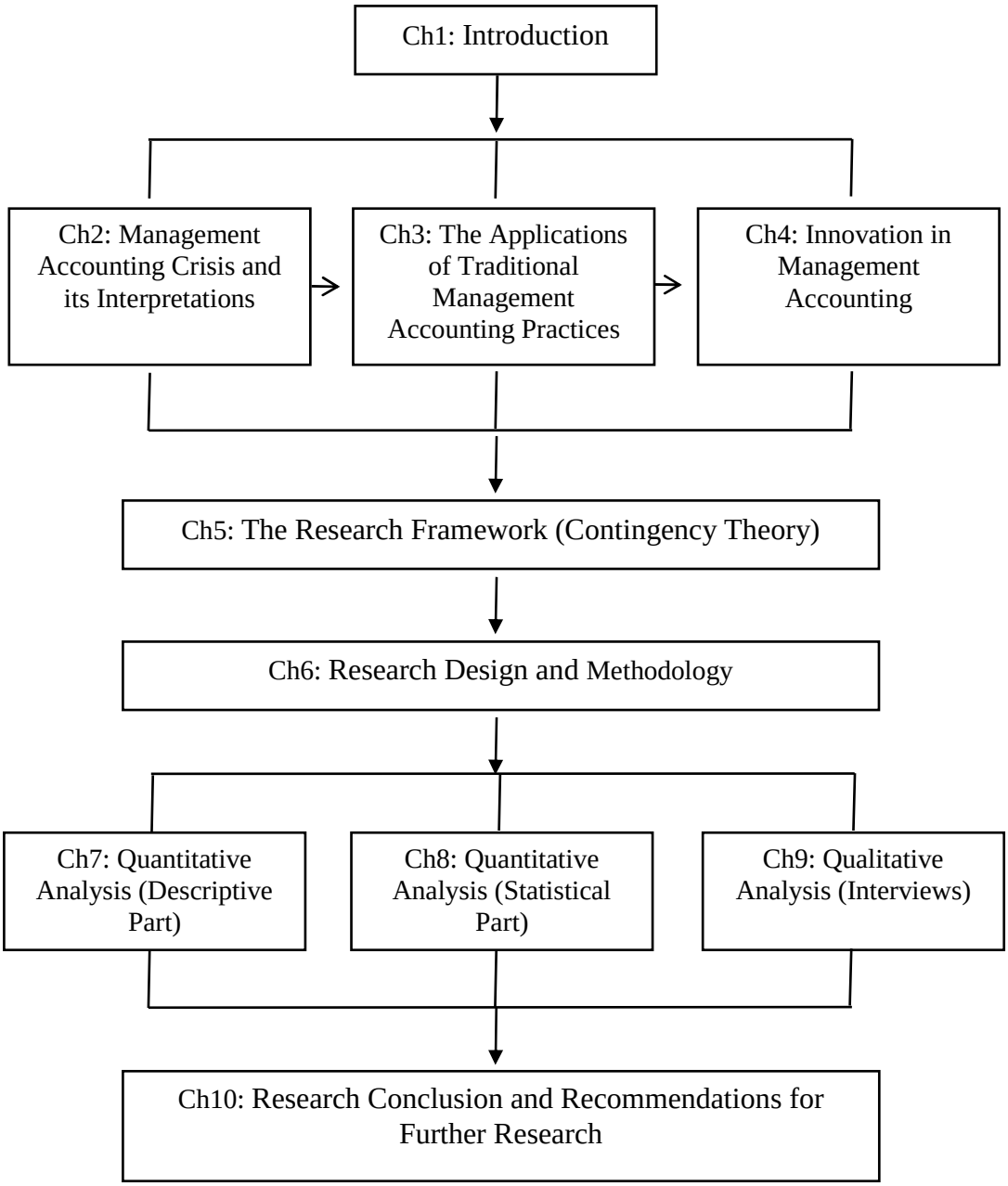

Figure 1.1: The Structure of the Research

Chapter Two: The Management Accounting Crisis and its Interpretations

2.1 Introduction

As mentioned in the previous chapter, some Western management accounting scholars deemed that management accounting was in a deadlock and faced a real crisis. This chapter aims to: (a) discuss how management accounting has developed over time in order to explore whether this development was motivated by some contingent aspects and establish where the roots of this alleged crisis lie, (b) shed light on how the crisis has been interpreted, and (c) present the reactions of other researchers regarding the alleged crisis, on the one hand, and the criticisms leveled at TMA systems on the other.

2.2 The Sequence of Developments in Management Accounting

Despite the wide spread belief amongst Anglo-Saxon accounting historians that management accounting as a discipline did not exist until the middle of the twentieth century, some of the practices referred to in the management accounting textbooks today have their roots in previous centuries (Loft, 1995). However, these practices were known as factory systems or industrial accounting and were developed after the system known as cost accounting (Garner, 1954). During the early epoch, cost data was mainly used to serve firms' financial purposes, but with increasing competition and the mechanisation of manufacturing, entrepreneurs realised that there was a need to broaden the scope of this accounting tool. Hence, it is fair to say that management

accounting was a result of the sequence of developments in cost accounting although the two methods differ in scope. It is important to note here that the vast majority of accounting historians still refer to the developments in cost accounting as occurring in two stages: a) cost accounting before the industrial revolution (IR), and b) cost accounting after the IR.

2.2.1 Cost accounting before the industrial revolution

Reviewing the history of cost accounting was a topic of concern mainly during the twentieth century. However, as yet there has been no consensus amongst accounting historians regarding when and how cost accounting appeared and was practiced. As an example, Johnson (1981, p.510) stated that "accounting historians have long endorsed the view that cost accounting is a product of industrial revolution" (see also Littleton, 1981, p.320). In contrast, Garner (1947) pointed out that the roots of cost accounting can be traced back to the mediaeval era. He ascribed the early appearance and use of some cost accounts and practices to two reasons. First, the growth in commerce among European countries, particularly in the field of industry, stimulated some enterprises to adopt appropriate techniques and accounts in order to be consistent with the nature of that job. Thus, some entrepreneurs benefited from using the double-entry procedure to control and organise their manufacturing activities. In addition, industrial records or accounts for such items as "Ore, Lead, Mine and Foundry, and General Expenses" have emerged. However, there is no clear-cut evidence that these records contain any reference to the term *cost* until the emergence of the accounts relating to '*cloth manufacturing and sold*' of medici business interests in the late fifteenth century (p.386).

During the subsequent two centuries, according to Garner (1954), there was a remarkable development in industry and the heavy use of machinery in manufacturing led to some improvements and refinements to the accounts of these industries. Thus, Garner believed, contemporaneous problems, particularly relating to the allocation of the burden of work could be traced back to the utilisation of those simple accounts. Capitalism can also be seen as a major impetus that enthused entrepreneurs to adopt better accounting practices in order to manage their expenditure and utilise information gathered from the past to draw up future business policies. Therefore, as Garner pointed out, the modern system, known as the job-order-costing system, has been used by industrial enterprises for a long time. For the abovementioned reasons, Garner stated that the early cost accounting system was used to "provide accounting control over the steps of production and to curb waste in the use of materials and labor" (ch1, p.25). He was convinced that it is a mistake to link the appearance of cost accounting with the rise of the IR, although undoubtedly it provided the impulsion for the profound development of cost accounting practices (p.387).

Solomons (1969) affirmed Garner’s view regarding the early appearance of some cost accounting techniques, but as he said they were not used extensively. He pointed out that it would be unlikely for small industrial enterprises operating at that time to adopt industrial accounts or even develop new double-entry book-keeping systems due to the simplicity of their manufacturing processes and the limited number of products being manufactured. However, some large industrial enterprises were certainly keen to adopt industrial accounts not for monitoring their industrial activities, but for setting up an appropriate pricing policy for their products and distinguishing profitable from unprofitable activities.

Edwards and Newell (1991) argued that industrial accounts were not in use before the IR was due to the "absence of keen competition" (p.36). Hence, they deemed that most industrial enterprises were able to competently run their businesses and achieve their targets within the bounds of limited accounting information. However, with the increase in the number of industrial firms and the growth of mechanisation, particularly during the seventeenth century, the need for more reliable data became necessary if firms were to survive. Thus, Littleton (1931) pointed out that adopting industrial accounts for the continuing reporting of manufacturing transactions within a double-entry framework could not lead to better practice as recommended by capitalism nor assist firms' competitiveness and decision-making because it wholly relied on historical data (see also Winjum, 1971). From the above discussion it can be inferred that some manufacturing enterprises had adopted some cost accounting techniques and accounts from the first appearance of primitive industry and tried to benefit from the double-entry bookkeeping system by establishing an industrial system that only reflected the results of manufacturing activities, although not with complete success (Edler, 1937; Yamey, 1949).

2.2.2 Cost Accounting after the Industrial Revolution

Despite several accounting historians being convinced that the dramatic development of cost accounting coincided with the IR, they have acknowledged that there was some development before that time, particularly in the textile, steel and other heavy industries, and the railroads and retailers. However, historians have characterised the literature of cost accounting before 1885 as showing a dearth in activities which restricted management, specifically UK managers, from utilising cost data in their

decision-making compared to their counterparts in the US. Noble (1929) argued that although the UK entrepreneurs and students of cost accounting were aware of the existence of the factory system and records years before their counterparts in the US, studying cost accounting in detail was not a subject of interest due to insufficient time and rivalry from other educational topics. Correspondingly, Stacey (1954, p.22) stated that “until the ramifications of economic progress pressed the art of accountancy into prominence in England, little was taken in it by the representatives of emancipated learning, unlike in Scotland where men of eminence paid homage to it”. Fleischman and Tyson (1993) argued that in addition to the reasons cited by Noble, the absence of accounting professionals and the rapid developments of US cost accounting, in particular the introduction of the superior invention of Frederick Taylor's scientific management movement, led to cost accounting remaining underdeveloped.

Johnson (1981) was not convinced by the above idea and argued that even if these views regarding the UK textile factories lagging behind their US counterparts are accepted, this does not necessary imply the superiority of American textiles. As an illustration, the production style in most "American mills tended to adopt multi-process operations while English mills were often larger in size and tended to be specialised in a single process" (p.517). Therefore, the lack of cost accounting applications in the UK compared to the US, if there was, before the last two decades of the nineteenth century could be seen as being due to the different way each country had of managing production. With this in mind, the dearth of cost accounting research during this period in the UK could be due to the rarity of cost accounting proponents, the modernity of some cost accounting applications, and the absence of communication between academics and practitioners to establish subscribed grounds

for cost accounting research which requires reliable data and unambiguous access to the production activities within enterprises. At the same time, several studies have substantiated clear-cut evidence regarding the interest in cost accounting research and the use of cost data for managerial purposes among UK managers in the years before the IR. For example, Solomons (1969) pointed out that cost accounting research has attracted UK researchers since 1887. Noble (1929) has gone further and argued that UK entrepreneurs have applied a wide range of cost accounting applications and used cost data for several managerial purposes since the book "*on the economy of machinery and manufactures*" was published by Babbage in 1835. Moreover, Fleischman and Parker (1991) carried out an extensive archival study of 25 large UK iron and textile industrial firms operating in the period 1760-1850. Their results demonstrate that mature cost management could be clearly identified in four major areas, particularly as regards cost control and standard utilisation.

Fleischman and Parker noticed that because of limited profit margins and increasing competition amongst these types of industrial firms, UK entrepreneurs were very keen, at least a century before the IR, to develop and adopt sophisticated techniques that did not rely on historical data in order to control their costs on the one hand and assist their decision-making policy on the other. This early movement from the restricted use of cost data only for financial purposes to the much wider area of managerial purposes by some UK firms would seem to disprove the view of Pollard (1965) that UK managers did not used accounting information to guide their decisions due to the lack of acute competition in the market during the seventeenth and first part of the eighteenth centuries. Furthermore, Fleischman and Parker's results refute the view that links the crucial development of cost accounting with the IR. Accordingly,

it may be more accurate to state that some of the applications that are illustrated in the cost and management accounting curriculum today were serving managerial purposes and practiced by managers centuries ago; this is not to say that such practices were without problems. For example, before 1890 there was almost no inclusion of the manufacturing burden in the factory costs of production, but after the IR this problem almost disappeared. In addition, the integration of factory accounts with general accounts was finally achieved. As a consequence, it is logical to say that the challenges imposed by the IR led to the development and refinement of cost practices, particularly in the late nineteenth century. During the first two decades of the subsequent century cost accounting practices such as standard costs, job costs, joint costs and others became highly developed and stable (Ashton *et al*., 1995). However, a real threat has recently manifested itself in this sphere as a result of the rapid developments in technology and the increasing intensity of competition. Thus, managers, particularly those operating in industrial firms have realised that the required response to these new threats is not the restricted use of accounting information, in particular cost data, for financial purposes, but rather a broader application should be considered. In other words, "accounting should be utilised as a tool to serve firms' objectives and to formulate firms' policies based on recorded business data" (Coleman, 1949, p.179).

The emphasis on management accounting has since increased and the fourth decade of the twentieth century witnessed the birth of management accounting as a subject being taught in US universities (Anthony, 1989). However, the emphasis on managerial issues in the cost accounting textbooks that were predominant at that time was limited and this can be attributed to two reasons. First, the only formal

managerial textbook was that of William J. Vatter (1950), although he was at first reluctant to publish as he felt much more work and reform was required. Second, most managerial textbooks that were published after the middle of the last century encompassed almost all cost accounting practices and techniques without any further developments. Two decades later, more than fifty four percent of the contents of the most popular cost accounting textbooks placed a heavy emphasis on managerial issues (Horngren, 1989). So, the majority of cost textbooks that were published during the last two decades of the twentieth century were categorised as cost and management accounting texts, which implicitly reveals the importance of the subjugation of cost data in serving firms' objectives. However, although the conspicuous change in emphasis that has occurred in the management accounting curriculum, it is charged by inertia to serve firm competitiveness and fulfill managers' needs, which implicitly points to the beginning of the management accounting crisis.

2.3 The Management Accounting Crisis

So far there is no agreement amongst Anglo-Saxon academics and practitioners regarding the reasons that have been driving the management accounting crisis. For example, Kaplan (1985) believed that the business environment during the 1980's faced tremendous turmoil and changes resulting from the rapid developments in technology and information systems. However, these rapid changes, particularly in the manufacturing environment, did not overwhelmingly influence TMA practices and techniques and therefore a crisis occurred.

Choudhury's view (1986) was, in part, consistent with that of Kaplan, but he argued that it is a mistake to presume that the tremendous changes in the business

environment were due only to the remarkable developments in technology. There were also noticeable organisational and social upheavals that enhanced the changes in the business field that were only minimally reflected in changes in TMA practices, thus precipitating a crisis. On the other hand, Eiler and Cucuzza (2002) attributed the appearance of the management accounting crisis mainly to the heavy emphasis placed on financial accounting by academics and professional bodies and less concern being given to management accounting rules and principles.

Irrespective of the reasons that have driven the management accounting crisis, two major paths have been followed to interpret that alleged crisis. Some American scholars claimed that TMA practices had become outmoded, and that changes to these practices was necessary (relevance lost theory). The second path entailed increasing recognition amongst some academics and practitioners regarding the divergence between management accounting theory and practice. The following discussion sheds light on both perspectives.

2.3.1 The management accounting crisis and relevance lost theory

Kaplan (1984) pointed out that most TMA practices had remained steady since they were developed in 1925. He argued that these practices were only suitable for that period due to the simplicity of the business environment and the limited use of technology in production. However, because the business environment has become more complex due to the increasing intensity of global competition, wide fluctuations in currency exchange rates and raw material prices, and the excessive use of advanced technology in manufacturing, TMA practices and techniques have become clumsy and need to be redesigned to cope in the new competitive environment in order to

serve firms' objectives effectively and efficiently. For that reason, Robert Kaplan (1983, 1984, 1985) published a series of papers demonstrating the obsolescence of current TMA practices, including (MAS). He concluded by publishing the polemical monograph entitled: "*Relevance lost: The Rise and Fall of Management Accounting*" in 1987 in collaboration with his colleague Thomas Johnson. Johnson and Kaplan claimed that management accounting has lost its relevance due to its incapability of dealing with rapid changes in the business arena. Their observations and critique of current TMA practices was subsequently summarised by Drury and Tayles (1994, p.444) in the following points:

1. Conventional management accounting does not meet the needs of today's manufacturing and competitive environment.
2. Traditional product costing systems provide misleading information for decision-making purposes.
3. Management accounting practices follow, and have become subservient to, financial accounting requirements.
4. Management accounting focuses almost entirely on internal activities and relatively little attention is given to the external environment in which the business operates.

In the light of the aforementioned criticisms Johnson and Kaplan (1987) put forward solutions for the shortcomings they had highlighted, and in particular proposed reforms to the existing MAS, which are summarised as follows:

1. It is not wise for firms to employ one accounting system for different purposes because firms' activities do not usually occur at the same time. Therefore, with regard to process control, a MAS must provide regular reports, e.g. hourly, daily, weekly, that contain adequate information to

guide managerial decision-making regarding each stage being controlled. However, with regard to product cost information, "MAS requires a longer time horizon because longer-run variable costs are the most relevant for estimating product costs" (Johnson and Kaplan, 1987, p.248).

2. The roles and principles for allocating costs in a process control system should be distinguished from those for a product costing system because the first involves less than the second. Furthermore, process information reflects only manager responsibility, so any costs that do not relate to that responsibility centre should be taken away. In contrast the product costing system traces all the costs to product, which involves extensive allocation, particularly as regards overhead costs.
3. Relying solely on financial measures that use a short-term profits policy for evaluating firm performance will not serve firm competitiveness. Hence, it would be better for the firm to abandon the 'managing by number policy' and use components of financial and non-financial measures in order to evaluate its performance in terms of its long-term profit policy.

From the above solutions, it is clear that Johnson and Kaplan were not satisfied with the integration between financial and cost accounting systems. Thus, they argued strongly for the relinquishment of this integration and the adoption of the cost management principles proposed by Hamilton Church during the nineteenth century (Hopper and Armstrong, 1991). Additionally, they recommended adopting the Japanese management style as a benchmark for surmounting the problems attributed to TMA practices. Although some European scholars of management accountancy were in partial agreement with Johnson and Kaplan’s diagnosis regarding the ineffectiveness of some TMA practices and their recommended remedies (see for

example Drury, 1996; Clarke, 1995), others were somewhat skeptical on both counts. For example, Bromwich and Bhimani (1989) pointed out that the US economy had struggled with turbulence, particularly during the second half of the twentieth century due to the rapid growth of the Japanese economy. At the same time, the UK economy was settled and TMA practices were not deemed to be in crisis because they responded well to the developments that had occurred in the business field. Therefore, Bromwich and Bhimani argued that the alleged crisis referred only to the failures of US management accounting and it would be wrong to extrapolate from these facts. This interpretation is wholly consistent with Hayes and Abernathy (1980) who maintained that the decline in the US economy was mainly due to managerial failures and the reluctance of some American managers to adopt innovative techniques in imitation of their counterparts in Europe and Japan. Some UK scholars also doubted the credibility of Johnson and Kaplan's thesis. For example, Roslender (1996) stated that it was clear that Johnson and Kaplan had based their theory upon their personal experience of a limited number of US companies, and that a "constructive critical accounting project is not something which can be determined by one person" (p.554).

Ezzamel *et al*. (1990) also presented a vehement critique of Johnson and Kaplan's thesis. They pointed out that it was questionable as to whether either the diagnosis or solutions suggested by Johnson and Kaplan were applicable to the Western environment because they were based entirely upon the Japanese model and neglected to take account of the differences between the cultures. Despite Ezzamel *et al*. having acknowledged that there were several positive aspects to the Japanese management style, such as effective communication channels between top management and workers and the workers' loyalty to top management, it also incorporates some

inhumane systems, e.g. the exploitation of female workers. In addition, the history of cost and management accounting as portrayed by Johnson and Kaplan was criticised by Ezzamel *et al.* as being inaccurate:

> "accounting became such a structure and a way during the 19th century…in this respect we fundamentally concur with Johnson and Kaplan, but we don't agree with the precise history that they tell, nor with the understanding of accounting and its power to which their history leads them" (p.156-157).

Ezzamel *et al*. believed that the criticisms leveled at management accounting were not new and that several problems had existed even with the cost management as practiced during the nineteenth century. Moreover, they noted that the MAS proposed by Johnson and Kaplan focused entirely on techniques for calculating costs, whereas they were of the view that more emphasis should be placed on the "behavioral and organisational contexts in which the MAS are operated" and "understanding the relationships in which firms interacted with external institutions" (p.163-64). Equally importantly, Ezzamel *et al*. pointed out that despite Johnson and Kaplan's preoccupation with the MAS implemented by Lyman Mills during nineteenth century, the essence of that accounting system was heavily managed by the final results which depended on numbers. Thus, Ezzamel (1994) anticipated that the use of numbers to evaluate firm performance will maintain its importance for the foreseeable future, even in Japan.

Noreen (1987) took an opposing view to that of Ezzamel *et al*. (1990) and favoured the portrayal of the history of cost and management accounting expounded by the authors of the relevance lost thesis. However, he argued that most of the remedies recommended by Johnson and Kaplan were so vague it was difficult to envisage how they could be put into practice:

> "the later chapters which sketch the authors' recommendations are more speculative than provocative…frankly, they read like an advertisement for consulting services" (p.116).

By the same token, although Hopper and Armstrong (1991) lauded Johnson and Kaplan's work, they were doubtful as regards the practical side of utilising the transactional cost theory that had been constructed by them to explain the American management accounting crisis. Hopper and Armstrong believed that the crisis was not only a consequence of the rapid developments in technology, which led finally to the stagnancy of American TMA practices, but that the initial problem began once the labour unions achieved positions of power and became efficient at bringing pressure to bear on the industrial owners. As a response to this pressure, and the resulting social and economic conflicts, the owners realised that there was a need to develop new forms of control in order to curb or at least accommodate employee resistance and solve the associated problems of profitability. Thus, Hopper and Armstrong argued that it was the growth of labour conglomerates that lay behind the American management accounting crisis.

Despite the work of Johnson and Kaplan containing several shortcomings as some management accountant scholars have argued, it was and still is one of the most powerful and influential theses to be written on this subject. Arguably, their study can be characterised as providing the first serious shock to draw the attention of both academics and practitioners to the problems presented by TMA practices, even though Johnson in particular retreated from his support of the relevance lost theory (Johnson, 1994, p.261-262). Moreover, their work encouraged several researchers to take an in depth look at practice of management accounting.

2.3.2 The management accounting crisis and the alleged discrepancy between theory and practice

Some thirty years ago the management accounting curriculum was a matter of concern mainly in Western countries in terms of what should be included in its common body of knowledge (Hawkes *et al*., 2003). Evidence indicated that there was considerable inconsistency in the viewpoints of the academics and practitioners, which eventually led to the academic research having little influence on the practice. For example, Deakin and Summers (1975) carried out the first survey in the US to determine the level of harmonisation between what had been illustrated in the management accounting curriculum and what was happening in practice. Thirty-nine management accounting topics that were listed in the most popular textbooks were selected in order to determine the extent of their importance and usefulness for both practitioners and academics. Their results exposed that in the practical arena managers were still convinced that performance evaluation and responsibility accounting were significant areas for them, irrespective of the tools being used to achieve them. On the other hand, it was quantitative techniques such as corporate planning, simulation, and linear programming that were the main concerns of the academics. With this in mind, the majority of practitioners justified their negative response to the more advanced techniques proposed by the academics as being due to their complexity and the lack of experience required for implementing them. Accordingly, the gap between the two groups was distinct.

In a similar vein, Knight and Zook (1982) undertook a study also in the US that aimed to identify the similarities and differences of the topics required for developing financial and managerial accounting education. Large-scale questionnaires were sent to 500 certified public accountants (CPAs) and management accounting controllers

working in large companies in order to survey their opinions on 72 topics developed by a subcommittee of the American Accounting Association. The results of the survey revealed tremendous differences in the emphases placed by each group on the chosen topics. Knight and Zook therefore suggested that co-operation amongst educators and practitioners should be established in order to enhance the quality of the accounting curriculum and what takes place in practice.

Even though the earliest endeavours to investigate the extent of compatibility between management accounting practice and the management accounting curriculum were first established in the US, this type of study thrived in the UK during the 1980s. For example, Scapens (1983) pointed out that the way of practicing management accounting in UK companies was very different from the picture portrayed in most management accounting textbooks. He argued that this difference could be due to the nature of the management accounting textbooks that existed at that time because most academics illustrated management accounting "only as series of techniques and that could be relevant only for teaching, but practitioners have different perspectives and they have always seen management accounting as more than a set of techniques" (p.34). For that reason discrepancies appeared between the actions of the two parties (academics and practitioners). In other words, the practitioners claimed that most of the management accounting techniques and methods portrayed by academics in the textbooks were unsuitable and impractical, while academics ascribed the gap to the unsuccessful adoption and implementation of the modern techniques by the practitioners.

Scapens started to look behind this problem not only to determine the reasons that led to the gap between theory and practice, but also to determine the party responsible for the gap. He discovered two facts: first he noticed that most techniques proposed pragmatically by academics were not only structures based on concepts developed in the middle of the last century, but were also lacking in any theoretical framework, which served to lessen their merit. Second he saw that the majority of academics promoted modern techniques as being fit for purpose without unambiguously elucidating the problems associated with implementing them. Based on these two facts, Scapens sided with the practitioners and charged the academics with sole responsibility for the gap between theory and practice. Hence, he argued that in order to address the situation and narrow the gap between academics and practitioners it would be necessary for the academics to fully comprehend and realise the nature of the existing practice before attempting to persuade practitioners to adopt the proposed techniques. Additionally, anticipating and understanding any problems that might be associated with the suggested techniques should be a priority before offering the new techniques to practitioners. Full collaboration between the parties would also be important in narrowing the gap. Irrespective of the above recommendations proposed by Scapens, the actual purposes of publishing the article can be seen as to encourage researchers to investigate in depth this new phenomenon on the one hand, and on the other to take more well planned steps toward changing management accounting rules and concepts in order to be consistent with what is taking place in practice.

Otley (1985) subsequently affirmed Scapens's view regarding the existence of a gap between theory and practice and stated that "the results of management accounting research have had little impact on practice"(p.16). He argued that the minimal impact

of the research was mainly due to two reasons. First, most of the management accounting research done at that time had no theoretical underpinning, which led it not only to be less valid, but also hard to generalize from. Thus, Otley's perspective was wholly consistent with Scapens's view regarding the necessity of constructing research upon a valid theory in order to enhance its validity. Second, there was too much emphasis on the deductive approach in most management accounting literature at that time, with less attention paid to the inductive approach, and as a consequence a gap had appeared between theory and practice. Otley suggested three optimal solutions to the problem of bridging this gap. First, the researcher's responsibility should not be confined to testing their null hypotheses and then publishing their work; they should also take full responsibility for generalising from their results. Thus, researchers will become more aware and take care to base their work upon a valid perspective. Secondly, it would be advisable for researchers to investigate the real world through close observation in order to develop their own theory or establish a so-called 'grounded theory'. This would not only serve to enrich the management accounting discipline, but also open new avenues for other researchers. Thirdly, researchers should fully recognise that the research process requires a clear coherence between both inductive and deductive methodologies in order to correctly interpret what is precisely happening in practice. The achievement of Otley's three recommendations may well facilitate the bridging of the gap.

Although both Scapens's and Otley's scenarios were and still are the works most often cited by researchers studying the conformity (or lack of) between theory and practice, Chouldhury (1986) stated a different viewpoint and implicitly criticised their works. Although he avowed that management accounting research tends to be isolated from

the practice it does not necessarily follow that it has had little impact. In other words, he pointed out that most management accounting research has been undertaken as individual endeavours and it is difficult to establish whether or not it has had either a direct or indirect impact on firms' strategies, particularly in relation to the area of decision-making. Hence, he argues that the divergence of theory from practice should be seen as natural and not considered as a phenomenon. Also, it is deemed by Chouldhury that the methodology of grounded theory, suggested by Otley as being important, can be perilous, particularly for the inexperienced researcher as it may lead away from the real problem. In addition, it seems questionable to place sole responsibility for the inconsistencies between theory and practice on the academics, as arguably both academics and practitioners have played a part. Chouldhury argued that, as illustrated in the majority of management accounting literature, there is some consensus amongst academics and practitioners regarding the necessity and usefulness of adopting problem-solving approaches to narrow the apparent gap between theory and practice. He saw this consensus itself as creating the alleged gap because it precludes academics' creativity. Thus, detachment is necessary and could be the first step toward approximating the differences between theory and practice. Equally importantly, since the majority of practitioners are convinced that the solutions proposed by academics for particular problems are voiced from an individual standpoint, the advice is often ignored as being untrustworthy due to the absence of opinion pluralism. Chouldhury thus argued that, in order to enhance credibility and convince practitioners, relevant management accounting research should be carried out by more than one person, preferably with at least one member from each group.

Contrary to Chouldhury's view, Baxter (1988) shared the concerns of Scapen and Otley. He argued that practitioners desire timely and abbreviated practicable solutions for their problems, and these must be free from jargon and mathematical patterns. Conversely, academics claim that it is worthless to construct research solely upon a theoretical background without the use of mathematical or statistical tools to clarify the body of the research and make it more convincing for users. Baxter reviewed a sample of articles published by academics in order to make a fair judgment and found "around half of them either incomprehensible or repellent to most accountants" (p.1). Consequently, he pointed out that it is not wise to blame practitioners for ignoring the majority of academic research. He suggested two solutions to this problem. First, academics should discover different tools from those they are used to using because few practitioners come from a mathematical or statistical background. Second, professional bodies should not avoid this controversy, but should participate by suggesting a list of practical problems and encourage academics to devise sensible solutions to them, giving those academics precedence in publishing their works. Otherwise, the discrepancy will continue and may become wider.

MacLean (1988a) argued that the discrepancy between theory and practice was mainly due to the contents of the management accounting curriculum and the examinations set by professional bodies. He argued that most management accounting subjects taught at universities rely on research that was published years ago. Additionally, most management accounting examinations still contain few questions that relate to practical matters. Therefore, the appearance of this discrepancy is inescapable. Other reasons such as the "time lag between theory and practice, the irrelevancy of management accounting theory, and inactivity of practice" (p.46) can

also be seen as significant reasons aggravating the acuteness of strife between academics and practitioners. With regard to the responsibility issue, MacLean (1988b) did not charge academics with sole responsibility, but argued it should be shared equally. He pointed out that the discrepancy between the groups could be lessened if the two parties co-operated. For example, academics need to grasp what the daily activities within an entity are, which is hard to achieve without access to these activities, and practitioners should therefore lend a hand to academics in this regard. Conversely, academics should offer training programmes to practitioners in order to enlighten them about modern trends in theory. Such co-operation would not only lead to the promotion of management accounting research, but would also assist in re-writing the management accounting curriculum to be consistent with what takes place in the real world, and students would then be ready for a career. The absence of co-operation between the parties will mean the continuing enhancement of the practitioners' view of the management accounting curriculum and academic research as resulting in a ragbag collection of techniques.

Edwards and Emmanuel (1990) carried out a large-scale questionnaire study in order to ascertain whether or not the alleged disparity between management accounting practices and academics also existed in Scotland. Their questionnaire was divided into three issues: technical, organisational and societal. The respondents were asked to determine the level of importance of each topic illustrated under those issues. Their results revealed that there was a noticeable difference between the groups, with the academics placing much emphasis on the importance of organisational and societal issues, whilst the practitioners were of the view that technical issues were of greater importance. Edwards and Emmanuel attributed this divergence not only to the time

lag between theory and practice but also to the lack of communication between the groups. They also noticed that the majority of academic research relies heavily upon thoughts and concepts borrowed from psychology, sociology and other such disciplines, which most practitioners are less than familiar with. Hence, they suggested that using better communication mechanisms and relinquishing unpopular concepts borrowed from other disciplines would enhance the influence of academic research on practice.

Kaplan (1984) attributed the lack of influence of academic research on practical matters to the fact that simplistic economic and operational research models heavily underpin the constructions, rather than the focus being on the actual problems within entities and suggesting practical solutions. Also, the heavy use of quantitative techniques since 1960 marked a remarkable shift in academic research but has not extended to the domain of practical management accounting. For this reason, a gap appeared between the two groups, and arguably academics can be held solely responsible for this.

From the above theoretical discussion it can clearly be deduced that academic research has been irreconcilable with the deep-rooted concepts and beliefs of the practitioners. This discrepancy between theory and practice arose unambiguously. Even if it is held that a management accounting crisis has been identified only within the US, this does not mean that management accounting research in the UK has been capable of convincing UK practitioners to modify their traditional practices. It is clear that management accounting in both countries has been in trouble, at least as regards the minimal effect academic research has had on practical matters, which calls the

assertion of Bromwich and Bhimani (1989,1994) that UK TMA practices do not seem to be in crisis into question. Arguably, UK management accountants share their US counterparts' concerns regarding the dominant use of TMA practices, despite several changes occurring in the business arena. This is clearly the situation from Hopwood's (1985, p.229-230) viewpoint:

> "still, however, traditional notions of management accounting craft are firmly entrenched, as Kaplan's chapter makes clear. As someone from the United Kingdom…I have to agree with his view that accounting is still about accounting. In most of its manifestations it appears to remain an organisational practice rather loosely connected with changes occurring in other organisational arenas. Its emphasis is still on the narrowly financial, the short-term, and the organisationally constraining."

Unquestionably, the efforts and observations made by some Anglo-American management accountancy scholars have legitimised firstly, the re-evaluation of the usefulness of TMA practices; secondly, the need to understand the mode of practitioners and the re-writing of the management accounting curriculum in order to prepare students for their careers; and lastly, the need to take serious steps toward changing the art of management accounting.

2.4 Summary

This chapter has discussed the sequential developments of cost and management accounting since its primitive appearance in the mediaeval era, and how some contingent aspects have participated in this development. As illustrated in the first part of this chapter, several contingent drivers, including capitalism, growing commerce among certain European countries, competition, and the heavy use of automation (especially among large iron and textile firms in the UK and USA), have led to the birth and adoption of modern costing systems before and after the IR.

The rise of globalisation and the rapid development in information systems which occurred during the last two decades of the 20th century led to the appearance of several AMA systems. As discussed in the previous chapter, several researchers have found that the adoption or non-adoption of AMA systems is related to certain contingent aspects. Therefore, it is not unfair to say that from the mediaeval era until recently, contingent aspects have been considered crucial elements which may trigger firms to adopt or not adopt innovation in management accounting.

This chapter has also shed light on how the management accounting crisis has been interpreted. As noted, despite some researchers extolling the theory proposed by Johnson and Kaplan (the Relevance Lost), others have criticised this contribution or suggested solutions for TMA systems proposed by these two authors. This criticism may in fact justify the low level of adoption of AMA systems, even in most industrialised countries.

Since MAS is considered part of the organisational structure, a firm has the full autonomy to select the MAS that satisfies its needs, whether it be traditional or modern. Therefore, and in line with the first aim of conducting this research, the next chapter covers certain issues that are at the heart of Johnson and Kaplan's critique in order to explore in depth whether or not practitioners are convinced regarding the limitations attached to TMA systems, and whether or not these systems still make sense, even within today's business environment.

Chapter Three: The Applications of Traditional Management Accounting Practices

3.1 Introduction

This chapter discusses the following topics: costing systems within organisations, information tools for decision-making, planning and control systems, transfer pricing, and financial performance measures. It is important to explain that the selection of these topics was chosen because they are consistent with the core critique proposed by Johnson and Kaplan (1987), and because they have received much attention in the management accounting literature.

3.2 Accounting Systems and Costing Prctices within Organisations

As indicated by Drury *et al*. (1993), the accuracy of product costing measurements has received much attention since the late 1980s. At the core of this attention, there have been two main issues: (a) the quality of the information produced by MASs within organisations, and (b) the logic and accuracy of the methods used for allocating overhead costs to products. Light will now be shed on these two main problems, including other applications of costing systems.

Brierley *et al*. (2001) pointed out that, according to Johnson and Kaplan (1987), "manufacturing organisations require MAS that will satisfy the three goals of cost and management accounting, namely: stock valuation (a financial accounting goal), decision making, and planning, control and performance appraisal" (p.218).

Johnson and Kaplan (1987) argued that, in order to achieve the above goals, it is "unwise" to use a single accounting system which services many purposes, because this will lead to managerial information being used to serve the firm's financial goals, with management accounting becoming subservient to financial accounting. They, therefore, sought to use multiple accounting systems, each for a specific purpose, to ensure discrete financial and managerial goals.

Additionally, Kaplan (1988) argued that using one official accounting system may lead to managers being provided with deceptive information, particularly with regard to product/service costs information. This could in turn lead to the wrong decisions being taken by firms, which would then affect their competitiveness. Similarly, Clemens (1991) pointed out that MASs should identify the resources consumed for each single product or activity within the firm, and that this is hard to achieve when relying on one accounting system.

Some Western authors have shared Johnson and Kaplan's concerns, and supported their views regarding the limitations of using one accounting system for a variety of purposes (Horngren, 1989; Dunk, 1989). However, although using multiple accounting systems can provide managers with the high quality information needed for implementing competitive pricing policies, monitoring and controlling product costs, improving the efficiency of activities within the firm, and so on, it can be costly and time-consuming, as has been shown by a number of studies.

For example, Triest and Elshahat (2007) used questionnaire mail surveys to investigate the applications of costing systems in Egypt. The researchers focused their

study only on manufacturing firms, because the selected firms were: (a) participating actively in the Egyptian economy, (b) highly technological, and (c) experiencing economic growth and development during the previous years. Triest and Elshahat found that the integration of financial and managerial systems was common amongst manufacturing firms in Egypt, and concluded that this was due to the nature of the Egyptian economy.

Similarly, Al Chen *et al*. (1997) compared the development in costing systems amongst Japanese manufacturing firms which operated in the USA, with those operating in Japan. The researchers focused their study only on high tech manufacturing firms operating in the USA and Japan. One area investigated in this study was the number of accounting system being used by surveyed firms in both countries.

Their findings showed that 70% of the US-based Japanese manufacturers were still using one accounting system, while 60% of the domestic firms were continuing to do so. The reason for this was given as avoidance of conflict by the firms operating in Japan, whereas the firms operating in the US gave the adequacy of one system to perform all the firm's functions as the primary reason.

The dominance of using one accounting system among US manufacturing firms has also been reported in several studies (Drury and Tayles, 2000; Fry *et al*., 1998). However, Szendi and Elmore (1993) pointed out that US manufacturing firms had started to pay more attention to their strategies, and that there had been noticeable

signs indicating they had also begun to move away from using integrated systems, although the pace of change was slow.

Evidence from some parts of Europe, but not the UK, has shown the popularity of using one accounting system for multi-purposes. For example, Brierley *et al*. (2001) reported that the integration of financial systems and MASs in some Nordic countries was not infrequent. By the same token, Friedl *et al*. (2009) studied the application of costing accounting amongst the largest German manufacturing and non-manufacturing firms. They found that the integration between internal and external accounting systems was a common trend in Germany.

Joseph *et al*., (1996) surveyed 308 UK members of the Chartered Institute of Management Accountants (CIMA) working in several industrial and commercial firms, regarding their perception as to whether or not their firms' internal systems were dominated by external ones. Surprisingly, and in contrast to the above two European studies, they found that almost 54% of respondents indicated that the MASs were completely isolated from the financial systems in their companies.

The latest study undertaken by Brierley *et al*. (2007) divulges that there is a growing predisposition amongst some UK manufacturing firms to adopt more than one accounting system, or one system for different purposes, which may simply reflect the need of the managers to adopt a system which gives more accurate information in response to aggressive competition in the UK market. However, even though this tendency has been observed in the UK, we should not be too optimistic regarding the rapid adoption of multiple systems even in that country, because, as pointed out by

Brierley *et al*., the level of adoption of more than one accounting system is still not high (31%).

In light of the above studies, it is clear that the vast majority of firms, even those operating in competitive environments and using high levels of technology in their operations, are still unwilling to adopt more than one accounting system. This continuous rejection may indicate that managers are still unconcerned about how information is produced, rather about how it can be used in a flexible manner to serve their firm's main objectives. With this in mind, it can be argued that the adoption of more than one accounting system may be subject to particular circumstances, with environmental dynamism, the level of development within a society, firm size and the level of automation within firm not necessarily acting as motives for adopting more than one accounting system or one system for different purposes.

Another controversial area which has received much debate in the literature of cost and management accounting is cost accumulation methods. Cost accumulation simply refers to the way in which costs are collected and identified with regards to particular jobs, batches, processes, departments and individual customers. Two particular traditional costing methods or systems (job and process) have been criticised by a number of Western academics, mainly due to problems associated with the manipulation of work-in-process (WIP) (Sena and Smith, 1986; Williams, 1985; Dinius, 1987; Gordon, 1949).

Johnson and Kaplan (1987) pointed out that these two particular methods, which depend on much detailed book keeping, may serve firms' financial goals, but offer

little information which is useful for improving operational efficiency or for manipulating faults which may occur within the operational process. It is for this reason that the backflush method has been suggested as an alternative (see next chapter).

Turning to the empirical studies, several researchers have presented evidence regarding the continuous use of both job and process costing methods. For example, Wijewardena and Zoysa (1999) compared the extent to which these two methods had been adopted by Japanese and Australian manufacturing firms. The researchers restricted their investigation in this study to only the largest firms. Their results show that the job-order costing system was used more in Japan than in Australia (40% and 30%, respectively), while the Australian firms tended to use the process costing system more than the Japanese firms (52% and 46%, respectively).

Based on data collected by a questionnaire survey, Cinquini *et al*. (1999) reported little use of the process costing system (8%), when compared with the job-order costing system (52%), amongst Italian large and medium-sized manufacturing organisations, while the opposite was found to be the case amongst the largest Estonian manufacturing firms (Haldma and Laats, 2002).

Al-Khater (1999) used grounded methodology for investigating product costing systems (for example, cost allocation methods, cost accumulation practices, cost structure and others) used by petrochemical firms which operate in the GCC countries. He found that 19 out of 24 firms used process costing systems, even though 62.6% of surveyed firms indicated that they operate in competitive or highly

competitive environments, and 71% of respondents indicated that their production systems are considered either mostly automated or completely automated.

In India, Joshi (2001) found that 41.7% of large and medium-sized manufacturing firms use batch costing systems, while only 8 out of 60 companies use job costing systems.

Regardless of the types of costing methods which can be used in production, it can be argued that the continuing use of these two particular methods is due to: (a) the main focus of the firm's production strategy being either short or long term, or (b) the continuing emphasis, until recently, on the two systems in the cost and management accounting textbooks and professional examinations.

It has been greatly emphasised in management accounting literature that product cost information should be prepared with care, because managers use it in the main for very sensitive decisions, such as setting product prices, introducing new products or dropping particular products, evaluating customer profitability, and so on. Therefore, the type of product costing method which should be used in these types of decisions has been a point of much debate amongst both academics and practitioners.

Drury *et al*., (1993) stated that, according to Cooper, "full product costs that have been computed to meet financial accounting requirements are also commonly used as basis for decision making". Johnson and Kaplan (1987) argued that traditional product costing methods (full costing and variable) are poor at giving accurate, predictive information for a wide range of products in the long run, because the full

costing method presumes that all fixed costs remain unchanged whatever may happen within the firm in the future, while the variable method completely ignores the fixed costs.

Moreover, Johnson and Kaplan warned against using full product costs directly in decision-making, and advised that they be used only as an indicator in this process. They argued that, if senior managers rely solely on full costs when taking decisions, there is the possibility of a profitable product being dropped, or the continuing production of an unprofitable one. They have instead sought to use incremental/avoidable product costs as a basis for product decision-making, because this method involves undertaking intensive studies before the decision is made, which in turn lessens the risk of taking erroneous decisions.

They also recommended this method because it can encompass both the short and long term, whereas traditional methods focus only on the short term. However, this raises a question regarding firms which produce a limited number of products. Is it correct to assume that, in such cases, the use of traditional (historical) costing methods is worthless or gives misinformation about product costs? Also, do firms operating in non-dynamic environments really need to adopt the suggested product costing method?

Evidence from several places around the world reveals that, apart from in a few cases, there is limited use of the incremental/avoidable costing method in decision-making. For example, Lamminmaki and Drury (2001) compared the application of product costing in UK manufacturing firms and their counterparts in New Zealand (NZ). Since the size of the firm was identified as criteria for conducting this study, all small

and medium-sized manufacturing firms in both countries were omitted. Lamminmaki and Drury's results show that UK firms tended to use variable/incremental manufacturing cost methods for decision-making purposes more than those in NZ.
In a similar fashion, Hyvonen (2005) reported in his study that the variable costing system is widely used by large Finnish manufacturing firms (94%), with the emphasis on using this system continuing in the future.

Contrary to the previous two cases, Ask and Ax (1997) surveyed management accounting practices amongst Swedish engineering firms. The researchers restricted their study to one industrial sector, because they believed that this sector operates in the so-called new manufacturing environment. Despite 88.3% of the surveyed firms indicating that they face either intense or very intense competition, Ask and Ax found that most Swedish engineering firms were using either full costing (58%), or full and variable costing methods together (32%) in their decision-making. It can be argued that the heavy use of full costing in Sweden could be due to the common practice of adopting a short-term perspective in decision-making, resulting from the usage of one official accounting system.

Shields *et al*. (1991) studied the similarities and differences in product costing between US and Japanese large and medium-sized manufacturing firms. They found that the US firms were more likely to use full costing (75%) compared with their Japanese counterparts (67%). One might expect that both the American and Japanese firms would be keen to adopt the incremental/avoidable costing method, because the nature of the environment in each case involves more accurate product costs information. However, the continuing use of the full costing method may indicate the

preferences for the managers in both countries for any sensitive decisions to pass the cost and profit test, even where the firm is producing a range of products.

Other studies undertaken in China, India and Estonia have also reported extensive use of full costing in decision-making (Firth, 1996; Joshi, 2001; Haldma and Laats, 2002). Based on the international studies mentioned above, it is hard to say that the use of traditional costing methods when making sensitive decisions is in decline.

Cost structures and methods being used for allocating overhead costs was another hot topic in cost and management accounting literature. Cost structure is derived from the component elements, such as the direct material, direct labour, and production and non-production costs which comprise the total cost of the product(s) being manufactured. Langholm (1965) pointed out that the selection of the product costing method for production planning purposes depends on the firm's cost structure (also see Brierley *et al*., 2001, 2007). However, Al-Khater (1999) stated that a company can select any type of cost classification which fits with its objectives, and that this may mean there is no adherence to the elements mentioned above.

Cinquini *et al*. (1999) reported in their study that 62% of Italian large and medium-sized manufacturing firms always classified their product costs (cost structure) as for direct material, direct labour, other manufacturing costs and other non-manufacturing costs. They found that the total of the last three cost components in the total product costs was no more than 20%, while direct material was found to be the largest component among the surveyed firms.

In the same way, Clarke (1992) found that large Irish manufacturing firms classify their product costs similarly to Italian manufacturing firms. Clarke reported in his study that 81% of the surveyed firms indicated that the proportion of direct labour costs in their total product costs was less than 25%. Also, Clarke found that the combined overhead figures (manufacturing) are greater than direct labour costs. Hence, Clarke stated using a more advanced costing system, as in the Irish case, may be justifiable for controlling overhead costs. With regard to direct material, Clarke found that the percentage of this component was the largest one in the cost structure in the Irish case.

Contrary to the above two European studies, Waweru *et al*. (2005) found that 92% of South African companies (differing in size and industry) classify their product costs as fixed and variable.

In the same way, Al-Khater (1999) indicated in his study that 87.5% of the surveyed firms classify their product costs as fixed and variable, and only 20.8% of these firms classify their product costs as product and period costs. Al-Khater reported that 82.8% of the respondents indicated that the proportion of direct labour costs in their total product costs was less than 25%, while 58% of the respondents indicated that the proportion of overhead costs in their total product costs was over 25%. Additionally, Al-Khater reported that 63% of the respondents indicated that direct material was considered the largest component in their cost structure.

It has been said by Johnson and Kaplan (1987) that, due to the decline in the proportion of direct labour costs in the total product costs, and more precisely in the

manufacturing costs, and the increase in proportion of overhead costs resulting from new technological trends in operating and diversifying production, the continuing use of simplistic drivers such as labour hours/costs or plant-wide rates will distort product costs. Therefore, they have called for the adoption of more sophisticated approaches, such as the ABC system, for allocating overhead costs based on reasonable cost drivers. There now follows a brief discussion of these two traditional allocation recovery bases.

The plant-wide rate means that there is no preference as to the allocation of overhead costs based on a particular driver; instead, the firm first aggregates all the overhead costs and then allocates them directly to the product. Drury *et al*. (1993) argue that using this allocation method will lead to a distortion of product costs information, because it assumes that all activities within the firm are invariable, with the result that each unit produced receives an equal amount of overhead costs, even if it has passed through several departments, which as they pointed out, is rarely the case in practice. Despite the criticism attached to this approach, empirical evidence shows remarkable variations regarding the use of this simple recovery base.

For example, Ask and Ax (1997) reported that this base was not used at all in Sweden, while Clarke (1997) found that 52% of large Irish manufacturing firms were using it, and only a few companies in the UK were (Brierley *et al*., 2007; Abdel-Kader and Luther, 2006).

In Asia, 35% of Indian manufacturing firms were found to be still using this allocation approach (Joshi, 2001), and 31.5% of Malaysian firms also used it (Chun *et al*., 1996).

A possible explanation for the continuing use of this recovery base in different places in the world, but not Sweden, may be (a) due to the limited number of products being manufactured, or (b) because the proportion of the manufacturing overhead costs are small, and managers are convinced that there is no need for treating these costs in isolation from other factory overhead costs.

With regards to direct labour recovery rate, firms allocate the overhead costs at the end and base them on labour costs/hours, either directly or in two stages. Despite the shortcomings of this approach, several empirical studies have found that it is still favoured and used by the vast majority of manufacturing firms, even in the most advanced countries.

For example, Al Chen *et al*. (1997) compared the extent to which the labour recovery rate was used for allocating overhead costs for products in domestic Japanese firms and Japanese firms operating in the US. Their results show that there was a greater tendency for Japanese domestic firms to use labour costs than those located in the US (83% and 66%, respectively). The firms operating in Japan cited two prevalent reasons for using this method: the need for accelerating automation and the need to control labour, with the latter of these being profoundly expressed by their counterparts in the US.

Correspondingly, Brieley *et al*. (2007) cited the extensive use of the direct labour hours/costs rate in the UK, even though the proportion of direct labour did not exceed 11% of the total product cost (also see Clarke, 1992, 1997; Wijewardena and Zoysa, 1999). A plausible reason for this continuing use of the direct labour rate, even in the most industrialised countries, may be that it is important to keep an eye on labour costs for controlling purposes or simplicity.

In contrast to the previous studies, Joshi (2001) found that the vast majority of Indian firms (65%) were in favour of using direct materials as a basis for allocating overhead costs for products. The unit of outputs was the first priority for Malaysian manufacturing firms, while the direct base ranked second (Chun *et al*., 1996).

Ask and Ax (1997) noticed that most Swedish manufacturing firms used a component of the recovery rates, such as direct material, labour costs/hours, units of output and machine hours, for allocating overhead costs for products. It is clear from the above empirical evidence that companies regard traditional allocation methods in general, and the direct labour recovery base in particular, as a tenet hard to renounce.

As can be seen, the vast majority of firms are still not convinced that it is a good idea to adopt more than one accounting system and cease using simplistic approaches for allocating manufacturing overhead costs for products, which affirms the allegation raised by some Western academics regarding the existence of a gap between the theory of management accounting and its practice.

3.3 Information Tools for Decision-making

Johnson and Kaplan (1978) pointed out that the traditional tools used for decision-making purposes provide managers with worthless information nowadays, due to the increasing level of uncertainty resulting from the tremendous changes occurring in the business arena. Therefore, modern mathematical, statistical and other tools can be seen as life buoys or preservers, which may ensure a firm's survival. The following discussion revolves around three traditional information tools: cost-volume-profit analysis, traditional pricing methods and capital budgeting tools.

Drury (2007) stated that cost-volume-profit (CVP) analysis is based on the relationship between volume and sales revenue, costs and profit in short run". Johnson and Kaplan (1987) argued that the main shortcoming of this approach is was that it focuses only on the short term, which mainly serves inventory valuation, even though the current business environment necessitates using sophisticated quantitative tools for long-term planning and decision-making.

Similarly, Drury (2007) pointed out that CVP analysis presumes all variables which affect the total product costs, except the volume, are constant, and that this is acceptable for short-term decision preparation only. However, for long-term decisions, factors such as the product range, the firm's advertising strategy and others, although not the volume, also have an impact on the total product costs, which in turn diminishes the strength of the CVP analysis.

Practically, CVP analysis is still widely used for planning and decision-making purposes. For example, Clarke (1992, 1997) found that more than 80% of large Irish

manufacturing companies were using this method, while 44% of UK food and drinks firms have indicated that they often use this tool (Abdel-Kader and Luther, 2006).

Unexpectedly, Joshi (2001) noticed that the emphasis placed on CVP analysis by Indian manufacturing firms had increased during the most recent three years of the study compared to the previous three years. In like fashion, Wijewardena and Zoysa (1999) compared the extent of the usage of the CVP approach amongst the largest Japanese and Australian manufacturing firms. Their results show that the Japanese firms ranked this approach as the second most important tool for decision-making, while their Australian counterparts ranked it as the fifth most important.

This heavy emphasis on CVP analysis in Japan was not a great surprise, because Shield *et al*. (1991) had reported in a previous study that Japanese manufacturing firms were more likely to use the CVP tool than those in the US. The evidence from Japan is somewhat bewildering, because Japanese firms are commonly referred to in management accounting literature as paying great attention to strategic management accounting, which raises the question of how this can work alongside the adoption of short-term decision-making approach such as CVP analysis.

A possible explanation may be the simplicity of the CVP tool, or because it is common in Japan to use one official accounting system. These explanations may equally apply in the case of studies undertaken in other countries which have reported the extensive use of CVP analysis.

Tools being used for setting product prices are considered to be another area which received much debate amongst researchers. As discussed previously, the full costing method, although it has some deficiencies, is widely used in practice for taking sensitive decisions. Johnson and Kaplan (1987) pointed out that the full cost-plus approach which adds a percentage of the profit to the total cost of the product is no longer relevant for setting the product price, especially in a competitive market, because it focuses only on the supply side (costs), and ignores the impact of market demand (customers and competitors) on the product's price. It is for this reason that the idea of target costing has been introduced (see next chapter).

Drury *et al*. (1993, p.19) stated that "estimating incremental revenues requires demand estimates for a range of product selling price". The question raised here is: how easy is it to estimate demand at different levels of a product's price? For example, customer preference is not easy to estimate, especially when little is known about the firm's target customers. Using the cost-plus approach in this case can be justified. Again, in the situation where the product is made according to the customer's specifications, using the full cost-plus method might be relevant.

There is evidence indicating that full-cost plus is considered an important factor which has a great impact on pricing decisions. For example, Clarke (1997, 1992) noticed in his two studies undertaken in Ireland that full cost-plus was used by the vast majority of manufacturing firms, but was not considered the sole driver influencing pricing decisions. In other words, he found that both competitors' prices and full product costs were seen as the main drivers for determining pricing decisions.

Based on qualitative data collected through semi-structured interviews, Hopper *et al*., (1999) studied the application of cost accounting amongst 13 small and medium-sized Japanese manufacturing firms. Five of these firms were found to be either automated or highly automated. Hopper *et al*. found that pricing decisions in these firms were not solely underpinned by full product costs, but in most cases, this tool was used more as a general indicator for setting the product's final price, which could be due to the heavy usage of target costing in Japan.

Drury *et al*. (1993) reported that more than 80% of the UK manufacturing firms they surveyed used the cost-plus pricing technique, with 39% of these using it in most of their pricing decisions. However, the most important point here is the extent to which cost-plus influences the final price decision. Drury *et al*. indicated that, as was the case in Japan, the vast majority of UK firms (63%) were using full product costs, which raises the question of whether UK manufacturing firms really are heavy users of the target costing system for setting product prices, or if it is the nature of the UK market which necessitates following this approach?

Another area which requires careful decision is that relating to evaluating firm investment. Generally speaking, globalisation and the continuous increase in market competition around the world have put direct pressure on firms and their chances of survival. However, ensuring survival involves not only continuous improvement within the firm, but also looking for market opportunities to enhance its long-term existence.

Investment in capital projects can be seen as a type of market opportunity which requires well planned decision-making underpinned by accurate information. Since investment decisions are in most cases associated with some degree of risk, especially when the firm is operating in an uncertain environment, traditional investment tools such as the payback period and the accounting rate of return (ARR), which can be used for evaluating capital projects, have been lambasted by a number of management accounting gurus. The essential criticism aimed at these tools is that the time value of money and the returns after the payback period are ignored (Drury *et al*., 1993; Lefley, 1997; Akalu, 2001).

Discounted cash flow (DCF) techniques, such as net present value (NPV) and internal rate of return (IRR), have therefore been suggested as alternatives, because they partly address this problem. Although there is a large body of literature indicating that firms are interested in adopting DCF methods, these methods also have some shortcomings (Pogue, 2004).

Adler (2000) stated that traditional investment tools, including DCF practices, contain several imperfections such as "too-narrow perspective, exclusion of non-financial benefits, overemphasis on short term, and inconsistent treatment for inflation". More recently, Adler (2006) has gone further by pointing out that DCF tools offer incomplete information, especially when the investment decision has been considered as a strategic matter for the firm. Hence, he called for the eradication of DCF from the accounting curriculum.

Although Weil and Oyelere (2006) in part shared Adler's view regarding the lacklustre nature of the DCF tools, they and others have disagreed with him regarding eradicating them completely, due to the lack of an ideal alternative on the one hand, and on the other, the increasing level of satisfaction with it in practice (Paisey, 2006; Jones, 2006; Mugan, 2006).

Several empirical studies have reported the continuous use of both traditional and DCF techniques, despite the charges made against them. For example, Drury and Tayles (1997) reported that the payback and ARR practices were still alive and practiced by a large number of UK manufacturing firms (also see Addel-Kader and Dugdale, 1998). However, when the size of the company was taken into account, they noticed that large firms were more likely to adopt IRR and NPV tools than their smaller counterparts.

Both of the above studies indicate that there is a tendency among UK firms to apply more than one technique when evaluating their capital projects. It can be argued, however, that the continuing use of non-DCF tools could be due to their simplicity, and the fact that they do not need as much financial experience as DCF techniques.

The case of the US manufacturing firms was similar to that of the UK firms regarding the use of traditional investment tools. Chadwell-Hatfield *et al*. (1996/97) found that 72% of the US manufacturing firms surveyed still considered IRR a very important tool for accepting project investment, while the payback technique was classified as the second most important tool.

Thomas and Warng (1999) compared the preference for capital budgeting tools amongst ten large manufacturing companies located in the US, Germany and Japan. Their findings revealed that the firms in Germany and Japan greatly preferred using the payback method, while the US case was in line with the results of Chadwell-Hatfield *et al*. Preference for using the payback method in investment decisions was also found amongst Italian and Chinese manufacturing firms (Cescon, 1998; Xiao, 2006/07).

Based on case studies of the process of investment decisions at two manufacturing firms located in South Africa, Gilbert (2003) reported that the managers of both firms tended to use a combination of IRR and payback methods for justifying their investment decisions. He pointed out that the main reason cited for using this procedure was that it enhanced the accuracy of the investment decision, which clearly affirms Adler's allegation regarding the limited usefulness of the DCF practices.

It is clear that, despite the charges against DCF and non-DCF techniques, practitioners still favour both, particularly the former, which is indisputable evidence regarding the continuous divergence between what has been portrayed in the most recent management accounting textbooks and what occurs in practice.

In summary, the allegation of Johnson and Kaplan (1987) and others regarding the limited usefulness of traditional investment tools for making accurate decisions is inconsistent with the view of the majority of managers in practice. One may ask, therefore, on what justifications did Johnson and Kaplan base their allegation? The following section looks at the planning and control practices (for example, standard

costing and budgeting) which have been under fire since the revolutionary era of management accounting began in the early 1980s.

3.4 The Standard Costing System (SC)

Nowadays, it is widely believed among management accountants that the SC system is most suitable for manufacturing firms which produce a variety of products requiring repetitive activities in the manufacturing process (Drury, 2007; Horngren *et al*., 2005). However, this does not mean it cannot be applied to organisations providing services. Drury (2007) argued that, although there are some difficulties in applying the SC system in non-manufacturing firms, it could be applied in firms providing financial services as well.

With regard to the benefits to be gained from such a system, the vast majority of managers are still convinced that it can serve firms in different areas (such as planning, controlling, decision-making, performance measurement, product pricing, and improving and modifying firm strategies). With specific reference to manufacturing firms, the majority of literature has pointed out that the purposes of adopting the SC system can be outlined in three main points:

1. It provides managers at different levels of the hierarchy with reliable information necessary for measuring firm efficacy.
2. It facilitates the exchange of information between top management and operational managers in order to improve firms' strategies.
3. It enables managers to understand where variances have occurred and who is responsible for them, and propose appropriate solutions for the prevention, or at least control, of those variances which may appear in the future.

Despite the benefits which might be gained from adopting the SC system, it has been described as working against the application of modern philosophies (such as TQM, JIT and benchmarking) for continuous improvement within the firm. Thus, commentators have predicted its demise as a result of increased satisfaction with the new philosophies in practice (Drury, 1999), while others have called for its eradication, because it threatens long-term firm survival (Johnson and Kaplan, 1987; Lucas, 1997).

Turning to the empirical studies, several researchers have reported alarming results, indicating that the SC system is still maintaining an existence and durability in its application among organisations not only in developing countries (Omer *et al*., 2004; Sulaiman *et al*., 2005), but also in highly technological manufacturing environments (Sharman, 2003; Wijewardena and Zoysa, 1999; Szendi and Elmore, 1993).

For example, Fry *et al*. (1998) reported that 82 of 110 small and large US manufacturing firms regarded the SC system as being important for controlling purposes. Interestingly, they noticed that 80% of the companies using this system also relied heavily on sophisticated philosophies such as TQM and JIT. This surprising result may lead to the argument that academic opinions should be viewed with care, because they may be regarding the new philosophies from a purely theoretical viewpoint and not taking into account the flexibility which exists in practice.

The position across Europe is similar to that in the US. For example, Drury *et al*. (1993) reported that the SC system was still widely used in the UK, with 76% of firms adopting it. Although UK organisations use the SC system for various purposes, the

survey revealed that inventory valuation, cost control and performance evaluation were the main reasons for applying it.

Other evidence from Europe shows that the rate of usage of the system ranges between 73% and 85% (Ask and Ax, 1997; Clarke, 1992, 1997). The main purpose for applying standard costing differed between countries. Obtaining the information needed for product costing decisions and inventory valuations were found to be the most significant reasons for applying it in Sweden (Ask and Ax, 1997), while variance analyses (Clarke, 1992, 1997) and setting budgets (Lukka and Granlund, 1996) were considered as its major purposes amongst Irish and Finnish manufacturing firms. Apart from the case of Ireland, previous studies have not mentioned whether or not the firms surveyed had adopted any novel philosophies. Clarke (1992) made it clear that some Irish firms who were using the SC system had also already adopted some of the new managerial philosophies.

Studies undertaken in the East were almost in line with those done in the West. For example, Zoysa and Herath (2007) indicated that the SC system is still seen as an important system for controlling cost and performance evaluation by the majority of Japanese manufacturing firms, even though most of those firms had adopted JIT and TQM systems some years previously. This is unquestionably clear evidence indicating that the SC system does not clash with modern managerial philosophies.

The case of SA was not much different from that found in Japan. Alebaishi (1998) indicated in his study that, despite the level of competition among Saudi large and medium-sized manufacturing firms being very intense in terms of price and quality,

57% of the surveyed firms indicated that they used SC systems, and 75% of these firms deemed SC system to be important or very important. Interestingly, 50% of the users of SC systems in SA indicated that they have adopted the JIT technique (Alebaishi, 1998).

By the same token, Joshi (2001) reported that the emphasis on the SC system among Indian firms will increase in the near future. The case of Malaysian manufacturing firms is also in line with the international mainstream (Chun *et al*., 1996).

It is undeniable that these studies rebut the claim raised by some academics regarding the inappropriateness of the SC system for today's business environment. It would seem, therefore, that instead of provoking practitioners into ditch this system, it would be much better to convince them to redesign it in order to make it fit with the modern philosophies, if the criticisms leveled at it are correct.

3.5 Traditional Budgeting

Several centuries ago, governments developed the concept of budgeting as a tool for planning and control. However, in the last few decades, it has been used in the business environment, mainly for planning and coordinating activities such as controlling costs, allocating resources and motivating employees (Covaleski *et al*., 2003; Clarke, 2001).

Despite the fact that the majority of organisations see budgeting as the cornerstone of the management control process, and traditional budgeting is practiced by a large number of organisations throughout the world, it is thought by some academics to be

incapable of meeting the managerial demands of the competitive environment (Hansen *et al*., 2003). Clarke (2001) illustrated the major criticisms which have been leveled at traditional budgeting:

- It is rarely strategically focused and often contradictory.
- It often precludes responsiveness to change in the organisation's environment.
- It reinforces "short-termism" due to the focus being on one year only.
- It creates and promotes departmental barriers, rather than supporting knowledge sharing.
- It may encourage risk-taking and corrupt behaviours.
- The process of budget preparation is time-consuming and costly.

Although traditional budgeting appears to have a number of disadvantages, it enjoys widespread use among organisations. Joshi's (2001) study revealed that traditional budgeting ranked as the primary TMA technique used by all Indian firms as a tool for monitoring day-to-day business activities. Additionally, Joshi observed that, despite a growing interest in AMA systems, for example, TC, ABC, shareholders' value analysis and benchmarking, traditional budgeting is likely to maintain its popularity among Indian firms in the future.

Joshi's final conclusion is in line with the findings of Chenhall and Langfield-Smith (1998a), and Hyvonen (2005) regarding the continuous use of budgeting in Australia and Finland. However, Chenhall and Langfield-Smith mentioned in their study that controlling cost was the predominant reason given by the Australian manufacturing firms regarding their continuing use of budgeting, while Hyvonen noticed that

evaluating managers' performance was the main motive for its continuing use by the vast majority of Finish manufacturing firms.

Burns *et al*. (2004) investigated the top ten tools perceived as vitally important by UK qualified management accountants from 2000-2005. They found that budgeting was thought by the accountants to be the most important tool. Thus, they concluded by stating that "traditional techniques are not disappearing but are being automated" (also see Abdel-Kader and Luther, 2006; Scapens *et al*., 2003; Drury *et al*., 1993). Clarke (1992) also reported that a large number of Irish manufacturing firms still believed that budging is an important tool for planning and control purposes.

Based on a response rate of 27.4%, Cress and Pettijohn (1985) reported that the vast majority of the US manufacturing firms surveyed (80.5%) prepared annual budgets. They indicated that planning, controlling, and performance evaluation were the motives for preparing budgets by the US firms. They drew attention to the fact that the use of statistical techniques for planning was rare among these companies, and concluded by stating that US manufacturing firms seem unlikely to stop using traditional annual budgeting.

By the same token, Blake *et al*. (1998) reported that the majority of manufacturing firms operating in Latin America still considered budgeting as an important tool, mainly for decision-making purposes.

The aforesaid evidence makes it clear that practitioners have some doubts regarding the alleged shortcomings of traditional budgeting. However, it can be argued that

practitioners should be very aware of the problems associated with this particular system, such as the delay in feedback which may put firms in danger, and that the best solution for these problems could be the adoption of flexible budgets. Also, academics should present clear evidence regarding how flexible budgeting can minimise the faults in the information produced by traditional budgeting, which in turn will enhance the quality of firms' decision-making. Otherwise, practitioners will not give up traditional budgeting and it will not disappear, mainly due to its long history.

3.6 Transfer Pricing

It has been widely emphasised that large firms, in particular, sometimes face factual difficulties when it comes to controlling operations in their sub-units, especially when the senior management is concentrated in one location, so they have tended to decentralise for controlling purposes. However, giving the senior managers of sub-units full autonomy creates another problem, relating to the mechanism which should be used for evaluating the performance of each sub-unit.

Transfer pricing has been seen as one procedure for evaluating sub-unit performance, by including each division in the company's total revenues. This is the reason for linking transfer pricing with performance evaluation in this part of the study. However, it should be recognised that transfer pricing can only be done when there is extra capacity in a particular division, which means judging the performance of the senior manager in a particular division is not necessarily based upon transfer pricing practice. Also, the transference between divisions is, in most cases, specified at the intermediate stage of the product or service.

Drury *et al*. (1993) pointed out that a product or semi-product can be transferred from the seller division to the buyer division using one of three methods: (a) production cost, (b) current or dominant market price, or (c) negotiation. Drury *et al*. made it clear that, if a particular product has been transferred based on the production cost (variable cost), then the seller division will receive no economic benefit, which in turn will influence its performance, so this type is rarely used in practice.

In most cases, the seller division uses full cost-plus for the purpose of maximising its profit. However, following this procedure may harm the buyer division, even though the rules of transfer pricing allow both seller and buyer divisions to achieve a level of economic benefit. For this reason, Drury *et al*. (1993) stated that "the buyer division should pay the selling division annual lump-sum payments to reimburse the fixed costs associated with meeting the buying division's requirements" (p.63).

Negotiating the transfer price is more suitable when the market contains some turbulence. When there are a variety of product prices on the market, the buyer division does not necessarily have to buy from a sub-unit which belongs to the same company if it is seeking to enhance its performance. However, the whole situation depends on the level of freedom given to the senior manager of the sub-unit to sell or buy outside of the company group.

It can also be argued that this particular procedure can be used as an indicator for judging the skills of the senior managers of each sub-unit, or for the linking of rewards to success in the negotiation process, especially where there are lower prices on the market compared to those given by the seller division.

Drury *et al*. found that the vast majority of UK manufacturing firms which had several divisions used more than one transfer pricing method within the company, with a greater preference for the negotiation method. Additionally, the market based transfer price method was ranked by those firms as the second most preferred method, which may reflect the nature and conditions of the UK market, and the level of autonomy given to UK managers.

Shields *et al*. (1991) also reported that market price was the most popular method used by both US and Japanese firms. However, the selection of the appropriate method for transfer pricing between divisions becomes more complex when tax regulations, either domestic or international, are taken into account. The present research focuses only on a simple issue of transfer pricing, which is whether or not Saudi and non-Saudi manufacturing firms use the transfer pricing system, and that if they do, which method is most commonly practiced. This simply means that the complexity of tax regimes is beyond the scope of this research.

3.7 Financial Performance Measures (FMs)

Another controversial area in management accounting is known as "performance measurement". The idea that FMs can be used for evaluating firm performance has been criticised on a number of grounds. For example, Johnson and Kaplan (1987) pointed out that, because competition, particularly in most industrialised countries, has become more rigorous, relying on FMs *ad hoc* will not assist firms in achieving competitive advantages in the long term. According to them, the core problems with these measures are that they are too backwardly focused, as there is heavy emphasis on the short term, and that they downgrade the key drivers which affect the firm's

performance in the long term, such as customer satisfaction, employees' views and improvement programmes, amongst others.

Similarly, Scapens *et al*. (2003) argued that, in order to achieve the full integration of operations, finances and strategies, non-financial measures (NFMs) should not be excluded for the purpose of evaluating firm performance. It can also be argued, however, that there are drawbacks to NFMs, such as the costs, the fact that they are time consuming, that there is an absence of agreed measures or dominators for measuring them, and that they may create conflict, especially when the firm uses a number of different measures.

Several studies have shown that, in practice, FMs are still the most widely accepted measures. For example, in their comparative study of Australian and Japanese firms, Wijewardena and Zoysa (1999) noted that return on investment (ROI) was used by the Australian firms more than the Japanese for evaluating divisional performance, while the Japanese firms put greater emphasis on return on sales (ROS).

In India, Joshi (2001) found that ROI was considered the most popular financial tool by all Indian manufacturing firms. Surprisingly, despite his study revealing the limited use of NFMs in India, he was of the view that the use of this measure will decrease in the future. Xiao (2006/07) came up with similar results among Chinese manufacturing firms, but noticed that there is a fast growing rate of adoption of the economic value added measure, which is considered a modern performance measure in China, which could be due to the openness of Chinese economics toward Western countries.

Drury *et al*. (1993) reported that most UK firms use more than one FM for evaluating their divisions' performances. They noticed that target profit and the ability to stay within budget were the two most popular FMs used. Shields *et al*. (1991) found a similarity between US and Japanese manufacturing firms regarding the extensive use of ROS.

In the case of Canada, the practice of the manufacturing firms differed little from the mainstream. Gosselin (2005) reported that a large number of Canadian senior managers were still paying great attention to FMs for evaluating managers' performances. A possible explanation for the continuing use of FMs across the world may be that the senior managers within firms or divisions try hard to avoid taking direct responsibility for the owners' or shareholders' concerns about low performance, which may in turn threaten their jobs in the future.

Although the aforementioned studies show that there is a continuous preference for using FMs for evaluating firm performance, there is also a growing body of literature which shows there is a move, although not rapid, toward adopting a combination of FMs and NFMs, which could be seen as a response to Johnson and Kaplan's viewpoint (see next chapter).

3.8 Summary

In short, Johnson and Kaplan (1987) have widely emphasised that TMA practices are no longer relevant for today's business environment, due to increasing levels of competition and the heavy use of modern technology, so they advise firms to adopt

AMA practices as an alternative. However, several studies presented in this chapter reveal that managers are still relying on TMA practices to run their business, even though their firms face high levels of competition or heavy users of technology (Ask and Ax, 1997; Triest and Elshahat; 2007; Al Chen *et al*., 1997; Al- Khater, 1999).

According to some researchers, investment in AMA systems involves huge amounts of money, and small firms are unlikely to invest in these (Tayles and Drury, 1994; Innes and Mitchell, 1995; Innes *et al*., 2000). Hence, most studies presented in this chapter have taken the effects of size into consideration, by omitting small firms and concentrating on either large, or large and medium-sized firms (Friedl *et al*.; 2009; Wijewardena and Zoysa, 1999; Clarke, 1992, 1997; Haldma and Laats, 2002; Lamminmaki and Drury, 2001; Joshi, 2001; Ciniquini *et al*., 1999; Shields *et al*., 1991; Chenhall and Langfield-Smith, 1998a; Hyvonen, 2005; Alebaishi, 1998).

Nevertheless, all aforementioned contingent aspects were not motivating managers to relinquish TMA systems in their firms, so it is hard to say if TMA systems have lost their relevance, as Johnson and Kaplan stated, but it is fair to say that these systems may be relevant for some firms, but that the contingent aspects are not necessarily motivating firms to relinquish TMA practices.

At the same time, it is hard to imagine that Johnson and Kaplan's (1987) thesis has not affected the real practice of management accounting within organisations. Therefore, the next chapter investigates adoption of innovation in management accounting in order to find out whether practitioners have responded to the suggested solutions to

TMA systems proposed by Johnson and Kaplan. The aim is also to shed light on the aspects or drivers that may trigger a firm to adopt or not adopt AMA practices.

Chapter Four: Innovation in Management Accounting

4.1 Introduction

As indicated earlier, those advocating innovation in management accounting have suggested several AMA systems for the purpose of resolving the management accounting crisis. However, the previous chapter exposed that TMA systems are alive and well, and recent studies have shown that they are still widely used in practice, which raises important questions regarding the alleged benefits to be gained from utilising the newer systems.

This chapter aims to give convincing answers to the following questions: "*Does innovation influence management accounting in practice, or is this merely an anecdotal myth*?", and "*What are the drivers which motivate firms to adopt AMA systems?"*

This chapter also sheds light on the most popular AMA systems, which received much emphasis in the management accounting literature. However, before answering these questions, it is necessary to provide a clear picture of what is meant by innovation in this instance, with regard to its definition, its classifications and its drivers.

4.2 Part One: An Overview of Innovation in Management Accounting and its Drivers

4.2.1 The Relationship between Change, Innovation, Invention and Diffusion

In recent management accounting literature, it can be seen that the terms “change” and “innovation” have been used interchangeably to address particular situations. It can be argued, however, that there is some overlap between these concepts; change in organisational structure is not necessarily a product of adopting an innovative system, whereas the inverse condition goes with innovation (Zaltman *et al*., 1973). Rogers (1998) has discriminated innovation from invention by stating that:

> "innovation is concerned with the process of commercialising or extracting value from ideas…this is in contrast with invention" (p.5).

Two facts can be inferred from Rogers’ view. Firstly, there is a negative relationship between invention and changing the organisational structure. Secondly, invention cannot be considered as innovation, unless adopted by some organisation through particular steps in order to attain economic worth. However, the diffusion of innovation is generally viewed as the process which causes a particular innovation to spread from one organisation to another, and this is wholly dependent on the potential attributes of that innovation already being adopted (Brown, 1981).

This research will not differentiate between the concepts of change and innovation, as adopting sophisticated management accounting techniques will surely automatically result in a change to the organisational structure, or at least an accommodation on the part of the current structure to enable it to integrate the necessary new software.

4.2.2 The Definition of Innovation

The concept of *innovation* has been widely employed in several disciplines for decades; according to Rogers (1998), it was the economist Joseph Schumpter who first emphasised its significance in 1930. Although the idea of innovation has been dealt with by a large volume of literature, there is still no established definition (Goswami and Mathew, 2005).

Some scholars have regarded innovation from the broadest view, in that it must contain or introduce a new idea, irrespective of the ends achieved by the actual implementation of that idea within the organisation (Damanpour, 1991; Rogers, 1995). Mohr (1969), on the other hand, believes that innovation should be linked to, or restricted by, only the successful implementation of a novel idea, while others pay much attention to communication channels as the key which ensures a successful implementation for any new idea (Van de Ven, 1986).

The last view has been confirmed by several empirical studies which found that the diffusion of new techniques depends on the support of senior management and the level of awareness within the organisation (Askarany, 2000; Jackson and Lapsley, 2003). Contrary to the aforementioned views, Hamel (2006) believes that innovation is not necessarily going to be confined by introducing a new idea which has not previously existed, but developing an existing practice is considered an innovation too.

Schoute and Wiersma (2001) defined innovation in management accounting as "an idea perceived as *new* by an adopting organisation which serves as an underlying

design principle for financial and/or non-financial information systems that help managers make decisions to fulfil the goals of the organisation" (p.5). It can be inferred from the differing views above that this area is clouded by the absence of a proper definition for the term “innovation”.

This was highlighted in a study undertaken by Johannessen *et al*. (2001), in which they pointed out that, although the vast majority of authors accentuated the notion of newness within innovation, there is no agreement about the nature of newness. Johannessen *et al*. therefore concluded their study by stating that three controversial questions (“What is new?”, “How new?” and “New to whom?”) continue to be under debate (also see Daft, 1978, p.197).

For the purposes of this research, innovation will be viewed from the broadest perspective, as proposed by Damanpour and Rogers. The reason for selecting this particular view is that the researcher believes that successfully coping with the ongoing changes occurring in the business environment involves the adoption of new systems or behaviour.

Also, the nature of this study tends to ascertain whether or not Saudi and non-Saudi manufacturing firms substituted old management accounting practices with new ones from one hand, or used old and new practices at the same time from another; thus, this view has been adopted here.

4.2.3 Innovation Typologies

Most authors who have dealt with innovation have distinguished between three types: (a) technical and administrative innovation, (b) product and process innovation, and (c) radical and incremental innovation (Wan *et al*., 2005; Damanpour *et al*., 1989; Daft, 1978). A brief discussion of each of the three types is presented below.

4.2.3.1 Technical and Administrative Innovation

Technical innovation can be defined as the introduction of a new product or service, or a new form of technology which is consistent with the activities being undertaken by the organisation. Conversely, administrative innovation denotes the adoption of a new administrative policy or structure designed to manage all of the organisation's activities with the use of a new administrative mechanism (Damanpour and Evan, 1984; Van de Ven, 1986).

The relationship between these two types of innovation has been a cause for concern for some scholars. Damanpour (1991) pointed out that the distinction between the different types of innovation is necessary, because their drivers are not, on the whole, the same. Contrary to Damanpour's view, Van de Ven, (1986) deemed that, in most cases, the adoption of technical innovation necessitates adopting new administrative forms, so they should, therefore, not be treated in isolation.

Arguably, Van de Ven's view is more logically acceptable because, for example, when a new service or system is installed for the first time within an organisation, the employees must be retrained, and this will generally involve a new administrative

instrument or structure. Thus, separation of the two types of innovation would seem irrational.

4.2.3.2 Product and Process Innovation

Product innovation refers to producing a new product or service in order to gratify customers' desires, while the process of innovation deals with the initial mechanism which has been used to produce that product or service (Martinez *et al*, 1998). According to Wan *et al*. (2005), this type of innovation is still rarely acknowledged, due to the scarcity of research into the natural relationship between organisational structure and this particular type of innovation.

4.2.3.3 Radical and Incremental Innovation

Although several authors have identified radical innovation as a concept, there is still a lack of any clear definition for it (McDermott and O'Connor, 2002). Some researchers have defined radical innovation as the extent to which an innovation engenders non-routine and intrinsic changes to the existing practices within an organisation's configuration (Norman, 1971; Dewar and Dutton, 1986; Hage, 1999; Wan *et al*., 2005).

Incremental innovation does not influence organisational structure to the same extent, because it usually produces fewer changes to the current practice. Hence, the level of risk varies between each type of innovation. Other researchers have used the term "effectiveness" to distinguish between the aforementioned types of innovation; this denotes the difference in the degree of influence each type has on the organisation's structure (Ettlie *et al*., 1984).

As has been depicted, innovation exists in several forms, and each one has its own characteristics; thus, it is wise to differentiate between them. Changing MASs, which is the primary focus of this chapter, is considered to be radical, because it requires replacing old systems with new ones. Therefore, understanding the types of innovations will facilitate the determination of the innovation drives within organisations.

4.2.4 Innovation Drivers within Organisations

As mentioned earlier, the second stage of management accounting research focused on studying the diffusion of both TMA and AMA systems for the purpose of verifying whether or not a gap exists between the theory and the practice of management accounting. It is clear from the previous chapter that the use of TMA systems is still dominant in both developed and developing countries.

Additionally, studies mentioned in chapter one give clear ideas regarding the low levels of satisfaction to AMA systems across the world. This section sheds light on the drivers which led some organisations to adopt innovation in management accounting. From a general viewpoint, these drivers can be classified as (a) institutional drivers, (b) fad and fashion drivers, (c) cultural drivers, or (d) contingent drivers. Brief discussions related to these drivers are illustrated below.

4.2.4.1 Institutional Drivers

Hussain and Hoque (2002) adopted a new institutional sociology (NIS) perspective for studying the reasons which motivated four Japanese banks to use non-financial measures (NFMs). The researchers justified their choice of the NIS framework,

because it gives a broad explanation compared with the old institutional economics framework (OIE) or the new institutional economics (NIE) perspective.

Hussain and Hoque found that (a) economic constraints such as economic recession, uncertainty and competition, (b) the central bank's regulatory control system, and (c) international accounting standards and regulations, were the most important institutional aspects which motivated some Japanese banks to adopt NFMs.

In addition, the researchers found a clear link between strategy and the extent of adopting NFMs at each bank. To make that clear, the researcher found that banks which only focus on the Japanese market did not adopt the balanced scorecard, while the other two banks adopted it because they sought to enhance their performance, not only in Japanese market, but also for the international market. On the other hand, pressure from consultants was not found to be an institutional aspect driving the adoption of NFMs by some Japanese banks.

Yazdifar *et al*. (2008) adopted NIS (reflecting external pressure) and OIE (micro-institutional aspects within the subsidiary) perspectives for studying the process of changing the existing accountability system, including the MAS system at Omega. The researchers pointed out that Omega was directed by another company until 1983. However, since that date, a UK petrochemical company seized or purchased Omega, and it has become a subsidiary to the parent.

They further indicated that, since the early 1980s until the mid 90s, 80% of the financial contribution from the subsidiary came from long-term contracts with

individual customers, and 20% from multi-client products. Two years before 1990, the financial earnings at the subsidiary had been dramatically falling, mainly due to the nature of the contracts with customers, the economic recession which occurred in 1988, and the non-renewing of two major contracts, which in turn led the parent company to re-evaluate the policy and accountability system, including MAS, for its subsidiary.

After identifying the weakness within the subsidiary policy, as well as accountability and measurement systems, the parent company formulated a clear strategy aimed at achieving balanced financial earnings for its subsidiary, which meant that 50% should come from contracts and a similar percentage from multi-client products. For accomplishing this aim, Yazdifar *et al*. indicated that the parent company put direct pressure on its subsidiary to imitate its policy and accountability system, and engaged in a process of changing the existing systems within Omega. To clarify, the parent company avoided the resistance from its system by (a) firing unnecessary employees and managers, (b) explaining the value of implementing the new system to all Omega members and encouraging them to ask questions in order to remove any ambiguity, (c) training Omega employees to use the imposed system, and (d) emphasising the importance of adopting group work in order to control the power of authority within Omega.

As a consequence, employees realised and satisfied the new system, and it has become institutionalised at Omega, giving the company the required legitimacy from the parent view on one hand, and enabling it to achieve the planned financial target drawn by its parent on the other. This study came up with a clear ending, which is the

successful implementation of the new system at Omega due to some external (coercive pressure from the parent), and normative or intra-institutional aspects (for example, training programs, corporate culture and distribution of power).

Based on archived data, Carmona and Macias (2001) studied the institutional aspects which forced the royal tobacco factory (RTF) to adopt early management accounting practices (such as budgeting and costing systems) during the 19th Century. Carmona and Macias pointed out that RTF was owned by the Spanish government until it was privatised by the end of 1887. They further indicated that RTF was utilising approximately 12.5% of the state income at that time.

As a consequence of the political and economical reforms which occurred in Spain during the first part of the 19th Century, RTF was forced by the state agency (finance ministry) to prepare annual budget and report cost data, in order to prevent state bankruptcy. Carmona and Macias concluded their study by emphasising that the early adoption of some management accounting practices by RTF was subject to state legislation.

Granlund and Lukka (1998) concluded their study by pointing out that management accountants' professionalisation, and University research and seminars, were one cluster (institutional aspects) which led to the diffusion and adoption of the ABC system in Finland.

4.2.4.2 Fad and Fashion Drivers

Abrahamson (1991) stated that:

> "the fashion perspective assumes that organisations' in a group imitate other organisations, such as management consulting firms, that reside outside that group…the fad perspective differs, however, because it assumes that the diffusion of innovation occurs when organisations within a group imitate other organisations within that group" (p.597).

According on Abrahamson's view, supply-side organisations are seen as playing a profound part in the process of diffusion of novel systems. Abrahamson also believes that organisations are sometimes encouraged by consultants to adopt new ideas, and when these new ideas are a success, they become fashionable and other organisations imitate the pioneering firms.

However, as DiMaggio and Powell (1983) stated, imitating other's successful experiments should only be recommended in the case of firms operating in an uncertain environment. Granlund and Lukka (1998) found fashion (benchmarking) was one driver which led to the diffusion and the adoption of the ABC system in Finland (also see Malmi, 1996).

Malmi (2001) studied the effect of supply-side organisations on the diffusion and usage of the BSC amongst Finnish firms. Based on 17 semi-structured interviews, with managers acting as senior financial officers in their entities, he found that foreign consultancy firms and the emphasis on the public media (books, seminars, conferences and so on) were the mechanisms which provoked this system to become fashionable in Finland.

He also noted that once the benefits of using the BSC software became obvious, other firms began installing it. Therefore, Malmi stated that imitating other successful organisations was the driver which motivated a large number of Finnish firms to adopt BSC.

He also researched the reasons for adopting BSC, and found that most firms adopted it for two purposes. The first was to gradually modify their traditional budgeting tools through the increasing use of non-financial measures, and the second was to facilitate the changes required for other programmes, such as TQM and the value chain concept.

The use of a novel system to modify a traditional system, as in the Finnish case, can be considered as a serious step towards changing traditional MASs. This, on the one hand, supports the merit of the modern thoughts and techniques in management accounting, and on the other hand, confutes the scepticism of Askarany and Smith (2000) regarding their validity and lack of merit. Ax and Bjornenak (2005) came up with the same result, as reported by Malmi (2001), regarding the driver which led to the adoption of the BSC, and aims to use it in Sweden.

4.2.4.3 Cultural Drivers

Brewer (1998) used Hofstede's framework for examining the relationship between culture and ABC's success. He chose one US company with six domestic plants and an international plant in Malaysia. All the plants had the same level of technology and organisational structure, but differed in size. He used two cultural dimensions (power distance and individualism) as comparative factors between the two countries, and

pointed out that the implementation of ABC in Malaysia was more than in the US plants, due to the effect of cultural aspects.

This result can be interpreted in two ways. Firstly, the message that came from top-level management was that people must participate in the ABC process to ensure its successful adoption. Malaysian culture can be described as collectivist, so everyone co-operated to make the ABC project successful. By contrast, Americans are unlikely to be collectivist, because they believe in individualism, so they did not co-operate to make the project a success.

Additionally, in a high power environment like Malaysia, there merely needs to be a threat from the top to the bottom of a hierarchical firm, and the workers at the lower levels will do what the top level wants, regardless of whether they agree with them or not. However, this situation is unlikely to exist in a low power environment like the US.

Brewer concluded his study by emphasising that the success and failure of the ABC project in both countries was a product of some cultural aspects. This may lead us to argue that culture may or may not trigger the adoption of innovation in management accounting.

Joshi (2001) used Hofstede's framework for comparing the extent of the emphasis attached to several traditional and modern management accounting practices between Indian and Australian manufacturing firms. He found there to be a similarity between both countries in terms of continuing high emphasis on budget systems in both

countries during the next three years. However, from a general viewpoint, the extent of the emphasis on adopting modern management accounting systems in India during the next three years is lower than that found in Australia, due to the variation in culture between both countries.

To clarify, Joshi pointed out that Australian managers were keen to adopt modern management accounting systems, except those related to performance measures in the next three years, because they practice low levels of power distance and uncertainty avoidance, and the inverse condition apply to Indian managers. With regards to individualism vs. collectivism and masculinity, they were not found to be a significant influence on the extent of emphasis on modern management accounting techniques in either country.

4. 2.4.4 Contingent Drivers

It is mentioned in chapter one that several researchers found that the adoption of the AMA system was due to some contingent aspects, even in SA (Waldron and Everett, 2004; Scapens *et al*., 2003; Smith *et al*., 2008; Abdel-Maksoud *et al*., 2008; Al-Mulhem, 2002; Al-Saeed, 2005; Alnamri, 1993).

Since the current research is underpinned by the contingency perspective, the researcher will discuss the contingent drivers which motivated organisations to adopt AMA systems in much more detail in the next chapter, and it will be touched on in the next part of this chapter. The next part focuses on some of the modern management accounting practices which have been suggested by academics as alternatives to traditional systems.

4.3 Part Two: Advanced Management Accounting Practices (AMA)

4.3.1 The Modern Costing Systems

As indicated in the previous chapter, Johnson and Kaplan (1987) argued that the traditional product costing system provides managers with inaccurate information, mainly due to the techniques used for allocating the overhead costs of the product. The ABC system was, therefore, suggested as a solution to the main problem attached to the traditional allocation methods.

In the late 1980s, and at the beginning of the ’90s, several papers were published regarding the ABC system (Cooper, 1988a, 1988b, 1989a, 1989b; Cooper and Kaplan, 1992), which announced the beginning of the revolutionary era of ABC. Within a few years, the ABC system had spread across the world and attracted a great deal of research.

Horngren (1995) pointed out that the ABC technique can be seen as the best novel practice to appear during the second half of the 20th Century, due to its superiority over the traditional allocation methods. Swenson (1995) indicated that the ABC technique provides managers with several benefits, in that it gives, amongst other things, greater accuracy of information needed to make strategic decisions, and for identifying, measuring and managing firm activities, and improving the visibility of the activities within an organisation, leading to higher efficiency and profitability.

Although a heavy emphasis has been placed on the alleged benefits to be yielded from adopting the ABC system, there is evidence from various parts of the world which

shows either that there has been no adoption at all of the technique, or that it has at best received a lukewarm reception.

For example, Eunsup and Stagliano (1997) reported a low rate of ABC adoption amongst US manufacturing firms. They found that no more than 27% of firms had adopted the system, while 37.6% were considering it. The reasons for adoption were found to be information enhancement relating to product costing, and customer profitability. On the other hand, the costs associated with implementation, the lack of knowledge about the system, and satisfaction with the existing costing technique were given as the overwhelming reasons for not adopting the ABC system.

The position amongst UK manufacturing firms is less clear regarding the adoption of ABC, as reported by Dugdale *et al*. (2006). They surveyed 41 medium and large manufacturing companies, and enhanced the robustness of their survey by carrying out 17 interviews. They noticed that some companies which were using ABC reported that their decision to do so related in the main to costs and profitability analyses, and there was no evidence of the system being fully adopted as a substitute for the traditional method. The conclusion was that the complexity, costs, personal antipathy, and unsuitability of ABC to the nature of the firm's activities were the most frequently cited barriers to its adoption in the UK.

Evidence collected from several European countries revealed that the rate of ABC adoption ranged between 7% and 13% (Haldma and Laats, 2002; Ask and Ax, 1997; Clarke *et al.*, 1999; Cinquini *et al.*, 1999; Hyvonen, 2005). These studies found that

the most frequently provided reasons for not adopting the ABC system were very similar to those given by US and UK organisations.

In India, Joshi (1998) found that only 10 of the 39 manufacturing companies studied had adopted the ABC system. He observed that performance measurements and cost reductions were the main motives which led those companies to implement the new system.

In the Middle East, Triest and Elshahat (2007) found no use of the ABC system in Egypt at all, while Al-Khater (1999) reported in his study that 14 out of 22 firms were found to be familiar or very familiar with the ABC system in GCC countries. However, as he indicated, familiarity with the ABC system does not necessarily mean that these firms were using this system.

The aforementioned studies indicate that few managers consider ABC to be a desirable system, even in the developed countries. As a result of these findings, Gosselin (1997) raised a question regarding this ABC paradox: "*if ABC has demonstrated benefits, why are more firms not actually employing it*?" (p.105). Answering this question involves shedding light on whether or not the adoption to the ABC system generates real benefits to the company.

Ittner *et al*. (2002) studied the association between the ABC system and firm performance, based on data collected from 2789 US manufacturing firms (differing in size). Their findings revealed that there were direct and significant associations

between the extent of usage to the ABC system and firm performance, in terms of improvements in cycle time and cost data quality, but not with a return on assets.

Cagwin and Bouwman (2002) studied the relationship between the ABC system and firms' financial performances in the USA. They found that there was a positive association between the ABC system and firms' financial performances (return on investment) if the ABC system was used with other managerial philosophies (JIT and TQM) at the same time.

Contrary to the two studies above, Gordon and Silvester (1999) studied whether or not the adoption of the ABC system by some US firms impacted their stock market. Gordon and Silvester focused only their study on the ABC users for achieving the purpose of their study. Their findings make public the use to ABC system has no either positive or negative impact on stocks market for those firms. Therefore, they concluded their study by emphasising that, since there is no clear evidence regarding the financial benefits which might be utilised from the adoption of the ABC system, why should firms use or invest in this system?

Another possible answer to the question raised by Gosselin is the nature of the firm's strategy focus (short-term vs. long-term) or unsuitability of the ABC system for all firms, particularly those which have low overhead costs, and this justification is mentioned in several management accounting studies (Estrin *et al*., 1994; Pattison and Arendt, 1994; Waweru *et al*., 2004). The last possible answer to Gosselin's question is that practitioners were unwilling to adopt ABC systems because it had been introduced and marketed on sound consultancy (Johnson, 1992).

The studies mentioned above give a clear idea that the adoption of the ABC system across the world is limited, maybe because mangers within organisations have doubts regarding the benefits which might be gained from using this system. At the same time, some firms already adopted it, so the question which can be asked is whether or not the adoption of the ABC was subject to some internal and external aspects.

Anderson (1995) studied the factors which led to the failure of ABC projects at the General Motors Corporation (GMC). She pointed out that, when the GMC was facing serious competition in the late 1980s, ABC was introduced as an improvement strategy for cost reduction, and was directly supported by two executive managers. However, when one of the managers died and the other retired, the whole project failed.

She concluded that these factors brought about the end of the successful implementation of any new MAS such as ABC, which requires ongoing support from senior management. This conclusion is supported by Narayanan and Sarkar's (2002) research, which found that the direct support of top and middle managers for the ABC project was a factor which led the Andrews Steel Company to yield noticeable benefits, mainly concerning pricing decisions, which was reflected by the improving performance of the organisation as a whole.

The two examples presented above may lead to the expectation that the success or otherwise of ABC implementation greatly depends on certain managerial aspects, rather than on technological factors. However, Askarany and Smith (2003) reached a different viewpoint, having studied the link between ABC adoption, and certain

technological aspects and organisation size. Their conclusion is based on data collected from 51 Australian manufacturing firms.

They found a positive relationship between ABC, and both firm size and technological aspects. These findings are in line with other studies which have found that small firms in particular are unlikely to adopt ABC software, mainly because of the costs associated with implementation, and the absence of expertise and training programmes (Ruhanita and Nasir, 2007; Clarke *et al*., 1999; Bjornenak, 1997; Groot, 1999; Drury and Tayles, 1994). It is clear from the previous studies that there is a link between the adoption of the ABC system, and some of the external and internal aspects, so it would be fair to say that contingent aspects may or may not drive the adoption of AMA systems within organisations.

Here it would be necessary to mention that all aforementioned studies, except Waweru *et al*. (2004), have focused on the adoption of a modern costing system (ABC). However, other researchers have surveyed the use or non-use of modern costing systems from a macro-view, including the ABC one.

For example, based on information extracted from 165 manufacturing firms operating in New Zealand (NZ), Adler *et al*. (2000) noticed that the level of implementing AMA techniques, in general, is on the rise, but at a sluggish pace. Based on Adler *et al.*'s statistical analysis, strategic management accounting and the cost of quality reporting were found to be the most popular innovative systems to have been adopted by NZ manufacturing firms.

They pointed out that the organisations cited several reasons for selecting those particular systems. These were: to enhance product profitability through the use of life cycle costing procedures, to reduce cost by adopting target costing systems, and to improve product quality by adopting quality reporting programs.

Adler *et al*. also studied the barriers deterring some of the NZ manufacturing firms from adopting advanced systems. They found that "firms' human resources, including such factors as a lack of relevant skills, a lack of time, management inertia, and the cost of hiring capable employees" were the obstacles most frequently cited by the vast majority of organisations (p.144).

Similarly, Chenhall and Langfield-Smith (1998a) reported that few of the large Australian manufacturing firms they surveyed were likely to adopt AMA techniques. However, they reported that the emphasis on such techniques (for example, ABC and product life cycle) would increase over the following three years.

In their comparative study, Wijewardena and Zoysa (1999) reported the levels of adopting ABC and product life cycle costing systems in Japan were 2% and 13%, respectively, while the adoption levels of these two systems in Australia were 23% and 5%, respectively. The researchers did not mention anything in their study about the motives and obstacles behind the adoption or non-adoption of these systems in both countries.

Abdel-Kader and Luther (2006) studied the adoption of both TMA and AMA systems being used by British food and drinks firms. The researchers omitted small firms, and

focused their study only on the active and independent firms in this industry. They found that the level of adopting both ABC and cost of quality reporting systems was limited. Again, no reasons were mentioned in this study regarding the limited use to those two modern costing systems.

In the same way, Clarke (1992) reported in his study that only a few large Irish manufacturing firms had already adopted ABC systems, cost of quality reporting and life cycle systems. Clarke clearly indicated that the cost of adopting change in MAS and satisfaction with the existed costing systems were the most important reasons which motivated a large number of Irish manufacturing firms not to adopt advanced costing systems. At the same time, the use of some modern manufacturing technologies (for example, computer aided design, manufacturing resource planning and JIT) were the main drivers or motives which led to the adoption of some AMA systems in Ireland.

Alebaishi (1998) reported in his study that 27.8% of Saudi large and medium-sized manufacturing firms were using ABC systems, while the majority did not (72.2%). In addition, 40.6% of his respondents indicated that they believed that the ABC system was important or very important to their companies, while 42.8% did not. With regards to product life-cycle systems, Alebaishi found that 35.2% of Saudi manufacturing firms were using this system, while 64.8% were not.

Interestingly, Alebaishi found that there was growing satisfaction with this particular costing system in SA, because 63.5% of respondents indicated that they regarded this

system as being either important or very important, while only 27.5% did not, and this result opposes the level of importance related to the ABC system in the same country.

With regards to the accumulation methods, as mentioned in the previous chapter, the vast majority of manufacturing firms are still in favour to either job or process costing methods. However, modern management accounting literature suggests that firms who have adopted the JIT and TQM philosophies should use the backflush (BF) costing method. It is important to note here that there is a dearth of literature dealing with the BF system. The main idea of this system is that fewer inventory accounts are used for accumulating manufacturing costs, which in turn leads to saving time and costs.

Adler *et al*. (2000) found that 18% of the 101 New Zealand manufacturing firms surveyed had not heard of the BF system, in spite of the fact that some of them were using the JIT philosophy. They reported that only 9.7% of the firms were using the system.

Similarly, Joshi (2001) reported that BF had received very little attention in India. In the case of both countries, this could either be due to the limited adoption of JIT and TQM, or due to the continuing emphasis on the older techniques. A possible explanation regarding the dearth of literature relating to BF, which in turn is reflected in the level of adoption, may be that the academics have paid more attention to the ABC system.

As can be seen, modern costing systems, especially the ABC technique, are an innovation in management accounting which have received much emphasis in the literature, which in turn has led to two systems (ABM and ABB) emanating from it. Studies undertaken in several countries reported that the level of acceptance of these two practices was lower than the adoption rate of ABC (Joshi, 2001; Hyvonen, 2005; Askarany *et al*., 2007). Therefore, the continuing reluctance to adopt these techniques, particularly the original ABC system, raises doubts, not only regarding their benefits and validity, but also of Horngren's (1995) assertion that this system is the best development to have occurred in management accounting since 1950.

4.3.2 Modern Pricing Decision: the Case of Target Costing

Target costing (TC) is a Japanese cost management technique used for setting the product price when a firm faces intense competition. The core focus of this system is that both the demand and supply sides should be taken into account when making the pricing decision, as opposed to the cost-plus pricing method. TC aims to plan or reduce the costs of the "new" product over its whole life cycle, from the earliest stages of the product's development to meet customers' needs.

Shank and Fisher (1999) pointed out that, if TC is viewed as a strategic improvement, it is a mistake to restrict its focus to newly developed products only, as it can also be applied to existing products. According to Ansari *et al*. (2006), TC can be used when a firm has little influence on market prices, and can be achieved by subtracting the desired profit margin from the projected selling price. However, they also pointed out that, in order to accomplish an effective and accurate TC system, several departments

should be engaged in its process by taking customers' needs, competitors' prices and the owners' pricing strategies into consideration.

It is clear that TC could be suitable for firms which face real competition in the market place and are trying to compete through cost reduction to achieve a long-term competitive edge. However, when the customer has little influence on the market price, is the use of the TC system desirable? How about in monopolistic conditions?

Furthermore, the nature of the production within an organisation can also be seen as a barrier to adopting TC. For example, in a firm where production is characterised by homogeneity, would the use of TC be justified? Several studies have shown that the adoption of TC is still limited, except in the case of Japan. For example, Rattray *et al*. (2007) surveyed the extent of its usage amongst 31 New Zealand manufacturing companies. Their results showed that 39% of the firms had adopted TC as a cost strategic improvement, in order to ensure their survival. Interestingly, they found firm size to have no impact on the level of adoption, which indicates that it was due to aspects such as competition, market structure or other factors.

Based on numbers of 56% and 24.4%, Chenhall and Langfield-Smith (1998a) and Joshi (2001) reported a moderate level of satisfaction with TC in Australia and India (38% and 35%, respectively). Although the researchers did not suggest any reasons for this growing interest in TC in these countries, it could be due to the growth in both domestic and international competition.

Over a decade ago, Tani *et al*. (1994) found that around 60% of Japanese manufacturing firms were using TC. Most of these indicated that they were keen to compete strategically by using ongoing cost reductions of their products to fulfil their customers' needs, which in turn ensured that they would be competitive in the market.

In the West, Dekker and Smidt (2003) investigated the level of TC adoption amongst Dutch manufacturing firms. They reported that around 19 of the 31 companies surveyed claimed to use a technique similar to TC, due to market competition. Most of those not using TC or something similar gave their reasons as due to either a lack of knowledge regarding the technique, or its unsuitability for their production system.

In contrast to Dekker and Smidt's results, Borgernas and Fridh (2003) found that only 16% of Swedish manufacturing companies used TC as a long-term profit strategy, and that competition was the main factor which triggered adoption. The reasons given by the Swedish firms for not adopting TC were similar to those cited by the Dutch companies. It is interesting, however, that Borgernas and Fridh noted that some Swedish managers were of the view that TC was just a fashionable system which would shortly disappear.

Omer (1997) investigated the level of adoption among 12 leading automobile manufacturing firms in the UK. His results showed that the vast majority of these companies had tried to maximise their profits by using cost-plus pricing methods for their new expensive cars, which involved the manufacture of specific features, whilst TC was used by some of these firms for their standardised or less expensive cars, as a way of achieving a competitive edge. It is clear that the UK market responds to the

customer's voice. It cannot, however, be assumed that such use of TC will be applied to all manufactured products, either in the automobile sector or other manufacturing firms (see Drury *et al*., 1993).

Based on seven case studies in the US and eight in Europe, Davila and Wouters (2004) found that the main reason for not adopting TC was the nature of the product costing system in use, which emphasised objectives rather than cost reduction. They therefore concluded that TC may collide with the main objectives of the product costing system within the firm.

Cooper and Slagmulder (1997) investigated the factors which influenced six Japanese manufacturing firms when deciding whether or not to adopt TC. They found that the intensity of competition, the characteristics of the products and the strategies were the motives behind the decisions made. It was for this reason that Cooper and Slagmulder argued that, in most cases, the decision to adopt the TC system was subject to certain internal and external conditions.

Based on information extracted from 90 Turkish manufacturing firms, Kocsoy *et al*. (2008) studied the extent of adopting TC systems and its drivers in Turkey. Kocsoy *et al*. reported in their study that the level of adopting the TC approach in Turkey was no more than 27%. Interestingly, the researchers found that most Turkish manufacturing firms did not restrict the application of TC systems for the newly produced products, but used them as cost reduction system for almost all manufactured products.

Turbulence within the Turkish business environment, automation and the level of competition were the main drivers which motivated some Turkish manufacturing firms to adopt TC systems. On the contrary, emphasis on short-term strategy and unsuitability of the nature of firm production systems were the main reasons which motivated non-users to use TC in Turkey. Therefore, Kocsoy *et al* concluded their study by emphasising that adopting modern managerial approaches such as the TC system requires oriented management and internal support, otherwise emphasis on the cost-plus system will continue.

It is clear from the discussion above that TC is used by only a limited number of organisations across the world, except in the case of Japan. This can unquestionably be interpreted as evidence of the continuous existence of the divergence of the theory and practice of management accounting. A feasible explanation for the limited use of the TC system could be the absence of real market competition, the type of strategy being adopted by firms or other factors.

4.3.3 Modern Performance Measurement Systems

It was illustrated in the previous chapter that FMs are still widely used as parameters for indicating the success of a firm's strategy. However, advocates of NFMs argue that FMs constitute only one indicator, and that customer satisfaction, market share, product quality, after sale service, employee satisfaction and other aspects also have a great impact on firm performance, particularly in the long-term. Calls have therefore been made for the use of both FMs and NFMs as long-term secure strategies.

The balanced scorecard (BSC) is a practice which encompasses both FMs and NFMs, which, it is claimed by its supporters, enables the firm to maintain its existence in the

long-term, because it boosts a firm's value by translating its vision and strategy into action (Kaplan and Norton, 1992, 2001). To clarify, Kaplan and Norton have argued that the BSC can enhance firm profitability, because it links four perspectives: financial, customer, internal business process, and learning and growth (innovation); the second of these is considered the key to enhancement.

Norreklit (2000) argued that, although customers' views are considered an important aspect for enhancing firm performance, this does not necessarily lead to an improvement in firm profitability in the long term, thereby raising some doubt regarding the validity of the BSC system. In similar fashion, Kenny (2003) questioned the structure of the BSC. He argued that the separation of the last two of the above perspectives makes no sense, because innovation can be seen as a function of the internal business process. He, therefore, sought to reduce the four perspectives to three as a first step in redesigning the BSC.

Amazingly enough, Kaplan and Norton were of the view that the BSC can be applied to any type of organisation. However, they failed to demonstrate how the system could enhance the performance of non-profit making organisations, such as schools and hospitals.

Here, another important question is raised: "Will adopting BSC really enhance the performance of firms which operate in monopolistic conditions?" It is clear that Kaplan and Norton have tried to extrapolate from findings in the US study for other countries. However, this would be to ignore the fact that in less developed countries, for example, the level of education and customer awareness differs from that in the

US and the UK, which raises some doubts regarding the impact of customers' views o firm performance in these countries.

Irrespective of the comments concerning the BSC, there is evidence that it has been applied in practice, although it is not overwhelming. For example, Nielson and Sorensen (2004) surveyed the extent of BSC usage amongst 53 Danish medium and large manufacturing companies. Their results showed that only two companies had adopted the full package of the system. Remarkably, they found that the concept of the BSC was widely known about by non-users, but that the complexity of achieving satisfactory links between the four perspectives of the BSC was the main reason given by many of the companies for not considering it.

Based on information collected from 84 Italian manufacturing companies, Arena and Azzone (2005) found that the adoption of the BSC was no more than 29%. They found that changes to required information, and changes in strategy and competition were the main aspects which drove firms to adopt the system. They also noticed that the smaller companies showed less inclination to adopt NFMs, including the BSC, compared with the larger ones (also see Hoque and James, 2000).

Scapens *et al*. (2003) reported in their study that the future emphasis on the BSC is relatively low in the UK. This low acceptance of the BSC, especially in the UK, may be the reason for the scepticism regarding the validity of this technique. However, this does not mean that the usage of NFMs is not flourishing in the UK. Abdel-Maksoud *et al*. (2005) carried out a large survey in the UK, in order to investigate the extent of

usage of NFMs, and the drivers for their adoption, among manufacturing organisations.

Based on a response rate of 14.3%, they found that most of the firms used several types of NFMs, but not the formal BSC, as suggested by Kaplan and Norton. Abdel-Maksoud *et al*. noticed that uncertain competitive conditions, the usage of modern managerial philosophies such as TQM, and the type of production technology, were the main motives for adopting NFMs, and that the adoption of these measures was reflected positively in the performance of the companies concerned.

The studies mentioned above indicate that the adoption of the BSC is not rife, although it is alleged that it gives senior management a comprehensive picture regarding their firm's performance in the long term. This raises the question: "Why are the majority of firms still unenthusiastic about adopting the BSC"? Or in other words: "What exactly is the drawback? Does it lie with the BSC itself or with the managers?"

4.3.4 Value-based Management (VBM)

The Charted Institute of Management Accountants (CIMA) has defined VBM as "management team preoccupation with searching for and implementing the activities which will contribute most to increase in shareholder value" (2005, pp. 97-98). According to Ronte (1998), VBM is a long-term journey which begins by creating the corporate culture within an entity. Ronte pointed out that the success of managing a business based on value involves: (a) adopting modern information systems, (b)

creating effective communication channels between different levels within the entity, and (c) setting up effective training programmes for employees.

Bannister and Jesuthasan (1997) argued that employees, especially in democratic countries, may hinder the success of any new managerial philosophy if they feel that it will only serve to maximise the shareholders' profits. They, therefore, advised that senior managers should clearly explain to employees how managing business based on value can benefit both the shareholders and themselves in the long term.

With regards to the need to provide training programmes, Pruzan (1998) stated that the failure of many VBM projects within organisations, even in the most industrialised countries, was due to the reluctance to finance training programmes. It can be argued, however, that the failure of VBM projects is not wholly linked to this reluctance; there is also a problem with the VBM itself, because it focuses on emphasising the long-term economic benefits, whereas both employees and senior management are often more interested in short-term benefits.

Most of the studies which have dealt with the VBM concept are theoretical. One exception is that undertaken by Ryan and Trahan (1999), who surveyed the extent of VBM adoption amongst 184 leading US industrial firms. Their findings show that 87% of these public firms identified themselves as being familiar with the technique, and used it mainly in the areas of investment decisions, long-term planning and performance measurement.

Ryan and Trahan concluded their study by emphasising that compensation and training programmes were the drivers which led to the successful implementation of

VBM in the US. Evidence from Japan revealed that only 82 of the 519 organisations surveyed had applied VBM (Morisawa and Kurosaki, 2002). This low level of VBM adoption could be due to the widely felt satisfaction with the TQM philosophy.

4.4 Summary

On the whole, the evidence presented in this chapter has shown that innovation in management accounting is not merely an anecdotal fable. However, there is a move towards adopting AMA systems, even though this move is characterised by a slow pace. Hence, researchers started to study this phenomenon through identifying the constraints which preclude the adoption of AMA practices, and the drivers which may trigger organisations to adopt these new systems.

As depicted in the current chapter, satisfaction with the existing management accounting systems, the unsuitability of some AMA systems to the nature of the businesses for some organisations, economic and human barriers such as cost, the unavailability of relevant staff, the unwillingness of top managers, and others, were found to be the obstacles which hindered the adoption of AMA systems the most (Galia and Legros, 2004; Ren, 2009).

With regards to the aspects which may drive the adoption of AMA systems, researchers found that institutional, cultural, and fad and fashion aspects may lead to the adoption of the innovation in management accounting. Noticeably, some studies presented in the previous chapter found that contingent aspects, such as competition, automation and size, did not motivate firms to relinquish their TMA systems.

However, most studies presented in the current chapter proved that the adoption of AMA systems was subject to some contingent aspects, such as size (Chenhall and Langfield-Smith, 1998a; Joshi, 2001; Abdel-Kader and Luther, 2006), size and technology (Askarany and Smith, 2003; Clarke, 1992), competition or competition and technology (Anderson, 1995; Dekker and Smidt, 2003; Borgernas and Fridh, 2003; Abdel-Maksoud *et al*., 2005), strategy or competition and strategy (Tani *et al*., 1994, Arena and Azzone, 2005), and culture (Brewer, 1998; Joshi, 2001).

Evidence from SA was also in line with studies which found that the adoption to AMA systems was due to some contingent aspects (see chapter one). Therefore, the current research was based upon the contingency perspective, because it believed that contingent aspects were very important, which in turn may or may not drive the adoption of AMA systems in the Eastern Province of SA. One important point should be mentioned here before moving to the next chapter. The second part of this chapter focuses on the extent of adoption of AMA practices in real practice and the drivers that have motivated firms to adopt or not adopt these practices. Thus, the extent of adoption of AMA practices in the current study has been conceptualised as a dependent variable in order to accomplish the second objective of conducting this research (see the research framework, p. 136)

Chapter Five: The Research Framework (Contingency Theory)

5.1 Introduction

The main aims of this chapter can be summarised in two points:

1. to shed light on the most important theoretical frameworks that have been used by researchers to study change in management accounting and why these theories are considered too narrow or specific, and
2. to focus on contingency theory and suggest the contingent aspects to be examined, in the belief that they are important elements that may affect Saudi and non-Saudi firms' decisions to adopt or not innovation in management accounting.

5.2 Management Accounting and Theory

As demonstrated in Chapter Two, the gap that exists between academics and practitioners in the field of management accounting is due, in part, to the large volume of unconvincing research that has been produced. Hence, some scholars have suggested that the first step toward narrowing the gap should be the improvement of the quality of academic research by underpinning it with legitimate and compelling theories (Scapens and Bromwich, 1996). However, management accounting as a discipline has yet to develop its own theories because it has only recently been viewed as a discrete subject. So, researchers in this field, as Malmi and Granlund (2006) stated, have relied solely on theories borrowed from other disciplines (sociology, anthropology, economic, management, etc). Consequently, compared to the previous century, the last decade in particular has witnessed heavy usage of a variety of theories, which has led to an enhancement of the merit of management accounting

research. However, Zimmerman (2001, p.425) pointed out that according to Ittner and Larcker, although researchers have based their work on a range of frameworks, they have failed to build a strong body of knowledge. This particularly applies to the empirical part of the management accounting literature with the result that there has been a noticeable fragmentation of the theoretical and empirical parts of the research. He suggested that instead of using a hotch-potch of theories, it would be more useful to adopt an economics approach in order to achieve coherence between the theoretical and empirical parts of management accounting research, which would also be helpful to other parties (governments, organisations, etc).

By contrast, Luft and Shield (2002) argued that, in general, economic methodologies are not considered as universal approaches and have several deficiencies (see also Hopwood, 2002, p.784). They therefore recommended the careful use of different types of methodology instead of relying on one specific type. When taking an in-depth look into the body of management accounting research, it is noticeable that there is a propensity amongst Anglo-Saxon scholars to apply both economic and behavioural methodologies in their research and these approaches have dominated the study of innovation in management accounting. However, because there is no ideal theory common to all researchers, it can be argued that both economic and behavioural methodologies also embrace several deficiencies. There follows a discussion of the problems with some of the approaches that have dominated management accounting research since it was charged with irrelevance.

5.3 The Shortcomings of some Popular Perspectives Used for Studying Change in Management Accounting

Rather than the employing contingency methodology, some researchers have used three well-known perspectives for studying change in management accounting, namely: institutional theory, cultural theory, and fad and fashion theory. Although these perspectives are all unquestionably valid for social science, it would be fair to say that their associated imperfections may lessen their merit. A brief discussion of these methodologies is illustrated below.

5.3.1 The Institutional Perspective

Although the field of 'institutional study' consists of a large volume of literature, there is still no consensus amongst institutionalists on the correct definition for the concept of institution (Tolbert and Zucker, 1994; Scott, 1987). Hall and Taylor (1996) argued that the main reason behind the disagreement could be that the concept has been viewed from the perspectives of different disciplines (history, politics, and sociology). This may have led to institutional research being less institutionalised. Regardless of whether there is unanimity or not, sociologists have recognised the importance of studying the relationship between organisational structure and societal norms, in particular the influence of environmental aspects. They believe that the essential theme of institutional theory is that organisational structure should be wholly molded upon societal norms (Meyer and Rowan, 1977). In other words, the parallels between organisational structure and ecological and cultural institutions will give organisations the hallmark of legitimisation, and enable them to obtain the resources necessary for their survival (Barley and Tolbert, 1997). However, it can be argued that maintaining a firm’s survival should not be at the expense of the firm's effectiveness, even for

non-profit making organisations. Consequently, institutional theory has been charged with several deficiencies. Perrow (1985), for example, deems that three major problems can be levelled at the institutional approach. The first of these is the fact that enhancing firm effectiveness, which is considered at the heart of changing or modifying the existing structure within a firm, is completely neglected. Secondly, the institutionalists have downgraded the importance of technical aspects, which sometimes arouse organisations to change their structure. Finally, keeping work processes isolated from the firm's structure to achieve the proposed conformity between the firm and the societal institutions demolishes the unitary nature of the organisation.

Hall (1992) also pointed out that institutional theory suffers from several disadvantages. He argued that institutionalists always portray the institution as a hotch-potch of myths and symbols, but the question is how did this mixture originate and then become institutionalised? It would seem that Hall's scepticism regarding the fundamental core of institutional theory should be taken seriously because if this assortment contains illogical aspects, it is ironically enforcing firms to be fully compliant with it. Hall also stated that, "institutional theory has paid no attention to what is institutionalised and what is not" (p. 79). In similar vein, Donaldson (1996) reviewed several pieces of institutional literature and noticed that most of the empirical results were paradoxical within the theoretical core of the theory. In other words, he questioned why there should be a noticeable variation in the empirical results regarding the factual institutional aspects, particularly where firms operate in the same environment and face the same external pressures. He argued that inconsistencies between the essence of institutional theory and its empirical outputs

could be due to the opposition of institutionalists, who tend to be more conservative, to the notion of functionalism. Additionally, Donaldson believes that the nub of institutional theory collides with the philosophy of positivism because, as he claims, it is hard to believe that only societal aspects can influence a firm's structure.

This assertion has been confirmed by Scapens (2006), who found institutional factors to be just one cluster that may influence a firm's decision to adopt or not adopt innovation in management accounting. Therefore, Donaldson pointed out that the last two decades of the twentieth century witnessed some well-known institutionalists retracting their support for the notion of institutional perspective. According to him, one of these was Powell:

> "Institutional theory holds that the institutional environment determines organisations structure, yet Powell explicitly revokes this idea and argues that organisations should not be seen as passive and that conflicting institutional expectations allow entrepreneurs to manoeuvre creativity" (p. 122).

Additionally, "Scott has written of institutional theory of organisation as being in its adolescence...it is unlikely to enter adulthood" (Donaldson, 1995, p. 128). It is clear from the discussion above that the institutional approach has several theoretical weaknesses. However, the empirical part of institutional theory is not without shortcomings. For example, Kraatz and Zajac (1996) stated that:

> "…most surprising conclusion is that across seven different tests of hypotheses, the new institutional perspective consistently unable to account for the observed organisational behavior and performance in this empirical study" (p. 831).

In like fashion, Granlund (2001) adopted a synthesis methodology (structuration theory and the isomorphism approach) in his case study to explain the resistance to changing existing management accounting systems. He noticed that the merit of adopting the amalgamation methodology was only that it gave more explanations for

the factors that enhanced stability within the current management accounting system. He therefore concluded by pointing out that it is hard to make such generalisations from the statistical findings underpinned by that methodology. Ribeiro and Scapens (2006) attributed the ill-suitedness of the framework adopted by Granlund mainly to "the absence of processual dimension in the structuration theory" (p.100).

The above theoretical and empirical shortcomings of the institutional approach may reflect its immaturity. Several researchers have found that the institutional methodology gives little clarification of the issue of changing management accounting systems compared to its value in studying stability within firms (Busco *et al*., 2006; Siti-Nabiha and Scapens, 2005). Furthermore, using a single institutional approach for interpreting the reasons driving firms to change or not change their management accounting systems is, on the whole, insufficient (Scapens, 2006). Thus, a combined institutional methodology might be more beneficial, particularly for studying change in management accounting. However, as Ribeiro and Scapens pointed out, there are two difficulties in adopting this type of framework. These are realising and understanding the connection between the issues and factors associated with each institutional approach on the one hand, and deciding what criteria should be used to connect the methodologies on the other. Clearly, institutional theory faces serious trouble at its core. So, the first step to enhancing its efficacy and merit is to expand the core in order to encompass non-societal aspects and maximise firm effectiveness while tying it in with the required legitimacy. Otherwise, the institutional approach will continue to be vulnerable to criticism.

5.3.2 The Fad and Fashion Perspective

Benders and Van Veen (2001) pointed out that although the fad and fashion perspective attracted many researchers, particularly in the field of management and marketing, it has no definition except that proposed by Abrahamson some years ago. They argued that this definition is based solely upon neo-institutionalist sociology and diffusion perspectives in that it emphasises the rules and beliefs on the one hand and the process of disseminating the innovation on the other. It can also be argued, however, that although Abrahamson clearly stressed the process of innovation diffusion, there is a distinct difference between the diffusion perspective and the fad and fashion perspective. To clarify, diffusion theory emphasises the demand side such as the characteristics of the innovation, characteristics of the adopters and so on (Bjornenak, 1997; Askarany *et al*., 2007), while the fad and fashion perspective pays greater attention to the supply side (e.g. professional bodies, consultants, media).

Donaldson and Hilmer (1998, p. 15) pointed out that the fad and fashion methodology contains one major problem, which is that it downgrades the need "for formal structure and analysis". They argued that changing the existing MAS within a firm involves analytical and well-planned decision making and that it is hard to adopt one particular system due to the existence of others. Donaldson and Hilmer's views seem logical because adopting innovation may succeed within one particular firm but not necessarily in another, as much depends on certain circumstances such as the support of senior management and co-operation and communication between the top and lower levels within the entity.

It is noticeable when looking at management accounting studies that only a few researchers have used this methodology for studying the diffusion of particular AMA systems among organisations (Ax, and Bjornenak, 2005; Malmi, 1999). However, the question that should be asked is: '*can we use this methodology for studying the diffusion of a range of AMAs*'? The answer would seem to be yes, but in this case data should be collected from case studies in order to monitor the process of innovation diffusion and this data instrument will not be used in the current study. The fad and fashion framework will not be used for this research because of (a) the adoption of Damanpour and Rogers' definition of the innovation (see previous chapter), and (b) little is known about the nature of the Saudi business environment regarding its certainty and the essence of the fad and fashion approach necessitates that it be applied only in uncertain environments.

5.3.3 The Cultural Perspective

According to Gray (1988), the term *culture* is widely used by anthropologists to demonstrate the relationship between societal norms and individual/group behaviour. However, in the field of management, authors have broadly acknowledged that Geert Hofstede was the first author to depict specific specimens or models for studying the relationship between sub-cultures (work culture) and national cultures and to operationalise these indices (Verma and Gray, 1998). Hofstede (1980) defined culture as "the collective programming of the mind which distinguishes the members of one group from another" (p.25). Hofstede based his framework on a large survey of more than fifty countries during the period 1967-1973. The framework comprised four dimensions, namely: power distance, individualism versus collectivism, uncertainty

avoidance, and femininity versus masculinity. A decade later, Hofstede (1991) added another dimension to his original methodology and named it Confucian Dynamism.

Although this perspective has been praised and adopted by several researchers, particularly in management studies, others have scrupulously criticised the model. For example, McSweeney (2002) pinpointed five problems with Hofstede's thesis, the central one of which was the validity of the statistical instrument used that enabled a generalisation to be made from a micro-culture (the firm) to a macro-culture (societal culture). Likewise, Baskerville (2003) not only supported McSweeney's critique but also disavowed the whole of Hofstede's notion by stating that:

> "…the four dimensions in the social, political or economic measures indicates that the dimensions identified by Hofstede describe characteristics of different nations, most of which could be identified as socio-economic in origin…these are not cultural dimensions" (p. 10).

Hofstede (2002) promptly refuted all McSweeney's criticisms. He strongly defended the authenticity and validity of his statistical analysis by pointing out that several researchers from different disciplines (political science, sociology, marketing, etc) had at some time used the same statistical instrument. Thus, if that instrument were to be considered invalid as McSweeney deemed, the findings of all those researchers should be assumed doubtful. Smith (2002) also did not entirely agree with McSweeney's critique and endorsed the validity of Hofstede's statistical measurement by stating that:

> "Hofstede cites some test-retest reliabilities, but his overall position is clear enough: the extent of significant correlations with a wide range of independently collected culture-level scores provides abundant proof that his dimensions are both reliable and validly measured" (p. 123).

As has been noticed, some scholars have been somewhat sceptical regarding the validity of Hofstede's thesis. However, it can be argued that the ongoing adoption of

Hofstede's framework by those in the fields of management studies (Laroche, 2007; Soares *et al*., 2007; Fujimoto *et al*., 2007) and accounting (Harrison, 1992; Lau *et al*., 1997) might give it the required legitimacy by downplaying the aforesaid criticisms. Additionally, although Gray (1988) portrayed his own cultural view, he based his work wholly upon Hofstede's framework and this can be considered as more support for the merit and validity of Hofstede's monograph. Gray suggested four hypotheses for assessing the influence of societal norms on societal institutions, which in turn affect accounting applications or systems within organisations: (a) professional versus statutory control, (b) uniformity versus flexibility, (c) conservatism versus optimism, and (d) secrecy versus transparency. Although Gray's depiction seems to be logical and intuitively workable, he did not operationalise his work, which lessens its validity.

Doupnik and Tsakumis (2004) reviewed several studies that examined Gray's theory and came up with several observations. First, they found that most of the studies paid a deal of attention to studying the relationship between societal norms and institutional aspects, while placing a low emphasis on accounting practices. Second, the relationship between secrecy and accounting reporting was examined by some of the studies, but none looked at the other indices (hypotheses) proposed by Gray. Third, most researchers who examined Gray's theory did not satisfactorily justify the tools used to measure the variables. Therefore, Doupnik and Tsakumis believe that Gray's theory is still vague mainly due to the unexamined other hypotheses. Empirically, both Gray's and Hofstede's perspectives still remain to be proven. For example, Tsakumis (2007) used the last two dimensions of Gray's typology to investigate whether there are notable differences between Greek and US firms

operating in Greece regarding the use of accounting rules and applications. He tested two hypotheses and came up with this end: (a) the statistical results do not support the first hypothesis, which may indicate that, "Gray's theory is flawed" (p.43). Also, the limited support for the second hypothesis leads us to be at least cautious regarding Gray's study because of the effect of contingent factors. In the same way, Salter and Niswander (1995) tested Gray's theory using data extracted from twenty-nine countries and concluded their study by stating that:

> "…it finds that while Gray's model has statistically significant exploratory power, it is best at explaining actual financial reporting practices and is relatively weak in explaining extent professional and regulatory structures from a cultural base" (p. 394).

Lau *et al*. (1997) also examined the effect of the first two dimensions proposed by Hofstede on the budgeting emphases of Singaporean manufacturing managers and their counterparts in Australia. Their results showed an inconsistency with Hofstede's classification for each country (see also, Albaum, 2003 and Spector, 2001). This clearly indicates that the criticisms levelled at Hofstede's theory should not be ignored. Based on the above discussion, several observations can be made regarding the inappropriateness of both perspectives (Hofstede's and Gray's). These can be outlined in the following points:

1. culture may be considered a significant factor that may preclude the diffusion or adoption of innovation. So, it would be more useful for studying stability rather than change (see Morakul and Wu, 2001).
2. cultural theory ignores non-societal aspects and it is hard, as Tsakumis stated, to downplay other influential factors like contingent aspects.
3. because the nature of human life changes over time, it is hard to imagine that cultural dimensions remain constant.

4. the core of the cultural perspective might be fit only for cross-international studies. However, assuming two local companies, one that has adopted change in its managerial accounting system and one that has not, using cultural theory makes no sense and contradicts its core. For this reason, Dawson and Young (2003) pointed out that there is still no reliable and exhaustive cultural theory that encompasses all internal and external cultural dimensions.

It is clear from the above discussion that each of the methodologies has some limitations, although this does not mean that they are invalid or of no use. The problems with the different approaches vary, with some (institutional and cultural) regarding innovation in management accounting from one aspect only and downplaying other factors that contradict their fundamental cores, while the fad and fashion perspective is too bound and specified due to its suitability only for the uncertain environment. With this in mind, it can be argued that the contingency approach, even with its deficiencies, is more relevant than other theoretical frameworks for studying innovation in management accounting, as will be expounded below.

5.4 Contingency Theory and Management Accounting

5.4.1 An Overview of Contingency Theory

According to Otley (1980), the contingency approach (CA) does not have a long history in management accounting literature although it was first introduced in the1960s. However, there has been growing interest in its use in management accounting since the mid-1970s. As several scholars have indicated, the notion of CA

is based on the premise that there is no best way to manage (Otley, 1980; Wood, 1979, Ford and Slocum, 1977). This simply means that for example, when a company adopts a particular system there are circumstances that led to that adoption and these circumstances generally differ from one company to another.

Donaldson (2001) defined the term *contingency* as, "any variable that moderates the effect of an organisational characteristic on organisational performance" (p.7). Based on this definition, it is clear that the main goal of the CA is enhancing firm effectiveness. However, as Donaldson pointed out, the term *effectiveness* in managerial studies is loose and has several meanings with some researchers using it to refer to profitability or firm efficiency, while others use it to indicate innovation rates or the extent of adopting novel systems (see Libby and Waterhouse, 1996).

Irrespective of the situation in which the term is used, CA is based on two pillars. Firstly, there must be equilibrium or a fit between organisational structure and organisational context, and secondly, the formulation of the organisational structure depends on contingent variables (external and internal). Based on this loose conception, it is clear that CA is very simple because it links the adoption of a particular system or practice directly to the contingent variables, and for this reason it has been criticised.

5.4.2 Criticisms of Contingency Theory

Although Child (1972) determined five problems with CA, the main issue of his critique focused on the simplicity of the contingent structure. He believes that organisational structure has little influence on firm performance. Child supported his critique by conducting two empirical studies and found in each a weak relationship

between contingent aspects and firm performance (Child, 1973, 1975). He therefore suggested developing the basic structure of contingent methodology. Likewise, Waterhouse and Tiessen (1978) stated that:

> "…while contingency theory is supported by an impressive body of literatures, definitions and measures of variables have often lacked conceptual clarity" (p. 66).

Otely (1980) supported this criticism and argued that the nature of contingent variables was not satisfactorily explained by this theory (see also, Longenecker and Pringle, 1978). Hence, further research was required in order to eradicate this ambiguity. Schoonhoven (1981) went further and was largely pessimistic regarding the contingency approach. She stated that, "contingency theory is not a theory at all… it is no more than an orienting strategy because it relies on a few of assumptions" (p.350).

Drazin and Van de Ven (1985) affirmed Child's assertion and added that there was a noticeable fragmentation of the theoretical and empirical parts of the contingent studies. They argued that this fragmentation could be due to downgrading the micro-contingent variables that play a significant role in achieving the fit between the organisational structure and the macro-contingent variables. They studied three forms of fit (selection, interaction, and systems) taking micro-contingent variables into account. However, they failed to come up with any strong coherence among those three types. They therefore concluded by pointing out that their extensive statistical analysis revealed weak relationships between both the interaction and system types and their moderator variables. In contrast to Drazin and Van de Ven’s view regarding the fragmentation of the theoretical and empirical parts, it can be argued that the appearance of that gap could be due to the excessive use of different simple statistical

approaches, such as correlation coefficients, to draw conclusions about complex relationships.

Although Donaldson (1985, 1987) enthusiastically defended the merit of traditional CA, his enthusiasm dwindled when he identified three problems (Donaldson, 2001, p. 246). First, contingency theory fails to give a proper explanation for why contingent aspects change over time. Second, when a firm moves from misfit into fit, the problem is how can managers know that the new structure is the appropriate one? Lastly, if the firm moves from misfit into fit it can be justified if it is capturing a high performance, but a problem occurs where a firm moves from one fit into another even though there is no improvement in firm performance. In order to overcome these problems or limitations, Donaldson sought to reform traditional contingency theory and argued for a move to a second generation of CA, known as neo-contingency theory.

The basic notion of the new CA revolves around the necessity of studying organisational change from a broad viewpoint, through analysing the conjunction between fit and the other causes of performance (Donaldson, 2001, p.250). The current research adapts both contingent perspectives (the old one and the new one).

To clarify that, old CA presumes that there is a direct or linear relationship between performance and contingent aspects, so researchers often use correlation analysis for studying this relationship. The current research also used correlation for studying the relationship between AMA practices and contingent aspects, and this fits with the old version of the CA.

The second step of analysis covers two tests (see Appendix D, p. 481-491). The first (test for moderation) focuses on studying the interrelationships among new predictors (except product diversity) by utilising correlation analysis for the purpose of identifying the strength and significance of the relationship between new external and internal predictors, again with the exception of product diversity, satisfying the goal of the new CA. The second (test for mediation) is conducted in order to ensure that the effect of the independent variables (new predictors), with the exception of product diversity, on the dependent variable is direct and not in fact mediated by a third variable. This also satisfies the new version of the CA (see Bryman and Bell, 2007, p.366-367).

5.4.3 The Advantages of Contingency Theory

The advantages of applying the CA compared with other approaches (institutional, cultural, fad and fashion) can be summarised by the following points:

1. CA covers a wide range of internal/external aspects, including some institutional aspects (governmental rules) and cultural variables, which means it considers change in management accounting from several viewpoints.
2. There is an explicit departure with CA, which is the emphasis on firm effectiveness, and this is of course contrary to the institutional approach, which pays more attention to capturing firm legitimacy.
3. The essence of CA is well suited to studying both change and stability within firms, contrary to the institutional and cultural approaches, both of which are more pertinent to studying stability rather than change.

4. CA is not as specific as fad and fashion, and can be used for studying innovation in management accounting in both certain and uncertain environments. As explained previously, a fad and fashion perspective is relevant for studying the diffusion of the innovation in an uncertain environment. However, there is no evidence that unambiguously indicates the Saudi business environment is uncertain to the best knowledge of the researcher, so basing the current research upon the contingency perspective is justifiable in this case.

5.4.4 The Structure of the Research Framework

Figure 5.1 gives a general idea about the theoretical framework adopted in the current research.

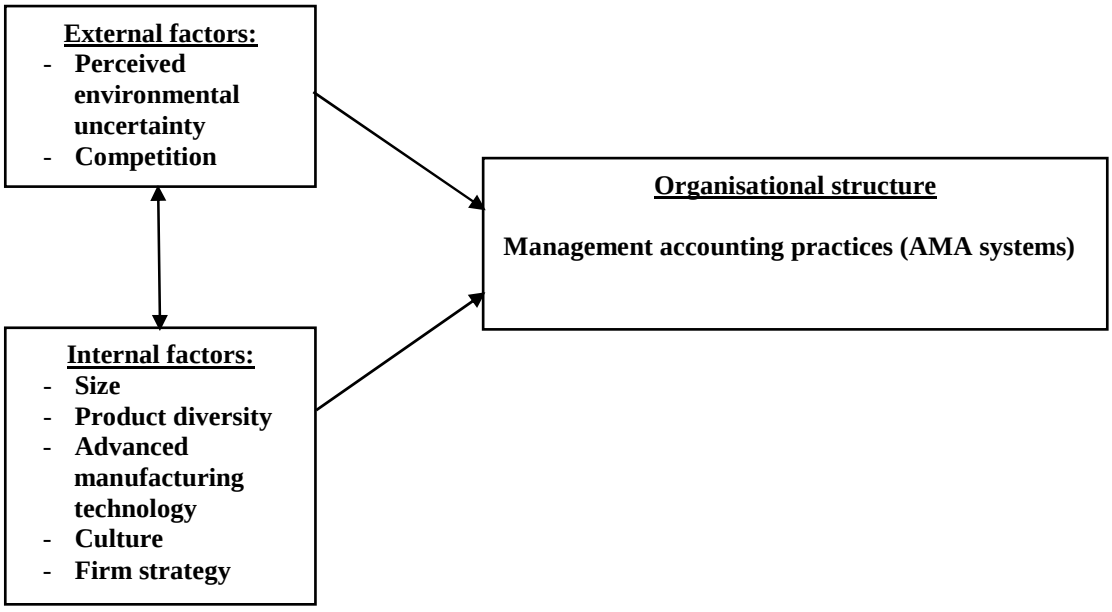

Figure 5.1: Research framework structure

Contingency theory presumes that there is no universal organisational structure. According to Anderson and Lanen (1999), a management accounting system is considered part of the organisational structure, which means firms can select the MAS that will enable it to maximise its performance and accomplish its objectives. At the same time, it has been widely emphasised in literature on management accounting that the selection of a particular MAS is subject to certain internal and external contingent aspects (Drury and Tayles, 2005; Abdel-Kader and Luther, 2008; Abdel-Maksoud *et al*., 2005).

In line with the above framework, it can be said that two groups of aspects (external and internal) may or may not motivate decision-makers within Saudi and non-Saudi manufacturing firms to adopt AMA practices. A brief discussion of each group is presented below.

5.4.4.1 Group One: External Aspects

Chenhall (2003) pointed out that two contingent factors (perceived environmental uncertainty and market competition) will continue to be significant in contingency studies. The most recent studies to have dealt with studying change in MASs within organisations have examined the effect of these two factors on the extent of adopting innovation in management accounting (Jusoh, 2008; Ax *et al*., 2008; Abdel-Kader and Luther, 2008; Al-Omiri and Drury, 2007; Drury and Tayles, 2005), which confirms Chenhall's view of their significance. Therefore, the researcher believes these two

external aspects to be important, in that they may drive the adoption of innovation in management accounting in the Eastern Province of SA.

5.4.4.1.1 Perceived Environmental Uncertainty (PEU)

According to Child (1975), organisations which operate in dynamic and complex business environments face high levels of uncertainty, because outcomes are difficult to predict and this may put pressure on the managers to adopt more broad management accounting and control systems (MACSs) in order to ensure their firm's survival (also see Duncan, 1972; Miller and Friesen, 1983).

Miller (1992) classified PEU into three groups, namely: (a) general environmental uncertainty, (b) industrial uncertainty and (c) firm uncertainty, each of which contains several types of uncertainty. Empirically, several researchers have studied the relationship between PEU and the adoption of modern MASs, and come to different conclusions.

For example, Gorden and Naratanan (1984) studied the relationship between PEU, the type of firm structure (independent variables) and the characteristics of the MAS (dependent variable) based on data collected from 34 medium sized American companies. Gorden and Naratanan hypothesised that organisations which depend on a less mechanistic structure tend to use broad MASs compared with those who depend on a less organic structure.

Their first analysis revealed that there was a positive relationship between both independent and dependent variables. However, after controlling for PEU, the

relationship between the independent and dependent variables was negative. For that reason, Gorden and Naratanan concluded their study by emphasising that the adoption of broad MASs in the USA was due to the direct effect of PEU, but not due to the type of organisational structure.

Similarly, Verbeeten (2006) used the typology proposed by Miller for studying the relationship between PEU and the extent of adopting modern investment tools amongst large Dutch organisations. His findings revealed that the large organisations were not relying solely on traditional investment tools for evaluating their investment decisions, but commonly used a combination of both traditional and modern capital budgeting tools, and that this usage was mainly motivated by the influence of PEU, especially the industrial one.

In the same way, Addel-Kader and Luther (2008) investigated the reasons which triggered some UK food and drinks companies to adopt AMA systems. They found that PEU was one amongst other drivers which put pressure on the managers of some of these firms to change their MASs. Based on previous studies, the view stated by Child and others could not be rejected, because both the US and the UK business environments in particular are complex and dynamic. However, the question which can be asked is whether or not the position is the same in other places around the world.

Based on data collected from 120 manufacturing firms, Jusoh (2008) examined the relationships between PEU and the level of adopting NFMs in Malaysia, and used the extent of adopting the BSC, which is considered a type of NFM, as a mediating or

moderate aspect for clarifying this relationship. Her statistical analysis exposed that there is a positive relationship between PEU and the extent of the usage of NFMs in general.

At the same time, her findings divulged unanticipated results regarding the effect of PEU on the level of BSC adoption among Malaysian firms. To clarify, Jusoh found that the firms which had adopted multiple measures, including the BSC, did not face high levels of uncertainty in the business environment, and that the adoption of this novel system reflected positively on the performance of these firms.

A possible explanation of this finding is that the Malaysian business environment may be characterised by dynamism due to the rapid growth of the Far East economy, and it is not necessarily the case that this growth has not resulted in the Malaysian environment becoming as complex as that in the US and the UK. Another possible interpretation of her findings could be fashion, whereby companies have imitated others who have successfully adopted the BSC.

Kattan *et al*. (2007) studied change in MASs at the Stone manufacturing company located in Palestine. They pointed out that during the period of 1993-2000, the company was not keen to adopt novel MASs, mainly because of the stability of the Palestinian political system and environmental conditions. However, the Palestine-Israeli conflict resumed in 2000, and the company shifted to its pre-1993 strategy of adopting more sophisticated MASs as a way of coping with the uncertain conditions.

It is clear from the studies above that uncertainty is a product of several conditions, such as the intensity of market competition, customers' power, technology and the instability of the domestic political system, amongst others, and all of these may influence the extent to which AMA systems are adopted. Therefore, we may hypothesise that:

H1. ***There is a positive relationship between PEU and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.***

5.4.4.1.2 Market Competition

Market competition became a topic of concern a few decades ago, particularly in the West. This concern increased remarkably, particularly during the 1980s and 90s, mainly due to the rapid growth of some Eastern economies. Hence, some organisations have realised that the adoption of AMA systems is unavoidable if they wish to compete domestically and internationally.

Khandwalla (1972) identified three competitive forces which may prompt firms to adopt sophisticated control systems, which in turn influences firm profitability. These forces are price, product quality and distribution channels. Based on data collected from 92 industries in the USA, he examined the relationship between these three types of competition and the desire of firms to adopt modern control systems.

His statistical analysis showed that product quality competition was the major driver stimulating the vast majority of companies to adopt innovative control systems (also see Abdel-Maksoud *et al*., 2005). Surprisingly, he found no relationship between

price competition and the adoption of novel control systems, although he made no mention in his study of any particular reason behind this negative relationship.

However, Mia and Clarke (1999) claimed that the absence of this relationship was mainly due to ignoring moderator variables. It would seem that this assertion should not be ignored, because when dealing with a complex environment like that in the USA, it is unwise to make a direct link between cause and effect. In other words, downgrading the intertwining variables may reflect unreal conditions, particularly in more dynamic environments.

Mia and Clarke identified two problems with Khandwalla's study. The first relates to the mechanism used to measure the relationship between competition and the rate of adoption of control systems. The second focuses on the restricted competition typology, which was proposed by Khandwalla. It was asserted that competition should be broadened to include other significant factors, such as the number of competitors in the market, changes in government regulations, and others.

In the study of 61 Australian industrial firms, the relationship between market intensity and the level of usage by managers of information to improve firm performance was examined. Their results revealed that there was a positive relationship between the variables measured. However, they concluded by pointing out that, although the instrument used in this study was considered novel, further research would be needed to verify its validity. The final results of their study should, therefore, be treated with caution.

Hoque *et al*. (2001) examined the effect of market competition on the extent of using multiple financial and non-financial measures amongst 71 New Zealand

manufacturing organisations. The regression model which has been used by these researchers discloses that the usage of multiple performance measures was driven by two contingent aspects, one of which was market competition.

In a similar vein, Libby and Waterhouse (1996) examined the extent and correlation of changes in MACSs based on responses from 70 medium-sized Canadian manufacturing organisations. They relied on contingency theory to demonstrate the relationship between the changes in MACSs, and several organisational and contextual factors. Four factors were identified as potentially relevant predictors of change, one of which was the intensity of market competition. However, their results exposed only a moderate relationship between changes in MACSs and the intensity of competition.

Alebaishi (1998) found that market competition was one driver which prompted some large and medium-sized Saudi manufacturing firms to adopt TMA and AMA systems in SA. Intermittingly, the regression analysis preformed by Alebaishi revealed no relationship between price and quality competition, and the adoption to TMA and AMA systems. Al-Omiri and Drury (2007) studied the factors which prompted some large UK firms to adopt the ABC system. They found that market competition was one of these factors.

As can be seen, the vast majority of studies have supported the effect of market competition on the rate of adoption of innovation in management accounting. The following hypothesis is based on this finding:

H2. ***There is a positive relationship between market competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.***

5.4.4.2 Group Two: Internal Aspects

The second group contains several aspects, such as the size of the organisation, the technology used (the level of automation within the firm and product diversity), cultural factors and firm strategy. The last two aspects in particular are included in this research because Chenhall (2003) classified them as contingent drivers that may trigger firms to adopt or not adopt innovation in management accounting. A brief discussion of each of these aspects concluding with how they relate to the hypothesis is presented below.

5.4.4.2.1 Organisational Size

The size of an organisation is considered an important pillar of the contingency perspective, because it is particularly associated with technology, for the purpose of determining organisational structure (Pugh *et al*., 1969, p.112; Aiken, 1971).

However, the extent to which this factor affects firms' decisions to accept or reject AMA practices is still treated with scepticism, because some studies have found a significant relationship between this factor and the adoption rates of AMA systems, while others have not. For example, Libby and Waterhouse (1996) found a weak relationship between the rates of change in MACSs and the size of firm (number of employees) (also see William and Seaman, 2001).

Based on data collected from 75 large manufacturing firms, Bjornenak (1997) studied the drivers which led the ABC system to be disseminated in Norway. Bjornenak used the number of employees as a proxy for studying the relationship between the size of the firm and the diffusion of the ABC systems. His statistical test showed a positive and significant relationship between the size of the firms and the adoption of the ABC systems (also see Cinquini *et al*, 1999; Malmi, 1999; Askarany and Smith, 2003).

In the UK, Al-Omiri and Drury (2007) studied the drivers which stimulated the leading firms to adopt sophisticated costing systems. The researchers used annual turnover as a proxy for studying the association between size and the adoption to the ABC system. Their results showed a positive and significant relationship between size and the adoption of the ABC system in the UK (also see Innes and Mitchell, 1995; Clarke *et al*., 1999).

Similarly, Abdel-Kader and Luther (2008) found a positive and significant relationship between the size (total assets) and the adoption to some modern management accounting systems in the UK (also see Alebaishi, 1998).

In the same way, Hoque and James (2000) utilised three measures (total assets, annual sales revenue and number of employees) for studying the relationship between the size and the diffusion of the BSC in Australia. Their statistical analysis revealed that there was a positive and significant relationship between size and the diffusion of the BSC in Australia.

Most aforementioned studies have linked this strong relationship to the levels of financial resources and expertise within large firms compared to small firms. The situation in SA regarding the link between firm size and the rate of adoption of AMA practices could be similar to that found across the world. Hence, the following hypothesis can be formulated:

H3. ***There is a positive relationship between the size and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.***

5.4.4.2.2 Technology

Fisher (1995, p.31) pointed out that there are two well-known definitions of technology. The first comes from Woodward's work, which classifies technology into four types: small batch, large batch, process production and mass production. The second is Perrow's definition, which was "based on the number of expectations in the product or service generation process and the nature of the search process when expectations are encountered".

Researchers have used several viewpoints when studying the relationship between technology and the adoption of AMA systems in general, or the relationship between technology and the adoption of one particular MAS. However, product diversity, the level of automation within the firm and cost structures were the most commonly used viewpoints when elucidating the above relationship.

The current research excludes the last of these, because it has been extensively used by several other researchers (Brown *et al*., 2004; Bjornenak, 1997; Cinquini *et al*.,

1999; Malmi, 1999; Clarke *et al*., 1999) for clarifying the effect of technology on the use of modern costing techniques, such as the ABC system, and the focus of this research is not restricted to the ABC system, but includes a range of AMA systems. A brief discussion of the two selected viewpoints is presented below.

5.4.4.2.2.1 Product Diversity

Cooper (1989a) pointed out that, where a firm produces a wide range of products, especially when that range is characterised by heterogeneity in its nature, the manufacturing process tends to be more complex, and this type of production leads to the proportion of the overhead costs being increased. Consequently, using simplistic cost drivers for allocating overhead costs for a mixture of products will provide inaccurate information for the decision makers. Therefore, he suggested that the use of a more sophisticated product costing system could solve that problem.

In the same way, Bjornenak (1997) argued that the character of the production within a firm (standardised or customised) can be considered to be one aspect which may affect the decision of the managers regarding whether or not they should adopt a modern product costing system. Bjornenak clearly stated that "highly customised production normally means high product diversity" (p.11).

Several researchers have studied the effect of product diversity on the selection of modern costing systems, and have come up with different results. For example, Drury and Tayles (2005) used two measurements for studying the relationship between product diversity and designing the product costing system, which were (a) a variation

in the resources consumption by different products and (b) the production range (standardised production vs. customised production).

They found a positive and significant relationship between product diversity and the degree of complexity of the product costing system. Similarly, Bjornenak (1997) used the range of production and the number of products being manufactured for studying the relationship between product diversity and the adoption to the ABC system in Norway. He found a positive and significant relationship between product diversity and the adoption to ABC (also see Clarke *et al*, 1999; Malimi, 1999). Contrary to the studies above, Al-Omiri and Drury (2007) found no relationship between product diversity and the adoption of sophisticated costing systems in the UK.

Abernethy *et al*. (2001) studied the effect of product diversity on the selection of advanced cost accounting systems at two companies. The first consisted of three divisions (HC1, HC2 and HC3) and the second had two divisions (FT1 and FT2). They found that only one division from each company (HC3 and FT2) had adopted modern costing systems, and that the adoption was motivated by both the use of advanced manufacturing technology and product diversity.

In other words, product diversity itself was not a sufficient driver for the adoption of advanced costing systems in those divisions. At the same time, the limited number of products being manufactured was the main reason given by the other divisions for not adopting the new systems.

Although there is some evidence to suggest that product diversity has not led to changes to existing systems, it is possible that this variable might be considered a strong motive for Saudi and non-Saudi organisations to adopt AMA systems, or even some of these modern systems. Therefore, we may hypothesise that:

H4. ***There is a positive relationship between product diversity and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.***

5.4.4.2.2.2 The Level of Automation within the Firm

According to Udo and Ehie (1996), the last two decades of the twentieth century witnessed the appearance of several advanced manufacturing technologies (AMTs) for the purpose of improving the performance of organisations in general. However, Dangayach and Deshmukh (2005) pointed out that AMT is an umbrella term which can be used to describe a wide range of automation within firms (for example, production technologies, information technologies, administrative technologies and others)[1] (also see Dean *et al*., 1992; Zammuto and O'Connor, 1992; Jonsson, 2000).

The management accounting literature proponents of AMA practices have frequently argued that using AMTs involves adopting modern MASs (Johnson and Kaplan, 1987; Otley, 1994). In their study, Drury *et al*. (1993) found that one reason behind the continuing use of TMA practices amongst UK manufacturing firms was the limited use of AMTs, particularly in the manufacturing sector (for example, JIT,

[1] This research relates to AMT from its broad view, as proposed by Dangayach and Deshmukh (2005)

flexible manufacturing systems and numerically controlled computers). However, as Scapens *et al*. (2003) stated, the rate of AMT adoption in the UK accelerated during the latter years of the twentieth century, which in turn led to a greater emphasis on the importance of adopting AMA systems.

Contrary to the study above, Isa (2007) came up with unequivocal evidence regarding the strong correlation between the level of automation in production and information systems, and the extent of adoption of AMA systems in Malaysia. More precisely, Isa noticed that there was a marked change in the cost structures of manufacturing firms which adopted and used AMTs by substituting traditional costing systems with the ABC system in order to enhance the quality of their cost information.

Also, the use of AMTs stimulated those firms to use NFMs extensively. Isa concluded that the use of other innovative management practices such as customer profitability, product-line profitability and supplier performance was motivated by the use of AMTs.

Similarly, Dangayach and Deshmukh (2005) studied the influence of using certain AMTs on the extent of adoption of AMA systems amongst 122 Indian manufacturing firms. Their study exposed that the adoption of the ABC system was subject to the implementation of the ERP system, which is considered a type of AMT. They, therefore, concluded that companies which invested in AMTs gained some benefits, particularly in the area of identifying customer profitability, as a result of substituting the old product costing system with the new one.

Granlund and Malmi (2002) pointed out that the adoption of ERP systems in Finland enhanced the accuracy of sales and costs forecasting, but that the process of preparing budgets remained unchanged. Therefore, they concluded their study by emphasising that the adoption of ERP systems did not have a major impact on changing the traditional logic of management accounting practices in Finland.

Mandal *et al*. (1999) surveyed the extent of TQM adoption amongst 147 Australian manufacturing firms and the drivers which influenced that adoption. They found that the adoption of some modern production technologies, such as computer-integrated manufacturing (CIM), material requirement planning (MRP) and manufacturing resource planning (MRPII), stood behind the adoption of the TQM system, which in turn reduced the number of products rejected, and enhanced the profitability of these firms.

Based on information extracted from 116 manufacturing companies in the USA, Small (1999) found a remarkable variation in the performance of companies who relied heavily on modern production and information systems, with those with limited use of such systems.

The statistical test performed by Small revealed that delivery lead-times to customers, the size of the production per worker and the average number of tasks per operator were the three distinguishable areas responsible for enhancing firm performance between the heavy adopters and non-heavy adopters of the AMTs. Small, therefore, concluded his study by emphasising that the heavy adoption of AMTs led the firms in the USA to adopt a combination of FMs and NFMs, which in turn was reflected in the enhancement of their performance (also see Upton, 1998).

It is clear from the above studies that the use of AMTs may lead to changes in the traditional MASs, or affect the extent to which AMA practices are adopted. Therefore, we may hypothesise that:

H5. ***There is a positive relationship between the extent of using AMTs and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.***

5.4.4.2.3 Culture

As is commonly known, each organisation has a culture of its own (a micro-culture) and this culture is, in the main, a part of the larger societal culture (the macro-culture), in that it follows the norms and rules which exist in the wider culture. Brewer (1998) pointed out that cultural aspects may or may not drive the adoption of innovation.

Several researchers have studied the interaction between culture and innovation from different viewpoints. The most commonly used applies the typology proposed by Hofstede. For example, Van der Stede (2003) studied the effect of the two dimensions of Hofstede's framework on the type of management control and incentive systems (MCISs) used by business units (domestic and international) operating in Belgium, and also found a weak link between culture and MCISs. He asserted that this weak influence could be due to the cultural similarities of the firms, as they were all considered to be European firms, and he concluded that studying firms from different cultures may lead to different results.

Choe and Langfield-Smith (2004) compared the effect of national culture on the amount of information provided by management accounting information systems in

Korea and Australia. Contrary to the above study, their findings revealed that the quality of performance information generated from traditional MASs in Australian firms was much higher than that of their counterparts in Korea, because the Australian firms practiced a low level of collectivism. However, the Korean firms were considered more flexible in their use of performance information, because they tended to be more collectivist. This was the only difference to be found to indicate that the affect of culture on management accounting systems/practices was not as great as anticipated.

In similar fashion, O'Connor (1994) examined the differences between domestic and foreign manufacturing firms operating in Singapore regarding the influence of organisational culture on the level of participation in budget setting. He found that the only difference between the two types of firms was in the power distance dimension. In other words, the low power distance for the foreign subsidiaries led to an increase in the amount of participation in budget setting, which in turn reduced the role of ambiguity within budgets, whereas the inverse condition was found for the local firms.

Another group of researchers studied the interaction between innovation and culture by looking at where the authority was concentrated. Kanter (2004) clearly pointed out that innovative organisations tended not to concentrate authority at the top level of the hierarchy, and that these companies generally used effective communication channels to link people within the hierarchy, and "help them go beyond the confines of their defined jobs to do what needs to be done" (p.159). Similarly, McNulty and Ferlie (2004) stated that the adoption of innovation involves empowerment through

authority and not adherence to job regulations, which means that flexibility is an essential part of the adoption of innovation.

Harrison *et al*. (1994) studied the effect of national culture on the degree of emphasis on the use of quantitative techniques in Western and Eastern countries. They clustered Singapore and Hong Kong in one group, and the USA and Australia in another group representing the Anglo-Saxon culture. Their results showed that organisations in the USA and Australia placed greater emphasis on these techniques compared with their counterparts in the East, mainly due to their use of decentralised structures, which allowed the empowerment of authority (low power distance).

At the same time, their findings revealed that there was no job formalisation effect (uncertainty avoidance) on the emphasis of the use of quantitative techniques in the West and the East. They, therefore, concluded their study by emphasising that the adoption of innovation can be subject to some cultural aspects.

With regards to Arab countries, Hofstede (1980) described them as having high power distance and high uncertainty avoidance, which means that authority tends not to be delegated, and employees must fully comply with and follow the rules of their job. At-Twaijri and Al-Muhaiza (1996) examined Hofstede's view by looking at six Arab countries, in order to ascertain its credibility. Their results disclosed that Hofstede’s description of Arab countries almost exactly reflected the real picture. This may lead us to predict that Saudi managers are unenthusiastic about adopting innovation, due to the nature of the Saudi culture. We therefore posit that:

H6. ***The extent to which AMA practices are adopted by non-Saudi manufacturing companies is noticeably higher than Saudi companies due to cultural differences.***

5.4.4.2.4 Firm Strategy

According to Guilding *et al*. (2000, p.115), the concept of *strategy* originated in military literature, and was then borrowed and used by other disciplines. Hence, it has been given a variety of definitions, and there is no agreement among scholars regarding its precise meaning (Shirley, 1982).

Mintzberg *et al*. (1998) defined strategy as a "pattern or plan that integrates an organisation's major goals, policies and action sequences into a cohesive whole" (p.5). It is clear from this definition that strategy is considered as the spine which links the different parts of an organisation, in order to transform the senior management's vision into reality. However, the process of this transformation is not always easy because it depends on the degree of support from particular parties within the organisation.

Raps (2004) pointed out that achieving the successful implementation of a particular strategy involves paying full attention to four keys factors: (a) the organisational culture, (b) the organisational structure and decision flow processes, (c) human resources, and (d) the nature of the control system and the instruments within the organisation.

Now questions arise as to why firms adopt strategies, and how one or all of these factors contribute to successful implementation. Auzair and Langfiield-Smith (2005, p.403) stated that, according to Slater and Olson, "business strategy is concerned with how a business achieves competitive advantage". They suggested that, to achieve this aim, the firm should align the existing structure with its strategy. However, Chandler (1990, p.315) pointed out that structure often fails to follow firm strategy, and that this undeniably endorses the significance of the key factors proposed by Raps.

Most of the researchers who have dealt with business strategy have distinguished between three well-known typologies: Porter (product differentiation strategy and low cost strategy), Miles and Snow (defenders, prospectors, analysers and reactors), and the product life cycle (build, hold, harvest and divest). Fisher (1995) pointed out that there is no particular advantage to any one of these typologies, because each one seeks to maximise firm effectiveness. However, certain circumstances may stimulate firms to adopt a particular type of strategy (such as the nature of the market, the financial and non-financial ability of the firm, and so on).

Noticeably, most researchers who have studied the relationship between business strategy and the change in MAS have adopted either the first or the second typology (Simons, 1987, 1990; Gosselin, 2005). The current research focuses on Miles and Snow's classification of business strategies.

Chenhall and Langfiield-Smith, (1998b) pointed out that firms which adopt prospector strategies can be classed more as innovators than analysers or defenders, because they always concentrate on browed market domain, invest aggressively in

research and development, and continuously produce new products in order to benefit from market opportunities. This can be evidenced by studies which distinguish between ABC adopters and non-adopters (Malmi, 1999, 1996; Innes and Mitchell, 1995; Innes *et al*., 2000; Clarke *et al*., 1999).

Gosselin (1997) studied the relationship between the type of strategy and the forms of activity management (AM). He found that companies which classified themselves as prospectors were keen to adopt the full package of the ABC system, due to the availability of expertise and financial support, while defenders adopted the reduced forms of the technique (activity analysis).

However, the most surprising thing to arise from Gosselin's study was the type of structure adopted to drive the success of the ABC within prospectors' firms. He noticed that there was a direct relationship between centralisation and formalisation, and the successful implementation of the ABC software in these companies, and concluded his study by emphasising that the success of innovation is dependent upon a centralised and formalised structure.

Eight years later, he revised this conclusion after studying the relationship between business strategy and the extent to which financial and non-financial measures had been adopted by Canadian manufacturing firms. He (2005) reported that prospectors who depend on a decentralised structure were more likely to adopt NFMs, and that this reflected more positively on their performance than was the case with companies which followed defender strategies. His findings affirm the assertion of some

researchers regarding the keys which drive the success of innovation within firms (low centralisation and low formalisation).

Other studies have focused on studying the factors which may affect the decisions by firms to change their existing structures by adopting a particular strategy. For example, Anderson and Lanen (1999) examined the effect of the liberalisation of the Indian economy on firms' MASs following the contingency perspective. Their findings revealed that there had been noticeable changes in the strategic planning and control of some Indian firms, in response to changes occurring in the external business environment.

However, since the business environment in India tends to be more stable than in the West, Anderson and Lanen indicated that the vast majority of Indian firms preferred to compete by offering customers low product costs and high quality, in order to enhance their performance rather than change their existing structure. This clearly indicates that changing the structure of organisations will remain a big challenge, and that the nature of the business environment may or may not affect the decision of firms regarding such change.

Jusoh and Parnell (2008) looked at strategy as an intertwining aspect when studying the relationship between the conditions of the business environment in Malaysia, and the extent to which modern performance indicators were adopted. They found that most Malaysian firms relied heavily on defender strategies, and that the vast majority of these firms were unenthusiastic about changing their structure by adopting a mixture of techniques for measuring their performance. They concluded that the

reason behind the continuous reliance on FMs in Malaysia was mainly due to the stability of the Malaysian business environment.

Inverse results were reported by O'Regan and Ghobadian (2006) in the UK. They studied the association between the nature of the business environment and the type of strategy adopted by small and medium-sized manufacturing firms. Interestingly, they found that small firms were more likely to adopt prospector strategies than their medium-sized counterparts, which unquestionably enhances the scepticism regarding the importance of firm size as a contingent aspect.

O'Regan and Ghobadian pointed out that small firms preferred to adopt an oriented strategy, because they practice their business in a more dynamic environment than is the case with medium-sized firms, and this allows them to compete strategically and ensure their survival.

The position in the USA was similar to that found in the UK. Chen (2008) investigated whether manufacturing firms in the USA who were classified as defenders placed much emphasis on DCF practices, or whether they preferred to use mixed performance measures. Chen reported no significant relationship between the defenders' strategy and the sole use of DCF techniques. However, these results should be treated with care, because the sample in this study was not restricted to small and medium-sized firms.

Noticeably, all the previous studies had focused on Miles and Snow's two typologies (prospectors and defenders), omitting the other two types of strategies. Chenhall and Langfiield-Smith, (1998b) argued that analyser strategy largely stands between the

prospector and defender strategies, and has no clear features. Similarly, O'Regan and Ghobadian argued that, since most empirical studies have focused on the comparison between prospector and defender strategies, the reactor and analyser strategies are no longer appropriate as categorisations (p. 615).

Hence, this research focuses only on two classifications of strategy (prospector and defender), in order to explore whether or not the extent to which AMA practices are adopted varies depending upon the type of strategy followed by Saudi and non-Saudi companies. We, therefore, hypothesise this:

H7. ***Companies which are following a prospector strategy are more likely to adopt AMA practices than those following a defender strategy.***

5.5 Summary

In brief, this chapter has discussed some of the theoretical frameworks which have been adopted to examine or study change in management accounting. Although each of them has disadvantages, they are still valid and in use. To clarify that, evidence which came from SA revealed no support for the institutional framework (see chapter one), so using this framework might be relevant for studying stability within MAS rather than change in MAS.

With regards to the fad and fashion framework, it is mentioned in the current chapter that this methodology is relevant for studying change in MAS in uncertain business environments. However, to the best knowledge of the researcher, there is no study

which has proved whether the Saudi business environment is certain or uncertain, so using this framework is risky.

Evidence presented in the previous two chapters supports the notion of the contingency approach in terms of there being no best way to manage, which means that firms may or may not use AMA systems to satisfy their performance. The whole situation depends on how the use or non-use of these systems will influence firm performance on the one hand, and the degree of pressure caused by the contingent aspects on firm management on the other.

The selection of the contingent aspects included in the current study was done based on careful reviews of the contingent studies undertaken in Western countries and other places around the world, including SA. As mentioned in the current chapter, several studies found clear links between the adoption of AMA practices and some contingent aspects, such as size (Al-Omiri and Drury, 2007; Bjornenak, 1997; Alebaishi, 1998), automation (Isa, 2007; Dangayach and Deshmukh, 2005) and competition (Khandwalla, 1972; Hoque *et al*., 2001; Al-Omiri and Drury, 2007), so the selection to the contingent aspects in the current research fits with previously mentioned studies.

However, aspects such as uncertainty, product diversity, culture and strategy remained unexplored in SA, even though several Western studies found links between these drivers and the adoption of all or some AMA practices (Addel-Kader and Luther, 2008; Clarke *et al*, 1999; Malimi, 1999; O'Connor, 1994; Gosselin, 1997). Therefore, the current research tries to extend the contingent framework used by Alebaishi (1998) by covering unexplored contingent aspects in SA. The following chapter sheds some light on the research design and methodology.

Chapter Six: Research Design and Methodology

6.1 Introduction

Chapter six focuses on the research design and methodology, comprising two parts. The first part is the focus of the study, and it covers three subtopics: an overview of the research problem, the research questions, and the content of the investigation which accomplishes the research objectives and answers the research questions.

The second part deals with the research methodology and several subtopics discussed under the methodology issue (for example, population, sample frame and size, the research methods, data collection instruments, research limitations, the validity and reliability of the research instruments, and the data analysis).

6.2 Part One: The Focus of the Study

6.2.1 Overview of the Research Problem

As mentioned briefly in the first chapter, and as subsequently detailed in the third and fourth chapters, the adoption of AMA systems is still limited in developed and developing countries. In other words, TMA systems are still alive and widely used in practice, even though they have been severely criticised. Evidence from different parts of the world makes it clear that the entire adoption of AMA systems is subject to contingent circumstances. As a consequence, this research seeks to investigate this phenomenon amongst Saudi and non-Saudi manufacturing firms operating in the Eastern Province of SA.

6.2.2 The Research Questions

1. What current management accounting practices are being used by Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA between 2002 and 2006?
2. What are the internal and external drivers which prompted Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA to adopt or not adopt AMA systems?

Answering the previous two questions will lead us to discover whether:

(a) the case of the Eastern province of SA is similar to those found across the world regarding the slow and low levels of adoption to AMA practices, or not.

(b) the adoption and non-adoption of innovation in management accounting by Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA was subjected to the contingent aspects illustrated in the previous chapter, or whether there were other aspects.

6.2.3 Contents of the Study Investigation

Based on careful review of the literature of management accounting, the researcher identified the macro and micro elements which he deems relevant for answering the research questions and accomplishing the research objectives. These elements have been divided into: (a) management accounting practices within firms, and (b) external and internal contingent aspects. Table 6-1 represents the selected management

accounting issues which are believed to lead to accomplishing the first aim of this research.

(A) Management accounting practices (descriptive study)

		Macro-issues		Micro-issues
Management accounting systems	**Traditional management accounting systems**	Costing systems (see tables 7-1-7-9)	1.	Accounting system(s) within firms (e.g. single, multiple, other)
			2.	Types of product costing systems within firms (job, process, batch, other)
			3.	Type of product costing methods for calculating product cost (full, variable, full & variable …)
			4.	Overhead allocation methods (plant-wide rate, direct labour hours/costs, machine hours …)
		Decision-making practices (see tables 7-10-7-14)	1.	Cost-volume-profit analysis
			2.	Pricing techniques (market price, cost-plus)
			3.	Capital budgeting techniques (payback, ARR, discount payback, NPV, IRR)
		Planning and controlling systems (see tables 7-15-7-19)	1.	Standard costing system
			2.	Budgeting
		Transfer pricing & financial performance measures (see tables 7-20-7-22	1.	Transfer pricing techniques (market price, cost of production, negotiation)
			2.	Financial performance techniques (ROI, ROS, RI, variance analysis, divisional profit …)
	Advanced management accounting systems	Modern costing practices (see tables 7-23-7-24)	1.	Activity-Base costing
			2.	Life cycle costing system
			3.	Cost of quality reporting system
			4.	Backflush system
			5.	Throughput accounting
		Modern pricing decision system (see tables 7-23-7-24)		Target costing system
		Modern planning and control practices (see tables 7-23-7-24)		Activity-based budgeting
		Non-financial performance measures (see tables 7-23-7-24)	1.	Customer satisfaction, employees' attitudes, manufacturing leading time, etc
			2.	Balanced scorecards
		Modern management and production systems (see tables 7-23-7-24)	1.	Activity-based management
			2.	Total quality management
			3.	Value-based management
			4.	Just-in-time production system

Table 6-1

At the beginning, it would be necessary to mention that the selection of the issues illustrated in table 6-1 was not done haphazardly, as several management accounting studies have covered these issues, or at least most of them. For example, Drury *et al*. (1993) investigated most of the issues illustrated in the above table in the UK, in order to find out whether or not there was a gap between the theory of management accounting and its practices. Their results revealed that, in general, the UK manufacturing firms were loyal to their TMA practices. In other words, the adoption rate of some AMA practices, such as ABC, TC and JIT, was not prevalent in the UK.

Similarly, Abdel-Kader and Luther (2006) investigated management accounting practices amongst the UK food and drink industry. They focused their investigation on a wide range of micro-issues illustrated in the previous table, except for advanced management and production systems (JIT, TQM, VBM and ABM). Their findings showed that the rate of the usage of TMA practices was still high in this type of industry, even though they found that the movement towards adopting some of the AMA practices was slow (such as non-financial measures).

Evidence from other European countries, rather than the UK, revealed that some researchers investigated either several aspects from those illustrated in table 6-1 (Hyvonen, 2005), or only some of them (Clarke, 1992, 1997; Ask and Ax, 1997; Cinquini *et al*., 1999; Haldma and Laats, 2002). The result of all of those studies showed that only a few firms adopted AMA practices, which means that managers within organisations are still in favour of using TMA systems, even though most of these firms are large, or operate in competitive markets.

In the USA, Garg *et al*. (2003) reported in their study that, according to a survey undertaken by the Institute of Management Accountants (IMA), and Ernst and Young (E&Y), the rate of adopting AMA systems is low in the USA, while the inverse condition is true for the rate of adopting TMA practices in the same country. Several issues illustrated in table 6-1 were covered in the survey undertaken in the USA; hence, the selected issues fit with the survey.

Other management accounting studies undertaken in several places around the world also covered a wide range of the micro issues illustrated in table 6-1 (Joshi, 2001; Wijewardena and Zoysa, 1999; Al Chen, 1997; Chenhall and Langfield-Smith, 1998a; Firth, 1996; Waweru *et al*., 2005). Based on the aforementioned studies, it is fair to say that the selected macro and micro elements for accomplishing the first aim of the current research have a solid basis in the literature of management accounting, which means that the researcher is not the first one who investigated these issues.

However, since most of the previous studies were undertaken in Western countries, and there is no extensive empirical evidence covering all of the issues illustrated in the previous table in SA, this research tries to fill this gap through bringing about a cohesive picture about how management accounting is practiced in the Eastern part of SA, in order to confirm, or not, whether the case of the Eastern part of SA goes with the mainstream regarding the continuing heavy use to TMA systems and the limited adoption to AMA systems, or if there is an unexpected result.

(B) The Internal and External Contingent Aspects (explanatory study)

Group One (external aspects)

This group focuses on two macro issues: perceived environmental uncertainty and market competition. The following tables expose the micro variables which relate to each macro contingent aspect.

	Macro contingent aspect		Micro variables
1.	Perceived environmental uncertainty (PEU) H1: *There is a positive relationship between PEU and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-1)	1.	The level of economic change within the external environment during the last five years (stable, dynamic, other)
		2.	The level of technological change within the external environment during the last five years (stable, dynamic, other)
		3.	The level of political and economic constraints change during the last five years (remained the same, greatly changed or proliferated, other)
		4.	The ability of predicting customer tastes and preferences during the last five years (easy, hard, other)
		5.	The number of product(s) offered to customers during the last five years
Table 6-2			

	Macro contingent aspect		Micro variables
2.	<u>Market competition</u> H2: *There is a positive relationship between market competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-2) <u>Note</u> This particular hypothesis can be measured from four different ways. Therefore, it will be divided into four sub-hypotheses, with each one focused on one micro-variable (see next chapter, part two)	1.	The level of competition for bidding for the purchase or inputs in the firm industry (of negligible intensity, extremely intense, other)
		2.	The level of competition for manpower in the firm industry (of negligible intensity, extremely intense, other)
		3.	The level of competition for product quality in the firm industry (of negligible intensity, extremely intense, other)
		4.	The level of competition for product price in the firm industry (of negligible intensity, extremely intense, other)
Table 6-3			

Group Two (internal aspects)

This group focuses on four macro issues: size, technology (advanced manufacturing technology (AMT) and product diversity), culture and firm strategy. The following tables show the micro issues which relate to each macro internal contingent aspect.

	Macro contingent aspect		Micro variables
3.	The size of the firm H3: *There is a positive relationship between the size and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* Note This particular hypothesis can be measured from three different ways. Therefore, it will be divided into three sub-hypotheses, as follows: H3a: *There is a positive relationship between the number of employees and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-3) H3b: *There is a positive relationship between the firm's total assets and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-4) H3c: *There is a positive relationship between the firm's total sales revenue and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-5)	1. 2. 3.	The number of employees Firm's total assets Firm's annual sales revenue
Table 6-4			

	Macro contingent aspect		Micro variables
4.	<u>Product diversity</u> H4. *There is a positive relationship between product diversity and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.* (see tables 8-6 and 8-7)	1.	The number of products being produced by the firm
		2.	The best description of firm production (standardised, customised, other)
Table 6-5			

	Macro contingent aspect		Micro variables
5.	<u>Advanced manufacturing technology (AMT)</u> H5: *There is a positive relationship between the extent of using AMTs and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations* (see table 8-8)	1.	The level of automation for the production process within the firm (not automated, completely automated, other)
		2.	The frequency of the usage of customer technology (never, always, other)
		3.	The nature of the firm production type (small patch, job shop, large patch technology, mass production technology, continuous process technology (never, always, other)
		4.	The level of usage of electronic data processing within the firm (not used at all, used for all activities, other)
		5.	The level of usage of particular types of AMTs, such as computer-aided design, computer-aided engineering, computer integrated manufacturing, ERP and others, by firm (never, always, other)
		6.	The degree of change that occurred in operations technology within the firm during the previous five years (no change at all, at least five changes, other)
Table 6-6			

	Macro contingent aspect		Micro variables
6.	Culture H6: *The extent to which AMA practices are adopted by foreign manufacturing companies is noticeably higher than Saudi companies, due to cultural differences* (see tables 8-9 - 8-11)	1.	The delegation of authority in design-making (no delegation, complete delegation, other)
		2.	Formalisation (formal job task description, no formal job task description)
Table 6-7			

	Macro contingent aspect		Micro variables
7.	Firm strategy H7. *Companies which are following a prospector strategy are more likely to adopt AMA practices than those which follow a defender strategy* (see table 8-12)	1.	Market domain (broad, narrow, other)
		2.	The significance of searching for market opportunities
		3.	The level of investment in product market research
		4.	Pioneering the introduction of new products into the market
		5.	Competing through product price, quality, after sale service and fast delivery to customers
		6.	The significance of customising firm's products to meet the customers' needs
		7.	The significance of maintaining market strength in all areas in which the firm operates
		8.	Emphasising the efficiency of the existing operation
Table 6-8			

It was mentioned in the previous chapter that this research is based upon the contingency framework, because several empirical studies found a clear link between the contingent aspects, and the design of management accounting and control systems, or the adoption of AMA systems (see chapter 5). Therefore, the contingent aspects illustrated in tables 6-2 - 6-8 have a solid empirical background.

Other contingent studies fit in line with those presented in previous chapters, regarding the influence of the contingent aspects on the selection of management accounting systems. For example, Haldma and Laats (2002) used the contingency framework to identify the aspects which motivated large Estonian manufacturing organisations to change their management accounting and control systems. Haldma and Laats found size, competition and new regulations for financial accounting to be the drivers which motivated more than 70% of Estonian manufacturing firms to develop their managerial accounting systems.

Based on a response rate of 48.8%, Hoque (2008) studied factors which have motivated several Australian manufacturing firms to change their management accounting systems. Hoque conceptualised change in management accounting as a dependent variable, and examined the relationship between the dependent variable and four contingent aspects (capacity of change, size, centralisations and competition).

His regression analysis showed that there was a positive and significant relationship between the dependent variable, competition and the capacity of change, but not with size and centralisation. Therefore, Hoque concluded his study by emphasising that change in management accounting systems in Australia was down to the effect of some contingent aspects.

In the same way, Ezzamle (1990) examined the relationship between three contextual aspects (uncertainty avoidance, size and managerial autonomy) and the design of the corporate budget system in UK firms (differing by industry). His analysis showed a weak and negative relationship between two of the contextual variables (size and

managerial autonomy) and the dependent variable. However, he found a positive and significant relationship between uncertainty and the design of the budgeting system.

Askarany and Smith (2003) studied the relationship between the ABC system and two contingent aspects (size and technology). They focused their study on only one type of industry (plastic), because firms which belong to this industry operate in a competitive market and use several types of modern technological systems (for example, JIT, flexible manufacturing system, Robotics and others).

Askarany and Smith pointed out that the heavy use of modern technological system will motivate some Australian plastic firms to adopt modern costing system which fit with their use of modern technological systems. Their statistical test revealed there is a direct and significant relationship between dependent (extent of using ABC) and independent variables (size and technology). Therefore, they concluded their study by emphasising that the adoption of the ABC system in the Australian plastic industry was subject to some contingent aspects.

Pavlatos and Paggios (2009) examined the relationship between cost system functionality and four contingent aspects (competition, size, strategy, and the extent of use of cost data), based on quantitative data collected from 100 leading hotels in Greece. Their findings revealed no relationship between size and competition, and the functionality of the costing system in the surveyed hotels, while a positive and significant relationship was found between the dependent variable, and the strategy and extent of use of the cost data.

It is clear from previous studies that, despite some researchers finding no support for some contingent aspects, others did, so there is a possibility that Saudi and non-Saudi manufacturing firms are motivated by some aforementioned contingent aspects ,and have adopted AMA systems for the purpose of enhancing their performance.

Based on this optimistic expectation, several contingent aspects have been covered in the current research to bring about a clearer picture about the drivers which motivated Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA to adopt or not adopt AMA practices. The next topic sheds light on the research methodology.

6.3 Part Two: Research Methodology

6.3.1 Defining the Relevant Population

Bryman and Bell (2007) pointed out that population is a universal term, and that the sample of population can be individuals or groups, nations, cities, firms, departments, or something else. For the current research, population comprises all Saudi and non-Saudi manufacturing firms which operate only in the Eastern Province of SA, and established their business in or before 2002.

Since one instrument used for collecting the research data (questionnaire) contains some questions related to past events, companies established after the end of 2002 have been excluded. The result of this exclusion reduced the population from 715 to 672 companies. With regard to firms' size classification, the Ministry of Commerce &

Industry in the SA branch of the Eastern Province classifies firms according to the number of employees into three categories. The table below shows this classification:

Small firms	Medium-size firms	Large firms
20 employees or less	21-500 employees	More than 500 employees

Table 6-9

The current research excludes the first category of firm classification for several reasons. Firstly, previous studies in management accounting and other subjects undertaken in SA revealed that the response rate from small Saudi firms was very low (Alebaishi, 1998, Al mulhem, 2002; Al saeed, 2005; Al mulhem, 2001).

Secondly, seven experts (five academics, one manager at Saudi Industrial Development Fund, and another manager at the Ministry of Commerce & Industry, Eastern Province branch) advised the researcher to omit small firms, because these firms were unlikely to co-operate with researchers.

Thirdly, the researcher phoned roughly 60% of these firms (247 out of 412) to check whether or not these companies applied any traditional or advanced management accounting systems. Surprisingly, 6% of these firms informed the researcher that they had never heard about management accounting at all, while 23% regarded co-operating in research as wasting their time, because they did not benefit at all from this co-operation. The remainder of the sample stated that they used simple book-keeping records to manage their businesses.

For the aforementioned reasons, the researcher confined the definition of the population in the current research to only: (a) medium and large Saudi (governmental, private and public) manufacturing firms, and (b) large private foreign and joint venture manufacturing firms, due to the absence of medium-sized firms for the last

two types of manufacturing firms (260 out of 672). The distribution of these companies is shown in Table 6-10.

Saudi manufacturing firms				Large private non-Saudi firms	Large joint venture firms	Total
Large firms			Medium size firms			
Governmental	Public	Private				
5	7	63	140	34	11	260
Table 6-10						

Based on table 6-10, we can confirm that the research design for the current study links with the research framework from two aspects, which are (a) size and (b) type of firm ownership. As mentioned in the previous chapter and in this chapter, some researchers found a clear link between the size of the firm and the extent of adopting AMA practices, while others did not.

Additionally, the difference in firm ownership will enable us to examine the relationship between culture and the extent of adopting AMA practices in Saudi and non-Saudi firms. Joshi (2001) studied the variation in the emphasis on TMA and AMA practices between Indian firms, and foreign medium-sized and large manufacturing firms, so the current research design fits with that used by Joshi in terms of size and ownership.

6.3.2 The Research Sample Frame

According to several scholars, the sampling frame contains a list of elements from which the actual sample will be selected (Bryman and Bell, 2007; Blumberg *et al*, 2005; Czaja and Blair, 1996). It is rare to find a perfect or complete frame which shows each single element listed once in that list (Kish, 1965).

For elevating the main problem with the research frame, Kish (1965) pointed out that researchers can ignore the deficiencies with the frame if they are minor, correct them if this correction is not costly and time-consuming, or redefine the population to make it fit with the selected imperfect frame.

For the current study, the researcher used three sources as the frame, to overcome the missing data associated with each single source. These three sources were: (a) the latest version of the directory of Saudi manufacturing firms, (b) the top 1000 Saudi companies in 2006/07, and (c) the list obtained from the Eastern Chamber of Commerce and Industry which contained Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA.

The selected research frame provided the researcher with information about the targeted companies, such as their names and addresses, the year of establishing their business, the owners, the number of the employees, the type of production, and the financial status. Having identified the research frame, the question can be asked: *Should we use a sample from the defined population or treat the whole population as a sample*?

6.3.3 The Sample Size

Determining the relevant sample which reflects the characteristics of the defined population is still a topic of concern amongst researchers. Sekaran (2003) pointed out that samples rarely match the defined population100%, but the researcher should select his/her sample based on scientific justification, such as using mathematical formulae in order to ensure a high degree of harmony between the sample and the

entire population. Based on her argument, the following equation can be used for determining the sample size if this determination is a prerequisite for any research:

$$n = \frac{N}{1 + N(e)^2}$$

Source: Yamane (1973, p.727)

Where:

n = the sample size

N = the size of the population

e = the margin of error ($\pm 5\%$) at confident level 95%

$$n = \frac{260}{1 + 260(0.05)^2} = 157$$

The result of the calculation above shows that 157 companies can be seen as representative of the whole population (260 companies). However, the above approach is not the only one which can be used for estimating the sample size. Israel (2009) pointed out that imitating other studies' sample sizes, and using published tables and censuses are considered to be other approaches for estimating the sample size.

For the current study, the census approach is more suitable, because the researcher deals with a small number of companies. Blumberg *et al*. (2005) clearly pointed out that the merits of sampling over census are not magnified when the defined

population is small. Hence, the researcher treated the whole population in this research as a sample, mainly due to the limited number of companies under focus, for demographic reasons (focusing on just one area from SA) and the nature of the research objectives.

6.3.4 The Research Methods

Bryman (2008, p.160) pointed out that the terms “method” and “methodology” are used interchangeably by the majority of researchers in social science, although they differ in meaning. According to him, the term method can be used to refer to: (a) the instrument used by the researcher for collecting the data needed for solving the research problem, such as a questionnaire, interview or observation, (b) the tools used for analysing the data, or (c) aspects of the research process, while the methodology term refers to the study of the selected method(s) and uncovering the differences among researchers who employed these methods philosophically.

Bryman ascribed the mismatched use of these two terms in research as being due to the paradigm war. He indicated that the positivistic paradigm (quantitative approach) had attracted researchers in social science for many years mainly, for publishing purposes (also see Yu, 2005). However, as he mentioned, there was a slight increase in the volume of business research which was not underpinned by the quantitative approach during the last quarter of the previous century (also see Van de Ven and Huber, 1990; Dent, 1991). In other words, researchers have become more aware of the significance of studying human aspects which may influence the phenomenon under focus.

In the field of management accounting, Young (1999) pointed out that qualitative studies published mainly in accounting journals were less than 5% prior to the 1980s. However, from the last decade of the 20th century to recently, the number of qualitative management accounting studies published has noticeably increased (Innes and Mitchell, 1990; Selto *et al*., 1995; Sohal and Chung, 1998; Morakul and Wu, 2001; Roslender and Hart, 2002; Anderson *et al*., 2002; Ellram, 2006). It can be argued, however, that this increase in published research could be seen as a response to the suggestion stated by some well-known management accounting scholars (Kaplan, 1987; Otley, 1994; Humphrey and Scapens, 1996) on the importance of studying how and why a particular MAS is adopted.

Regarding this point, it is necessary to mention that increasing the level of emphasis on the quantitative approach for studying innovation does not mean it is without defects. Several writers pointed out that both quantitative and qualitative approaches have strong and weak points (Bryman and Bell, 2007; Blumberg *et al*., 2005; Collis and Hussey, 2003; Sekaran, 2003).

Zelditch (1962) stated that, despite the quantitative approach being flexible in terms of treating data, allowing the whole study to be replicated and strong regarding the validity of the research findings, it often fails to give a deep and precise explanation of the issues being investigated.

On the other hand, the qualitative approach avoids the main shortfall of the quantitative one, and its core problem lies in the external validity of its result (Carr, 1994; Borman, *et al*. 1986; Krenz and Sax, 1986). Hence, adopting the mixed

methods (triangulation) approach has been suggested as a remedy for overcoming the main deficiency with each single approach (Jack and Raturi, 2006; Modell 2005; Brannen, 2005; Onwuegbuzie and Leech, 2005; Erzberger and Prein, 1997; Paul, 1996; Jick, 1979; Sieber, 1973).

Eldabe *et al*. (2002) pointed out that triangulation can be performed between or among theories, data or investigators, and that there is no formal structure for conducting it. According to them, triangulation can be done at the early stage of conducting the research, for the purpose of identifying the main "problem and the key components" (theory building), or at the latest stage of capturing more explanations of the issues at hand (confirming or refining theory) (Eldabe *et al*., 2002, p. 71).

However, some researchers have criticised the ideology of the triangulation approach. For example, Hopper and Hoque (2006) pointed out that researchers who adopt the triangulation approach may have difficulty explaining some observed issues or the interpretation stage. Therefore, they were against the use of this research method, because they deemed that it may lead to "theoretical and methodological opportunism and incoherence" (p.483).

However, Modell (2009, p.218) commented on Hopper and Hoque's concern by arguing that the difficulty "in explaining some empirical observations arose mainly from a lack of well-developed theories". Hence, the charge should not be attached to the triangulation approach itself, but rather in questioning the accuracy of some inductive studies which generated some theories.

Some writers also criticised the triangulation approach with regard to epistemological issues. For example, Kuzel and Like (1991, p.151) stated that, according to Lincoln and Guba "the use of multiple theories as a triangulation technique seems to us to be both epistemologically unsound and empirically empty". Howe (1988) argued that the problem with the epistemological issue is deep rooted in the philosophy of science, and is not restricted to specific research methods, so the epistemological problem with the triangulation approach should not be viewed as being problematic. In the same way, Bryman (2008, p.163) pointed out that, despite the deficiency with the triangulation approach, it is considered to be a way of enhancing creativity in social science, because its outcomes are not predictable.

It is clear from the above discussion that the mixed methods approach is like other approaches, in that it has advantages and disadvantages, and the heavy adoption of it in management accounting studies in general, and innovation studies in particular, may enhance its validity (Dugdale and Lyne, 2010; Yussef, 2006; Cadez and Guilding, 2008; Isa, 2007; Sartorius *et al*., 2007; Alkaraan and Northcott, 2006; Davila, 2005; Davila and Foster, 2005; Bhimani, 2003; Uddin and Hopper, 2001; Groot, 1999).

Therefore, the current research regards research methods as instruments used for collecting research data, and adopts the triangulation methodology mainly for: (a) validating the research quantitative result, and (b) confirming or not confirming the influence of the selected contingent aspects on firms' decisions regarding adoption or non-adoption of innovation. The next topic sheds light on data sources and data collection techniques.

6.3.5 Data Sources

For the purpose of accomplishing the current research objectives, the researcher has identified two data sources. The primary data was collected directly from Saudi and non-Saudi manufacturing companies operating in the Eastern Province of SA, while some secondary data was collected from external parties (for example, interviews with academics who are considered experts in Islamic culture, academic published work, and the Ministry of Commerce and Industry SA's website).

According to Sekaran (2003), secondary data is very important for conducting organisational research. The current research is considered to be organisational research, because it aims to unfold the current management accounting practices within manufacturing firms on the one hand, and to explore the aspects which motivated some of these companies to change or not change their MASs on the other.

6.3.6 Data Collection Techniques

According to a number of business writers, data can be collected through utilising a wide range of methods, such as surveys (for example, questionnaire, interviews and observation), motivational techniques and others (Blumberg *et al*., 2005; Ghauri and Gronhaug, 2005; Sekaran, 2003; Collis and Hussey, 2003).

However, as Marsh (1982) stated, the survey method, in particular, has been widely adopted in social science studies, and its roots can be traced back to the beginning of the 18th century. Since there is no best method for collecting data, and taking into account the current research methodology (triangulation approach), two instruments

(questionnaire and semi-structured interviews) were used for collecting the research data.

6.3.6.1 The Questionnaire Instrument

Czaja and Blair (1996) pointed out that there are several forms of the questionnaire instrument which can be used for collecting data, which are mail, telephone, face-to-face, or a combination of these methods, and the selection from them depends on circumstances such as time, cost and the length of the questionnaire. Since each instrument has its advantages and disadvantages, the researcher phoned 13 academics who carried out their studies in SA, and who were currently teaching accounting and other business subjects in several Saudi universities.

The researcher requested asked them for advice regarding the best way for collecting data in SA. The vast majority advised the researcher to use the mail questionnaire. Due to that recommendation and the merits of using the mail questionnaire, the researcher decided to use it. However, Bryman and Bell (2007) pointed out that, despite the benefits which can be utilised from employing mail surveys, it struggles with three main problems: (a) it fails to give a deep explanation for the issues being investigated, (b) there is a possibility of it not being filled out by the right person, and (c) it produces a low response rate compared with other survey methods.

However, as many writers indicated, the non-response bias which resulted from the low response rate cannot be completely avoided, but it can be lessened if the researcher pays attention to the stage of designing his/her mail survey (Blumberg *et al*., 2005; Ghauri and Gronhaug, 2005). The mail survey used in the current study has passed through five stages: (a) the pre-designing stage, (b) the constructing stage, (c)

the piloting stage, (d) the distribution stage and (e) the collection stage. A detailed explanation for each stage is presented below.

6.3.6.1.1 Pre-designing Stage

Before constructing the current survey study, the researcher looked deeply into management accounting literature, especially that which dealt with adopting or not adopting innovation and contingency studies, for the purpose of identifying the proper macro and micro issues which should be investigated for fulfilling the research objectives.

Then, the researcher developed a list of these issues and discussed them face-to-face with some PhDs students who were focusing in their research on management accounting at Durham Business School, and with those who have backgrounds in management accounting. Also, the researcher contacted three Saudi professors who were teaching cost and management accounting in three Saudi Universities by phone, in order to capture their feedback and comments about the selected issues.

The researcher took this step because some scholars indicated that the first stage in designing the survey study is very sensitive, and that a poor questionnaire design leads to the research problem not being solved (Oppenheim, 1992; Czaja and Blair, 1996). For that reason, the researcher paid attention to this stage, in order to ensure success in accomplishing the research goals.

6.3.6.1.2 Constructing Stage

Several business writers indicated that the researcher must structure his/her questionnaire based on certain standards, mainly to ensure that each respondent understands the contents of the questionnaire in the same manner, otherwise it yields bias (Oppenheim, 1992; Czaja and Blair, 1996; Sekaran, 2003). Hence, the researcher designed his questionnaire based on guidelines proposed by Ghauri and Gronhaug (2005).

For the purpose of validating the research result, the researcher designed his survey based on some popular management accounting, organisational and behavioural studies, mainly undertaken in developed countries (Drury *et al*., 1993; Al Chen *et al*., 1997; Chenhall and Langfield-Smith, 1998a; Garg *et al*., 2003; Waweru *et al*, 2005; Khandwalla, 1977; Segev, 1987; Hofstede, 1980).

The first draft of the questionnaire has been structured over thirteen pages, excluding the cover page, and it contains four parts, with a total of 50 questions. The first one comprises seven questions, and is aimed at collecting general information about the surveyed companies. The second part was designed to collect data about the current TMA practices within these firms, and it is divided into four sections.

The first section contains nine questions about the applications of costing systems. The second section sought to extract information related to decision-making tools, and it comprises five questions in different formats. The third one is divided into two sub-sections: (a) two questions cover the area of the standard costing system, and (b) three

questions are related to budgeting. The last section contains two questions related to the transfer pricing system and financial measures.

The third part of the questionnaire includes four questions related to the use or non-use and level of importance of thirteen AMA practices, the reason(s) behind adopting or not adopting these thirteen practices, and one question designed to collect information about firm performance, covering the period from 2002- 2006. Eighteen questions included in the last part of the questionnaire aimed to gather information about some internal and external contingent aspects (PEU, market competition, the size of the firm, product diversity, AMTs, culture and firm strategy).

Based on the explanation above of the contents of the survey study, one might ask whether or not the researcher took into consideration the problem associated with the length of the questionnaire, which may yield a very low response rate. It can be argued, however, that the researcher could not change the length of the questionnaire, mainly due to the nature of the research goals, and he expected to yield a low response rate, as commonly found in some survey studies (Drury *et al*., 1993; Innes and Mitchell, 1995; Cinquini *et al*., 1999; Ask and Ax, 1997; Triest and Elshahat, 2007).

Hence, the researcher used the closed-question format, except with some questions, and adopted a variety of Likert scales for the purpose of enhancing the response rate, then minimising the biases on the one hand, to be in line with the previously mentioned survey studies on the other.

6.3.6.1.3 Piloting Stage

Before mailing the questionnaire to the whole population, the researcher circulated it to a number of academics, management accountants and nine PhD students (two students were studying management accounting, three students were studying finance, and the rest were studying management) seeking their advice about the clarity of the questionnaire, the sequence of the questions and scale measurements. The questionnaire satisfied all PhD students who reviewed it, but they suggested supporting the questionnaire with a glossary for clarifying some terms.

Since the main recommendation given to the researcher by some academics and management accountants in the UK and SA is in line with that given to him by some PhD students, the researcher postponed his decision regarding the inclusion of the glossary, until he knew the views of some targeted firms. When the researcher moved to SA, he handed the questionnaire to thirty managers (twenty three Saudi and seven foreign) to check the quality and clarity of it.

Seventeen managers suggested that the researcher eliminate two questions from the first part of the questionnaire, and another one from the last part related to product homogeneity; this elimination led to a reduction in the number of the questions in the questionnaire, from 50 to 47. Also, 27 of the consulted managers advised the researcher to include a glossary within the questionnaire, and 11 informed the researcher that it would be much better if you could mention this inclusion on the cover page.

The researcher took into consideration all comments given to him by people he consulted, and he made the necessary changes before piloting the questionnaire again with ten companies, rather than the previous 30 companies. No new comments or suggestions were given to the researcher during the second pilot. Therefore, the researcher believed that each targeted manager would now be able to understand the content of the questionnaire without ambiguity.

Saudi Arabia is an Arabic country, so the researcher translated the questionnaire into Arabic and checked the accuracy of the translation with four management accounting professors and three management accountants. The final draft of the questionnaire (English and Arabic) comprised 15 pages, which were cover page prepared for explaining the purpose of the study to the respondents, twelve pages designed to accomplish the research objectives, and two pages included at the end of the questionnaire as a glossary (see Appendices A and B).

Additionally, the questionnaire was supported by two official letters signed by legal parties in SA (Al-Imam Muhammad Ibn Saud Islamic University - branch of Al Hassa, and the Manager of Al Hassa Industrial Zone) to stimulate targeted firms to fill in the questionnaire and return it to the researcher. Now the questionnaire was ready for distribution, and this is the focus of the next stage.

6.3.6.1.4 Distribution Stage

Before distributing the questionnaire to the whole population, the researcher phoned all targeted firms located in all industrial zones in the Eastern Province of SA (Al Hassa, Dammam, Al Khobar and Al Jubail), in order to identify the proper person

who the questionnaire should be posted to. The receptionists of all the companies had given the researcher the name of the targeted person after he introduced himself to them, and the researcher made a list of these names and their fax numbers.

The researcher avoided contacting the selected managers directly, because he was concerned they may refuse to participate in the study, due to the length of the questionnaire. Hence, he faxed an official letter in English and Arabic signed by the Dean of the College of Shari'a and Islamic Studies, to targeted managers by explaining to them the aim of his study, assuring them regarding their provided data, and offering them feedback about the research's final result. The researcher has performed the previous step for the purpose of increasing the response rate.

Since there was no fax returned, the researcher decided to send his questionnaire to the whole population. However, before posting the questionnaire to the targeted population, the researcher prepared a table for each type of industry (food and beverages, textiles and leather, and so on), in order to monitor the response rate for each type of industry. This table contained the names of the targeted firms in each industry, contact phone numbers for the specified person in each company, type of ownership which each company belonged to, date of posting the questionnaire to the company, date of the questionnaire being returned back to the researcher, and the reason behind no response to the questionnaire.

On 26th January 2008, the questionnaire was posted with a first class stamped return envelope to all of the specified managers in the population. Eight weeks had been identified as the relevant period for collecting the quantitative data after the sending

of the questionnaire. One week after the distribution date, the researcher visited all respondents to make sure they received the questionnaire, giving them an idea of the seriousness of the study, motivating them to answer all questionnaire parts by themselves, and collecting their business cards.

The main benefit of the researcher's visit to the companies was that it enabled him to track non-respondents through their businesses or personal e-mail addresses, and mobile numbers. Also, the researcher used the contact information illustrated on the respondent's businesses cards to contact them for arranging interviews. The next stage mainly sheds light on the collection of the questionnaires, and how the non-response problem was handled.

6.3.6.1.5 The Collection of the Questionnaire Stage

Only twenty-four completed questionnaires were returned to the researcher during the first two weeks, and each one was numbered based on its received date. At the beginning of the third week, the researcher sent the first reminder e-mail to non-respondents, and attached both versions (English and Arabic) of the questionnaire with it. Miller and Smith (1983, p.47) pointed out that several techniques can be used for enhancing the survey response rate, such as sending a reminder postcard or letter, calling non-respondents by phone, using financial rewards, personal appeals or appeals based on social terms, and so on.

In Saudi society, religious and social terms are considered highly appreciated by Saudi people, so the researcher included some of these terms in the first follow-up e-mail, to stimulate non-respondents to respond. As a result, sixty-four questionnaires

were returned back to the researcher by the end of the fifth week. The second follow-up was done by phone or mobile, and yielded fifty-five questionnaires being returned. Another reminder e-mail was sent at the beginning of the eighth week, aimed at reminding non-respondents about the deadline date for collecting the questionnaire. Twenty-one questionnaires were returned as a result of sending the last follow-up.

Table 6-11 shows the total number of questionnaires posted and returned based on the type of ownership, while Table 6-12 logs the posted and received dates of the questionnaires, by type of industry. The same table also shows the usable questionnaires used in the analysis, based on the type of industry.

Type of firm ownership	Number of questionnaires posted	Number of questionnaires received
Governmental Saudi manufacturing firms	5	0
Large public Saudi manufacturing firms	7	1
Large private Saudi manufacturing firms	63	35
Medium-sized private Saudi manufacturing firms	140	103
Large foreign private manufacturing firms	34	26
Joint venture manufacturing firms	11	2
Total	260	167

Table 6-11

Type of industry	Number of questionnaires posted	%	Number of questionnaires received	%	Usable questionnaires	%
Food and beverages	37	14.2	25	15.0	25	15.8
Textile and leather	18	6.9	9	5.4	9	5.7
Wood and furniture	14	5.4	8	4.8	8	5.1
Paper and printing	24	9.2	13	7.8	13	8.2
Chemical products	58	22.3	46	27.5	37	23.4
Engineering products	65	25.0	45	26.9	45	28.5
Building material-non-metallic product	44	17.0	21	12.6	21	13.3
Other	0	0.0	0	0	0	0
Total	260	100%	167	100%	158	100%

Table 6-12

Sekaran (2003) pointed out that the returning 30% of posted questionnaires is considered a satisfactory rate for achieving the research objectives. Alebaishi (1998) indicated in his study that the previous PhD accounting and management studies undertaken in SA which used questionnaire instrument yielded a response rate of no more than 40%. Alebaishi (1998) studied the applications of management accounting in SA based on a response rate 50.5%, while Yussef (2006) studied the contingent aspects affecting the use of performance measures in Egypt based on a response rate of 35%.

Both Al Mulhem (2002) and Al saeed (2005) studied the diffusion of the ABC system in SA based on response rates of 28% and 33%, respectively. For the current research, 167 out of 260 questionnaires were returned to the researcher, giving a response rate of 64%, so the response rate achieved in the current study is considered higher than that achieved by Alebaishi (1998) and Yussef (2006). However, not all of the

questionnaires returned to the researcher for the current study are considered usable for analysis.

For example, two questionnaires returned to the researcher by joint venture companies, and one from a large public Saudi firm, have been eliminated from the sample, due to their ignoring more than 80% of the body of the questionnaire. The researcher contacted these firms to complete the missing parts of the questionnaires, but they refused to do so. Hence, the elimination of these three returned questionnaires is justifiable.

Since there was no response from Saudi governmental firms, and with the elimination of the three aforementioned responses, the ability to generalise the current research findings applies only to private Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA (164 firms). Additionally, six received questionnaires have been taken out of the sample, because these six companies returned them completely empty, and provided the researcher with their reasons in letters included. This elimination, in fact, reduced the number of returned questionnaires from 164 to 158, with a response rate of 61%. Surprisingly, all of the eliminated questionnaires belonged to one type of industry, the chemical industry.

During the data collection period, the researcher returned twenty-seven questionnaires to respondents by hand, to complete the missing questions. All twenty-seven firms completed the missing parts and handed them back to the researcher, so all of the received questionnaires (158) are considered usable for analysis (100 medium-sized Saudi firms, 34 large Saudi firms and 24 large non-Saudi firms).

As mentioned before, one of the major problems with the use of the questionnaire instrument was the concern that the questionnaire was not filled in by the proper person. Therefore, the researcher phoned all of the respondents who returned the questionnaire to him, except those excluded (nine firms), to ask them about the actual person who filled in the questionnaire. No-one from the contacted people stated that the questionnaire was filled in by someone on their behalf, and this of course enhances the reliability of the returned questionnaire.

Some respondents clearly informed the researcher that the members of their accounting departments were not knowledgeable enough about management accounting terms, so if we were to forward the questionnaire to them, it would not be filled in. Table 6-13 exposes the distribution of the respondents based on their positions in their companies.

	Respondent work position	
1.	CEO	7
2.	General manager	6
3.	Head of accounting and finance department	99
4.	Chief accountant	28
5.	Chief management accountant	1
6.	Controller of the company	6
7.	Other (Two Vice-Presidents, and 9 financial and administrative managers)	11
	Total	158

Table 6-13

However, the number of years spent by these respondents in their positions is not the same. Thirty-six managers spent five years or less in their positions, while there are no more than forty-seven respondents who spent between six and ten years in their positions. Thirty-eight mangers spent between eleven and fifteen years in their positions, while only thirty seven mangers spent more than fifteen years in their

positions. The researcher mentions the last three tables here because the questionnaire contains some questions related to those areas (see the questionnaire Part One).

Another concern attached to the questionnaire instrument is related to the handling of the non-response problem. The researcher contacted all non-respondents (93 companies), in order to explore why they did not respond or return the questionnaire. Eighteen companies stated that their firm's policy prohibits answering questionnaires, and this justification is the same one stated by the six firms which returned the questionnaire empty. A lack of time and being busy were the main reasons for the remainder of the non-respondents.

For assessing the data bias, the Chi-square test was used for analysing the differences between the early and late respondents, with regards to firm size and total assets. The Mann-Whitney *U* statistical test computed the data provided by both groups. The analysis of the data showed no significant difference between the early and late respondents at 5% level of confidence. For that reason, it was concluded that there was no threat to the validity of the research's final result. The next topic focuses on the second instrument (semi-structured interview) used for collecting the primary research data.

6.3.6.2 Semi-structured Interview Instrument

The next stage of the current research mainly used the semi-structured interview instrument for validating the quantitative result and providing more of an explanation regarding the entire reasons which motivated some Saudi and non-Saudi manufacturing firms to adopt or not to adopt innovation in management accounting.

Carruthers (1990, p.66) stated that "…if the purpose of holding interviews were to validate data received from another source, then reason enough exists for holding interviews". As with the questionnaire instrument, the interview process also passed through several stages.

6.3.6.2.1 Pre-construction Stage

During this stage, the researcher prepared a list of topics to be discussed with the interviewees. Five appointments were arranged with five managers working in large and medium-size manufacturing companies (three Saudi and two non-Saudi), in order to find out their opinions about the suitability of the selected topics.

The researcher gave them full freedom for adding any new issue(s). Within an average of thirty minutes of discussions with each manager, no-one added any new topics, other than those selected by the researcher. Therefore, the researcher started constructing the body of the interview based on these selected issues, and guided by protocol or steps proposed by Bryman and Bell (2007).

6.3.6.2.2 Construction Stage

The interview booklet design was eleven pages, and was supported by a cover page explaining the purpose of conducting the interview to the interviewees. The content of the interview contained three parts. The first one sought to collect general information about the interviewee and their companies. The second part was designed to investigate the opinions of the interviewees regarding some TMA systems, such as costing systems, budgeting, standard cost system and new trends related to those systems.

The final part covered several internal and external contingent aspects, and was designed to find out the view of the interviewee as to whether or not all or some of these aspects were considered to be the reason(s) which motivated their companies to adopt or not to adopt innovation in management accounting.

6.3.6.2.3 Pilot, Distribution and Response Stage

The researcher distributed the content of the interview in English to five academics (four management accounting professors, one specialised in production management) and two management accountants, to check the suitability and clarity of the questions. No major comments were given to the researcher by those academic management accountants, except relating to the length of the interview.

The booklet of the interview was circulated to the previous five companies (see the first stage), and they advised the researcher to eliminate unnecessary questions. Hence, the researcher refined the interview booklet, eliminating sensitive and unnecessary questions, and it became ready for distribution (see Appendix C). The researcher phoned all of the companies which returned the questionnaire to set up an appointment for a two-hour interview. Only eight managers agreed to be interviewed between 1/4/2008 and 14/5/08.

The researcher arranged an appointment with those managers and circulated the booklet of the interview three days before the date of the interview with each interviewee. Again, the researcher phoned the managers of firms which did not respond to him; he explained to them the importance of their participation in this study, and pledged them to treat their data with a high degree of confidentiality, which led to an acceptance from three managers to be interviewed.

The researcher was convinced that getting acceptance from eleven mangers to be interviewed would not provide a cohesive picture, especially about the reasons which stimulated some Saudi and non-Saudi manufacturing firms to adopt or not to adopt AMA practices. Hence, he decided to go directly to the companies which did not respond to his request for meeting the proper managers, and arranged an appointment for conducting an interview with them.

However, an expected behaviour resulted from this visit with some companies, which was that the security at the main gates of some companies did not permit the researcher to get into the premises based on permission given to them from their financial managers. Also, the researcher met face-to-face with the selected people for ninety seven companies, and some of them requested that the researcher left their offices and did not bother them, while the majority apologised to the researcher for not taking part in this interview. At the same time, the last visit succeeded in getting an acceptance from seven managers, raising the number of interviewees to eighteen companies. The researcher did not stop this increase in the number of interviewees, but made every effort to maximise the number of interviewees, so he asked his friends and relatives for help, and this led the number of the interviewees to be raised to twenty.

The researcher contacted all of the late interviewees to set appointments with them at proper times, and circulated the booklet of the interview three days before the date of the interview. One important point should be mentioned here: the researcher asked each manager who agreed to take part in the interview about the language that he preferred for conducting the interview. All of them preferred to receive the booklet

interview in English, so the researcher did not translate the contents of the interview into Arabic. However, that does not necessarily mean that the discussion between the interviewer and interviewees was in English in every case.

During the interview, the researcher requested that each interviewee asked the production and information system managers participate in the interview, but all of the interviewees refused to do so. Hence, the interview was only held between the researcher and the targeted person from these twenty companies. Also, from the beginning, all interviewees requested that the researcher did not mention the names of their companies in his research, and that he instead used codes or abbreviations for their companies, based on their industry, so the researcher adhered to their requests, in order to secure the interviewees and let them feel free to express their opinions without concern.

With regards to the time spent for each interview, the interviewees did not adhere to the time requested by the researcher, due to their tight schedules, but the minimum time spent in the interview was one hour and forty five minutes, and the maximum time was three hours and ten minutes.

At the beginning of each interview, all interviewees were asked to fill in the first part of the interview booklet. This part sought to gather general information about the interviewees (names, positions in their firms, number of years spent in this position, and educational and practical qualifications) and their companies (names, company's year the company was established, nationality, type of industry, company structure and number of employees).

All interviews were recorded, and the researcher promised all of the interviewees that he would only use these tapings for the current study, after which all tapes would be destroyed. Tables 6-14 shows the analysis of the first question, illustrated in the first part of the interview booklet, while table 6-15 shows the analysis related to the second question, in the same part of the interview booklet.

	Position in the company	Number of years in this position	Education & practical qualifications
1	Head of Acc. and Fin. Dep.	16	Bachelor's degree in accounting + CPA
2	Head of Acc. and Fin. Dep.	9	MBA + CPA
3	Head of Acc. and Fin. Dep.	8	Bachelor's degree in accounting + CPA
4	Head of Acc. and Fin. Dep.	7	Bachelor's degree in accounting
5	Head of Acc. and Fin. Dep.	6	Master's degree in financial Acc.
6	Head of Acc. and Fin. Dep.	17	Bachelor's degree in accounting
7	Head of Acc. and Fin. Dep.	4	Bachelor's degree in accounting + CMA
8	Chief accountant	16	Bachelor's degree in accounting + CPA
9	Head of Acc. and Fin. Dep.	4	Master's degree in accounting + CPA
10	Head of Acc. and Fin. Dep.	8	Bachelor's degree in accounting
11	Head of Acc. and Fin. Dep.	3	Bachelor's degree in accounting + CPA
12	Chief accountant	4	Bachelor's degree in accounting
13	Chief accountant	7	Bachelor's degree in accounting
14	General manager	4	Bachelor's degree in Management
15	Chief accountant	9	Bachelor's degree in accounting
16	Controller of the company	13	Bachelor's degree in Management
17	Head of Acc. and Fin. Dep.	6	Bachelor's degree in accounting
18	Head of Acc. and Fin. Dep.	11	Bachelor's degree in accounting
19	Head of Acc. and Fin. Dep.	18	Bachelor's degree in accounting
20	Financial and administrative manager	4	Bachelor's degree in Management

Table 6 - 14

Name of the company	Year the company was established	Company's nationality	Type of industry	Company's structure	Number of employees
Co1	1981	Non-Saudi	Non-metallic products	Informal	1310
Co2	1984	Non-Saudi	Engineering products	Informal	723
Co3	1987	Non-Saudi	Food & beverage	Informal	640
Co4	1980	Non-Saudi	Chemical products	Informal	846
Co5	1983	Non-Saudi	Wood & furniture	Informal	640
Co6	1978	Saudi L*	Wood & furniture	Formal	780
Co7	1982	Saudi L*	Paper and printing	Informal	1226
Co8	1976	Saudi L*	Chemical products	Formal	1930
Co9	1977	Saudi L*	Engineering products	Informal	2340
Co10	1979	Saudi L*	Engineering products	Formal	1426
Co11	1981	Saudi L*	Non-metallic products	Formal	2860
Co12	1986	Saudi L*	Food & beverage	Formal	930
Co13	1985	Saudi MS**	Food & beverage	Formal	156
Co14	1987	Saudi MS**	Food & beverage	Formal	90
Co15	1988	Saudi MS**	Wood & furniture	Formal	86
Co16	1984	Saudi MS**	Chemical products	Formal	418
Co17	1982	Saudi MS**	Engineering products	Formal	456
Co18	1986	Saudi MS**	Textile & leather	Formal	90
Co19	1978	Saudi MS**	Engineering products	Formal	476
Co20	1980	Saudi MS**	Non-metallic products	Formal	347

Table 6-15

* L= Large firm, **MS= Medium-sized firm

Table 6-14 shows that the managerial positions for the interviewees were not the same. Thirteen of them were working in their firms as heads of the accounting and finance department, while only 5 of the interviewees were working in their firms as chief accountants. One of the interviewee indicated that his managerial position was financial and administrative manager, while another indicated that he was the controller of the company.

In addition, table 6-14 shows that the minimum years spent by some interviewees in their managerial positions was 4 years, while the maximum was 17 years, with an average of 8.7 years. With regards to education and practical qualifications for the

interviewees, table 6-14 shows that the vast majority of the interviewees had Bachelor's degrees (14 in accounting and 3 in management), and that some of them had practical qualifications, such as CPA (four interviewees) or CMA (one interviewee). Two of the interviewees had Master's degrees in accounting, and one of them was CPA qualified. Only one of the interviewees was MAB and CPA qualified.

Table 6-15 shows that the first five companies are non-Saudi firms, while the rest are Saudi firms differing in size (7 large firms and 8 medium-sized firms). Also, it is clear from table 6-15 that all of the firms participating in the interview spent at least two decades in business, so one may have expected these firms to have been familiar with the new trends in management accounting. It is also evident from the same table that the participating firms all belonged to the manufacturing sector (3 firms from the non-metallic industry, 5 engineering firms, 4 food and beverage firms, 3 chemical firms, 3 wood and furniture firms, one firm belonging to the paper industry, and another one belonging to the textile industry).

With regards to firm structure, table 6-15 shows that almost all Saudi firms, except two of them, used formal structures, while the inverse condition was true for non-Saudi firms. The number of current employees within the interviewed firms was not the same. All large firms had more than 500 employees, while the medium-sized firms had less than that number, and this result confirmed the accuracy of the classification made by the Saudi Ministry of Commerce & Industry branch of the Eastern Province regarding the firm size (see table 6-9).

6.4 Research Limitations

1. This research covers only private large and medium-sizes Saudi firms, and large foreign manufacturing firms which operate in the Eastern Province of SA. Therefore, the research findings must only be restricted to this sector, size and area of SA.
2. Oil companies were excluded from the population, due to governmental restrictions, so the research results cannot be applied to this type of industry.
3. Despite the fact that the respondents to the questionnaires unambiguously assured the researcher that they were the actual people who filled in the questionnaire, there is a possibility that they may have hidden the truth. Therefore, the results should be treated with care.
4. All the interviewees did not permit the researcher to contact their subordinates, so the qualitative result must be treated with caution.

6.5 Validity and Reliability

According to Al Mulhim (2001), research is considered valid and reliable when its final result is true and repeatable. Several researchers pointed out that there are two main types of validity: that each piece of research should meet content and construct validity (Blumberg *et al*, 2005; Collis and Hussey, 2003; Sekaran, 2003).

Content validity is concerned with how the items illustrated reflect what they are supposed to measure. As mentioned earlier, the researcher consulted several academics, experts and graduate students about legitimising the contents of the instrument used for collecting the research data. In addition, the research pre-tested the questionnaire two times, and once for the interview content, to eliminate

deficiencies and errors. Therefore, the content validity for the questionnaire and interview has been met in the current research.

The second type of validity is construct validity. This type is concerned with how the construct measure fits with what it is supposed to be theoretically measured (Sekaran, 2003). Sekaran further indicated that validity can be established by adopting several methods, such as using published measures. The researcher has based his study upon other popular published studies, to avoid the validity threat.

With regards to the reliability issue, the researcher used Cronbach's Alpha to test the consistency among some descriptive and explanatory variables. This particular test was selected because it has been widely employed by other researchers in management accounting studies (Adel-Maksoud *et al*., 2008; Abernethy and Bouwens, 2005; Hoang and Igel, 2006; Salaheldin, 2007; Dangayach and Deshmukh, 2005; Jonsson, 2000; Sharma and Dangayach, 2008).

However, it would be necessary to mention here that some items illustrated in the questionnaire were designed to extract facts about the phenomenon under focus, and that these items were not included in the Alpha test. Sekaran (2003, p.205) clearly indicated that Cronbach's Alpha can be used for testing the internal consistency amongst items designed upon multipoint-scales, which means that this test may not be relevant for non-ordinal items. Table 6-16 shows the result of Cronbach's test for the ordinal items.

Categories	Number of items based on ordinal scale	Alpha test
Product costing	7	.473
Decision-making tools	12	.681
Planning and control systems	14	.771
Financial measures	6	.506
Advanced management accounting (AMA) practices	13	.408
Performance (growth in sales revenue, growth in total assets and growth in the number of firm customers)	3	0.785
Perceived environmental uncertainty	5	.845
Market competition	4	.910
Technology (product diversity and advanced manufacturing technology)	16	.840
Culture	5	.954
Strategy (prospector)	4	.910
Strategy (defender)	6	.896
Table 6-16		

The table above exposes that most items are considered to be reliable based on the Alpha standard (0.70). Sekaran (2003) pointed out that the closer Alpha test is to 1, the higher the internal consistency of the scale items. However, Peters (2002, p.70) stated that, according to Peterson, Cronbach's Alpha also supports 0.30 and 0.50 as being an acceptable score. By taking Peters' clarification into account, items composing the four categories, such as product costing, decision-making tools, financial measures and AMA practices, are considered reliable because their score is above 0.30.

6.6 Data Analysis

For the current research, the questionnaire instrument was mainly designed to collect descriptive and explanatory data for fulfilling the research objectives, so descriptive and inferential statistical tests are the proper techniques which fit with the data collected. According to Sekaran (2003, p. 185), four types of descriptive techniques

(nominal, ordinal, interval and ratio) can be used for analysing the descriptive data, and the degree of sophistication among them increases when we move from the first to the last (also see Blumberg *et al*., 2005).

By looking deeply at the questionnaire instrument, we will note that all scale measurements are either nominal or ordinal, so these two analytical tests are used for analysing the descriptive data (see the first part of the next chapter). The major weaknesses attached to nominal and ordinal analysis are that they do not represent differences amongst variables. Therefore, the researcher used central tendency and dispersion measures which represent mean, median and standard deviation as complementary with the nominal and ordinal analysis for elevating the problem level to the last two measures.

Contrary to the descriptive statistical analysis, inferential statistical techniques can only be categorised into two statistical tests: parametric and non-parametric. Sekaran (2003) pointed out that inferential statistical analysis enables the researcher to draw inference from the sample to the whole population. Hence, parametric analysis, in particular, demands that the distribution of the selected sample must be normal, in order to achieve similarity between the sample and the population for generalisation purposes. However, as mentioned earlier, the current research is a census study, so the magnitude of similarity between the sample and population is diminished, at least for the current research.

Additionally, Bosman (1969) pointed out that parametric analysis is a powerful statistical test, because it is based upon clear assumptions, while the non-parametric

one is more flexible, because it depends on intuition (also see Harwell, 1988). Furthermore, parametric analysis, as several researchers have stated, is more suitable for data which is collected based on interval and ratio scales, while non-parametric analysis is more suitable for data collected upon the nominal and ordinal scale (Sekaran, 2003, p.394; Ghauri and Gronhaug, 2005; Blumberg *et al*., 2005).

It has been mentioned previously that nominal and ordinal scales dominated the questionnaire instrument used in the current research, so the non-parametric test is the most appropriate one for analysing the explanatory data for the current research.

Another motive standing behind the use of the non-parametric test is data distribution. To clarify that, the researcher entered his data into the SPSS (Statistical Package for the Social Sciences) software, and he then checked the data entries twice. Firstly, he picked samples of the cases, and then compared the data entered into the SPSS with that which existed in the questionnaires, in order to make sure that no mistake had occurred during the entrance stage.

Secondly, the researcher checked the data entries for all cases, in order to be certain about the accuracy of the data entered into the SPSS software. During the second check, eight mistakes were found and fixed. After checking the accuracy of the data, the first step performed by the researcher was testing the data distribution. The result of this test showed that the distribution of the data was not normal.

Siegel and Castellan (1988) clearly indicated that non-parametric measures were designed to handle the problem for non-normal data (also see Pallant, 2001).

Therefore, non-parametric measures were used for the current research to overcome the problem with ease. Other research in the field of management accounting adopted non-parametric measures, because the distribution of the data was not normal (Ezzamel, 1990; Waldron and Everett, 2004; Abdel-Maksoud *et al*., 2010; Abdel-Maksoud *et al*., 2005; Abdel-Kader and Luther, 2008).

With regards to studying the relationship between the extent of adopting AMA practices and explanatory aspects (contingent aspects), several researchers have conceptualised change in MASs or the adoption of AMA systems as dependent variables, and groups of contingent aspects as independent ones (Libby and Waterhouse, 1996; Williams and Seaman, 2001; Hoque, 2008; Abdel-Kader and Luther, 2008; Alebaishi, 1998).

This research follows the same strand as previous researchers, in that it uses Bivariate analysis (correlation) at first, and then applies Logistic Regression. This makes for clear correlation analysis for use in the current research, for studying the direct relationship between the dependent variable and each independent variable (environmental uncertainty, competition, size, product diversity, AMTs, culture and firm strategy).

For the second step, the researcher used Logistic Regression, in order to find out which predictors explained the adoption of AMA practices in the Eastern Province of SA. However, it would be necessary to mention here that the use of the second statistical measure was not done directly, but that a series of analyses were performed before it was utilised (see Appendix D). One important thing should be emphasised

here, which is that previous statistical tests were only used for analysing the quantitative data, while the qualitative data was analysed theoretically.

6.7 Summary

As mentioned earlier in this chapter, this is an empirical study which seeks to investigate the current applications of management accounting practices, and the internal and external drivers which stimulated Saudi and non-Saudi manufacturing organisations which operate in the Eastern Province of SA to adopt or not to adopt AMA practices.

This chapter discussed the research design and the methodology, and it explained how the selected design links with the research framework and fits with some prior management accounting studies. However, the main focus of this chapter was the instruments utilised for collecting the research data. The two methods used for collecting the research data were questionnaires and semi-structured interviews.

As indicated, the questionnaires were sent to 260 Saudi and non-Saudi manufacturing organisations, but only 167 questionnaires were returned to the researcher. However, nine of the returned questionnaires were taken out due to unsuitability for analysis, giving a final result of 158 usable questionnaires. The first part of the questionnaire was analysed and presented in the current chapter, because it contained general information about the surveyed firms.

Twenty semi-structured interviews were conducted to support the findings of the quantitative data. The main goal of conducting the interview was to investigate issues uncovered by the questionnaire instrument, gather futher details about the drivers which motivated the surveyed companies to adopt or not to adopt AMA practices, and to comfirm or not confirm the results of the questionnaire.

The researcher faced several obstacles when arranging interviews with the surveyed firms. One was that most of the surveyed firms loathed taking part in the interview. Another was that despite the researcher conducting twenty semi-structured interviews, the interviewees were very gaurded in their answers. They always gave short answers to the questions posed, and avoided giving much detail in their answers; these signs gave an indication of the difficulty of conducting research in developing countries, or countries with closed cultures like Saudi Arabia.

As with the questionnaire, the first part of the interview booklet has been analysed and presented in the current chapter. Furthermore, this chapter has discussed the mechanism which was used for analysing the quantitative data, and the justifications behind the statistical techniques selected. The next chapter focuses on analysing the quantitative data extracted from 158 manufacturing firms operating in the Eastern Province of SA, using descriptive statistical techniques.

Chapter Seven: Descriptive Analysis of the Questionnaire Results

7.1 Introduction

In the first chapter, it was mentioned that some Anglo-Saxon management accountant scholars, such as Johnson and Kaplan, suggested that TMA practices had lost their relevancy in the contemporary business environment. Because of this, these researchers advised firms to halt the use of these practices, and instead adopt AMA practices. However, the empirical studies presented in Chapter 4 suggest that the actual adoption of AMA systems can be a frustrating ordeal, leading to the current situation in which many firms are still loyal to their TMA systems (see Chapter 3).

The current study aims to explore whether or not firms in the Eastern part of SA are typical in the sense of a limited adoption of AMA systems. Additionally, this study aims to investigate the contingent drivers which stimulated Saudi and non-Saudi manufacturing firms which operated in the same area of SA to either adopt or not to adopt AMA practices. In summary, this chapter presents the analysis of the descriptive parts of the questionnaire (parts 2 and 3). Within this chapter, two types of statistical methods, both descriptive and inferential statistics, are utilised in order to analyse the data. This analysis mainly aims to explore the current management accounting practices (both TMA and AMA) among the manufacturing firms which operate in the Eastern part of SA. Based on these analyses, conclusions can be drawn relating to whether or not there is a gap between the theory of management accounting and its practice in the Eastern Province of SA.

7.2. Traditional Management Accounting Practices (TMAs)

7.2.1 Accounting Systems and Costing Practices

Johnson and Kaplan (1987) pointed out that the integration between financial and managerial information may lead to inaccurate decision-making, which in turn may threaten the existence of the firms, especially those which operate in dynamic environments. Therefore, they sought to use more than one accounting system each for specific functions, in order to enhance the quality of the firm's decisions on the one hand, and to maintain the firm's existence on the other.

However, evidence from around the world demonstrates that, despite the upheaval occurring in the manufacturing environment, the vast majority of large and automated manufacturing companies are still relying on one accounting system for running their businesses (see chapter three).

Since this area is still unexplored in SA in general, respondents were asked to indicate whether or not they are currently using one accounting system for a variety of purposes, multiple systems for a specific function each, or one system at present, but a plan to adopt more than one accounting system. Table 7-1 shows the result of this investigation.

Number of accounting systems	Nationality				Total	
	Non-Saudi companies		Saudi companies			
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Single system	17.00	10.76	96.00	60.76	113.00	71.52
Multiple systems, each for specific functions	3.00	1.90	27.00	17.09	30.00	18.99
Currently single, but the plan is to implement multiple	4.00	2.53	11.00	6.96	15.00	9.49
Other	0.00	0.00	0.00	0.00	0.00	0.00
Total	24.00	15.19	134.00	84.81	158.00	100.00

Table 7-1- The number of accounting systems within the surveyed firms

Table 7.1 shows that 71.52% of the respondents indicated that they were currently not using multiple accounting systems, and this result was in line with findings (Emore and Ness, 1991; Triest and Elshahat, 2007; Al Chen *et al*., 1997; Friedl *et al*., 2009; Brierley *et al*., 2007), and in contrast with what was reported by Joseph *et al*. (1996) in the UK.

At the same time, 18.99% of the respondents indicated that they had adopted multiple systems, and only 9.49% of the respondents indicated they had a plan to adopt multiple systems. By taking firm nationality into consideration, the extent of adopting multiple systems is quite limited amongst both Saudi and non-Saudi manufacturing firms.

As can be seen, there is no complete rejection of the suggestion by Kaplan (1988) regarding the necessity of adopting more than one accounting system, and this may give an indication regarding the keenness of the managers within the surveyed firms to adopt modern thoughts and techniques in management accounting. A possible explanation for this move towards the adoption of multiple systems by some Saudi and non-Saudi manufacturing companies may be due to several reasons, such as the

nature of the firm's strategy, market competition, management awareness within these firms, imitating pioneering firms, or due to something else.

Investigating the reason(s) stand behind the surveyed firms not adopting multiple systems was a point of concern for this research. Hence, non-adopters of multiple systems were asked to indicate the reason(s) which stimulated them not to adopt more than one accounting system. Table 7-2 summarises the main reason(s), as cited by non-adopters, including firms which have plans to adopt multiple systems.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Time-saving	15	9.5	11.7	11.7
	Financial constraints	3	1.9	2.3	14.1
	Simplicity of production process	40	25.3	31.3	45.3
	Current system, although not perfect, is adequate	14	8.9	10.9	56.3
	Avoiding conflict which may arise from adopting more than one system	21	13.3	16.4	72.7
	Combination of reasons	35	22.2	27.3	100.0
	Total	128	81.0	100.0	
Missing system		30	19.0		
Total		158	100.0		

Table 7-2- The extent of the influence of each motive on prompting the user to adopt a single accounting system and not multiple accounting systems

At the beginning, it would be necessary to mention that companies which have a plan to adopt a multiple systems are treated as non-adopters, because Scapnse *et al.* (2003) pointed out that planning to substitute traditional MAS with another faddish or modern one does not necessarily lead to actual implementation, so those companies are currently classified as non-adopters.

As table 7-2 shows, the simplicity of the production process was the main reason which prompted 31.3% of the respondents not to adopt multiple accounting systems.

The justification behind not adopting multiple accounting systems in the case of the Eastern part of SA is quite surprising, because none of the previous studies mentioned in chapter three cited the same justification, which could be due to the short history of the manufacturing industry in SA.

By way of contrast, financial resources and the adequacy of current accounting systems were not seen as stumbling blocks or primary reasons regarding the integration between financial and managerial systems in the Eastern part of SA, and this finding partially contrasts Al Chen *et al*.'s (1997) result regarding the barriers to adopting multiple accounting systems.

It was mentioned in the third chapter that one of the main deficiencies attached to traditional product costing systems was that product cost information was used by several firms for inventory valuation purposes, even in some industrialised countries. Therefore, Drury and Tayles (1994) stated that, according to Johnson and Kaplan, management accounting practices follow, and have become subservient to, financial accounting requirements. Respondents were asked about the entire functions of the product costing systems used in their firms, in order to know whether or not they used cost information for stock valuation. Table 7-3 reports the results, as selected by participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Product pricing	44	27.8	27.8	27.8
	Product control	25	15.8	15.8	43.7
	External financial reporting	5	3.2	3.2	46.8
	Evaluation of new product cost	6	3.8	3.8	50.6
	More than one function	78	49.4	49.4	100.0
	Total	158	100.0	100.0	

Table 7-3- The objectives of the product costing system as cited by the surveyed firms

Table 7-3 shows unambiguous evidence regarding the multi-functionality of the product costing system within Saudi and non-Saudi manufacturing companies. In other words, the vast majority of the respondents (49.4%) indicated that they used product cost information for several objectives, and only 11 firms restricted their cost information to serving a particular function, such as stock valuation and evaluating new product costs.

At the same time, it is hard to say that product cost information was not used by Saudi and non-Saudi manufacturing firms to serve financial accounting purposes, because table 7-3 gives no indication about how product cost information was used by the surveyed firms, and this is one of the disadvantages associated with the questionnaire instrument.

Johnson and Kaplan (1987) pointed out that traditional product costing systems, such as job and process, were designed to serve short-term firm objectives, so they sought not to use these systems. However, several empirical studies made public continue to use these traditional systems (see chapter three). Hence, respondents were asked to

indicate the type of costing system which was currently utilised in their companies. The following table summarises the findings.

Type of product costing system		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Job order costing	51	32.3	32.3	32.3
	Process costing	66	41.8	41.8	74.1
	Batch	24	15.2	15.2	89.2
	Other	4	2.5	2.5	91.8
	Job and process systems	13	8.2	8.2	100.0
	Total	158	100.0	100.0	

Table 7-4- The extent of adoption of each product costing system as citied by the surveyed firms

Table 7-4 shows that 41.8% of respondents indicated that they used a process costing system, and this result is completely in line with the results found in Estonia and GCC Countries (Haldma and Laats, 2002; Al-Khater, 1999), and partially in line with that reported by Wijewardena and Zoysa (1999), but in contrast with Cinquini *et al.*'s (1999) findings.

The job costing system also gained some popularity amongst the surveyed firms, because 32.3% of the respondents indicated that they were currently using it. In addition, it is clear from table 7-4 that Saudi and non-Saudi manufacturing firms were not in favour of using a batch costing system, which contrasts the result reported by (Joshi, 2001) in India. Moreover, 8.2% of Saudi and non-Saudi manufacturing firms indicated that they used combined costing systems (job and process), and only four firms indicated that they used other systems (such as ABC and standard costing).

Ask and Ax (1997, p.38) pointed out that, according to other researchers, the full product cost method should not be used in decision-making, because "it neglects the relationship between price and quantity which is found in microeconomic theory", so

variable cost is the alternative. However, as mentioned in chapter three, several researchers reported that the full costing method is still widely used in practice as a basis for calculating product costs or for decision-making.

Since previous researchers did not cover this area in SA, respondents were asked to indicate the current costing method being used by their companies for calculating product costs. Table 7-5 summarises the findings.

Costing methods		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full product cost	84	53.2	53.2	53.2
	Variable cost	17	10.8	10.8	63.9
	Variable cost and full cost	56	35.4	35.4	99.4
	Other	1	.6	.6	100.0
	Total	158	100.0	100.0	

Table 7-5- The extent of usage of each costing method in decision-making as citied by the surveyed firms

Table 7-5 shows that 53.2% of the respondents indicated that they were currently relying on the full costing method for calculating their product costs, and 35.4% of them used combined methods (full and variable). Interestingly, the result of the current research is in line with other findings, as reported in several studies (Ask and Ax, 1997; Firth, 1996; Joshi, 2001; Haldma and Laats, 2002; Shields *et al*., 1991), but in contrast with the findings of Lamminmaki and Drury (2001), and Hyvonen (2005). A possible explanation for this result may be due the nature of the pricing strategy within the surveyed firms, or managers' contentment towards this being the best method to use for making their decisions.

Johnson and Kaplan (1987) believe that the heavy use of modern technological systems in today's production environment has led to an increase in the proportion of overhead costs and a decrease in the proportion of direct labour costs in total product

costs, which in turn led to the cost structure changing. Therefore, they advised using more sophisticated costing systems, such as ABC, for assigning "direct costs to cost objects" (Drury and Tayles, 2005, p.59). Bjornenak (1997) stated that, according to Langholm, cost structure was found to be a driver which stimulated some Norwegian manufacturing firms to adopt variable costing systems.

Since there is little information in this area, respondents were asked to indicate on a five-point Likert scale (1 indicating “never” to 5 indicating “always”) the frequency of dividing their product costs between four resources (direct labour costs, direct material costs, other manufacturing costs and other non- manufacturing costs). Table 7-6 reports the findings.

Cost classifications	Level of frequency	Frequency	Percent	Mean	Median	S.D
Direct labour costs	Never	2	1.3			
	Rarely	1	0.6			
	Sometimes	4	2.5			
	Often	12	7.6			
	Always	139	88.0			
		158	**100.0**	**4.80**	**5.00**	**0.63**
Direct material costs	Never	2	1.3			
	Rarely	0	0			
	Sometimes	1	0.6			
	Often	12	7.6			
	Always	143	90.5			
		158	**100.0**	**4.86**	**5.00**	**0.53**
Other production costs	Never	4	2.5			
	Rarely	7	4.4			
	Sometimes	9	5.7			
	Often	24	15.2			
	Always	114	72.2			
		158	**100.0**	**4.50**	**5.00**	**0.96**
Other non-production costs	Never	19	12.0			
	Rarely	9	5.7			
	Sometimes	24	15.2			
	Often	34	21.5			
	Always	72	45.6			
		158	**100.0**	**3.83**	**4.00**	**1.38**

Table 7-6- The frequency of classifying product costs as four types of cost by the surveyed firms

Table 7-6 shows that 67% (106 out of 158) of respondents indicated that they often/always classified their product costs as direct labour costs, direct material costs, other manufacturing costs and other non-manufacturing costs, and this result is in line with the findings of Cinquini *et al*. (1999) and Clarke (1992), but in contrast with the findings of Al- Khater (1999) (see chapter 3).

Saudi and non-Saudi manufacturing firms were also asked to indicate on a five-point Likert scale (less than 10% to 67%-100%) the approximate proportion of each

component of the cost structure in the total product costs for their companies. The results are reported in table 7-7.

Total product costs breakdown for Saudi and non-Saudi manufacturing firms				
	Categories	Percentage of direct labour	Percentage of direct material	Percentage of overhead costs
Valid cases (158)	Less than 10%	29.1	0.6	34.8
	11-25%	50.6	1.3	41.1
	26-50%	9.5	20.3	15.2
	51-75%	6.3	55.1	7.0
	76-100%	4.4	22.8	1.9
		100.0	100.0	100.0
Mean		**2.06**	**3.98**	**2.00**
Median		**2.00**	**4.00**	**2.00**
S.D.		**1.02**	**0.73**	**0.97**

Table 7-7- Total product costs breakdown

Table 7-7 shows that 79.7% of respondents indicated that labour costs represented 25% or less of their total product costs, with an average of 2.06 and a standard deviation of 1.02. At the same time, 10.7% of respondents indicated that the proportion of labour costs in their total product costs was more than 50%, which may indicate that the level of automation within these firms is not high. This result is unquestionably in line with the findings of Clarke (1992) and Al- Khater (1999).

Several researchers have widely emphasised that direct material cost is considered the largest component in total product cost (Clarke, 1992, 1997; Johnson and Kaplan, 1987; Ask and Ax, 1997; Al- Khater, 1999). Table 7-7 confirms the assertion made by those researchers, because 77.9% of respondents indicated that direct materials exceeds 50% of their total product costs, with an average of 3.98 and a standard deviation of 0.73.

A possible explanation for the high level of proportion of the direct material in total product costs, as found in this study, may be due to the type of industry (manufacturing). Amazingly, one company indicated that the percentage of direct material cost was no more than 10% of its total product costs, so one may ask whether or not this particular company belonged to the manufacturing sector. However, the latest result is not surprising, because Clarke (1992) also found that the component of direct material for two large Irish manufacturing firms is less than 10% (also see Szendi and Elmore, 1993).

Table 7-7 also shows that 75.9% of respondents indicated that the percentage of overhead costs is no more than 25% of the total product costs, with an average of 2.00 and standard deviation of 0.97. This result is consistent with Clarke (1992), but contrasts Al- Khater's (1999) findings. It is clear from this table that the proportion of overhead costs in total product costs is less than the proportion of labour cost in total product costs, so it fair to say that the assertion stated by Johnson and Kaplan (1987) regarding the decline in the labour cost to total product costs cannot be applied, at least for the case of the Eastern part of SA.

To put it differently, Johnson and Kaplan's assertion might be applied for highly technological firms, where labour is not highly engaged in the production process. Based on the latest findings, one might ask if it is worth it for Saudi and non-Saudi manufacturing firms to operate in the Eastern Province of SA, to adopt sophisticated costing systems such as ABC.

Previous studies mentioned in chapter three revealed the variation in the usage of single plant-wide allocation methods throughout countries. Therefore, respondents were asked to indicate whether or not their companies used the single plan-wide method for allocating overhead costs. Table 7-8 summarises the replies to this question, as cited by respondents.

Does your company use single plant-wide overhead rate for allocating overhead costs to a product? (*n* = 158)

	Nationality				Total	
	Non-Saudi companies		Saudi companies			
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	1	0.6	69	43.7	70	44.3
No	23	14.6	65	41.1	88	55.7
	24		134		158	100.0

Table 7-8- The extent of the usage of plant-wide allocation method as cited by the users

It is evident from table 7-8 that 44.3% of respondents indicated that they use plant-wide methods, while 55.7% do not use it. Noticeably, the same table reveals that most non-Saudi firms do not use single plant-wide rates, compared with the heavy use of this system by Saudi firms, and this maybe reflects the superiority of non-Saudi firms compared with Saudi ones, or could be due to the sample variation between both nationalities. This result is in line with other studies' results (Clarke, 1997; Brierley *et al*. 2007; Abdel-Kader and Luther, 2006; Joshi, 2001; Chun *et al*., 1996), but not with Ask and Ax's (1997) findings.

Rather than the single plant-wide allocation method, several studies, as presented in chapter three, have also reported the continuing use of simple volume-based cost drivers. Therefore, respondents were asked to indicate the most common cost drivers used by their companies for allocating overhead costs. Table 7-9 represents the findings.

Cost drivers used for allocating overhead costs by Saudi and non-Saudi companies which do not use the plant-wide recovery basis (*n* = 88)						
Cost drivers	Nationality				Total	
	Non-Saudi firms		Saudi firms			
	Frequency	%	Frequency	%	Frequency	%
Direct labour hours	3	3.4	12	13.6	15	17.0
Machine hours	1	1.1	2	2.3	3	3.4
Direct labour costs	2	2.3	5	5.7	7	8.0
Machine set-ups	2	2.3	0	0.0	2	2.3
Units of outputs	4	4.5	9	10.2	13	14.8
Direct material costs	4	4.5	14	15.9	18	20.5
Other (ABC)	1	1.1	7	8.0	8	9.1
Combined bases	6	6.8	16	18.2	22	25.0
Total	23	26.1	65	73.9	88	100.0
Missing system (blanket rate)					70	44.3
Total					158	100.0

Table 7-9- The extent of the usage of volume based allocation rates as cited by the users

Table 7-9 shows that 50% of respondents allocate overhead costs based on direct labour hours or costs, or use combined drivers (more than one driver). This finding undoubtedly goes along with the mainstream, as reported by several researchers (Al Chen *et al*., 1997; Clarke, 1992, 1997; Wijewardena and Zoysa, 1999; Brieley *et al*. 2007; Ask and Ax, 1997), but contrasted other findings (Joshi, 2001; Chun *et al*., 1996).

Interestingly, eight companies have clearly indicated that they were currently using the ABC system. A plausible explanation for the heavy use of simple allocation methods by the surveyed firms may reflect the managers' commitments, in that continuing to use these methods will not lead to making the wrong decisions, so they regard modern allocation systems such as ABC as being beyond their needs.

7.2.2 Decision-making Practices

As mentioned in chapter three, Johnson and Kaplan (1987) advised managers to use modern decision-making tools, such as linear analysis, regression, and so on, and weed out traditional tools. Since CVP analysis is considered a traditional tool, respondents were asked to indicate whether or not their firms currently use this technique. Table 7-10 represents the responses to this question.

		Nationality				Total	
		Non-Saudi firms		Saudi firms			
		Frequency	%	Frequency	%	Frequency	%
Does your company utilise a cost-volume-profit relationship system?	Yes	15	9.5	104	65.8	119	75.3
	No	9	5.7	30	19.0	39	24.7
Total		24	15.2	134	84.8	158	

Table 7-10- The extent of the usage of CVP procedure in decision-making

Table 7-10 shows that 75.3% of respondents indicated that they use CVP analysis, and this result is unquestionably in line with that reported by several researchers around the world (Clarke, 1992, 1997; Joshi, 2001; Wijewardena and Zoysa, 1999; Shield *et al*., 1991). A possible explanation for the heavy use of CVP systems in the Eastern part of SA maybe reflects the preference of the managers within the surveyed firms for short-term decision strategies, or their unfamiliarity to advanced statistical or mathematical techniques, as suggested by Johnson and Kaplan (1987).

Johnson and Kaplan (1987) pointed out that, due to increasing the power of customers and competitors in recent years, relying on the cost-plus technique for determining product prices may not enable firms to achieve a competitive edge. Therefore, they sought after only using full product costs as one indicator for determining product price.

In other words, firm should take into consideration the effect of the supply side (cost) and the demand side (customers and competitors) when it sets its product price. Respondent were asked to indicate whether or not their firms used the cost-plus system for setting their product's prices. Table 7-11 reports the findings.

		Nationality				Total	
		Non-Saudi firms		Saudi firms			
		Frequency	%	Frequency	%	Frequency	%
Does your company currently use the cost-plus method for setting prices for the product('s) price(s) manufactured by your company?	Yes	11	7.0	91	57.6	102	64.6
	No	13	8.2	43	27.2	56	35.4
Total		24	15.20	134	84.80	158	100.00

Table 7-11- The extent of the usage of cost-plus method for sitting product price

Table 7-11 shows that only 35.4% of respondents are currently not using the cost-plus technique, while the remainder (64.6%) are used to it. Also, it is clear from this table that the adoption of the cost-plus method is high amongst Saudi firms, and almost half of the non-Saudi firms adopted this system. The heavy adoption of the cost-plus method in the Eastern part of SA may indicate the low impact of the demand side for determining firms' product prices. Therefore, respondents were asked to indicate on a five-point Likert scale (1 indicating "never" to 5 indicating "always") the frequency of comparing their products' prices to the market price. Table 7-12 reports the results.

	Level of frequency	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	9	5.7	5.7	5.7
	Rarely	13	8.2	8.2	13.9
	Sometimes	28	17.7	17.7	31.6
	Often	67	42.4	42.4	74.1
	Always	41	25.9	25.9	100.0
Total		158	100.0	100.0	

Table 7-12- The frequency of taking market price into account when the surveyed firms set product price

Table 7-12 shows that approximately 68% of respondents indicated that they often/always compare their products' prices to the dominant price, and this may give an indication of the managers' concerns about market determination within the surveyed firms. Based on this finding, it is not unfair to say that, together, full product cost and market price are the criteria being used by the vast majority of surveyed firms for setting their products' prices, and this is in line with other findings (Clarke, 1997, 1992; Hopper *et al*., 1999; Drury *et al*., 1993). In contrast, 13.9% of respondents indicated that they never/rarely take market prices into consideration, and this may lead someone to ask if these firms are producing monopolistic products.

Generally, companies exist to compete and expand their businesses for the purpose of maintaining their existence in the market. Accomplishing this aim involves continuous improvement and, sometimes, taking sensitive decisions. Investment is one of these issues which requires well planned decision-making, because it is associated with a high degree of risk, especially in highly competitive environments.

Several drivers may motivate firms to invest, such as economic growth, fear of losing the current customers, services provided by competitors, product quality for

competitors, and others. Therefore, respondents were asked to indicate on a five-point Likert scale (ranging from 1=not important at all to 5=very important) the importance of six criteria used as evaluation measures to justify investment decisions in their companies. Table 7-13 summarises the results.

	Investment justifications	Level of importance	Frequency	Percent	Mean	Median	S.D
Valid	Economic evaluation	1	9	5.7			
		2	16	10.1			
		3	33	20.9			
		4	41	25.9			
		5	59	37.3			
Total			**158**	**100.0**	**3.79**	**4.00**	**1.21**
Valid	Corporate strategy	1	8	5.1			
		2	15	9.5			
		3	29	18.4			
		4	41	25.9			
		5	65	41.1			
Total			**158**	**100.0**	**3.89**	**4.00**	**1.19**
Valid	Competitive-ness	1	1	.6			
		2	5	3.2			
		3	13	8.2			
		4	25	15.8			
		5	114	72.2			
Total			**158**	**100.0**	**4.56**	**5.00**	**0.82**
Valid	Customer service	1	8	5.1			
		2	4	2.5			
		3	18	11.4			
		4	45	28.5			
		5	83	52.5			
Total			**158**	**100.0**	**4.21**	**5.00**	**1.07**
Valid	Quality	1	0	.0			
		2	1	.6			
		3	9	5.7			
		4	24	15.2			
		5	124	78.5			
Total			**158**	**100.0**	**4.72**	**5.00**	**0.59**
Valid	Market share	1	7	4.4			
		2	5	3.2			
		3	21	13.3			
		4	48	30.4			
		5	77	48.7			
Total			**158**	**100.0**	**4.16**	**4.00**	**1.06**

Table 7-13- The level of importance attached to each investment justification by the surveyed firms

Level of importance: 1= Not important at all, 2= Below average importance, 3= Average importance, 4= Above average importance, 5= Very important

Table 7-13 shows that at least 63% of respondents regarded all of the evaluation measures illustrated in the table as being above important or very important for justifying investment decisions at their firms. However, quality and competitiveness, in particular, were cited by respondents as the most important motives for investment in their firms, with averages of 4.72 and 4.56 and standard deviations of 0.59 and 0.82, respectively.

To clarify that further, 93.7% of respondents indicated that quality was considered above or very important, while 88% of Saudi and non-Saudi manufacturing firms indicated that competitiveness was above or very important. It is clear from this descriptive analysis that Saudi and non-Saudi manufacturing companies mainly try to maintain their existence in the market through enhancing the quality of their products. Having known the motives for investment decisions within the surveyed firms, now the question which can be asked is: what is the method used by these companies for analysing their investment decisions?

It has been indicated in chapter three that traditional investment tools such as payback are still widely used in practice, even in some dynamic environments. Hence, respondents were asked to indicate on a five point Likert scale (ranging from 1=not important at all to 5= very important) the importance of five capital investment tools (payback, discounted payback, accounting rate of return, net present value and internal rate of return) to their companies. Table 7-14 represents the findings.

	Capital investment practices	Level of importance	Frequency	Percent	Mean	Median	S.D
Valid	Payback	1	7	4.4			
		2	10	6.3			
		3	23	14.6			
		4	29	18.4			
		5	89	56.3			
Total			**158**	**100.0**	**4.16**	**5.00**	**1.16**
Valid	Discounted payback	1	56	35.4			
		2	30	19.0			
		3	35	22.2			
		4	22	13.9			
		5	15	9.5			
Total			**158**	**100.0**	**2.43**	**2.00**	**1.35**
Valid	Accounting rate of return	1	49	31.0			
		2	17	10.8			
		3	29	18.4			
		4	38	24.1			
		5	25	15.8			
Total			**158**	**100.0**	**2.83**	**3.00**	**1.49**
Valid	Net present value	1	34	21.5			
		2	15	9.5			
		3	35	22.2			
		4	34	21.5			
		5	40	25.3			
Total			**158**	**100.0**	**3.20**	**3.00**	**1.47**
Valid	Internal rate of return	1	53	33.5			
		2	13	8.2			
		3	30	19.0			
		4	15	9.5			
		5	47	29.7			
Total			**158**	**100.0**	**2.94**	**3.00**	**1.65**

Table 7-14- The level of importance of each capital investment method as cited by the surveyed firms

Level of importance: 1= Not important at all, 2= Below average importance, 3= Average importance, 4= Above average importance, 5= Very important

Table 7-14 shows that 74.7% of respondents regarded payback as being above or very important as a technique for analysing their investment decision, with an average of 4.16 and a standard deviation of 1.16. This result is partly in line with some studies undertaken in several places around the world (Drury and Tayles, 1997; Thomas and Warng, 1999), but in contrast with Chadwell-Hatfield *et al*.'s (1996/97) results.

On the other hand, discounted cash flow received the lower level of importance amongst the surveyed firms, with an average of 2.43 and a standard deviation of 1.35. One may argue that the heavy adoption of the payback technique in the Eastern part of SA may be due to the nature of the Saudi business environment (dynamic vs. stable). However, some researchers found clear-cut evidence regarding the popularity of using this system, even in a dynamic environment (Drury and Tayles, 1997). Therefore, the wide use of the payback method for evaluating investment decisions may be due to its long history of practice, or its simplicity when compared with modern statistical techniques.

7.2.3 Standard Costing (SC) System

Respondents were asked to indicate whether or not their companies were currently utilising standard costing systems. This particular question was posed to evaluate the development in the usage of this system since 1998. Table 7-15 reports the results.

		Nationality				Total	
		Non-Saudi firms		Saudi firms			
		Frequency	%	Frequency	%	Frequency	%
Does your company currently utilise a standard costing system?	Yes	13	8.2	80	50.6	93	58.9
	No	11	7.0	54	34.2	65	41.1
Total		24	15.20	134	84.80	158	100.0

Table 7-15- The extent of the usage of standard costing system by the surveyed firms

Table 7-15 shows that 58.9% of respondents used the SC system, while 41.1% did not. It is clear from this table that the SC system is still alive among manufacturing firms which operate in the Eastern Province of SA, even though there is some noticeable decrease in its usage, especially among Saudi firms, when compared with Alebaishi's (1998) findings (57%).

A possible explanation for the decline in usage to the SC system, among Saudi firms in particular, may be because these firms moved away from adopting modern costing practices such as ABC. However, the result of this study is consistent with the mainstream, in terms of the continuing heavy use of the SC system, as reported in several studies (Drury *et al*., 1993; Ask and Ax, 1997; Clarke, 1992, 1997; Joshi, 2001; Chun *et al*., 1996).

Respondents (the users only) were also asked to indicate on a five-point Likert scale (1 indicating “never” to 5 indicating “always”) the frequency of using the SC system for fulfilling six goals (transfer pricing, setting budget, decision-making, evaluating investments, controlling cost and evaluating managerial performance) in their companies. In other words, the users of the SC system were asked to indicate their reasons for using the SC system at their companies. Table 7-16 reports the findings.

	Aims or reasons for using standard costing	Level of frequency	Frequency	Percent	Mean	Median	S.D
Valid	Transfer pricing	Never	47	50.5			
		Rarely	1	1.1			
		Sometimes	10	10.8			
		Often	5	5.4			
		Always	30	32.3			
Total			**93**	**100.0**	**2.68**	**1.00**	**1.81**
Missing			**65**	**41.1**			
Valid	Setting budgets	Never	3	3.2			
		Rarely	2	2.2			
		Sometimes	4	4.3			
		Often	21	22.6			
		Always	63	67.7			
Total			**93**	**100.0**	**4.49**	**5.00**	**.93**
Missing			**65**				
Valid	Decision-making	Never	3	3.2			
		Rarely	2	2.2			
		Sometimes	12	12.9			
		Often	34	36.6			
		Always	42	45.2			
Total			**93**	**100.0**	**4.18**	**4.00**	**0.97**
Missing			**65**				
Valid	Evaluating investments	Never	26	28.0			
		Rarely	16	17.2			
		Sometimes	19	20.4			
		Often	14	15.1			
		Always	18	19.4			
Total			**93**	**100.0**	**2.81**	**3.00**	**1.48**
Missing			**65**				
Valid	Controlling cost	Never	2	2.2			
		Rarely	0	.0			
		Sometimes	10	10.8			
		Often	21	22.6			
		Always	60	64.5			
Total			**93**	**100.0**	**4.47**	**5.00**	**0.86**
Missing			**65**				
Valid	Evaluating managerial performance	Never	5	5.4			
		Rarely	10	10.8			
		Sometimes	18	19.4			
		Often	25	26.9			
		Always	35	37.6			
Total			**93**	**100.0**	**3.81**	**4.00**	**1.20**
Missing			**65**				

Table 7-16- The frequency that each reason is behind the usage of SC system as cited by the users

It is clear form table 7-16 that the SC system is used by some Saudi and non-Saudi manufacturing firms to satisfy all of the objectives illustrated above. However, setting the budget (90.3%) and controlling costs (87.14%) were cited as the most frequent goals from utilising the SC system for some of the surveyed firms, with averages of 4.49 and 4.47 and standard deviations of 0.93 and 0.86, respectively.

Noticeably, the main goals for using the standard costing system in the case of the Eastern part of SA are partly in line with those for Finland, the USA, the UK and Japan (Lukka and Granlund, 1996; Fry *et al*., 1998; Drury *et al*., 1993; Zoysa and Herath, 2007), but in contrast with results reported in Sweden and Ireland (Ask and Ax, 1997; Clarke, 1992, 1997). A possible explanation to the continuous use of the SC system in the Eastern part of SA may be due to the nature of firm strategy (long strategy vs. short strategy) or its history, and managers believing that this system is still sufficient and serves them well.

7.2.4 Traditional Budgeting

Large and medium-sized Saudi and non-Saudi manufacturing firms which operate in the Eastern part of SA were asked to indicate whether or not their companies used traditional budgeting. Table 7-17 reports the findings.

		Nationality				Total	
		Non-Saudi firms		Saudi firms			
		Frequency	%	Frequency	%	Frequency	%
Does your company currently use annual budgeting systems?	Yes	21	13.3	108	68.4	129	81.6
	No	3	1.9	26	16.5	29	18.4
Total		24	15.20	134	84.90	158	100.0

Table 7-17- The extent of the usage of tradition budgeting as cited by the users

Table 7-17 shows that 81.6% of respondents used a traditional budgeting system, while only 18.4% did not. This result is unquestionably consistent with other studies (Joshi, 2001; Chenhall and Langfield-Smith, 1998a; Hyvonen, 2005; Burns *et al*., 2004; Cress and Pettijohn, 1985) regarding the continuing use of traditional budgeting systems in different places around the world. On the other hand, companies which indicated that they did not use traditional budgeting systems maybe noticed the shortages associated with traditional budgeting, so then adopted a modern budgeting system, such as ABB.

Exploring the purposes of utilising traditional budgets was the point of concern for the current research. Therefore, the users of traditional budgeting systems were asked on a five-point Likert scale (ranging from 1=not important at all to 5= very important) to rate the reasons or objectives which motivated their companies to utilise budgeting. Table 7-18 summarises the results.

	Budgeting objectives	Level of importance	Frequency	Percent	Mean	Median	S.D
Valid	Planning day-to-day operation	1	9	7.0			
		2	11	8.5			
		3	30	23.3			
		4	35	27.1			
		5	44	34.1			
Total			**129**	**100.0**	**3.73**	**4.00**	**1.21**
Missing			**29**				
Valid	Strategic analysis	1	3	2.3			
		2	20	15.5			
		3	24	18.6			
		4	40	31.0			
		5	42	32.6			
Total			**129**	**100.0**	**3.76**	**4.00**	**1.13**
Missing			**29**				
Valid	Controlling costs	1	1	.8			
		2	2	1.6			
		3	9	7.0			
		4	27	20.9			
		5	90	69.8			
Total			**129**	**100.0**	**4.57**	**5.00**	**.75**
Missing			**29**				
Valid	Judging performance	1	0	.0			
		2	8	6.2			
		3	14	10.9			
		4	32	24.8			
		5	75	58.1			
Total			**129**	**100.0**	**4.35**	**5.00**	**.91**
Missing			**29**				
Valid	Motivating managers within the firm	1	4	3.1			
		2	20	15.5			
		3	34	26.4			
		4	25	19.4			
		5	46	35.7			
Total			**129**	**100.0**	**3.69**	**4.00**	**1.19**
Missing			**29**				
Valid	Coordinating activities across business units	1	9	7.0			
		2	21	16.3			
		3	27	20.9			
		4	33	25.6			
		5	39	30.2			
Total			**129**	**100.0**	**3.56**	**4.00**	**1.26**
Missing			**29**				
Valid	Communication	1	5	3.9			
		2	13	10.1			
		3	32	24.8			
		4	34	26.4			
		5	45	34.9			
Total			**129**	**100.0**	**3.78**	**4.00**	**1.14**
Missing			**29**				

Table 7-18- The level of importance of each objective of the traditional budget as cited by the users

Level of importance: 1= Not important at all, 2= Below average importance, 3= Average importance, 4= Above average importance, 5= Very important

It is evident from table 7-18 that respondents use budgeting systems to meet all of the objectives illustrated above, but that controlling costs and judging performance were the main two goals from using this system, with averages of 4.57 and 4.35 and standard deviations of .75 and .91, respectively.

To clarify that further, 90.7% of users regarded the budgeting system as important or very important for controlling costs in their companies, while 82.9% deemed budgeting as being important or very important for evaluating their performance. This finding is completely consistent with Chenhall and Langfield-Smith's (1998a) results, and is partly in line with several other findings (Cress and Pettijohn, 1985; Clarke, 1992; Hyvonen, 2005), but in contrast with Blake *et al.*'s (1998) results.

The surveyed firms were also asked to indicate on a five-point Likert scale (1 indicating "never" to 5 indicating "always") the frequency of using flexible budgeting at their companies. Table 7-19 reports the results.

	Level of frequency	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	60	38.0	38.0	38.0
	Rarely	16	10.1	10.1	48.1
	Sometimes	47	29.7	29.7	77.8
	Often	20	12.7	12.7	90.5
	Always	15	9.5	9.5	100.0
Total		158	100.0	100.0	

Table 7-19- The frequency of usage of flexible budget by the surveyed firms

Table 7-19 shows that 22.2% of Saudi and non-Saudi manufacturing firms indicated that they often/always used flexible budgeting, while 48.1% of these companies

indicated that they never/rarely used it. Drury *et al*. (1993) reported in their study that 42% of UK manufacturing organisations used flexible budgeting, and that large firms tended to use this type of budgeting more than small firms.

However, the latest study undertaken by Dugdale and Lyne (2010) revealed that 80% of UK manufacturing firms did not flex their budget. A possible explanation for the limited use of flexible budgeting among Saudi and non-Saudi manufacturing firms was maybe due to the preference of the managers within these firms to use static guidelines for evaluating performance before establishing their business.

7.2.5 Transfer Pricing System

Respondents were asked whether or not their companies used the transfer pricing system. Table 7-20 reports the results.

		Nationality				Total	
		Non-Saudi firms		Saudi firms			
		Frequency	%	Frequency	%	Frequency	%
Does your company (division) utilise a transfer price system?	Yes	5	3.2	53	33.5	58	36.7
	No	19	12.0	81	51.3	100	63.3
Total		24	15.20	134	84.80	158	100.00

Table 7-20- The extent of the usage of transfer pricing system by the surveyed firms

Table 7-20 shows that only 36.7% of respondents used the transfer pricing system, while 63.7% did not. A possible explanation for the limited use of the transfer pricing system among the surveyed companies may be due to the management style within

these firms (centralised vs. decentralised). Transfer pricing involves managers practicing full autonomy in order to be able to buy or sell outside the market.

However, some companies tend not to delegate authority, so not using the transfer pricing system in this case is justifiable. Another possible explanation is that the non-users of the transfer pricing system, in the case of the Eastern part of SA, may use different criteria from the transfer pricing system for evaluating managers' performances within their sub-units.

Companies which indicated that they used transfer pricing system were also asked to indicate the common transfer pricing method used by their companies. Table 7-21 reports the results.

	Transfer pricing methods	Frequency	Percent
If yes, what is the common transfer pricing method which is currently used by your company (division)?	Based on market price	15	25.9
	Based on cost of production	34	58.6
	Negotiation	9	15.5
	Other	0	.0
Total		58	100.0
Missing		100	

Table 7-21- The extent of usage of different transfer pricing methods as a transfer pricing system as cited by the users

Table 7-21 shows that 58.6% of users of the transfer pricing system tended to use cost of production method, a result in contrast with Drury *et al*. (1993) and Shields *et al*.'s (1991) findings. Drury *et al*. (1993) stated that transfer pricing based on the cost of production will not permit the seller division to maximise its performance. A possible explanation for this finding is that the large number of users of the transfer pricing

system may have seen the cost of production as being similar to full costs, so they selected this method.

7.2.6 Financial Performance Measures (FMs)

As mentioned in chapter three, several studies proved that managers within companies were still in favour of using FMs for evaluating their performance. Therefore, respondents were asked on a five-point Likert scale (1 indicating “never” to 5 indicating “always”) to indicate the frequency of using six types of financial measures at their companies. Table 7-22 summarises the findings.

	Financial measures	Level of frequency	Frequency	Percent	Mean	Median	S.D
Valid	Return on investment	Never	26	16.5			
		Rarely	16	10.1			
		Sometimes	27	17.1			
		Often	34	21.5			
		Always	55	34.8			
Total			**158**	**100.0**	**3.48**	**4.00**	**1.46**
Valid	Return on sales	Never	12	7.6			
		Rarely	8	5.1			
		Sometimes	14	8.9			
		Often	34	21.5			
		Always	90	57.0			
Total			**158**	**100.0**	**4.15**	**5.00**	**1.23**
Valid	Residual income	Never	80	50.6			
		Rarely	25	15.8			
		Sometimes	24	15.2			
		Often	18	11.4			
		Always	11	7.0			
Total			**158**	**100.0**	**2.08**	**1.00**	**1.32**
Valid	Variance analysis	Never	60	38.0			
		Rarely	18	11.4			
		Sometimes	23	14.6			
		Often	26	16.5			
		Always	31	19.6			
Total			**158**	**100.0**	**2.68**	**3.00**	**1.58**
Valid	Divisional profit	Never	64	40.5			
		Rarely	22	13.9			
		Sometimes	21	13.3			
		Often	19	12.0			
		Always	32	20.3			
Total			**158**	**100.0**	**2.58**	**2.00**	**1.59**
Valid	Contribution margin	Never	56	35.4			
		Rarely	22	13.9			
		Sometimes	24	15.2			
		Often	26	16.5			
		Always	30	19.0			
Total			**158**	**100.0**	**2.70**	**300**	**1.55**

Table 7-22- The frequency of usage of each type of financial measure as cited by the surveyed firms

It is evident from table 7-22 that all of the six financial measures illustrated in the table were used by some respondents, but return on sales (ROS) was the most prominent FM used by respondents (78.5%), with an average of 4.15 and a standard deviation of 1.23, and this result is consistent with Shields *et al.*'s (1991) results,

partially consistent with Wijewardena and Zoysa (1999), but in contrast with Joshi (2001), Xiao (2006/07) and Drury *et al.*'s (1993) findings.

It is also clear from the same table's residual income that it is used by a limited number of Saudi and non-Saudi companies (18.4%), with an average of 2.08 and a standard deviation of 1.32. A possible explanation for this result may be the manager's preference for evaluating performance based on short-term indicators like achieving sales targets.

It was mentioned in the last part of chapter three that several studies were concentrated on large and medium-sized firms. This research omitted small firms, and the result of the analysis for TMA systems here is in line with those studies, in terms of the continuing heavy use of these systems, even though there is a slow movement toward adopting new ideas in management accounting, such as adopting more than one accounting system and ABC system. The next topic focuses on reporting the findings related to the adoption or non-adoption of AMA practices, and the motives which stimulated the respondents to adopt or not to adopt these new systems.

7.3 Advanced Management Accounting Practices (AMA):

As mentioned in chapter four, AMA practices were suggested as alternatives to traditional ones. Thirteen AMA systems were selected to be investigated through the current research, because most or all of them received much emphasis in several management accounting studies (Drury *et al*., 1993; Brierley *et al*., 2007; Abdel-Kader and Luther, 2006; Hyvonen, 2005; Clarke, 1992; Ask and Ax, 1997; Waldron and Everett, 2004; Fullerton and McWatters, 2004; Joshi, 2001; Adler *et al*., 2000; Chenhall and Langfield-Smith, 1998a) on the one hand, and because nobody investigated these thirteen systems together in SA on the other.

Hence, the researcher aims to contribute to the literature of management accounting by providing evidence regarding the current adoption of the selected systems in a non-Anglo-Saxon environment.

At the beginning, respondents were asked to indicate whether or not their companies employed all of these thirteen AMA systems, or at least some of them, and they were then asked to indicate on a five-point Likert scale (ranging from 1=not important at all to 5= very important) the importance of the adoption or non-adoption of each AMA system for their companies. Table 7-23 reports the results of the first part of this question, while table 7-24 represents the level of importance attached to these systems, as cited by respondents (users and non-users).

AMA practices	Employed vs. not employed	Frequency	Percent
Activity-based costing	Currently not employed	144	91.1
	Currently employed	14	8.9
Target costing	Currently not employed	116	73.4
	Currently employed	42	26.6
Lifecycle costing	Currently not employed	142	89.9
	Currently employed	16	10.1
Cost of quality reporting	Currently not employed	140	88.6
	Currently employed	18	11.4
Backflush costing	Currently not employed	154	97.5
	Currently employed	4	2.5
Activity-based budgeting	Currently not employed	147	93.0
	Currently employed	11	7.0
Non-financial measures	Currently not employed	96	60.8
	Currently employed	62	39.2
Balanced scorecards	Currently not employed	138	87.3
	Currently employed	20	12.7
Activity-based management	Currently not employed	152	96.2
	Currently employed	6	3.8
Total quality management	Currently not employed	94	59.5
	Currently employed	64	40.5
Value-based management	Currently not employed	154	97.5
	Currently employed	4	2.5
Throughput accounting	Currently not employed	149	94.3
	Currently employed	9	5.7
Just-In-Time (production)	Currently not employed	151	95.6
	Currently employed	7	4.4

Table 7-23- The extent of the adoption of AMA practices as cited by the surveyed firms

AMA practices		Level of importance, as cited by users and non-users of each AMA practice					Total	Mean	Median	SD
		1	2	3	4	5				
Activity-based costing	Frequency	75	32	30	15	6	158	2.02	2.00	1.18
	Percent	47.5	20.3	19	9.5	3.8	100.0			
Target costing	Frequency	19	17	36	48	38	158	3.44	4.00	1.29
	Percent	12	10.8	22.8	30.4	24.1	100.0			
Lifecycle costing	Frequency	54	32	26	32	14	158	2.49	2.00	1.37
	Percent	34.2	20.3	16.5	20.3	8.9	100.0			
Cost of quality reporting	Frequency	54	27	23	38	16	158	2.59	2.00	1.42
	Percent	34.2	17.1	14.6	24.1	10.1	100.0			
Backflush costing	Frequency	81	36	23	16	2	158	1.87	1.00	1.08
	Percent	51.3	22.8	14.6	10.1	1.3	100.0			
Activity-based budgeting	Frequency	82	32	31	13	0	158	1.84	1.00	1.01
	Percent	51.9	20.3	19.6	8.2	0.0	100.0			
Non-financial measures	Frequency	19	17	34	51	37	158	3.44	4.00	1.29
	Percent	12	10.8	21.5	32.3	23.4	100.0			
Balanced scorecards	Frequency	48	29	45	30	6	158	2.47	3.00	1.21
	Percent	30.4	18.4	28.5	19	3.8	100.0			
Activity-based management	Frequency	79	38	33	7	1	158	1.82	1.50	0.96
	Percent	50	24.1	20.9	4.4	0.6	100.0			
Total quality management	Frequency	24	19	35	59	21	158	3.22	4.00	1.26
	Percent	15.2	12	22.2	37.3	13.3	100.0			
Value-based management	Frequency	85	41	24	7	1	158	1.72	1.00	0.92
	Percent	53.8	25.9	15.2	4.4	0.6	100.0			
Throughput accounting	Frequency	69	42	30	16	1	158	1.97	2.00	1.05
	Percent	43.7	26.6	19	10.1	0.6	100.0			
Just-In-Time (production)	Frequency	70.00	44.00	30.00	13.00	1.00	158.00	1.93	2.00	1.01
	Percent	44.30	27.85	18.99	8.23	0.63	100.0			

Table 7-24- The level of importance attached to each AMA practice as cited by the surveyed firms

Level of importance: 1= Not important at all, 2= Below average importance, 3= Average importance, 4= Above average importance, 5= Very important

7.3.1 Modern Costing Systems

Table 7.23 shows that only 8.9% of respondents used the ABC system, while 91.1% did not. The limited use of the ABC system in the Eastern Part of SA is in line with results found in different places around the world (Emore and Ness, 1991; Waldron and Everett, 2004; Innes and Mitchell, 1995; Innes *et al*., 2000; Dugdale *et al*., 2006; Smith *et al*., 2008; Haldma and Laats, 2002; Ask and Ax, 1997; Clarke *et al*., 1999; Clarke, 1992; Cinquini *et al*., 1999; Hyvonen, 2005; Joshi, 1998), and contrary to the results reported by Triest and Elshahat (2007) in Egypt.

Here, it would be necessary to mention that table 7-9 only shows eight companies which are using the ABC system, while table 7-23 shows 14 companies currently using this system. The differences between the tables may reveal that some companies use both systems (the traditional system and the modern one) at the same time, or that they are used in a way so as to substitute their traditional system with an ABC one.

By comparing the current research results with those reported by Alebaishi (1998), we notice that the usage of the ABC system in SA has decreased, which may indicate the growing dissatisfaction towards the ABC system, at least in SA. A couple of reasons which may motivate Saudi and non-Saudi manufacturing firms not to use the ABC system include the complexity of the ABC system in practice, its unsuitability to the nature of the firm's businesses, the limited benefits which might be gained from using it, especially in the short-term, a lack of knowledge, satisfaction with the existing costing system, or something else.

With regards to the importance level attached to the ABC system by the surveyed companies, table 7-24 shows that only 13.3% of respondents regard ABC as important

or very important, while the majority (67.8%) believe that the ABC system is not important or below importance for their companies, with a mean of 2.02 and standard deviation of 1.18; this result is the opposite direction of that found in Australia (Chenhall and Langfield-Smith, 1998a).

Again, the level of importance attached to ABC by respondents from the current research had decreased by 27.3% if this result were to be compared to Alebaishi's (1998) findings. Indeed, the increasingly declining usage of the ABC system, as found in the Eastern part of SA and the UK by the case reported by Innes *et al*. (2000), may lead us to think deeply and seriously about the questions raised by Gosselin (1997) regarding the alleged benefits which might be gained from the ABC system.

Table 7-23 also showed that only 10.1% of respondents used the lifecycle costing system, while 89.9% did not, and this result was consistent with other researchers' findings (Waldron and Everett, 2004; Clarke, 1992; Wijewardena and Zoysa, 1999; Joshi, 2001). According to table 7-24, only 29.2% of respondents regarded the lifecycle costing system to be important or very important to their firms, while 54.5 % considered it either not important at all or below importance, with a mean of 2.49 and a standard deviation of 1.37; this result contradicted the findings of Alebaishi (1998), Chenhall and Langfield-Smith, (1998a), and Adler *et al*. (2000).

Table 7-23 shows that 11.4% of respondents used the cost of quality reporting system while 88.6% did not. The limited use of cost of quality reporting in the Eastern part of SA was similar to that found in the USA, the UK, Ireland and India, and this limited use is in line with other findings (Waldron and Everett, 2004; Abdel-Kader and

Luther, 2006; Clarke, 1992; Joshi, 2001). With regards to the importance level, table 7-24 shows that only 34.2% of respondents deemed cost of quality reporting to be important or very important to their companies, while over half of respondents (51.3%) believed that using this system was not important or below importance for them, with a mean of 2.59 and a standard deviation of 1.42. This result opposed that which was found in New Zealand (Adler *et al*., 2000).

Table 7-23 also shows that only 2.5% of respondents used the backflush costing system, while 97.5% did not. The limited use of the backflush system in the Eastern part of SA is consistent with what was found in India, New Zealand and the USA (Joshi, 2001; Adler *et al*., 2000; Waldron and Everett, 2004). Table 7-24 shows that only 11.4% of respondents regarded the backflush system as important or very important, while 74.1% of respondents deemed it as not important at all or below importance to their organisations, with a mean of 1.87 and a standard deviation of 1.08. The widespread dissatisfaction with the backflush system in the Eastern part of SA could be due to the limited use of the JIT system.

Table 7-23 shows that 5.7% of respondents used throughput accounting, while the vast majority (94.3%) did not. Table 7-24 reveals that only 10.7% of respondents regarded this system as important or very important, while 70.3% of respondents deemed this system as either not important at all or below importance to their companies, with a mean of 1.97 and a standard deviation of 1.05.

It is clear from the previous descriptive analysis that the extent of usage of the modern costing systems in the Eastern part of SA is limited, and this result unquestionably fits

with the mainstream. A plausible explanation for this result may be because the vast majority of the managers within the surveyed firms believed that adopting modern costing systems would not enable them to enhance their performance, not only in the short-term, but even in long-term, so they preferred not to invest in these sophisticated costing systems, or it could be due to something else.

7.3.2 Target Costing (TC)

As mentioned in chapter four, target costing is a managerial approach which aims to reduce total costs for new products through focusing on the product cycle. This system is suggested as an alternative to the cost-plus pricing procedure. Table 7-23 shows that only 26.6% of respondents used TC, while 73.4% did not. The limited use of the TC system in the Eastern part of SA is in line with the results found in Malaysia, Sweden and Turkey (Smith *et al*., 2008; Borgernas and Fridthat, 2003; Kocsoy *et al*., 2008), but not with what was found in Japan (Tani *et al*., 1994).

Table 7-24 shows that 54.5% of respondents regarded the TC system as important or very important, while only 22.8% deemed this system to be not important at all or below importance for their firms, with a mean of 3.44 and a standard deviation of 1.29. The growing level of importance of TC in the Eastern part of SA may indicate an increasing intensity of competition among companies operating in this area of SA.

7.3.3 Non-financial Measures (NFMs)

Table 7-23 shows that 39.2% of respondents used NFMs, while 60.8% did not. With regards to the importance level, table 7-24 shows that 55.7% of respondents regarded NFMs, in general, as being important or very important, while 22.8% believed that these types of measures were not important at all or below importance to their companies, with a mean of 3.44 and a standard deviation of 1.29. Based on this result, it is hard to say that the extent of usage of NFMs in the Eastern part of SA is limited, but we can say that there is a moderate use of these measures in the Eastern part of SA.

With regards to the extent of usage of the BSC in the Eastern part of SA, table 7-23 shows that only 12.7% of respondents are currently using it, while 87.3% are not, and this result is in line with other findings (Nielson and Sorensen, 2004; Arena and Azzone, 2005; Scapens *et al*., 2003; Abdel-Maksoud *et al*., 2005).

Table 7-24 shows that 22.8% of respondents regarded the BSC as important or very important, while 48.8% believed it was not important at all or below importance to their companies, with a mean of 2.47 and a standard deviation of 1.21. The limited use of the BSC in the Eastern part of SA could be due to its design, a lack of knowledge, or even due to something else.

7.3.4 Other AMA Systems

It was mentioned in chapter four that ABB and ABM emanated from the ABC system. Table 7-23 shows that only 7% and 3.8% of respondents used these two

systems, while 93% and 96.2%, respectively, did not, and this result is in line with other findings (Joshi, 2001; Hyvonen, 2005; Askarany *et al*., 2007).

Table 7-24 shows that 8.2% and 5% of respondents deemed ABB and ABM as important or very important, while 72.2% and 74.1%, respectively, believed that these two systems were not important at all or below importance to their firms, with means of 1.84 and 1.82 and standard deviations of 1.01 and 0.96, respectively. The limited use of these two systems in the Eastern part of SA may be related to the limited use of the original system (ABC) in the same region.

Table 7-23 shows that 40.5% of respondents used the TQM approach, while 59.5% did not, and this result is in agreement with the findings of Smith *et al*. (2008). Table 7-24 shows that 50.6% of respondents regarded the TQM system as important or very important, while 27.2% deemed it not important at all or below importance to their organisations, with a mean of 3.22 and a standard deviation of 1.26.

Table 7-23 shows that 2.5% of respondents used the VBM approach, while 97.5% did not. This result is in line with Morisawa and Kurosaki's (2002) findings, but not with Ryan and Trahan's (1999) results. The limited use of this system, not only in Saudi case but also in different places around the world, may be because it was only found late in the 20th century. With regards to its importance level, table 7-24 shows that only 5% of respondents regarded VBM as important or very important, while 79.9% believes it was not important at all or below importance to their firms, with a mean of 1.72 and a standard deviation of 0.92.

Table 7-23 shows that only 4.4% of respondents used JIT, while 95.6% did not. This result fits with other researchers' findings (Smith *et al*., 2008; Adler *et al*., 2000). Surprisingly, Alebaishi (1998) reported in his study that 50% of Saudi manufacturing firms were using this system, and his finding opposed the current research result, regarding the extent of usage of JIT in part of SA. However, the current research focuses only on part of SA, while Alebaishi's research covered the whole country, which may explain the variation between the results.

Table 7-24 shows that 8.7% of respondents regarded JIT as important or very important, while 72% deemed this system as not important at all or below importance for their companies, with a mean of 1.93 and a standard deviation of 1.01. A plausible explanation for the limited use of JIT philosophy in the Eastern part of SA may be because managers within the surveyed firms regard it as being impractical or unsuitable for their businesses.

7.3.5 The Motives for Using or Not Using AMA Practices

As can be seen, some Saudi and non-Saudi manufacturing firms which operate in the Eastern part of SA have adopted AMA systems, although the level of adoption, in general, is limited. Therefore, respondents were asked to indicate the reasons or motives which triggered them to adopt AMA systems. Table 7-25 summarises the findings.

Motives for adopting AMA systems		Frequency	Percent
To compete strategically	Yes	81	74.3%
	No	28	25.7%
To ensure the company's survival in the long-run	Yes	62	56.9%
	No	47	43.1%
In response to changes occurring in the business arena	Yes	50	45.9%
	No	59	54.1%
The dissatisfaction of the company's senior managers regarding the usefulness of TMA practices	Yes	11	10.1%
	No	98	89.9%
Imitating other successful Western and Eastern companies which have benefited from adopting such practices	Yes	11	10.1%
	No	98	89.9%
Other	Yes	0	.0%
	No	109	100.0%

Table 7-25- The influence of each motive on triggering users of AMA system(s) to use this/these practice(s)

Table 7-25 reveals several reasons which motivated Saudi and non-Saudi manufacturing firms to adopt AMA systems. However competing strategically and maintaining firm survival in the long-run were found to be the two main motives for adopting AMA systems according to some respondents. This result is partially consistent with some previous results (Tani *et al*., 1994; Rattray *et al*., 2007; Borgernas and Fridh, 2003; Cooper and Slagmulder, 1997), but partially in contrast with others (Arena and Azzone, 2005; Abdel-Maksoud *et al*., 2005; Ryan and Trahan, 1999; Davila and Wouters, 2004; Clarke, 1992; Adler *et al*., 2000; Joshi, 1998).

At the same time, dissatisfaction with TMA practices and imitating other successful organisations were found to be the lesser reasons behind the adoption of AMA systems in the Eastern Province of SA. One important thing which can be inferred from the previous table is that Saudi and non-Saudi firms were not concerned with mimicking practices which existed in some successful organisations, which may have give an indication regarding the low influence of the institutional aspects on the

adoption of AMA systems, at least in the case of the Eastern part of SA; this result unquestionably supports Al-Twaijry *et al.*'s (2003) findings.

Searching for constraints which precluded non-users of AMA systems in the Eastern part of SA was a point of concern for the current research. Therefore, respondents were asked to indicate the reasons which motivated them to not adopt AMA systems for their companies. Table 7-26 reports the findings.

Barriers of change		Frequency	Percent
Cost of change related to equipment, people and time	Yes	21	13.3%
	No	137	86.7%
Satisfaction with the existing costing systems	Yes	95	60.1%
	No	63	39.9%
Lack of relevant skills	Yes	48	30.4%
	No	110	69.6
Lack of relevant software	Yes	27	17.1%
	No	131	82.9%
Management inertia	Yes	17	10.8%
	No	141	89.2%
Fear of failure	Yes	8	5.1%
	No	150	94.9%
Governmental regulations	Yes	1	.6%
	No	157	99.4%
Cultural norms	Yes	5	3.2%
	No	153	96.8%
The absence of training programmes	Yes	46	29.1%
	No	112	70.9%
The level of development within society	Yes	10	6.4%
	No	147	93.6%
Other (please explain)	Yes	0	.0%
	No	158	100.0%

Table 7-26- The influence of each reason that led to non-users of AMA practices to not adopt these systems

It is evident from table 7-26 that several reasons triggered the non-adopters of AMA systems not to invest or use these systems in their organisations. However,

satisfaction with the existing costing systems, a lack of relevant skills and the absence of training programmes were cited as the most important reasons behind not adopting AMA systems in the Eastern part of SA. This finding is partially in line with some previous results (Clarke, 1992; Adler *et al*., 2000), but partially contrasts with other findings (Dekker and Smidt, 2003; Nielson and Sorensen, 2004; Dugdale *et al*., 2006; Eunsup and Stagliano, 1997).

Surprisingly, aspects such as culture and government regulations were found to be the lesser impediments which motivated non-adopters to not use AMA systems in their firms. Therefore, it is fair to say that culture may or may not hamper the adoption of innovation in management accounting.

7.3.6 Comparison between AMA Adopters and Non-adopters in Terms of Growth

The analysis above makes public that the level of adoption of AMA systems in the Eastern part of SA is not high. At the same time, some companies have already adopted some AMA systems, and this may lead us to ask if this adoption reflected positively on the performance of these firms. In other words, have companies which have adopted AMA systems gained real benefits from this adoption?

Answering this question involves comparing the performance (growth in total revenues, total assets and firms' customers) between companies which adopted AMA systems and those which have not adopted AMA systems at all. Only 49 Saudi and non-Saudi manufacturing firms indicated that they had not adopted any AMA

systems, while the rest (109) had adopted some of them. The maximum number of AMA systems adopted by respondents was nine systems, and the minimum was one.

The last question illustrated, from part three of the questionnaire, was designed for measuring the variation in the performance between the adopters of the AMA systems and the non-adopters. Therefore, respondents were asked to indicate on a five-point Likert scale (ranging from 1=sharply decreased to 5=sharply increased) the level of growth which occurred in total revenues, assets and the number of customers in their companies, between 2002 and 2006.

Kennedy and Affleck-Graves (2001) studied the variation in the performances between firms which adopted the ABC system and those which did not. They indicated that three years from the first date about adopting the ABC system is considered enough time to study the effect of this adoption on the firm's performance.

The current research adopted Kennedy and Affleck-Graves's criteria for measuring the variation in the performances between companies which adopted AMA practices from those which did not. Therefore, each respondent who indicated in the questionnaire that their company is currently using some AMA systems was phoned and asked when the company used or adopted the ticked or selected AMA system(s).

The vast majority of respondents indicated that they adopted the selected AMA system(s) in the period between 1995 and 2000, and only a few companies (27) indicated that they adopted the selected systems between 2000 and 2003, so the criteria suggested by Kennedy and Affleck-Graves has been met in the current

research. Generally, the comparison between adopters of AMA systems and non-adopters, in terms of growth of total revenues, assets and the number of firm customers, was performed descriptively and statistically.

7.3.6.1 Growth Analysis at the Descriptive Level

7.3.6.1.1 Total Revenues

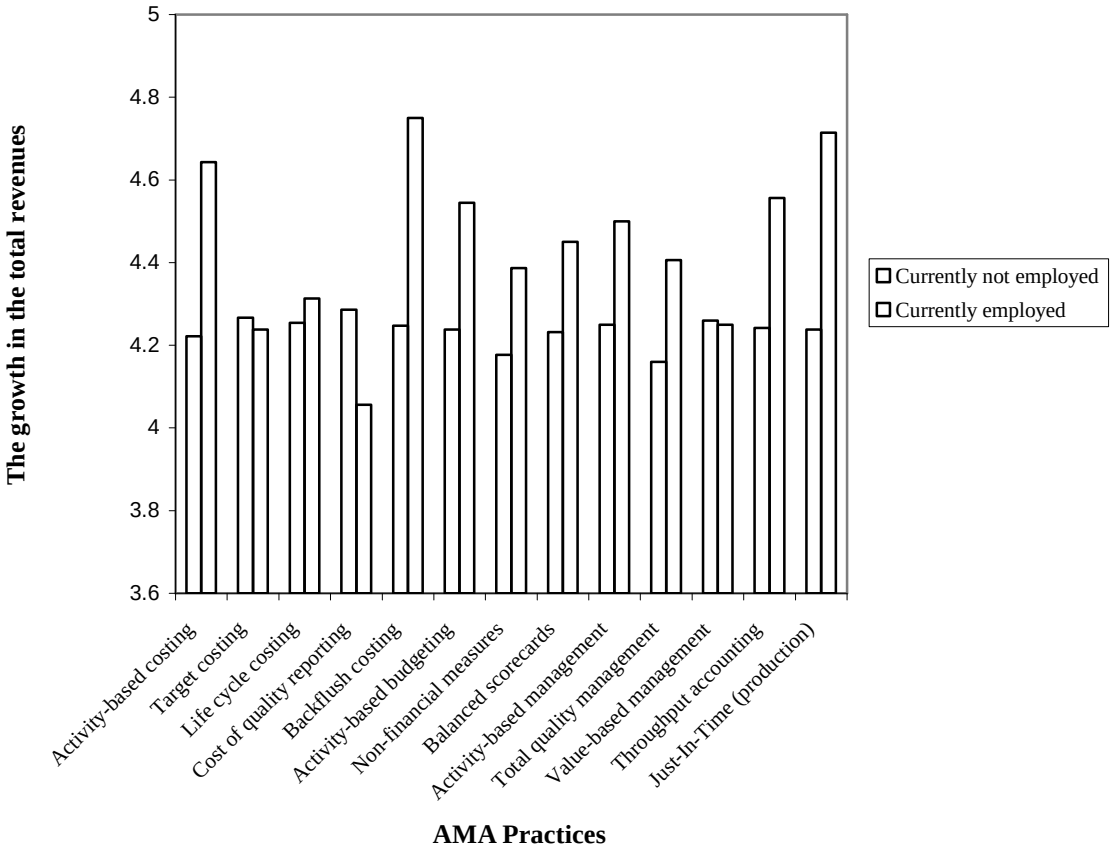

Figure 7.1: The average total revenues for Saudi and non-Saudi manufacturing companies which did and did not adopt the AMA practices

Figure 7.1 shows that there are noticeable variations between the growth rate, depending on the degree by which some of AMA practices were adopted (such as

activity-based costing, lifecycle costing, backflush costing, activity-based budgeting, non-financial measures, balanced scorecards, activity-based management, total quality management, throughput accounting and just-in-time) or not adopted (target costing, cost of quality reporting and value-based management). In other words, the adoption of a higher degree of AMA practices in the first group was associated with higher levels of growth in total revenues.

On the other hand, the higher degree in adoption of the other AMA practices (see the second group) was found to be associated with lower growth levels in total revenues. Therefore, it is fair to say that the adoption of some AMA systems may enhance firm performance in terms of growth in total revenues, but not necessarily.

7.3.6.1.2 Total Assets

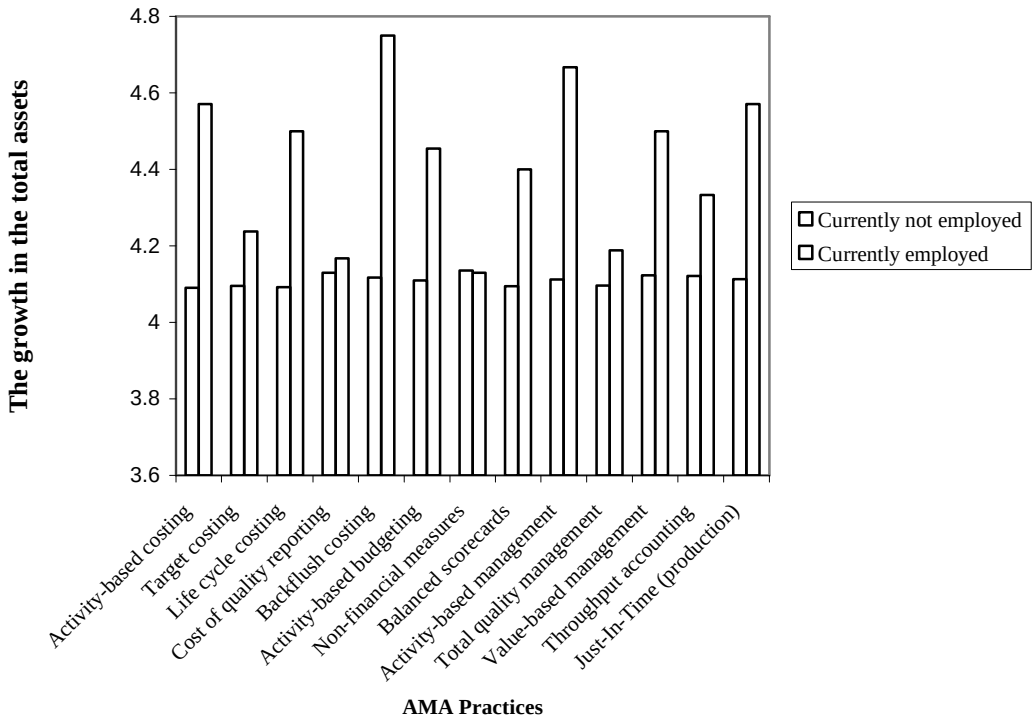

Figure 7.2: The average total assets for Saudi and non-Saudi manufacturing companies which did and did not adopt AMA practices

Figure 7.2 shows that there is variation between the growth rates, depending on the degree by which some of AMA practices were adopted (such as activity-based costing, lifecycle costing, backflush costing, activity-based budgeting, balanced scorecards, activity-based management, total quality management, throughput accounting, just-in-time, cost of quality reporting, target costing and value-based management) or not adopted (non-financial measures).

In other words, the adoption of higher degrees of AMA practices in the first group was associated with higher levels of growth in total assets. On the other hand, the higher degree of adoption of non-financial measures was associated with lower growth levels in total assets.

7.3.6.1.3 Growth in the Number of Customers

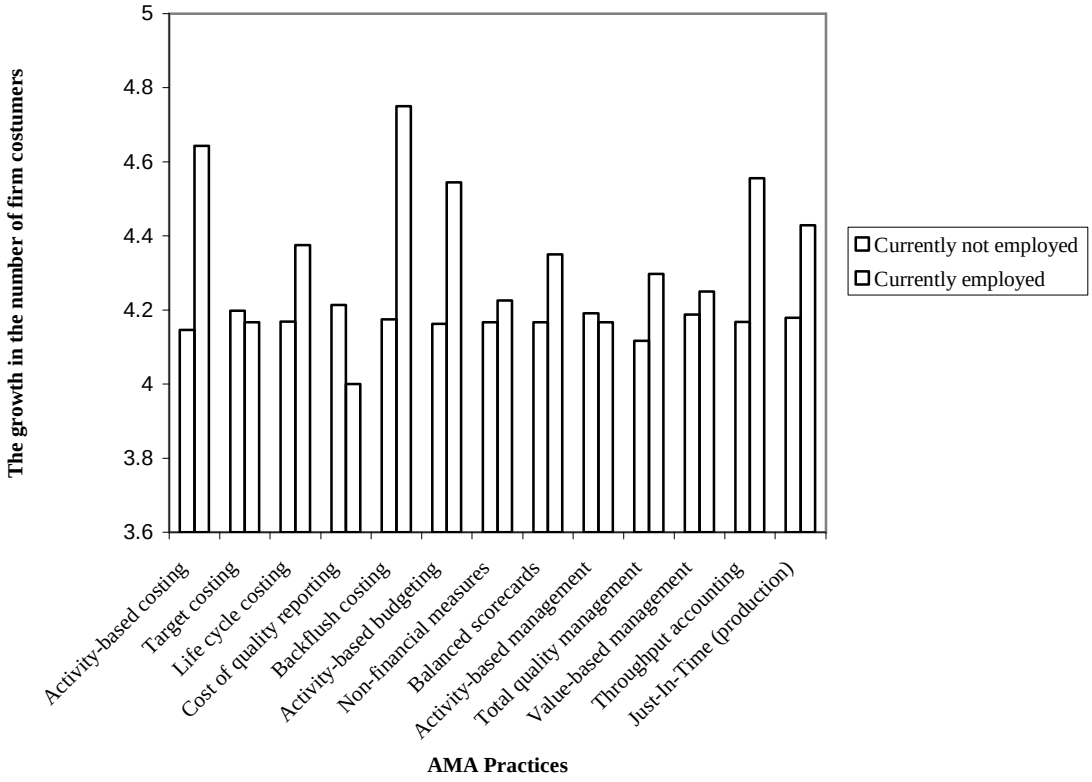

Figure 7.3: The average number of firm customers for Saudi and non-Saudi manufacturing companies which did and did not adopt AMA practices

Figure 7.3 shows that there is variation between the growth rates, depending on the degree by which some AMA practices were adopted (such as activity-based costing, lifecycle costing, backflush costing, activity-based budgeting, non-financial measures, balanced scorecards, total quality management, value-based management, throughput accounting and just-in-time) or not adopted (target costing, cost of quality reporting and activity-based management).

In other words, the adoption of higher degrees of AMA practices in the first group was associating with higher levels of growth in the total number of firm customers.

On the other hand, the higher degree of adoption of target costing, cost of quality reporting and activity-based management was associated with lower growth levels in the total number of firm customers.

7.3.6.2 Growth Analysis at Inferential Level

As shown by the descriptive analysis of the growth, there were some differences between companies which adopted AMA and those which did not adopt it, when the distributions are examined visually.

In this section, the descriptive analysis is followed by inferential analysis, where the Mann-Whitney *U* tests were conducted to compare the growth aspects between the adopters and non-adopters of the AMA practices. Tables 7-27 - 7-29 show the results of the comparison between adopters and non-adopters for each of the AMA practices within each growth element.

The difference between the AMA adopters and non-adopters in terms of the growth in total revenues

AMA practices		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Activity-based costing	Not employed	144	78.02	11235	795	11235	-1.49	0.14
	Employed	14	94.71	1326				
Target costing	Not employed	116	80.09	9290	2368	3271	-0.31	0.76
	Employed	42	77.88	3271				
Lifecycle costing	Not employed	142	78.93	11208	1055	11208	-0.54	0.59
	Employed	16	84.56	1353				
Cost of quality reporting	Not employed	140	80.31	11244	1146	1317	-0.72	0.47
	Employed	18	73.17	1317				
Backflush costing	Not employed	154	79.05	12173	238	12173	-0.89	0.37
	Employed	4	97	388				
Activity-based budgeting	Not employed	147	78.69	11568	690	11568	-0.93	0.35
	Employed	11	90.27	993				
Non-financial measures	Not employed	96	77.26	7417	2761	7417	-0.88	0.38
	Employed	62	82.97	5144				
Balanced scorecards	Not employed	138	78.64	10853	1262	10853	-0.71	0.48
	Employed	20	85.4	1708				
Activity-based management	Not employed	152	79.19	12037	409	12037	-0.49	0.62
	Employed	6	87.33	524				
Total quality management	Not employed	94	75.6	7106	2641	7106	-1.49	0.14
	Employed	64	85.23	5455				
Value-based management	Not employed	154	79.6	12259	292	302	-0.2	0.84
	Employed	4	75.5	302				
Throughput accounting	Not employed	149	78.75	11734	559	11734	-0.96	0.34
	Employed	9	91.89	827				
Just-In-Time (production)	Not employed	151	78.78	11896	420	11896	-1.05	0.29
	Employed	7	95	665				

Table 7-27

The difference between the AMA adopters and non-adopters in terms of the growth in total assets

AMA practices		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Activity-based costing	Not employed	144	77.74306	11195	755	11195	-1.7295	0.04*
	Employed	14	97.57143	1366				
Target costing	Not employed	116	77.30172	8967	2181	8967	-1.12133	0.26
	Employed	42	85.57143	3594				
Lifecycle costing	Not employed	142	77.91549	11064	911	11064	-1.44885	0.15
	Employed	16	93.5625	1497				
Cost of quality reporting	Not employed	140	79.46786	11125.5	1255.5	11125.5	-0.02751	0.98
	Employed	18	79.75	1435.5				
Backflush costing	Not employed	154	78.87987	12147.5	212.5	12147.5	-1.18102	0.24
	Employed	4	103.375	413.5				
Activity-based budgeting	Not employed	147	78.52381	11543	665	11543	-1.09532	0.27
	Employed	11	92.54545	1018				
Non-financial measures	Not employed	96	80.14583	7694	2914	4867	-0.24666	0.81
	Employed	62	78.5	4867				
Balanced scorecards	Not employed	138	78.05797	10772	1181	10772	-1.16264	0.24
	Employed	20	89.45	1789				
Activity-based management	Not employed	152	78.625	11951	323	11951	-1.35176	0.18
	Employed	6	101.6667	610				
Total quality management	Not employed	94	77.55319	7290	2825	7290	-0.72417	0.47
	Employed	64	82.35938	5271				
Value-based management	Not employed	154	79.11039	12183	248	12183	-0.742	0.46
	Employed	4	94.5	378				
Throughput accounting	Not employed	149	78.44966	11689	514	11689	-1.31173	0.19
	Employed	9	96.88889	872				
Just-In-Time (production)	Not employed	151	78.71192	11885.5	409.5	11885.5	-1.12345	0.26
	Employed	7	96.5	675.5				

Table 7-28

* 1-tailed

The difference between the AMA adopters and non-adopters in terms of the growth in the number of costumers

		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Activity-based costing	Not employed	144	77.50	11160	720	11160	-1.96	0.05**
	Employed	14	100.07	1401				
Target costing	Not employed	116	79.22	9189	2403	9189	-0.14	0.89
	Employed	42	80.29	3372				
Lifecycle costing	Not employed	142	78.57	11157	1004	11157	-0.85	0.40
	Employed	16	87.75	1404				
Cost of quality reporting	Not employed	140	80.57	11280	1110	1281	-0.91	0.36
	Employed	18	71.17	1281				
Backflush costing	Not employed	154	78.88	12147	212	12147	-1.18	0.24
	Employed	4	103.50	414				
Activity-based budgeting	Not employed	147	78.30	11509.5	631.5	11509.5	-1.35	0.18
	Employed	11	95.59	1051.5				
Non-financial measures	Not employed	96	78.64	7549	2893	7549	-0.33	0.74
	Employed	62	80.84	5012				
Balanced scorecards	Not employed	138	78.49	10832	1241	10832	-0.81	0.42
	Employed	20	86.45	1729				
Activity-based management	Not employed	152	79.55	12092	448	469	-0.08	0.94
	Employed	6	78.17	469				
Total quality management	Not employed	94	75.22	7071	2606	7071	-1.58	0.05*
	Employed	64	85.78	5490				
Value-based management	Not employed	154	79.45	12236	301	12236	-0.09	0.93
	Employed	4	81.25	325				
Throughput accounting	Not employed	149	79.06	11779.5	604.5	11779.5	-0.55	0.58
	Employed	9	86.83	781.5				
Just-In-Time (production)	Not employed	151	79.06	11938.5	462.5	11938.5	-0.62	0.53
	Employed	7	88.93	622.5				

Table 7-29

* 1-tailed
** 2-tailed

7.3.6.2.1 The Growth in Total Revenues

Despite the differences between the rank means, the Mann-Whitney *U* tests did not show any significant differences in between the total revenues of the adopters and the non-adopters of each of the AMA practices. This result is completely consistent with Gordon and Silvester's (1999) findings, even though these researchers used different criteria for measuring firm performance between ABC adopters and non-adopters.

At the same time, the current result (growth in revenues) does not support the alleged benefits of adopting AMA systems, or more precisely, ABC, as mentioned by Swenson (1995). Therefore, if there is no tangible financial benefit from adopting AMA systems, even some of them, then why should firms invest in these systems?

7.3.6.2.2 The Growth in Total Assets

There was a significant difference, U (158) =755, W=11195, Z=-1.7295, $p<.05$, 1-tailed, between companies which adopted activity-based costing (M=97.57) and the non-adopters (M=77.74), in terms of the growth in total assets, and this result affirms the anticipated benefits from using AMA systems, particularly the ABC system.

This result is in line with Cagwin and Bouwman's (2001), although these researchers used different financial measures for clarifying the association between ABC and firm performance, and partially in contrast with Ittner *et al.*'s (2002) findings. No further significant difference in growth was found in the total assets of the adopters and the non-adopters for the further AMA practices.

7.3.6.2.3 The Growth in the Number of Customers

There was a significant difference, U (158) =720, W=11160, Z=-1.96, p<.05, 2-tailed, between companies which adopted activity-based costing practices (M=100.07) and the non-adopters of this system (M=77.50). Additionally, there was a significant difference, U (158) =2606, W=7071, Z=-1.58, p<.05, 1-tailed, between companies which adopted the total quality management system (M=85.78) and the non-adopters (M=75.22). No further significant difference in growth was found in the number of customers of the adopters and the non-adopters for the further AMA practices.

Based on the analysis above, we can confirm that the adoption of AMA systems may lead to enhancements in firm performance, but not necessarily all of these systems may have a positive or equal impact on firm performance. Hence, firms should be aware and cautious regarding their decisions if they decide to invest in these new systems.

Also, firms should take into account the fact that the anticipated benefits of adopting AMA systems may not visible in the short-term, so it may not be recommended for companies to invest in these systems if they follow short-term strategies for evaluating their performance, mainly due to the excessive costs required for implementing these systems.

Before concluding the descriptive analysis, one may ask based on what criteria, other than the size aspect, can this analysis be linked with the literature presented in chapters three and four? Several criteria can be used for linking the result of the

descriptive analysis presented above with the current research framework or with the literature review, such as competition, automation, product diversity and others.

The level of automation within the production process for the surveyed firms, and price and quality competition, were selected for accomplishing the link. Respondents were asked to indicate on a five-point Likert scale (anchored 1= not automated at all to 5= completely automated) the degree of automation with the production process in their companies. Table 7-30 reports the findings.

Level of automation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not automated at all	6	3.8	3.8	3.8
	Slightly automated	30	19.0	19.0	22.8
	Moderately automated	26	16.5	16.5	39.2
	Mostly automated	50	31.6	31.6	70.9
	Completely automated	46	29.1	29.1	100.0
	Total	158	100.0	100.0	

Table 7-30- The level of automation within the surveyed firms

Table 7-30 shows that 60.7% of respondents indicated that the production process in their companies was either mostly automated or completely automated, while only 22.8% of respondents indicated that the production process was either not automated at all or slightly automated.

Price and quality competition was measured by asking the respondents to indicate on a five-point Likert scale (anchored 1= of negligible intensity to 5= extremely intense) the degree of competition that their companies face in the market, in terms of price and quality, manpower, and bidding for purchases or inputs.

With regards to price and quality competition, respondents were asked to indicate on a five-point Likert scale (anchored 1=of negligible intensity to 5= extremely intense) the degree of intensity which their companies faced in the marketplace for these two items (prices and quality). Tables 7-31 and 7-32 summarise the findings.

Price competition		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Of negligible intensity	13	8.2	8.2	8.2
	Slightly intensive	30	19.0	19.0	27.2
	Moderate intensity	6	3.8	3.8	31.0
	Intense	28	17.7	17.7	48.7
	Extremely intense	81	51.3	51.3	100.0
	Total	158	100.0	100.0	

Table 7-31- The intensity of price competition among the surveyed firms

Quality competition		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Of negligible intensity	26	16.5	16.5	16.5
	Slightly intensive	17	10.8	10.8	27.2
	Moderate intensity	6	3.8	3.8	31.0
	Intense	40	25.3	25.3	56.3
	Extremely intense	69	43.7	43.7	100.0
	Total	158	100.0	100.0	

Table 7-32- The intensity of quality competition among the surveyed firms

Table 7-31 shows that 69% of respondents indicated that they either faced competition or high competition in the marketplace in terms of product price, while 27.2 indicates that they either did not face any competition at all or some competition for their price. Table 7-32 shows that 69% of respondents indicated that they either faced competition or high competition in the marketplace in terms of product quality, while 27.3 indicates that they either did not face any competition at all or some competition in their product quality.

7.4 Summary

In summary, it was indicated earlier that one objective from conducting this research was to explore the current management accounting practices amongst Saudi and non-Saudi manufacturing organisations which operate in the Eastern Province of SA.

Most researchers who have explored how management accounting is used in a practical manner have focused their studies either on large companies (Innes and Mitchell, 1995; Innes *et al*., 2000; Clarke, 1992; Chenhall and Langfield-Smith, 1998a; Bjornenak, 1997; Lamminmaki and Drury, 2001; Hyvonen, 2005; Haldma and Laats, 2002; Al- Khater, 1999), or large and medium-sized ones (Dugdale et al., 2006; Abdel-Kader and Luther; 2006; Nielson and Sorensen, 2004; Cinquini *et al*., 1999; Joshi, 2001; Alebaishi, 1998), mainly due to the availability of financial resources and expertise.

The current research continues in the same manner, and focuses on large and medium-sized manufacturing firms, being linked with the contingent perspective with regards to at least one dimension: size.

In general, the descriptive analysis elucidated in this chapter reveals that Saudi and non-Saudi manufacturing firms which operate in the Eastern part of SA are still loyal to their TMA practices. For example, the vast majority of the surveyed firms are still unwilling to adopt more than one accounting system, even though the theory of management accounting suggests the necessity for separating the managerial accounting system from the financial one.

Also, modern theory in management accounting recommends not using simple allocation methods such as the single recovery base (blanket rate) or volume recovery bases for allocating overhead costs, while several firms, especially Saudi firms, are continuing to use these simple allocation methods. Moreover, a large number of Saudi and non-Saudi manufacturing firms believe that the standard costing system and budget are very important practices, especially for setting the budget, controlling costs and performance evaluation. Furthermore, other TMA practices, such as CVP analysis, the payback investment tool and financial measures (such as return on sale) are widely used in practice.

Contrary to the wide use of TMA systems in the Eastern part of SA, the analysis also found that several Saudi and non-Saudi manufacturing firms had adopted non-financial measures, TQM and that there was a growing interest in adopting a target costing system; some surveyed companies had adopted more than one accounting system.

The descriptive analysis related to automation, price and quality competition (see tables 7-30 - 7-32) reveals that at least 60% of surveyed companies were automated or highly automated, and faced real competition in their products' quality and price, so there is the possibility that these two aspects, as well as the size of the firm, were the drivers which motivated some respondents to adopt AMA systems.

Generally speaking, the continuing heavy use of TMA systems and the limited adoption of AMA systems in the Eastern Province of SA corresponds with a number of previous studies (Joshi, 2001; Abdel-Kader and Luther, 2006; Cinquini *et al*.,

1999), and corresponds to a fairly substantial degree with a number of other findings (Clarke, 1992; Chenhall and Langfield-Smith, 1998a; Hyvonen, 2005; Haldma and Laats, 2002). This undoubtedly affirms the existence of the gap between the theory of management accounting and its practice.

Two important conclusions can be drawn from the descriptive analysis presented in this chapter. Firstly, (a) despite the fact that most Saudi and non-Saudi manufacturing companies which operate in the Eastern part of SA are automated and operate in a competitive environment, a large number of these firms regard TMA systems as useful, or at least acceptable, systems for running their businesses. Because of this, they continue to use these systems regardless of the weaknesses or criticisms attached to them. This finding completely corresponds with the majority of the studies presented in chapter three.

Secondly, (b) organisational aspects such as size, automation and competition may trigger firms to adopt AMA systems, but not in all circumstances. The next chapter presents the statistical analaysis of the research hypotheses by adopting bivariate (correlation) and multiviraite analysis (logistic regression).

Chapter Eight: The Statistical Analysis of the Questionnaire Results

8.1 Introduction

This chapter has been organised into two parts. The first focuses on the analyses conducted on the explanatory portion of the questionnaire, consisting of the bivariate analyses. This part aims to examine the relationship between the independent variables included in the study and the dependent variable, which consists of the extent of adoption of AMA practices, through the use of correlation analysis.

In this part, three types of non-parametric measures have been utilised to test these relationships. These measures consist of (a) Kendall's *tau*-b, (b) Spearman's *rho* and (c) the Mann-Whitney *U* test. These three tests have not been used together to test each research hypothesis, with the first two non-parametric measures generally being used, and the Mann-Whitney *U* test being used in situations where group differences have been tested (Bryman and Cramer, 2009). The Mann-Whitney test has been used in order to study the difference between Saudi and non-Saudi firms in relation to culture.

The second part mainly focuses on logistic regression analysis. This part has sought to identify the predictors which were associated with the decisions of Saudi and non-Saudi firms to either adopt or not adopt AMA practices. A series of analyses have been performed before conducting the logistic regression analysis (see Appendix D).

As each independent variable contained three or more items (with the exception of product diversity), factor analysis has been utilised first in order to reduce the number

of items related to each independent variable (again, with the exception of product diversity). However, as factor analysis incorporates a number of assumptions, before these factor analyses have been conducted, a series of tests have been run in order to determine whether or not these assumptions have been met.

Next, the interrelationship between the external predictors (PEU and competition) and the internal predictors (size, AMTs, culture and firm strategy), with the exception of product diversity, have been tested. The final step focuses on conducting the logistic regression analysis and has compared the results of the correlation analyses with the results of the logistic regression.

8.2 Part One: Bivariate Analysis (Correlation)

8.2.1 Introduction

As mentioned earlier in this chapter, correlation analysis was utilised in order to examine the relationship between the dependent variable (the extent of adopting AMA practices) and each independent variable (environmental uncertainty, market competition, size, product diversity, AMTs and firm strategy).

The selection of the appropriate statistical test was an important concern in this study. The researcher utilised non-parametric methods, as the distribution of these variables was not normal and could not be transformed into a normal distribution. Three non-parametric statistical tests were then utilised in order to study the relationship between

the dependent and independent variables, which consisted of (a) Kendall's *tau*-b, (b) Spearman's *rho* and (c) the Mann-Whitney *U* test.

Siegel and Castellan (1988) have stated that Kendall's *tau*-b, as well as Spearman's *rho,* require that both variables included in the analysis are at least ordinal in scale (indicating that the variables must be measured on the ordinal, interval or ratio scale). Bryman and Bell (2007) further suggest that Kendall's *tau*-b, as well as Spearman's *rho,* can be used when one ordinal variable is correlated with another continuous (interval/ratio) variable. These two correlation coefficients were utilised in this study, as the majority of independent variables are measured on the ordinal scale, while the dependent variable is measured as a continuous variable.

With regards to the Mann-Whitney *U* test, Bryman and Cramer (2009) state that this particular test is justified when the researcher aims to study the differences between two groups. This current study focuses upon two groups, Saudi and non-Saudi organisations, so this test can be used when focusing upon the differences between these two groups in relation to culture, and its effect on the adoption of AMA practices.

As the tests utilised in this study have been thoroughly discussed, the statistical analysis consisting of correlations can now be conducted. In essence, each hypothesis will now be tested in order to determine whether or not any support can be given to the original research hypothesis, or whether the null hypothesis, suggesting no relationship, must be accepted.

8.2.2 The Relationship between AMA Practices and External Contingent Aspects

8.2.2.1 The Relationship between AMA Practices and Perceived Environmental Uncertainty (PEU)

Research Hypothesis No.1:

"There is a positive relationship between PEU and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Five items developed by Gordon and Narayanan (1984) were utilised for measuring the relationship between PEU and the extent of adopting AMA practices by Saudi and non-Saudi manufacturing companies. Respondents were asked to indicate on a five-point Likert scale (anchored 1= none to 5= many) the number of new products manufactured by their companies during the previous five years, and the degree of the stability/dynamism (anchored 1= stable to 5= very dynamic) within their external environment in terms of economics and technology.

Respondents were also asked to indicate the degree of ability for predicting the preference of their customers during the previous five years (anchored 1=much easier to predict to 5= much harder to predict), and the degree of change (anchored 1= remained about the same to 5= have proliferated or change greatly) in legal, political and economic constraints occurring in their business environment during the previous five years. Table 8-1 reports the findings.

Kendall's *tau*-b *and Spearman's rho* correlations coefficient between the PEU aspects and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

PEU aspects		Kendall's *tau*-b	Spearman's *rho*
		Number of employed AMA practices	Number of employed AMA practices
How many new products has your company produced or marketed during the last five years?	Correlation Coefficient	.464**	.577**
	Sig. (2-tailed)	.000	.000
	N	158	158
Economic	Correlation Coefficient	.356**	.436**
	Sig. (2-tailed)	.000	.000
	N	158	158
Technological	Correlation Coefficient	.404**	.497**
	Sig. (2-tailed)	.000	.000
	N	158	158
During the last five years, how hard or easy has it been to predict the tastes and preferences of your customers?	Correlation Coefficient	.495**	.619**
	Sig. (2-tailed)	.000	.000
	N	158	158
During the last five years, have the legal, political and economic constraints surrounding your company changed?	Correlation Coefficient	.544**	.674**
	Sig. (2-tailed)	.000	.000
	N	158	158

Table 8-1

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

Table 8-1 shows that there are significant positive relationships between the PEU aspects and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies. Both the *Kendall* and *Spearman* correlation coefficients between the PEU aspects were showing a similar pattern, which was a significant correlation.

The detailed results of the correlation between each of the PEU aspects and the number of AMA practices were as follows. The number of new products which have

been produced, Kendal's *tau*-b *(158) = .464, p<.0001*; *rho (158) =.577, p< .01;* economic, Kendal's *tau*-b *(158) = .356, p<.0001; rho (158) =.436, p< .01*; technological, Kendal's *tau*-b *(158) = .404, p<.0001;rho (158) =.497, p< .01;* costumer's taste, Kendal's *tau*-b *(158) = .495, p<.0001*; *rho (158) =.619, p< .01;* political and economic constrains, Kendal's *tau*-b *(158) = .544, p<.0001*; *rho (158) =.674, p< .01*.

According to the observed positive significant correlations, it can be concluded that the null hypothesis of hypothesis no.1 can be rejected at a 0.1% level of significance, and the original research hypothesis will be accepted. It is worth recalling that, interestingly, the entire five sub-hypotheses showed similar patterns in supporting the general hypothesis. A possible explanation of this finding is that SA has witnessed political and economical changes since the beginning of the new century, and these changes may have caused some turbulence in the Saudi business environment. Hence, some firms have sought to maintain themselves through adopting AMA systems.

Moreover, the Arabian Peninsula has faced two military events since 1990. The first one was the Iraq-Kuwaiti crisis which occurred in 1990, while the second related to the previous Iraqi political regime. There is a possibility that the military actions which occurred in the Persian Gulf caused the Saudi business environment to become unstable, so some companies adopted AMA systems in response to these military conflicts.

Generally, the result of the first hypothesis regarding the existence of a positive and significant relationship between the PEU and the extent of adopting AMA in the

Eastern part of SA is consistent with some previous findings (Gorden and Naratanan, 1984; Addel-Kader and Luther, 2008; Verbeeten, 2006; Kattan *et al*., 2007), but not with Jusoh (2008) and Ax *et al*.'s (2008) results.

8.2.2.2 The Relationship between AMA Practices and Competition

Research Hypothesis No.2:

"There is a positive relationship between market competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Four items adapted from Khandwalla (1977) were used for measuring the relationship between competition and the extent of adopting AMA practices by Saudi and non-Saudi manufacturing firms. The intensity of competition was measured by asking the respondents to indicate on a five-point Likert scale (anchored 1=of negligible intensity to 5= extremely intense) the degree of competition which their companies faced in the market, in terms of price, quality, manpower, and bidding for purchases or inputs. Table 8-2 reports the results related to each type of competition.

Kendall's *tau*-b *and Spearman's rho* correlations coefficient between the competition and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

	Competition measures		Number of employed AMA practices
Kendal's *tau*-b	Bidding for purchases or inputs	Correlation Coefficient	.535**
		Sig. (2-tailed)	.000
		N	158
	Competition for manpower	Correlation Coefficient	.628**
		Sig. (2-tailed)	.000
		N	158
	Quality competition	Correlation Coefficient	.654**
		Sig. (2-tailed)	.000
		N	158
	Price competition	Correlation Coefficient	.624**
		Sig. (2-tailed)	.000
		N	158
Spearman's *rho*	Bidding for purchases or inputs	Correlation Coefficient	.653**
		Sig. (2-tailed)	.000
		N	158
	Competition for manpower	Correlation Coefficient	.743**
		Sig. (2-tailed)	.000
		N	158
	Quality competition	Correlation Coefficient	.759**
		Sig. (2-tailed)	.000
		N	158
	Price competition	Correlation Coefficient	.740**
		Sig. (2-tailed)	.000
		N	158

Table 8-2

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

In order to facilitate presenting the results of hypothesis number 2, the main hypothesis is divided into four sub-hypotheses, as follows.

H2(a) "There is a positive relationship between bidding for purchase competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Table 8-2 shows that there is a significant positive relationship between bidding for purchases or inputs, and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.535, p<.0001; rho (158) =653, p< .000.* Therefore, the null hypothesis of the sub-hypothesis H2(a) can be rejected at the 0.1% level of significance, and the original research sub-hypothesis H2(a) will be accepted.

H2(b) "There is a positive relationship between manpower competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Table 8-2 shows that there is a significant positive relationship between competition for manpower and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.628, p<.0001; rho (158) =743, p< .000.* Therefore, the null hypothesis of sub-hypothesis H2(b) can be rejected at the 0.1% level of significance, and the original research sub-hypothesis H2(b) will be accepted.

H2(c) "There is a positive relationship between quality competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organizations".

Table 8-2 shows that there is a significant positive relationship between quality competition and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.654, p<.0001; rho (158) =759, p<.000.* Based on this finding, the null hypothesis of the sub-hypothesis H2(c) can be rejected at the 0.1% level of significance, and the original research sub-hypothesis H2(c) will be accepted. The result of this sub-hypothesis is in line with Khandwalla (1972) and Abdel-Maksoud *et al*.'s (2005) findings, but in contrast with Alebaishi's (1998) result.

H2(d) "There is a positive relationship between price competition and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Table 8-2 shows that there is a significant positive relationship between price competition and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.624, p<.0001; rho (158) =740, p<.000.* Therefore, the null hypothesis of the sub-hypothesis H2(d) can be rejected at the 0.1% level of significance, and the original research sub-hypothesis H2(d) will be accepted. The result of this sub-hypothesis opposes Khandwalla (1972) and Alebaishi's (1998) findings.

Based on result presented above, it can be concluded that the null hypothesis for the original research hypothesis no.2 will be rejected at the 0.1% level of significance, and the original research hypothesis will be accepted.

Generally, the strong relationship between competition and the adoption of AMA systems was not restricted to only within the current research, but other researchers used measures other than those used in the current research, and came up with the same results (Waldron and Everett, 2004; Clarke *et al*, 1999; Ax *et al*, 2008).

A couple of reasons may explain the results of this hypothesis. Firstly, the Saudi government issued new regulations in 2005, in order to restrain foreign labour, and this maybe led to increasing the level of competition among manufacturing organisations, in terms of qualified manpower (Ministry of Economic and Planning, 2005). Secondly, it was mentioned earlier that SA joined the WTO in 2005, and this maybe aggravated the competition between Saudi and non-Saudi firms in this part of SA.

The spread of the internet in SA may have enabled Saudi customers to compare domestic and international prices, which in turn led to the existence of price competition between organisations. According to Bhuian (1998), the number of manufacturing firms which adopted quality standard ISO 9000 has increased in SA since 1990, and this might have led to the existence of quality competition. The aforementioned reasons maybe motivated some Saudi and non-Saudi manufacturing firms which operate in the Eastern part of SA to adopt AMA systems as a response to the competition which existed in the marketplace.

8.2.3 The Relationship between AMA Practices and Internal Contingent Aspects

8.2.3.1 The Relationship between AMA Practices and Size

Research Hypothesis No.3:

"There is a positive relationship between size and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Two different scales were used for measuring the relationship between the extent of adopting AMA practices and the size of the firm. The first one was the ordinal scale[2] (number of employees), while the second one was the continuous scale[3] (approximate total assets and annual sales revenue for the surveyed companies). With regards to the first measure, respondents were asked to indicate on a five-point Likert scale the number of employees in their companies.

Also, respondents were asked to give approximate figures as to the total assets and the annual sales revenues in their companies. This hypothesis was divided into three sub-hypotheses, in order to examine the relationship between the extent of adopting AMA practices and each measurement of the size. Tables 8-3 - 8-5 represent the findings.

[2] As mentioned in chapter six, small manufacturing firms were excluded from the current study. However, the researcher included one category related to small firms in the ordinal scale (less than 20 employees), for the purpose of verifying the correctness of the sample frame. As a result, none of the respondents ticked the first category in the ordinal scale, which in turn affirms the validity of the sample frame used in the current research, at least in terms of the number of employees within the firms

[3] Some companies indicated their total revenues and total assets on the questionnaire, based on US Dollars. The total revenues and assets for those companies have been converted to Saudi currency (Saudi Riyal), based on the average exchange rate (3.75 SR) at the time of collecting the current research data

H3(a) "There is a positive relationship between the number of employees and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Kendall's *tau*-b *and* Spearman's *rho* correlation coefficient between the nnumber of employees and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies

	Size (number of employees)		Number of employed AMA practices
Kendall's *tau*-b	Number of current employees	Correlation Coefficient	.480**
		Sig. (2-tailed)	.000
		N	158
Spearman's *rho*	Number of current employees	Correlation Coefficient	.577**
		Sig. (2-tailed)	.000
		N	158

Table 8-3

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

Table 8-3 shows that there is a significant positive relationship between the number of employees and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.480, p<.0001; rho (158) =.577, p< .000.*

Based on this result, the null hypothesis of sub-hypothesis H3(a) will be rejected at the 0.1% level of significance, and the original research sub-hypothesis H3(a) will be accepted. The result of this sub-hypothesis is consistent with some previous findings (Bjornenak, 1997; Cinquini., *et al*, 1999; Malmi, 1999; Askarany and Smith, 2003), and in contrast with the results found by Libby and Waterhouse (1996), and William and Seaman (2001).

H3(b) "There is a positive relationship between the firms total assets and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

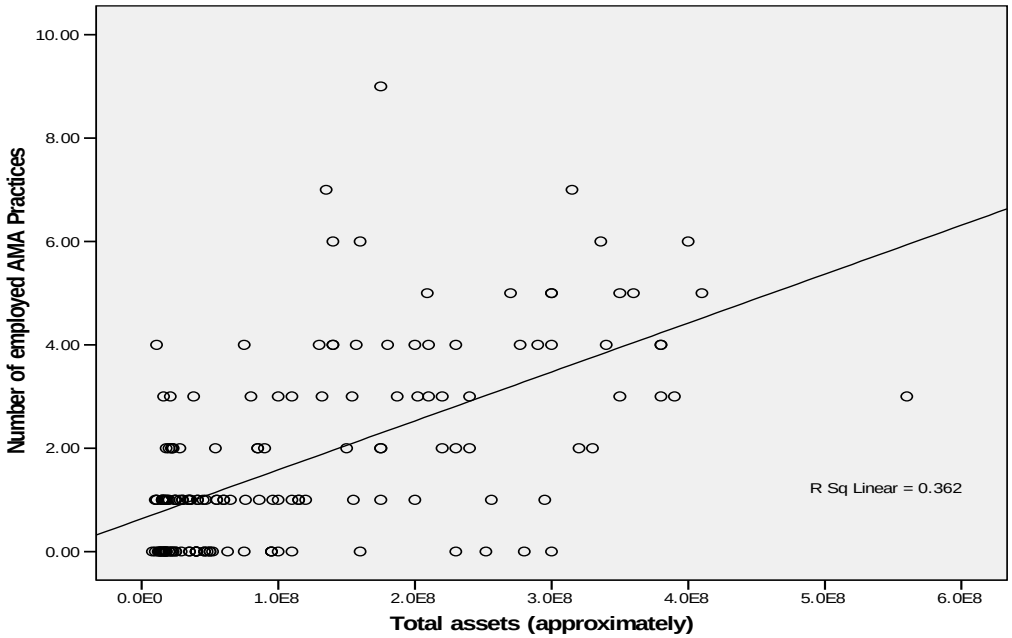

Figure 8.1: Scatter plot of total assets by the extent or number of AMA practices adopted by Saudi and non-Saudi manufacturing firms

The above scatter plot shows that there is a positive, yet not perfect, relationship between the total assets and the number of AMA practices adopted by Saudi and non-Saudi companies. The scatter plot also addresses the linear nature of the relationship between these two variables. To examine whether or not the observed pattern is significant, Kendall's *tau*-b and Spearman's *rho* followed the scatter plot (see the analysis below).

Kendall's *tau*-b *and* Spearman's *rho* correlation coefficient between the total assets and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies

	Size (total assets)		Number of employed AMA practices
Kendall's *tau*-b	Total assets (approximately)	Correlation Coefficient	.439**
		Sig. (2-tailed)	.000
		N	158
Spearman's *rho*	Total assets (approximately)	Correlation Coefficient	.580**
		Sig. (2-tailed)	.000
		N	158

Table 8-4

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

Table 8-4 shows that there is a significant positive relationship between the total assets and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.439, p<.0001; rho (158) =.580, p<.000*..

Therefore, the null hypothesis of sub-hypothesis H3(b) will be rejected at the 0.1% level of significance, and the original research sub-hypothesis H3(b) will be accepted. The result of this sub-hypothesis is in line with Abdel-Kader and Luther (2008), and Alebaishi's (1998) findings, and partially fits with Hoque and James's (2000) results.

H3(c) "There is a positive relationship between the firms total revenues and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

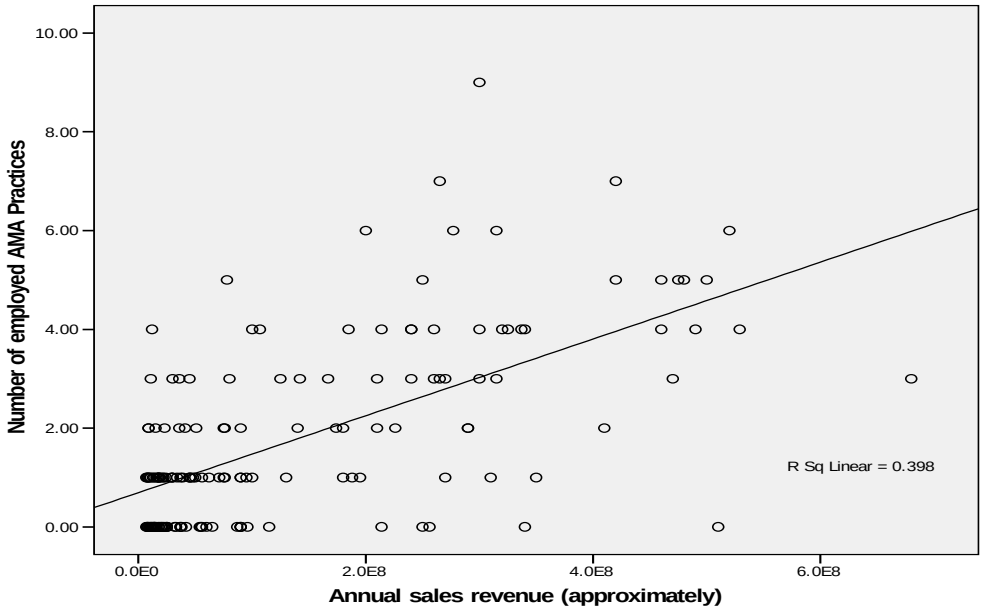

Figure 8.2: Scatter plot of total revenues by the number of AMA practices adopted by all companies

Figure 8.2 shows that there is a positive, yet not complete, association between the total revenues and the number of AMA practices which were adopted by Saudi and non-Saudi manufacturing firms. The scatter plot also addresses the linear nature of the relationship between these two variables. To examine whether or not the observed pattern is significant, Kendall's *tau*-b and the Spearman's *rho* followed the scatter plot.

Kendall's *tau*-b *and* Spearman's *rho* correlation coefficient between the sales revenue and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies

	Size (annual sales revenue)		Number of employed AMA practices
Kendall's *tau*-b	Annual sales revenue (approximately)	Correlation Coefficient	.454**
		Sig. (2-tailed)	.000
		N	158
Spearman's *rho*	Annual sales revenue (approximately)	Correlation Coefficient	.587**
		Sig. (2-tailed)	.000
		N	158

Table 8-5

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

Table 8-5 shows that there is a significant positive relationship between the total assets and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies, *tau*-b *(158) =.454, p<.0001; rho (158) =.587, p<.000.*.

Therefore, the null hypothesis of the sub-hypothesis H3(c) will be rejected at the 0.1% level of significance, and the original research sub-hypothesis H3(c) will be accepted. The result of sub-hypothesis H3(c) is consistent with Al-Omiri and Drury (2007), Clarke *et al*. (1999), and Innes and Mitchell's (1995) findings.

The aforementioned analysis gives a clear picture about the strong relationship between the size of the firm and the extent of adopting AMA practices by Saudi and non-Saudi manufacturing organisations. Therefore, the null hypothesis of research hypothesis no.3 can be rejected at the 0.1% level of significance, and the original research hypothesis no.3 will be accepted.

Several researchers attributed the strong relationship between size and the adoption of AMA systems to be mainly due to the availability of financial resources within large firms (Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Clarke, 1992, 1997; Chenhall and Langfield-Smith, 1998).

8.2.3.2 The Relationship between AMA Practices and Product Diversity

Research Hypothesis No.4:

"There is a positive relationship between product diversity and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Two measurements were developed by Bjornenak (1997) for measuring the relationship between product diversity and the extent of adoption of AMA practices by Saudi and non-Saudi manufacturing firms. These measurements were the number of products being manufactured and the production range (highly standardised vs. wholly customised).

Respondents were asked to indicate on a four-point Likert scale the number of products currently produced by their companies. Also, respondents were asked to indicate on a five-point Likert scale (anchored 1= highly standardised to 5= wholly customised) the degree which described the whole range of production in their companies. Therefore, product diversity measured in the current research was based on those two measurements. Tables 8-6 and 8-7 represent the results of the correlation.

H4(a) "There is a positive relationship between the number of products[4] being produced and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Kendall's *tau*-b and Spearman's *rho* correlation coefficients between the number of products being produced and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

			Number of employed AMA practices
Kendall's *tau*-b	How many products does your company currently produce?	Correlation Coefficient	.048
		Sig. (2-tailed)	.465
		N	158
Spearman's *rho*	How many products does your company currently produce?	Correlation Coefficient	.053
		Sig. (2-tailed)	.508
		N	158

Table 8-6

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

Table 8-6 shows that there is no significant relationship between the number of products being produced and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies. Therefore, the null hypothesis of sub-hypothesis H4(a) will be accepted at the 0.1% level of significance, and the original research sub-hypothesis H4(a) will be rejected.

H4(b) "Saudi and non-Saudi manufacturing companies which produce customised or wholly customised products are likely to adopt AMA practices".

[4] Since the categories in the ordinal scale related to the number of products are not similar, they have been redesigned and adjusted to three categories. The first one contains ten products or less, while the second is between 11 and 20 products; the last category contains more than 20 products.

Kendall's *tau*-b and Spearman's *rho* correlation coefficients between product customisation and the extent to which the AMA practices were adopted by Saudi and non-Saudi companies

			Number of employed AMA Practices
Kendall's *tau*-b	Please indicate which point on the following scale best describes the whole range of products marketed by your company	Correlation Coefficient	.069
		Sig. (2-tailed)	.279
		N	158
Spearman's *rho*	Please indicate which point on the following scale best describes the whole range of products marketed by your company	Correlation Coefficient	.080
		Sig. (2-tailed)	.316
		N	158

Table 8-7

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

Table 8-7 shows that there is no significant relationship between the customisation level and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies. Therefore, the null hypothesis of the original research sub-hypothesis H4(b) will be accepted at the 0.1% level of significance, and the original research sub-hypothesis H4(b) will be rejected.

The previous two tables show a generally weak relationship between product diversity and the extent of adopting AMA practices by Saudi and non-Saudi companies. Therefore, the null hypothesis of the original research hypothesis no.4 will be accepted at the 0.1% level of significance, and the original research hypothesis no.4 will be rejected.

This result is consistent with Al-Omiri and Drury's (2007) findings, and partially in line with Abernethy *et al*.'s (2001) result, but contradicts other findings (Drury and Tayles, 2005; Bjornenak, 1997; Clarke *et al*, 1999; Malimi, 1999). Here, it would be

necessary to mention that all previous researchers studied the association between product diversity and the adoption of modern costing systems, such as ABC. However, the current research covers costing systems and other AMA systems, and this may justify the absence of the relationship between product diversity and the extent of adopting AMA practices.

8.2.3.3 The Relationship between AMA Practices and Advanced Manufacturing Technologies (AMTs)

Research Hypothesis No.5:

"There is a positive relationship between the extent of using AMTs and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations".

Fourteen types[5] of AMTs adopted from Khandwalla (1977) were used for measuring the relationship between AMTs, and the extent of adoption of AMA practices by Saudi and non-Saudi companies. Firstly, respondents were asked to indicate on a five-point Likert scale (anchored 1= not automated at all to 5= completely automated) the degree of automation for production process in their firms.

Secondly, respondents were asked to indicate on a five-point Likert scale (never to always) the frequency of use of five types of technologies at their firms. Thirdly,

[5] Level of automation within the production process, customer technology, small batch technology, large batch technology, mass production technology, continuous process technology, computer aided design, computer aided engineering, computer integrated manufacturing, enterprise resource planning, material requirements planning, manufacturing resource planning, level of use of electronic data processing within the firm, and the level of change in operational technology within the firm.

respondents were also asked to indicate on a five-point Likert scale (anchored 1= not used at all to 5= used for almost all of the firm's internal and external transactions) the degree of using electronic data processing at their firms.

Fourthly, respondents were asked to indicate on a five-point Likert scale (never to always) the frequency of using six types of AMTs in their operations. Lastly, respondents were asked to indicate on a five-point Likert scale (anchored 1= no change at all to 5= at least 5 significant changes in the last five years) the degree of change which occurred for operation technology at their firms in the previous five years. Table 8-8 reports the findings.

Kendall's *tau*-b and Spearman's *rho* correlation coefficients between the AMTs and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

Advanced Manufacturing Technologies (AMTs)	Kendall's *tau*-b Number of employed AMA practices	P	N	Spearman's *rho* Number of employed AMA practices	P	N
How automated is the production process of your company?	.542*	.000	158	.654*	.000	158
Customer technology	.142*	.026	158	.176*	.014	158
Small batch technology	.077	.232	158	098	111	158
Large batch technology	.013	.840	158	.017	.415	158
Mass production technology	.077	.237	158	.093	.121	158
Continuous process technology	.034	.602	158	.038	.316	158
To what extent does your company use electronic data processing for performing its activities?	.129*	.049	158	.154*	.027	158
Computer aided design	.138*	.033	158	.173*	.015	158
Computer aided engineering	.084	195	158	.104	.096	158
Computer integrated manufacturing	.129*	.047	158	.161*	.022	158
Enterprise resource planning	.232**	.0001	158	.290**	.000	158
Material requirements planning	.120*	.063	158	.151*	.029	158
Manufacturing resource planning	.180**	.005	158	.223**	.002	158
How often have your operations undergone significant changes during the last five years?	.149**	.020	158	.189**	.009	158

Table 8-8

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

** Correlation is significant at the 0.05 level (1-tailed).

Table 8-8 shows that the correlations between AMT's items and the extent of adopting AMA practices by Saudi and non-Saudi manufacturing companies can be

divided in two groups. The first group represents items with those positive and significant correlations, while the second includes those with non-significant correlations. The AMT items showing significant relationships with the extent of adopting AMA practices are as follow:

1- How automated is the production process of your company? *tau*-b *(158)= .542, p<.0001*; *rho (158)=.654, p <.01*
2- Costumer technology, *tau*-b *(158)= .142, p<.05*; *rho (158)=.176, p <.05*
3- To what extent does your company use electronic data processing for performing its activities? *tau*-b *(158)= .129, p<.05*; *rho (158)=.154, p <.05*
4- Computer aided design, *tau*-b *(158)= .138, p<.05*; *rho (158)=.173, p <.05*
5- Computer integrated manufacturing, *tau*-b *(158)= .129, p<.05*; *rho (158)=.161, p <.05*
6- Enterprise resource planning, *tau*-b *(158)= .232, p<.0001*; *rho (158)=.290, p <.01*
7- Material requirements planning, *tau*-b *(158)= .120, p<.031, 1-tailed*; *rho (158)=.151, p <.05*
8- Manufacturing resource planning, *tau*-b *(158)= .180, p<.01*; *rho (158)=.223, p <.01*
9- How often has your operations technology (the machine-based processes involved in your operations) undergone significant changes during the last five years? *tau*-b *(158)= .149, p<.020*; *rho (158) =.189, p <.01*.

Based on the analysis above, the null hypotheses of those nine items can be rejected at the 5% level of significance, which means that the original research hypotheses relating to the same items will be accepted.

Table 8-8 also shows weak relationships between five AMT items (small batch technology, large batch technology, mass production technology, continuous process technology and computer aided engineering), and the extent to which AMA practices were adopted by Saudi and non-Saudi manufacturing companies. Therefore, the null hypotheses for those five items will be accepted, which means that the original research hypotheses relate to those five items will be rejected.

The correlation analysis presented above may lead us to conclude that there is partial support for the original research hypothesis no.5. In other words, the null hypothesis of the original research hypothesis no.5 can be partially rejected at the 5% level of significance, which means that the original research hypothesis no.5 will be partially accepted. Generally, the result of the previous analysis is partially in line with Mandal *et al*. (1999), Dangayach and Deshmukh (2005), and Isa (2007), and partially in contrast with Granlund and Malmi (2002).

Generally, the analysis above reveals that the decision-makers in some Saudi and non-Saudi firms maybe realised that the use of some AMTs required adopting systems which fit with these modern technological systems, so they adopted AMA systems in response to the use of some AMTs, and this may interpret the existence of the positive and significant relationships between some AMTs and the extent of usage of AMA practices in the Eastern part of SA.

At the same time, the absence of a significant correlation between some AMTs and the extent of usage of AMA systems may indicate the unsuitability of these technological systems for the majority of respondents, and this may justify the

absence of the correlation between some AMTs and the extent of usage of AMA systems in the same area of SA.

8.2.3.4 The Relationship between AMA Practices and Culture

Research Hypothesis No.6:

"The extent to which AMA practices are adopted by non-Saudi manufacturing companies is noticeably higher than Saudi companies, due to cultural differences".

Five ordinal items adopted from Gordon and Narayanan's (1984) study were used for studying the relationship between culture and the extent of adoption of AMA practices by Saudi and non-Saudi[6] manufacturing firms. Only two dimensions from Hofstede's perspective were used for clarifying this relationship, which were (a) power distance and (b) uncertainty avoidance.

According to Hofstede (1980), all Arab countries are characterised by high power distance and high uncertainty avoidance, which means that top managers within Arab firms tend not to delegate authority to their senior managers and use formal descriptions of job tasks, while the inverse condition applies to some Western firms (such as those in the UK, USA, Canada and others).

Therefore, respondents were asked first to indicate on a five-point Likert scale (anchored 1= no delegation to 5=complete delegation) the degree of delegating the

[6] All non-Saudi manufacturing firms which responded to the research belong to the environment which us characterised by low power distance and low uncertainty avoidance, such as those in the USA, Canada, Sweden and New Zealand (see Hofstede, 1980).

authority to the appropriate senior managers for four classes of decisions (pricing decisions, budgeting allocation, selecting of new investment and development of new products) at their companies.

Also, respondents were asked to indicate on five-point Likert scale (anchored 1= formal description of job tasks exists to 5= no formal description of job tasks exists) the degree which describes job tasks at their companies. Table 8-11 reports the findings.

However, before studying the relationship between culture and the extent of adoption of AMA practices by Saudi and non-Saudi firms, it would be logic to validate or invalidate the assertion made by Hofstede about the characteristics of the Arab culture, or more precisely, the Saudi culture. Therefore, the Mann-Whitney *U* test was employed to verify, or otherwise, the credibility of Hofstede's perspective. Tables 8-9 and 8-10 report the findings.

The Mann-Whitney *U* test for comparison of the delegation of authority and uncertainty avoidance between non-Saudi and Saudi firms

Cultural dimensions	Aspects for each cultural dimension	Nationality	No. of firms	Mean Rank	Sum of Ranks	Man-Whitney *U* test	Wilcoxon W	Z	P (2-tailed)
Power distance	Pricing decision	Non-Saudi firms	24	132.25	3174	342	9387	-6.971	.0001
		Saudi firms	134	70.05	9387				
		Total	158						
	Budgeting allocation	Non-Saudi firms	24	132.02	3168.5	347.5	9392.5	-7.059	.0001
		Saudi firms	134	70.09	9392.5				
		Total	158						
	Selection of new investment	Non-Saudi firms	24	134.31	3223.5	292.5	9337.5	-6.742	.0001
		Saudi firms	134	69.68	9337.5				
		Total	158						
	Development of new products	Non-Saudi firms	24	132.75	3186	330	9375	-6.545	.0001
		Saudi firms	134	69.96	9375				
		Total	158						
Uncertainty avoidance	Which of the following best characterises the specification of actual job tasks at your company?	Non-Saudi firms	24	24.13	579	279	579	-7.008	.0001
		Saudi firms	134	89.42	11982				
		Total	158						

Table 8-9

Table 8-9 shows that non-Saudi companies tend to delegate authority more than Saudi companies; this finding was supported by comparing non-Saudi and Saudi companies in their pricing decisions, $U = 342$, $Z = -6.971$, $p < .01$, budget allocation, $U = 347.5$, $Z = -7.059$, $p < .01$, selection of new investments, $U = 292.5$, $Z = -6.742$, $p < .01$, and development of new products, $U = 330$, $Z = -6.545$, $p < .01$.

In addition, Saudi companies showed dramatically greater levels of uncertainty avoidance *(M=89.42)* than non-Saudi companies, *(M=24.13);* the observed difference was significant, $U = 279$, $Z = -7.008$, $p < .01$. Therefore, table 8-9 verifies the validity of Hofstede's perspective regarding Arab culture, or more precisely, Saudi culture, and this result is unquestionably in line with At-Twaijri and Al-Muhaiza's (1996) findings (see chapter 5).

Since the analysis revealed a strong relationship between firm size and the extent of adoption of AMA systems by Saudi and non-Saudi firms, one may argue that the above comparison between Saudi and non-Saudi firms is overstated, due to the large variation in the sample size (134 Saudi vs. 24 non-Saudi firms). Table 8-10 only represents the comparison between large Saudi and large non-Saudi firms. This analysis was done in order to verify whether or not the result presented in table 8-10 applied to all Saudi companies, or if large firms tended to delegate authority and use informal job structures.

The Mann-Whitney *U* test for comparison of the delegation of authority and uncertainty avoidance between large non-Saudi and Saudi firms

Cultural dimensions	Aspects for each cultural dimension	Nationality	No. of firms	Mean Rank	Sum of Ranks	Man-Whitney *U* test	Wilcoxon W	Z	P (2-tailed)
Power distance	Pricing decision	Non-Saudi firms	24	41.63	999.00	117	712	-4.846	.0001
		Saudi firms	34	20.94	712.00				
		Total	58						
	Budgeting allocation	Non-Saudi firms	24	40.90	981.50	134.5	729.5	-4.473	.0001
		Saudi firms	34	21.46	729.50				
		Total	58						
	Selection of new investment	Non-Saudi firms	24	42.58	1022.00	94	689	-5.139	.0001
		Saudi firms	34	20.26	689.00				
		Total	58						
	Development of new products	Non-Saudi firms	24	41.65	999.50	116.5	711.5	-4.77	.0001
		Saudi firms	34	20.93	711.50				
		Total	58						
Uncertainty avoidance	Which of the following best characterises the specification of actual job tasks at your company?	Non-Saudi firms	24	16.08	386.00	86	386	-5.315	.0001
		Saudi firms	34	38.97	1325.00				
		Total	58						

Table 8-10

Table 8-10 shows that large non-Saudi companies tend to delegate authority more than large Saudi companies, in terms of pricing decisions, *U =117, Z= -4.846, p <.01,* budget allocation, *U =134.5, Z= -4.473, p <.01*, selection of new investments, *U =94, Z= -5.139, p <.01,* and development of new products, *U =116.5, Z= -4.77, p <.0*1.

Additionally, large Saudi firms show high levels of uncertainty avoidance *(M=38.97)* compared with large non-Saudi firms, *(M=16.08);* the difference between both nationalities was significant, *U =86, Z= -5.315, p <.01*. Based on the two previous tables (8-9 and 8-10), we can confirm the correctness of the two cultural dimensions (power distance and uncertainty avoidance) proposed by Hofstede about the Arab countries (Saudi country).

It was mentioned in chapter five that some researchers deemed that adopting innovation does not involve concentrating authority within the top level of the hierarchy and using informal job tasks. The two previous tables (8-9 and 8-10) show that non-Saudi firms tend to delegate authority more than Saudi firms, and use informal job tasks, so the next table focuses on whether or not the differences in culture affected the extent of adoption of AMA practices for each group.

Kendal *tau*-b *and* Spearman's *rho* correlation coefficinets between the cultural dimensions (power distace and uncertainity avoidance), and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

Cultural dimensions	Items	Correlation coefficients	Extent of adopting AMA practices			
			Non-Saudi large firms		All Saudi firms	
			rho	*tau*-b	*rho*	*tau*-b
Power distance	Pricing decisions	Correlation	.545*	.469**	.012	.010
		p	.003	.007	.893	.889
		N	24	24	134	134
	Budgeting allocation	Correlation	.539*	.454**	.119	.102
		p	.003	.008	.172	.175
		N	24	24	134	134
	Selection of new investments	Correlation	.438*	.354*	.141	.119
		p	.016	.039	.104	.109
		N	24	24	134	134
	Development of new products	Correlation	.497*	.427*	.046	.041
		p	.007	.015	.594	.579
		N	24	24	134	134
Uncertainty avoidance	Job tasks (adherence to the job rules)	Correlation	-.482*	-.417*	.086	.072
		p	.009	.017	.321	.327
		N	24	24	134	134

Table 8-11

Based on table 8-11, the relationship between culture and the extent of adopting AMA practices by Saudi and non-Saudi firms can be presented as follows:

(a) Power distance:

In terms of pricing decisions, the more delegation there was at large non-Saudi firms, the more AMA practices they tended to adopt, *rho (24) =.545, p<.01; tau*-b *(24) = .469, p<.01*. This was completely different from the Saudi companies, for which the delegation level did not correlate with the extent of adoption of AMA practices, *rho (134) = .01, p* = not significant (*N.S*)*; tau*-b *(134) = -.010, p = N.S.*

With regards to budget allocations, again, the more delegation there was at large non-Saudi companies, the more AMA practices they tended to adopt, *rho (24) =.539, p<.01; tau*-b *(24) = .454, p<.01*. The pattern was almost similar to the pricing decisions at foreign companies. On the other hand, the delegation level did not correlate with the extent of adoption of AMA practices in Saudi companies, *rho (134) =.119, p = N.S; tau*-b *(134) = .102, p = N.S.*

The result of the analysis related to the selection of a new investment case was similar to the two previous classes of decisions (pricing decision and budget allocation). In other words, the more delegation there was at large non-Saudi companies, the more AMA practices they tended to adopt, *rho (24) =.438, p<.05; tau*-b *(24) = .354, p <.05*. However, the pattern was different for Saudi companies, because the analysis revealed that there was no relationship between the delegation in terms of the selection of new investment and the adoption of AMA practices, *rho (134) =.141, p=N.S; tau*-b *(134) = .119, p=N.S.*

In terms of the development of new products, the more delegation there was at large non-Saudi companies, the more AMA practices they tended to adopt, *rho (24) =.497, p<.01*; *tau*-b *(24) = .427, p <.05*. At Saudi companies, however, there was no relationship between the delegation and the adoption of AMA practices, *rho (134) =.046, p=N.S; tau*-b *(134) = .041, p=N.S.*

(b) Uncertainty avoidance

In terms of the existence of formal vs. informal rules and job tasks, large non-Saudi companies tended to adopt informal structures, which was evident from the reverse

significant correlation between the degree of formality by the number of AMA practices were adopted, *rho (24) = -.482, p<.01; tau*-b *(24) = -.417, p =.017*.

In other words, the higher the use of formal job tasks, the lower the number of AMA practices which were adopted by non-Saudi companies. This pattern was different for Saudi companies, *rho (134) =.086, p=N.S; tau*-b *(134) = .072, p = N.S,* which means that no relationship was found between the formalisation level of job tasks or structure and the levels at which the AMA practices were adopted.

According to the patterns found, it can be inferred that the lesser the degree of the power distance amongst non-Saudi firms, the greater the level of adoption of AMA practices. In other words, the AMA practices which were adopted by non-Saudi firms were products of their cultural aspect, such as power distance measures. Additionally, in terms of uncertainty avoidance, the greater the job formalisation, the lower the degree of adoption of AMA practices at non-Saudi firms.

Since there was no relationship found between cultural dimensions (power distance and uncertainty avoidance) regarding the extent of adoption of AMA practices in Saudi companies, it can be tentatively said that hypothesis no.6 is confirmed, or at least partially confirmed. This is because the adoption of AMA practices in non-Saudi companies is significantly higher than for Saudi companies, which means that the null hypothesis of hypothesis no.6 can be rejected, and the original research hypothesis no.6 will be accepted. This finding is unquestionably partially in line with Van der Stede (2003), O'Connor (1994) and Harrison *et al.*'s (1994) findings.

The final result presented above may lead us to say that cultural aspects may lead to the adoption of innovation, but of course, not necessarily all the time. A plausible explanation for the absence of the effect of cultural aspects on the extent of adopting AMA practices in Saudi firms may be because managers within Saudi firms evaluated the adoption of AMA practices based on economical terms, which in turn downgraded the effect of social norms on their decisions.

8.2.3.5 The relationship between AMA Practices and Firm Strategy

Research Hypothesis No.7:

"Companies which are following a prospector strategy are more likely to adopt AMA practices those than following a defender strategy".

Ten strategic objectives[7] related to two types of strategy (prospector and defender) developed by Segev (1987) are used in the current research for examining the relationship between strategy, and the extent of adoption of AMA practices by Saudi and non-Saudi manufacturing firms. Respondents were asked to indicate on a five-point Likert scale the level of importance (1= not important to 5= very important) of each strategic objective to their companies. Table 8-12 reports the findings.

[7] Four objectives describe the nature of the prospector strategy (concentrating on the broad market domain, searching for market opportunities, engaging extensively in market research and leading on the development of new products), while six other objectives describe the defender strategy (emphasising the efficiency of the existing operation, offering customers a high quality product with a lower price, customising products and services to meet customers' needs, providing prompt deliveries to customers, providing an effective after-sales service and supporting product availability, and maintaining market strength in all areas in which the firms operate).

Kendall's *tau*-b *and* Spearman's *rho* correlation coefficinet between the type of strategy and the extent to which the AMA practices were adopted by Saudi and non-Saudi manufacturing companies

			Prospector strategy	Defender strategy
Kendall's *tau*-b	Number of employed AMA Practices	Correlation	.344**	-.230**
		Sig. (2-tailed)	.000	.000
		N	158	158
Spearman's *rho*	Number of employed AMA Practices	Correlation	.453**	-.334**
		Sig. (2-tailed)	.000	.000
		N	158	158

Table 8-12

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

The averages for the 4 items relevant to the prospector strategy, and 6 items relevant to the defender strategy, were calculated to form the new variables with the names of prospector and defender. The correlation coefficients were computed between each of the new composites, and a number of AMA practices were adopted by each company.

Table 8-12 shows that there was a positive and significant correlation between the prospector strategy and the number of adopted AMA practices, *tau*-b *(158)=.344, p<.0001, rho (158)=.453, p<.0001*. This means that the higher the score of the companies studied was for the prospector items, the more likely they were to adopt a greater number of AMA practices.

In the opposing direction, and in line with the prediction, there was a significant reverse correlation between the score of companies in the defender composite, and the extent to which AMA practices were adopted, *tau*-b *(158)= -.230, p<.0001, rho (158)= .-334, p<.0001*. This means that the higher the defender score of the companies, the lower the number of AMA practices they adopted.

Based on the analysis above, it can be inferred that the prospector strategy is associated with the adoption of more AMA practices, and this pattern is vice versa for the defender, which is associated with the adoption of a lower number of AMA practices. Therefore, the null hypothesis of hypothesis no.7 will be rejected at a 0.1% level of significance, and the original research hypothesis no.7 will be accepted. This finding fits in line with Gosselin's (1997, 2005) result, and is in contrast with Chen's (2008) finding.

8.2.4 Part One Summary

In brief, the second part of this chapter focused on examining the direct relationship between the explanatory variables (PEU, competition, size, product diversity, AMTs, culture and firm strategy), and the extent of adoption of AMA practices by Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA.

The result of the analysis reveals that hypotheses related to PEU, competition, size, culture and firm strategy have been confirmed, while hypotheses related to product diversity have not. In addition, the analysis shows that there is a partial confirmation of the hypothesis relating to AMTs. Generally speaking, the results presented in this part of the chapter confirm the assertion made by some Western management accounting scholars regarding the link between contingent aspects and the adoption of AMA practices (Innes and Mitchell, 1995; Chenhall, 2003; Ezzamel, 1990) on the one hand, and affirms the findings of Alnamri's (1993) study on the other.

Here, it is necessary to mention that the correlation analysis presented in the first part of this chapter focused on studying the relationship between each explanatory variable and the extent of adoption of AMA practices. However, Gordon and Narayanan (1984), and Bryman and Bell (2007) indicated that correlation analysis did not represent the inter-relationship among variables, and this view may motivate us to move forward from the narrow analysis (correlation) to a more advanced one (regression). The next part of this analysis will focus on the logistic regression analysis; however, a series of analyses will be performed before the logistic regression analysis is conducted (see Appendix D).

8.3 Part Two: Multivariate Analysis (Logistic Regression)

8.3.1 Introduction

The focus of this part is the study of the relationship between a number of internal and external contingent aspects, the relationship between both sets of internal and external contingent aspects, and the extent of adoption of AMA practices. Internal contingent aspects consisted of the following: 1) size, 2) product diversity, 3) AMTs, 4) culture and 5) firm strategy. External contingent aspects consisted of perceived environmental uncertainty (PEU) and competition. The dependent variable of interest consisted of the extent, or the number, of adopted AMA practices.

At the beginning, exploratory factor analysis was utilised in order to reduce the total number of items for the internal and external contingent aspects. The newly created factor scores resulting from the factor analyses conducted were then used in the inferential statistics conducted for this part of the study. Next, correlations were conducted in order to explore the relationships between PEU and size, product diversity, AMTs, culture, and strategy.

After that, a second set of correlations were conducted in order to explore the relationships between the competition and this same set of variables. Following this, tests for mediation were conducted in order to make sure the effect of the independent valriables (new predictors) on the dependent variable was direct, and not mediated by a third variable. Finally, a logistic regression analysis[8] was conducted in which AMA

[8] All tests performed before conducting the logistic regression test can be found in Appendix D.

practices were predicted from PEU, competition, size, product diversity, AMTs, culture, firm strategy and type of industry.

8.3.2 Logistic Regression

Finally, a logistic regression analysis was conducted, in which the total number of AMA practices was predicted from PEU, competition, size, product diversity, the three AMT factors, culture, the prospector strategy, the defender strategy and the type of industry. Logistic regression was utilised as the dependent variable, and the total number of AMA practices was not normally distributed and could not be transformed into a normally distributed variable, which is an important assumption of linear regression.

A number of transformations were attempted, including the inverse, inverse-square, log transformation, square transformation and square-root transformation. However, none of the transformations attempted served to transform this variable to be approximately normal. This variable was dichotomised, such that companies which employed zero to two AMA practices were in the first category, while companies which employed three or more AMA practices were in the second category.

A fairly large range of cases (three through nine AMA practices) were included in the second category, in order to ensure that there were enough cases included in the second category for the purposes of the logistic regression analysis. All of the factor scores were included in the regression analysis untransformed. The variables relating to product diversity, which consist of how many products companies currently produce, as well as the range of products marketed by companies, were included in the regression untransformed, being treated as continuous variables.

Finally, the variable measuring the type of industry was included in the analysis as a series of dummy variables. The category of "engineering products" was selected as the comparison category, as this category had the highest number of respondents, and was excluded from the analysis. As the type of industry consisted of a nominal variable (categorical and not ordered), and was included as a series of dummy predictor variables in the regression, it was required to leave out one of the categories as the comparison category, in order to avoid having perfect multicollinearity, which is a serious problem in regression analysis (Hardy, 1993; Hardy and Bryman, 2004). Dummy variables were created for all other categories and were included in the analysis.

The maximum likelihood method was utilised for this regression. This method is commonly used in order to calculate the logit coefficients resulting from logistic regression. Ordinary least squares estimation is used to estimate regression coefficients in linear regression, by minimising the sum of squares distances of the data points to the regression line, while maximum likelihood estimation seeks to maximise the log likelihood.

In logistic regression, the log likelihood reflects how likely it is that the observed values of the dependent variable may be predicted from the observed values of the independent variables. The following is the form of the general regression equation in logistic regression:

$$z = b_0 + b_1 x_1 + b_2 x_2 + \cdots + b_k x_k$$

Where:
z = the log odds of the dependent variable
b_0 = the constant
x = the independent variables

b = the logistic regression coefficients

In this specific analysis, the regression equation took the following form:

$$\textit{Log odds (AMA practices)} = b_0 + b_1(\textit{PEU}) + b_2(\textit{Competition}) + b_3(\textit{Size}) + b_4(\textit{DAT}) + b_5(\textit{OT}) + b_6(\textit{IAOT}) + b_7(\textit{Culture}) + b_8(\textit{Strategy: Prospector}) + b_9(\textit{Strategy: Defender}) + b_{10}(\textit{Number pf products}) + b_{11}(\textit{Range of products}) + b_{12}(\textit{Food and Beverage }) + b_{13}(\textit{Textiles and Leather}) + b_{14}(\textit{Wood and Furniture}) + b_{15}(\textit{Paper and Printing}) + b_{16}(\textit{Chemical Products}) + b_{17}(\textit{Building Materials})$$

The results of the logistic regression analysis are presented in table 8-54.

Logistic Regression

Factors	Odds Ratio	Standard Error	z-score	Probability Level	Confidence Interval (Min)	Confidence Interval (Max)
PEU	1.77	1.27	0.79	0.431	0.43	7.26
Competition	11.95	16.21	1.83	0.067	0.84	170.39
Size	5.82*	4.13	2.48	0.013	1.45	23.40
AMT: DAT	0.87	0.38	-0.33	0.745	0.37	2.05
AMT: OT	0.99	0.53	-0.01	0.990	0.35	2.80
AMT: IAOT	1.00	0.44	0.01	0.992	0.42	2.39
Culture	1.17	0.50	0.37	0.712	0.50	2.72
Prospector Strategy	8.05*	6.50	2.58	0.010	1.65	39.18
Defender Strategy	2.22	1.76	1.01	0.312	0.47	10.48
Product Diversity						
▪ Number of Products	5.49*	4.21	2.22	0.026	1.22	24.64
▪ Range of Products	1.19	0.42	0.49	0.625	0.60	2.37
Type of Industry						
▪ Food and Beverage	7.21	9.23	1.54	0.123	0.59	88.57
▪ Textiles and Leather	0.07	0.17	-1.13	0.258	0.00	7.01
▪ Wood and Furniture	5.79	9.72	1.04	0.296	0.21	155.79
▪ Paper and Printing	0.93	1.41	-0.05	0.962	0.05	18.28
▪ Chemical Products	0.84	1.09	-0.14	0.891	0.07	10.62
▪ Building Materials	0.38	0.87	-0.42	0.672	0.00	33.45

Table 8-13

*Variable is significant at the .05 level (2-tailed).
**Variable is significant at the .01 level (2-tailed).
***Variable is significant at the .001 level (2-tailed).

Table 8-13 reports the exponentiated values of the logistic coefficients, called the odds ratios. These values are calculated as the mathematical constant *e* raised to the power of the logistic coefficient. With regards to continuous variables, these values represent the factor by which the odds of having a 0 or 1 for the dependent variable change on the basis of a one-unit change in the predictor variable. With regards to dummy variables, these values represent the factor by which the odds of having a 0 or 1 for the dependent variable change on the basis of being a member of that category, as compared with being a member of the comparison category.

This table also reports the standard errors, *z*-scores, probability levels and confidence intervals. The standard error represents the amount of variability, or uncertainty, in the estimate of the variable's effect on the dependent variable. The *z*-score and its corresponding probability level indicate whether or not the variable in question has a significant effect upon the dependent variable, either positive or negative. Finally, the confidence interval represents the lower and upper bounds, within 95% confidence, of the estimated effect of the independent variable on the dependent variable.

Several variables were found to significantly predict the dependent variable and the total number of AMA practices. These variables were the size factor, number of products and the prospector strategy scores. Specifically, companies of larger size, companies which produce a greater number of products, and companies which more strongly utilised a prospector strategy, were found to be significantly more likely to employ three or more AMA practices versus only zero to two AMA practices.

In relation to the size variable, it was found that a one-unit increase in the factor score for size was associated with a 5.80 increase in the odds of having employed three or more AMA practices, as compared with zero through two AMA practices. With regards to the prospector strategy, these results found that a one-unit increase in the factor score for the prospector strategy was associated with 8.01 increase in the odds of employing three or more AMA practices, as compared with zero through two AMA practices. Finally, a one-unit increase in the number of products variable was associated with a 5.48 increase in the odds of having employed three or more AMA practices, as compared with zero through two AMA practices.

8.3.3 Summary of Hypotheses

This final section will discuss the research hypotheses presented earlier in this study, and will discuss whether these hypotheses succeeded or failed in being supported, based on the results of the bivariate analyses conducted between the original variables and dependent variable, the total number of AMA practices, and the results of the logistic regression analysis just presented. The research hypotheses included in this study consisted of the following:

PEU:
H1: There is a positive relationship between PEU, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

Competition:
H2: There is a positive relationship between market competition, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

Size:
H3a: There is a positive relationship between the number of employees, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

H3b: There is a positive relationship between the firm's total assets, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

H3c: There is a positive relationship between the firm's total sales revenue, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

Product diversity:
H4a: There is a positive relationship between the number of products being produced, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

H4b: Saudi and non-Saudi manufacturing companies which produce customised or wholly customised products are likely to adopt AMA practices.

Advanced manufacturing technology:
H5: There is a positive relationship between the extent of using AMTs, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

Culture:
H6: The extent to which AMA practices are adopted by non-Saudi manufacturing companies is noticeably higher than Saudi companies, due to cultural differences.

Strategy:
H7: Companies which are following a prospector strategy are more likely to adopt AMA practices than those which follow a defender strategy.

In this section, each hypothesis will be focused upon one at a time. The first hypothesis included in this study was the following:

H1: There is a positive relationship between PEU, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

In the bivariate analyses conducted between the variables measuring PEU and the total number of AMA practices, all correlations were found to be positive and statistically significant, which served to support this first hypothesis. However, the variable representing the factor score for PEU was not found to be significant in the logistic regression analysis. Therefore, these results only served to partially support this first hypothesis, and the null hypothesis stating no relationship between PEU and the number of AMA practices utilised could not be completely rejected.

The second hypothesis was the following:

H2: There is a positive relationship between market competition, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

In the bivariate analyses conducted between the original variables measuring competition and the number of AMA practices, all correlations were again found to be positive and statistically significant. However, the factor score representing competition was not found to significantly predict AMA practices in the logistic regression which was conducted. Therefore, these results only partially support this second hypothesis. The null hypothesis suggesting no relationship between competition and the extent of adoption of AMA practices cannot wholly be rejected.

Next, three hypotheses were included which focused upon the relationship between company size and the total number of AMA practices. These hypotheses consisted of the following:

H3a: There is a positive relationship between the number of employees, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations

H3b: There is a positive relationship between the firm's total assets, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations

H3c: There is a positive relationship between the firm's total sales revenue, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations

In the correlations which were conducted between the three original variables measuring size and the total number of AMA practices, all correlations were found to be positive and statistically significant. A logistic regression analysis also found the factor scores representing size to significantly predict AMA practices. Therefore, we can confidently say that the null hypothesis suggesting no relationship between company size and the total number of AMA practices can be rejected, and this hypothesis, suggesting a positive relationship between company size and the extent of adoption of AMA practices, can be fully supported.

Following this, two hypotheses were constructed focusing on the relationship between product diversity and the total number of AMA practices. These two hypotheses are presented below:

H4a: There is a positive relationship between the number of products being produced, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

H4b: Saudi and non-Saudi manufacturing companies which produce customised or wholly customised products are likely to adopt AMA practices.

In the correlations conducted, none of the correlations between the variables measuring product diversity and AMA practices were found to be statistically significant. However, in the logistic regression analysis, the variable measuring the total number of products was found to be positively and significantly related to AMA practices.

Therefore, hypothesis 4a was given some support, while the null hypothesis that there was no relationship between the number of products and AMA practices cannot be fully rejected. Additionally, no support was given for hypothesis 4b based on the analyses conducted here. Therefore, the null hypothesis that there was no relationship between the range of products and the number of AMA practices cannot be rejected.

Next, the following hypothesis was generated focusing on the relationship between AMTs and the number of AMA practices:

H5: There is a positive relationship between the extent of using AMTs, and the extent to which AMA practices are adopted by Saudi and non-Saudi manufacturing organisations.

The correlations conducted between the 14 variables measuring AMTs and the total number of AMA practices was generally found to be positive and statistically significant, while a number of the variables were not found to have a significant correlation with the number of AMA practices. In the logistic regression analysis which was conducted, three separate variables were included as predictors of AMA

practices, representing three separate factors associated with AMTs. None of these three variables were found to significantly predict AMA practices in the logistic regression. Therefore, only some support was given to this hypothesis, and the null hypothesis that there was no relationship between the extent of using AMTs and the number of AMA practices cannot be wholly rejected.

The next hypothesis focused on the relationship between culture and AMA practices:

H6: The extent to which AMA practices are adopted by non-Saudi manufacturing companies is noticeably higher than Saudi companies due to cultural differences.

The correlations conducted between culture and AMA practices served to test whether or not there was a significant relationship between culture and AMA practices specifically for Saudi and non-Saudi companies. Initially, it was found that the average usage of AMA practices was substantially higher for non-Saudi companies, as compared with Saudi companies. These correlational analyses found positive and significant correlations between four of the variables measuring culture (authority empowerment) and AMA practices specifically for non-Saudi companies.

Correlations between the fifth variable (uncertainty avoidance) measuring culture and AMA practices were found to be significant and negative for non-Saudi companies only. No correlation was found between culture and AMA practices when focusing specifically on Saudi companies. Additionally, culture was not found to be a significant predictor of AMA practices when included in the logistic regression analysis.

The fact that the correlations conducted found culture to generally have a positive correlation with the total number of AMA practices for non-Saudi companies only suggests that part of the reason why AMA practices are used to a substantially greater degree in non-Saudi companies can be explained through culture, which also tended to be higher among non-Saudi companies, as compared with Saudi companies.

Non-Saudi companies only have lower values for culture with regards to the fifth variable measuring culture (uncertainty avoidance). In this case, the negative correlation between values for this variable and the total number of AMA practices for non-Saudi companies also lends support to this hypothesis, suggesting that culture, in this specific case as well, leads to higher levels of AMA practices among non-Saudi companies. Overall, these analyses lend some support to this hypothesis, while the null hypothesis cannot be completely rejected, due to the non-significant findings resulting from the logistic regression analysis.

The final hypothesis included in this study focused on strategy, and consisted of the following:

H7: Companies that are following a prospector strategy are more likely to adopt AMA practices than those that follow a defender strategy.

All correlations which were conducted between the variables measuring the prospector strategy and AMA practices were found to be significant and positive. The variable representing factor scores for the prospector strategy was also found to be statistically significant in the logistic regression analysis. These analyses strongly

suggest a positive relationship between the prospector strategy and the total number of AMA practices utilised.

Next, correlations conducted between the variables representing the defender strategy and AMA practices were generally found to be negative and statistically significant. The variable representing factor scores for the defender strategy was not found to be statistically significant in the logistic regression analysis. These analyses, taken as a whole, lend some support to this hypothesis, while the null hypothesis, suggesting that companies following a prospector strategy are not more likely to adopt AMA practices than those following a defender strategy, cannot be wholly rejected.

8.3.4 Part Two Summary

The main focus of this study was the logistic regression analysis which was conducted on the number of AMA practices utilised. However, this study first needed to go through several phases of analysis before the logistic regression could be conducted. These steps consisted of testing the assumptions of factor analysis, conducting the necessary factor analyses, running a series of correlations, and then finally conducting the logistic regression analysis. This section summarises these steps taken.

Initially, before the factor analysis could be conducted, a series of tests needed to be conducted in order to test whether any of the assumptions of factor analysis were violated. First, Bartlett's test of sphericity was conducted in order to test whether the correlation matrix for the variables composing each of the factors was an identity matrix, which would indicate that the factor model was inappropriate.

Additionally, the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy was determined, in order to predict whether the data was likely to factor well. Next, the Mahalanobis Distance was used, in order to determine whether or not any cases were found to be outliers. Several cases were in fact found to be outliers, and these cases were then removed from any future analyses. Finally, line graphs were utilised in order to determine whether the relationships between the variables included in the factor analyses were approximately linear, which is another important assumption of factor analysis.

Next, the factor analyses were conducted, in order to come up with new variables for each of the factors included in the study. Exploratory factor analysis was utilised, meaning that the number of factors for each of the items was not predetermined, but instead determined on the basis of the results of the analysis. In order to make this determination, three different methods were utilised.

First, the scree plot was examined. The point of inflection on the scree plot was used as the cutoff point for the number of factors to retain (Cattell, 1966). Next, eigenvalues were used in order to determine the number of factors to keep. According to the Kaiser-Gutmann criterion (Kaiser, 1960), factors with eigenvalues greater than 1 are suggested for keeping, with all other factors being removed. Factors with eigenvalues less than 1 are not considered to be significant, as they do not explain a substantial degree of variation. Finally, the proportion of variance explained by each factor was also incorporated in the decision making process, as generally, a total explained variance of approximately 60% is considered to be satisfactory.

Following the factor analyses, correlations were conducted in order to determine the strength and significance of the relationship between the new predictors. Non-parametric correlation coefficients were chosen, as the data was significantly non-normal. Specifically, correlations were conducted between the new internal predictors (except product diversity) and the new external predictors.

Initially, a set of correlations were conducted between PEU, an external predictor and all internal predictors. Next, a second set of correlations were conducted between competition, the second external predictor and all internal predictors.

Before the regression analysis was conducted, tests for mediation were conducted in order to ensure that the effect of the independent variables on the dependent variable was direct, and not in fact mediated by a third variable. The new variable measuring company size was specifically focused on as a possible mediating variable in these analyses. The variables focused upon as predictor variables of AMA consisted of PEU, competition, the AMT factors, culture, the prospector and defender strategies, product diversity and type of industry. In order to test for mediation, the steps identified by Baron and Kenny (1986), and Judd and Kenny (1981) were utilised. As size was found to be a mediator or partial mediator in several of the mediational analyses conducted, it was included as a control variable in the logistic regression analysis.

Finally, a logistic regression analysis was conducted for the total number of AMA practices. Logistic regression was chosen as opposed to linear regression, as the variable measuring the number of AMA practices was not normally distributed, and

could not be transformed into a normally distributed variable. In this analysis, the total number of AMA practices was predicted from PEU, competition, size, product diversity, the three AMT factors, culture, the prospector strategy, the defender strategy, and the type of industry. Several variables were found to significantly predict the total number of AMA practices. These variables consisted of the size factor, the number of products and the prospector strategy scores.

Specifically, companies of larger size, companies which produced a greater number of products, and companies which more strongly utilised a prospector strategy were found to be significantly more likely to employ three or more AMA practices, versus only zero to two AMA practices. When comparing the results of the correlations conducted earlier with the results of the logistic regression, similarities as well as differences were found.

The results relating to the variables of size and prospector strategy were found to be the same between the correlations and the logistic regression analysis, while the results for the remainder of the variables were found to differ between these two sets of analyses. The next section represents a general summary for all two parts presented in the current chapter.

8.4 General Summary

In the first part of this chapter, correlation tests were conducted for the explanatory variables (PEU, competition, size, product diversity, AMTs, culture and firm strategy) and the extent of adoption of AMA practices. The hypotheses relating to PEU,

competition, size, culture and firm strategy were confirmed, while those related to product diversity were not. The hypothesis relating to AMTs was partially supported. In general, these results confirmed the assertion made by some management accounting scholars regarding the link between contingent aspects and the adoption of AMA practices.

In the last part of this chapter, a logistic regression analysis was conducted, with the total number of AMA practices utilised as the dependent variable. This method of regression was chosen rather than linear regression as the variable measuring the number of AMA practices was not normally distributed and could not be transformed into a normally distributed variable. In this analysis, the variables of PEU, competition, size, product diversity, the three AMT factors, culture, the prospector strategy, the defender strategy and the type of industry were included as predictors of AMA practices.

The results of this analysis found that companies of larger size, companies which produced a greater number of products and companies which more strongly utilised a prospective strategy were more likely to employ a greater number of AMA practices. Similarities, as well as differences, were found when relating the results of this logistic regression analysis with the correlation analyses conducted earlier.

Chapter Nine: Analysis of the Semi-structured Interviews

9.1 Introduction

The current chapter presents the analysis of the qualitative data gathered using the semi-structured interviews instrument. It was indicated in the sixth chapter that the interview booklet contains three parts, and the first one was presented in the same chapter. Hence, the current chapter only focuses on analysing the remaining two parts from that booklet.

Generally speaking, the main goals of conducting the semi-structured interviews were to (a) gather more information about the current management accounting practices (TMA and AMA) within Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA, (b) cover uncovered issues within the questionnaire instrument, and (c) investigate in-depth the drivers which prompted the firms interviewed as to whether or not to adopt AMA practices in particular.

9.2 Part Two: Discussion of the Argument Concerning Traditional and Modern Management Accounting Practices

This part provides additional details about the management accounting practice at the organisations interviewed. Several issues were discussed with the interviewees, such as costing systems within their firms, decision-making practices, standard costing, budgeting and others. Brief discussions relating to each issue are presented below.

9.2.1 Accounting Systems and Costing Practices

All of the managers interviewed were asked about the number of accounting system(s) which they used at their firms. Four out of five non-Saudi firms interviewed indicated that they were currently using one accounting system for a variety of purposes. At large Saudi firms, four out of seven firms interviewed indicated that they were currently utilising only one accounting system which served several purposes. Seven out of eight medium-sized Saudi firms interviewed indicated that they are currently using one accounting system.

The aforementioned firms interviewed were also asked to state the reasons which stimulated their firms to not adopt more than one accounting system. All of them ascribed their use of one accounting system as the simplicity of the production process in their organisations. The researcher also asked the firms interviewed which indicated that they were currently using only one accounting system if they had a plan or not to adopt multiple accounting systems during the next five years. All of the managers interviewed from these firms indicated that they did not have a plan to adopt more than one accounting system, because they believed that their current accounting systems provided sufficient information required for making accurate decisions.

Contrary to the aforementioned firms interviewed, the interviewee at one of the non-Saudi firms stated that:

"We expanded our business during the previous nine years. However, this expanding has positive side in terms of increasing our sales and negative side in terms of the difficulty of controlling the internal

activities in our firm. Therefore, we decided to adopt multiple accounting systems next year mainly for controlling purposes."

(Company No.1)

The managers interviewed from three large Saudi firms clearly indicated that they were currently using multiple accounting systems. With regards to the reasons which motivated their firms to adopt more than one accounting system, one manager stated that:

"The adoption to multiple accounting systems was due to the type of strategy that we are following (prospector strategy). He further indicated, the level of our export to GCC market and the Middle East market sharply increased during the previous years, so using one accounting system will not assist us to control our internal activity well which in turn may lead us to take inaccurate decisions."

(Company No.7)

The other two managers interviewed from two large Saudi firms emphasised an almost similar view, which was that:

"The adoption to multiple accounting systems (one for internal activities and another for external ones) in our firms was due to the belief of our top management."

(Companies No.10 and 12)

Additionally, one interviewee from a medium-sized Saudi firm indicated that his company was not currently using one accounting system, and he stated that:

"We diagnosed our accounting system during the previous five years and we found the adopted accounting system does not provide sufficient amount of control to our internal activities, so we adopted one accounting system for internal purposes and another for external ones. He further indicated, after this adoption the quality of our decisions has improved due to the information provided by each system."

(Company No.16)

Another interviewee from a medium-sized Saudi firm stated that:

"The level of competition among food and beverages companies that operate in the Eastern part of SA has increased since the beginning of the new century and continuing using one accounting system will not lead us to manage and control our internal activities well. Therefore, we have a plan to adopt multiple accounting systems shortly mainly for controlling purposes."

(Company No.13)

It is clear from the answers above that the vast majority of the firms interviewed believed that there was no need to isolate the internal accounting system from the external one. Therefore, it is fair to say that the MAS at these firms is used to serve financial purposes. On the other hand, few companies have adopted multiple accounting systems for mainly controlling their internal business activities.

With regards to the drivers which stimulated these few firms to adopt multiple accounting systems, the firms interviewed stated several drivers, such as competition, type of strategy adopted and top management belief. In addition, expanding the business can be seen as a driver for adopting more than one accounting system, as stated by one firm interviewed, and this undoubtedly may give an indication regarding the effect of some contingent aspects (for example, size) on the decision of the firm adopting or not adopting new trends in management accounting.

The interviewees were also asked about the function(s) of the product costing systems at their companies. All of the interviewees indicated that the two main functions of their product costing systems were pricing and product control. None of them indicated that they used product cost information to only serve one function at their companies.

The firms interviewed were also asked whether or not they used traditional allocation methods such as single blanket recovery base, direct labour hours/costs, direct material, and so on at their companies.

None of the non-Saudi firms interviewed indicated that they used single blanket recovery base at their firms, while five large Saudi firms (Companies No. 6, 7, 8, 10 and11) and five medium-sized Saudi firms (Companies No. 16, 17, 18, 19 and 20) indicated that they did. At the same time, four managers interviewed from four non-Saudi firms indicated that they were currently using labour hours/costs as a base for allocating overhead costs to the total product costs at their firms. One manager interviewed from a large firm indicated that his firm used units of output (Company. No. 12), and three managers interviewed from three medium-sized firms (Companies No. 13, 14 and 15) indicated that they used direct material costs as a base for allocating overhead costs to total product costs at their firms.

When the aforementioned firms interviewed were asked to evaluate the efficiency of their allocation methods, all of those firms indicated that allocating overhead costs based on traditional allocation methods did not lead to producing inaccurate product

information, because the proportion of overhead costs to total product costs was no more than 20% at their firms. One manager interviewed stated that:

"Since we manufacture limited number of products (6 products), we use single blanket rate as base for allocating overhead cost to product costs and this usage never led us to take incorrect decision."

(Company No.11)

Another manager interviewed stated this view:

"Allocating overhead cost based on traditional methods such as blanket rate or labour costs/hours or any other traditional allocation base may consider dangerous if overhead cost excesses than 30% of the total product costs. He further stated, we use single recovery base in our firm because the proportion of the overhead cost is no more than 16% of the total product costs"

(Company No.19)

Despite the fact that the aforementioned companies interviewed clearly indicated that they were currently using traditional methods for allocating overhead costs at their firms, the researcher also asked those firms whether or not they had a plan to adopt more advanced allocation methods such as ABC during the next five years. None of the firms interviewed indicated that they were going to adopt the ABC system in the next five years, due to their satisfaction with the cost information produced by their current costing systems, and the limited proportion of overhead costs to total product costs at their companies. Two companies interviewed stated almost the same view regarding the ABC system, which was that the:

"ABC system has been marketed upon consultancy sound and this is enough to not trust the alleged benefits that might be yielded from utilising the ABC system."

(Companies No.5, 11)

In addition, two firms interviewed commented on the ABC system by stating an almost similar view, which was that the:

"ABC system may give more accurate product cost information, but the difficulty with this system lies to the selection to the best cost driver. They stated, how can we know the selected cost driver is the best one. Also, they further indicated it is worth nothing to invest in system like ABC one if the proportion of the overhead cost is not high because adopting this system requires large amount of money."

(Companies No.3, 19)

Contrary to the view above, two companies indicated that they did not use traditional allocation methods, but that they used the ABC system.

Both managers commented on the use of the ABC system at their firms by stating almost the same view:

"Our companies used to use traditional allocation method years ago. However, the number of our products almost doubled since the beginning of the new century and this led us to face serious problem because we could not distinguish between the high profitable products from those low profitable ones. Therefore, we adopted the ABC system not only for analysing our products profitability but it also enabled us to manage our manufacturing and non-manufacturing activities."

(Companies No.2 and 9)

The firms interviewed were also asked whether or not they adopted the life cycle costing system, backflush costing, throughput accounting and the cost of quality reporting, and what the reason(s) were behind the adoption or non-adoption of some or all of these systems. Only one firm interviewed (Company No. 13) indicated that it adopted the life cycle costing system due to decisions taken by the owner of the company, while the remaining firms interviewed indicated that they did not adopt this system due to it being unnecessary.

Sixteen firms interviewed indicated that they had never heard about the backflush costing system or throughput accounting, while four firms interviewed (Companies No. 4, 6, 15 and 18) indicated that this system was not relevant to their organisations. Only two firms interviewed (Companies No. 1 and 8) indicated that they adopted the cost of quality reporting system, due to their adoption of the TQM technique, while the other firms interviewed indicated that they did not adopt it, due to their satisfaction with their existing MASs.

It is clear from the discussion above that the limited proportion of overhead costs to total product costs was the main motive which stimulated most of the firms interviewed not to adopt the ABC system. However, the interesting finding was that some firms interviewed regarded the ABC system as no more than an advertisement driven upon sound consultancy, and this view completely fits with Noreen's (1987) view regarding the theory proposed by Johnson and Kaplan (see chapter two).

At the same time, two firms interviewed clearly indicated that increasing the number of manufactured products was the motive behind the adoption of the ABC system at their firms. Furthermore, the extent of adopting other costing systems, such as cost of quality reporting, backflush costing, throughput accounting and life cycle costing system, is very limited by the firms interviewed, mainly due to the wide satisfaction with the existing MASs within the organisations interviewed. The next topic focuses on pricing decision tools at the companies interviewed.

9.2.2 Decision-making Practices

The firms interviewed were asked to indicate the criteria which they used for setting their product prices. All of the managers interviewed from the non-Saudi firms, and seven of the managers interviewed from the Saudi firms (Companies No.7, 8, 10, 12, 17, 18 and 20) indicated that they used the cost-plus method in specific circumstances at their firms, or used total product costs plus the targeted profit and dominant market price as criteria for setting their products costs.

To clarify that, the managers interviewed from the aforementioned companies indicated that they used the cost plus method with the newly manufactured products in order to maximise their profit, while they used the total product costs plus targeted profit and market price as a base for setting the price for their competitive products, and this result is in line with Omer's (1997) findings. Only two managers interviewed from two large Saudi companies indicated that they only used the cost-plus method for setting their product's price. However, a manager interviewed at one medium-sized Saudi firm stated that:

"We price our products based on four criteria which are (a) total product costs (b) targeted profit (c) market price, and (d) human aspects. He further commented on the last criteria by stating that people who live in the East, West and in the Middle of SA are roughly rich and the inverse condition applies for people who live in the North and South of SA. Since we have five distribution channels covers all areas of SA, we commonly take in our consideration the financial ability for people who live in the North and South of SA by reducing our target profit by 20% in order to make our customers in these two areas fully satisfied and make them loyal to our products."

(Company No.15)

Additionally, the managers interviewed were asked whether or not their firms adopted target costing (TC). Only five Saudi companies (Companies No.6, 9, 13, 16 and 19) had adopted the TC system, while the other firms interviewed indicated that they had not. The researcher asked the managers interviewed from the firms which adopted the TC system about the reasons which stimulated their firms to adopt this system.

Three firms interviewed (Companies No.6, 16 and 19) indicated that price competition, in particular, was the reason which motivated them to adopt the TC system, while the other two firms interviewed (Companies No.9 and 13) emphasised almost the same idea, which was that reducing the total costs for the newly manufactured products was considered a strategic objective at their firms, so they adopted the TC system. This result partially contradicts Cooper and Slagmulder's (1997) findings.

The researcher also asked the firms interviewed which did not adopt the TC system whether or not they had a plan to adopt the TC system in the next five years. Almost all of the managers interviewed from these firms clearly indicated that they did not have a plan to adopt the TC system during the next five years, due to its unsuitability to their companies. Three managers interviewed emphasised almost the same idea, which was that the:

"TC system is suitable only for assembly companies but not to all manufacturing firms".

(Companies No.10, 17, 20)

The firms interviewed were also asked about the method(s) which they often used for evaluating the investment decisions at their companies. Almost all of the managers interviewed indicated that the payback and internal rate of return are the two common

methods which they used for evaluating their investment projects, mainly because these two methods are simple and do not need much experience in finance. Only one manager interviewed at a large Saudi firm (Company No. 7) indicated that his company used net present value, because it gave a much better analysis for the risk associated with the investment decisions when compared with the payback method.

The companies interviewed were also asked if they had a plan to use sophisticated decision-making tools such as game theory or regression analysis for evaluating their investment decisions. None of the managers interviewed indicated that they had a plan to adopt any modern capital budgeting methods, mainly due to their satisfaction with the existing capital budgeting methods, and the absence of their knowledge about these modern methods. However, one manager interviewed at a medium-sized Saudi firm stated that:

"Despite the level of uncertainty has sharply increased during the previous years, we may switch from using the payback method to the net present value to accommodate with the level of uncertainty. At the same time, using modern capital budgeting tools required high qualified staff in finance and we do not have the enough financial resource for hiring those people."

(Company No.17)

The discussion above gives a clear picture about the methods being used for pricing and investment appraisal decisions at the firms interviewed. For pricing decisions, it is clear that the firms interviewed only used the cost-plus technique for pricing their newly manufactured products, while they often used total product costs, targeted profit and dominant price as criteria for setting their product's price. At the same time, the extent of adopting the TC system was still limited, as the analysis of the

interviews shows, and this may reflect the satisfaction with the current pricing method being used by the firms interviewed.

With regards to the methods used for evaluating the investment decision, it is clear that most of the firms interviewed are in favour of using traditional investment decision tools, such as payback and internal rate of return. In addition, the analysis above shows no use of any highly advanced capital budgeting tools in the Eastern part of SA, and this may indicate the unsuitability of these methods for the firms interviewed, or unfamiliarity of the firms interviewed with these advanced techniques. The next topic focuses on using the standard costing system with the companies interviewed.

9.2.3 Standard Costing (SC) System

The companies interviewed were asked if they currently used the SC system. Two-thirds of the firms interviewed indicated that they used the SC system for several objectives. During the discussion, all of the managers interviewed from the companies which were currently using the SC system informed the researcher that this system, in particular, was considered very important to them, mainly for setting their budgets and controlling their costs. Also, the managers interviewed from these firms were asked whether or not they revised their standards each year. Most of them indicated that they revised their standards annually (Companies No.1, 4, 6, 7, 8, 10, 12, 14, 16 and 19), while some firms revised their standards bi-annually (Companies No.3, 5, 9, 11 and 17).

It has been indicated in the literature of management accounting that the SC system collides with some modern managerial philosophies, such as JIT and TQM. Therefore, the firms interviewed which were currently using the SC system were asked whether or not they used any of these modern managerial philosophies, and if yes, how they refuted the views mentioned in the literature of management accounting.

Seven firms (Companies No.1, 3, 6, 7, 8, 9 and 10) indicated that they were currently using the TQM technique alongside the SC system. None of the managers interviewed from these companies indicated that the SC system affected their use of TQM. One manager interviewed stated that:

"Running business based on quality mode does not necessarily require relinquishing some important systems such as SC system."

(Company No.3)

Another manager interviewed commented on the use of both the SC system and the TQM technique at his company, stating that:

"We used to use SC system years ago and we adopted TQM in the mid of year 2000. Until this time we did not notice any misfit between both systems, but the opposite is the right thing."

(Company No.10)

Contrary to the above, five companies interviewed indicated that they did not use the SC system. Two firms interviewed (Companies No. 2 and No. 13) indicated that they did not use the SC system because they used another costing system (ABC or life cycle costing system). Another two firms interviewed (Companies No. 15 and No.

18) indicated that they did not use the SC system due to the absence of explicit rules for calculating the standards. One manager interviewed at a medium-sized Saudi firm (Company No. 20) indicated that the unsuitability of the SC system to his firm was the reason behind not using it.

Interestingly, two firms interviewed (Companies No. 13 and No. 20) from those which did not use the SC system indicated that they were currently using the TQM technique, but none of them ascribed their non-use of the SC system to their adoption of the TQM philosophy.

It is clear from the above theoretical analysis that the SC system is still widely used in practice, even at firms which have adopted some modern managerial philosophies, and this result contrasts with that of Scapens *et al*. (2003) on the one hand, and refutes the views of some researchers regarding the misfit between the SC system and the adoption of some modern managerial philosophies on the other (Johnson and Kaplan, 1987). Hence, one may ask what justification the supporters of modern managerial philosophies base their opinions on regarding the inconsistencies between the SC system and the modern managerial techniques. The next topic focuses on exploring the views of the companies interviewed regarding traditional budgeting.

9.2.4 Budgeting

All of the managers interviewed were asked to indicate whether or not they used budgeting systems at their organisations. Most of the managers interviewed indicated that they used traditional budgeting at their organisations to satisfy several objectives (such as planning their operations, coordinating their activities, communication

between different managerial levels, and so on), but that cost control and evaluating performance were the two main objectives, as emphasised by the users of these systems at the firms interviewed.

The companies interviewed were also asked whether or not depending on budgeting for evaluating a manager's performance was fair. Again, all of the managers interviewed whose firms used budgeting indicated that evaluating a manager's performance based on budget was fair in most cases. One manager interviewed made a very strong statement regarding budgeting, which was that:

"We are profitable company; without budget, it is impossible to evaluate not only the manager's performance but also the performance for the whole company."

(Company No.5)

Another manager interviewed from a large Saudi firm stated that:

"Evaluating manager's performance based on budget is fair but not in irregular circumstances. He further commented on this issue by pointing out that we did not use budgeting for evaluating the performance of our managers during the first part of year 2003 due to increasing the level of uncertainty in the Eastern part of SA that resulted from the Anglo-Saxon correlation against Iraq. However, when the war finished by the mid of the same year we returned back to evaluate the performance of our managers based on meeting budget."

(Company No.8)

Another manager interviewed from a medium-sized Saudi firm stated that:

"I know evaluating manager's performance based on meeting budget will cause both the production and sales mangers angry if there is variation between what has been planned and what has been achieved, but we do not have another choice for evaluating their performance except depending on budget."

(Company No.20)

The managers interviewed at the companies which were currently using traditional budget were asked if their companies had plans to abandon traditional budgeting during the next five years or not. When the researcher posed this question to the managers interviewed from these firms, several of them regarded this question as foolish and some of them laughed, while another group was surprised or shocked. As a result, none of the managers interviewed from these firms indicated that their company would stop using budgeting during the next five years.

The researcher did not stop there, and asked the managers interviewed from these firms an unwritten question from the booklet of the interview, regarding how their company controlled the variance from the budget. In other words, did their company wait until the end of the financial year before comparing what had been planned and what had been achieved? None of the managers interviewed from these firms indicated that their company waited until the end of the financial year, but they informed the researcher that they always monitored the variation from the budget based on monthly bases. To clarify that, all of the managers interviewed indicated to the researcher production manage as an example in their firms must submit monthly reports to monitor the variance from that budget, and that if there was an unacceptable variation, the correct remedies would immediately be taken to resolve the problem.

This answer was stated by all of the firms interviewed which were currently using traditional budgeting.

The discussions with the managers interviewed at the firms which were currently using traditional budgeting motivated the researcher to inform the interviewees at these firms about the criticism attached to traditional budgeting. The researcher clearly indicated to those people that the main criticism revolved around traditional budgeting, which did not serve the firm's objectives in the long-term. The aim of informing the managers interviewed at these firms about the criticism was to explore their reaction on the one hand, and to see how they made their decisions on the other. Unexpectedly, most of the managers interviewed clearly indicated that they depended on short-term decisions, and that using budgets would not impact their survival in the long-term. Surprisingly, this answer was stated not only by managers of medium-sized firms, but also by several large firms. One manager commented on the criticism attached to the traditional budget by stating that:

"If traditional budgeting contains shortcomings as you said, why all governments across the world prepare annual budget?"

(Company No.11)

Contrary to the result above, only four firms interviewed (Companies No. 2, 9, 13 and 15) indicated that they did not use traditional budgeting. The managers interviewed from companies 2 and 9 clearly indicated that their firms did not use the traditional budgeting system because they adopted the ABC system, and this adoption motivated them to adopt ABB. However, the managers interviewed from companies 13 and 15

indicated that neither traditional nor modern budgeting (ABB) was used at their firms, due to decisions taken by the owners of the firms.

The last two firms were asked about the criteria which they used for planning, controlling their costs and evaluating their performance. The interviewee at company No. 13 clearly indicated that they used the life cycle system, and this system enabled them to manage and control costs well. Surprisingly, the interviewee from this company indicated that evaluating performance was not an important issue at his firm! The interviewee at company No. 15 indicated that they used personal judgment for planning and performance evaluation. With regards to controlling costs, the interviewee indicated that they did not have a particular method for planning and controlling costs, and that they always changed their methods each year, so he indicated that he would not be able to give a specific answer to this question.

The managers interviewed from the companies which did not adopt the ABB system were asked about the reasons which motivated their firms not to adopt this practice. A lack of knowledge and satisfaction with traditional budgeting were the two main reasons stated by non-users of the ABB system. Also, managers from these firms were asked whether or not their firms had a plan to adopt the ABB practice in the next five years. None of them indicated that their company would adopt this system in the next five years.

The previous discussion reveals that several managers were not convinced with the criticism attached to traditional budgeting, and that they were continuing to use it mainly for controlling costs and performance evaluation, and this result completely

agrees with Scapens *et al.'s* (2003) findings. By contrast, the level of adoption of ABB is very rare in the Eastern part of SA, and this could be due to the limited use of the ABC system in the same area of SA. The next topic sheds light on the non-financial measures.

9.2.5 Non-financial Measures

The companies interviewed were asked to state their opinions about the use of both financial and non-financial measures at the same time. In other words, the interviewees were asked whether or not their firms were currently using both financial and non-financial measures. Seven companies interviewed (1, 4, 5, 6, 7, 10 and 12) indicated that they were currently using financial (return on sale) and some types of non-financial measures, such as customer and employee satisfaction. The managers interviewed from these firms ascribed their use of both measures to several reasons, such as market competition, task uncertainty and the sizes of their firms. Two managers from the previous companies (Companies No. 4 and 7) added that the type of strategy which we adopted (prospector) was another driver which stimulated us to adopt non-financial measures. One manager interviewed commented on the importance of adopting non-financial measures, by stating that:

"During the next few years depending solely on financial measures will not maintain firm competitiveness even in the short-term."

(Company No.1)

Strangely, all of the companies which adopted both financial and non-financial measures were large firms, and this may give an indication regarding the effect of firm size on the adoption of some AMA systems.

Contrary to the previous adopters of both measures, thirteen managers interviewed indicated that they did not use any types of non-financial measures, because as they indicated, their firms did not need these measures, and this may reflect the satisfaction of these firms with their financial measures.

The researcher also asked the managers interviewed from these firms about the predominant financial measure which they used. All of them indicated that return on sale was the common financial measure which they used at their companies. Additionally, none of the managers interviewed indicated that their company adopted the balanced scorecard, even at firms which were currently adopting some of non-financial measures, mainly due to a lack of knowledge about the balanced scorecard, or satisfaction with the existing financial measures. Furthermore, none of the managers interviewed indicated that they had a plan to adopt the balanced scorecard in the next five years.

Again, the adoption of non-financial measures was not widely prevalent in the Eastern part of SA, and this may give an indication regarding the solidity of some TMA practices (financial measures), even in a competitive environment. Also, none of the managers interviewed indicated that their company adopted the balanced scorecard, and this really raises serious questions as to what is wrong with AMA practices in general, and the balanced scorecard in particular.

9.2.6 Modern Manufacturing and Managerial Systems

The interviewed managers were asked whether or not their companies adopted the JIT manufacturing system, and what the reason(s) behind their adoption were if they adopted this system, and what the reason(s) behind not adopting this system were if they did not adopt it. None of the managers interviewed indicated that their company adopted the JIT system, mainly due to its unsuitability to their firms. Three managers interviewed commented on the JIT technique, by stating similar views, which were that:

"The problem with the JIT technique lies in its philosophy because it requires the company to not keep an inventory and this does not fit with the objectives of manufacturing firms, but it may suitable for assembly firms."

(Companies No.4, 10, 19)

Additionally, all of the interviewees were asked whether or not their firms adopted the TQM technique. Seven managers interviewed indicated that they adopted the TQM system at their companies, while another three mangers indicated that they were on their way to adopting this system (Companies 12, 13 and 20). Most of the managers interviewed indicated that the rapid changes in the business environment, as well increasing the levels of market competition and task uncertainty, put pressure on their firms to develop their production and managerial systems, so they adopted the TQM system.

Contrary to the above, the managers interviewed from companies which did not adopt TQM indicated that they had ISO certificates, and believed that having this certificate

would enable them to compete without needing to adopt the TQM system. One manager interviewed stated that:

"TQM is very complicated system because it involves creating first corporate culture within the company and convincing employees' within the entity to run toward one goal and this is not an easy task to be achieved, so we did not adopt it."

(Company No.5)

Another manager interviewed at a medium-sized Saudi firm stated that:

"We usually achieve our target successfully, so why should we invest in this system?"

(Company No.18)

The managers interviewed were also asked whether or not they adopted activity-based management (ABM) at their organisations. None of the interviewees indicated that their firms adopted the ABM system, except for two. The managers interviewed from companies 2 and 9 clearly indicated that they adopted ABM because they were using the ABC system. Also, the managers interviewed were asked whether or not their companies adopted value-based management (VBM). Again, none of the firms interviewed indicated that they adopted this system. All of the non-users of both ABM and VBM ascribe their non-adoption to these two systems to their satisfaction with their existing systems. Some of the managers interviewed indicated that these two systems were not practical (Companies No. 3, 4, 5, 6, 7, 8, 10, 11, 12 and 15), while others deemed these systems to only be suitable for teaching students at university (Companies No. 13, 14, 16, 18, and 19).

It is clear that the adoption of modern managerial philosophies, except for TQM, is very rare in the Eastern Province of SA. This means that the case of the Eastern part of SA goes with the mainstream regarding the limited use of AMA systems. At the same time, some companies adopted some AMA systems as a response to the market competition, or due to their strategy.

9.3 Part Three: Discussion of the Aspects that May or May Not Drive Change Within Companies

This part seeks to provide additional details about the drivers which stimulated some Saudi and non-Saudi firms to adopted or not adopt AMA practices at their organisations. As illustrated by the questionnaire, several internal and external aspects may motivate firms to adopt or not adopt AMA practices. Hence, this part aims to explore in depth the view of the interviewees about these aspects, which are: (a) environmental uncertainty, (b) competition, (c) size, (d) product diversity, (e) advanced manufacturing technologies, (f) culture and (g) firm strategy.

9.3.1 The Relationship between the External Contingent Aspects (Perceived Environmental Uncertainty and Competition) and the Extent of Adopting or Not Adopting the AMA Practices

At the beginning, the companies interviewed were asked to describe the growth in their industry in general. Most of the companies interviewed indicated that the growth in their industries was very rapid in terms of the number of new companies which enter the market each year. One interviewee stated that:

"The number of petrochemical companies that operate in the Eastern Province of SA was no more than 28 or 29 companies during the 80s. However, this number almost doubled during the previous fifteen years and this increase caused the competition to be very intense among petrochemical companies. He further indicated the reason that led the number of the companies to be increased was the encouragement from Saudi government to the private industrial sector in general."

(Company No.8)

Another five interviewees commented on the growth in their industry by stating almost the same view:

"We are operating in very competitive environment because the number of companies in our industry has grown during the previous years. Hence, adopting suitable innovative practices to our firms has become as life buoys for maintaining our existence in the market."

(Companies No. 4, 7, 10, 13 and 20)

Contrary to the previous views, two managers from two different industries stated that:

"The growth in our industry in terms of the number of new firms that have established their businesses over the past few years is limited. However, that does not mean there is no competition among these firms."

(Companies No.15 and 18)

It is clear from the previous views that there is some variation amongst different industries in terms of the growth in the number of companies which establish their businesses each year, and this may make the extent of adopting AMA practices vary across industries.

All of the managers interviewed were asked about the rate of adopting innovation in their industries in general, and how keen their competitors were to adopt modern techniques for their operations. When this question was posed to the managers, seven of them stated that they had to differentiate between the adoption of technological innovation and the administrative one. In terms of technological innovation, most of the interviewees indicated that the rate of adopting modern technology in operations in their industry was moderate or above moderate, but not administrative innovation. One manager stated that:

"Nowadays I think all large and even most of the medium-sized companies use several types of technology in their operations including our company because the nature of the current market requires manufacturing products quickly with an acceptable level of quality. Otherwise, you will lose your customers."

(Company No.9)

Another manager stated that:

"The rate of adopting technological innovation in our industry is almost high but not the administrative one. He further indicated most companies in our industry are keen to adopt the needed advanced technological systems in order to speed up our operations for capturing the market opportunities. However, adopting the advanced technological systems does not necessarily require adopting modern administrative practices such as TQM, VBM or any other type of complex administrative innovation."

(Company No.4)

Moreover, the managers interviewed were asked whether or not the adoption of some AMA systems by their organisations was motivated by the surrounding environment. Twelve firms interviewed (Companies No. 1, 2 ,3, 4, 5, 6, 8, 10, 13, 14, 16 and 19)

indicated that the rapid changes in the surrounding environment, especially changes in technology, was one motive which stimulated their companies to adopt some AMA systems, such as the ABC, TC, non-financial measures, TQM and so on. However, two out of those twelve firms (Companies No. 3 and 10) indicated that the rapid change in technology and increasing levels of uncertainty within the Eastern business environment in SA were two motives which triggered them to adopt some non-financial measures. One manager interviewed from the last two firms stated that the:

"Business environment in the Eastern Province of SA was characterised by stability during the 80's. However, the military actions occurred near this area in SA during the 90's and the first three years from the new century and the continuing threat from Iran led to increasing the level of uncertainty with business environment in the Eastern part of SA. Therefore, both change in technology and increasing the level of task uncertainty were two motives that triggered our company to adopt some of AMA practices."

(Company No.10)

Contrary to the views above, three firms interviewed (Companies No. 15, 17 and 18) clearly acknowledged that changes in the surrounding environment did not motivate them to adopt any AMA practices, because they were able to compete and achieve their targets by depending on TMA systems.

The managers interviewed were also asked if an increase in the level of dynamism within the surrounding environment would increase the motivation at their firms to adopt more AMA practices. Most of the managers interviewed stated that, at this time, they could compete well with the existing management accounting systems (TMA and AMA) without much concern. However, seven firms interviewed (Companies

No. 1, 3, 4, 5, 6, 10 and 13) clearly indicated that they may adopt more non-financial measures, but not anything else. Other managers interviewed indicated that they would not adopt any AMA systems, and that even the level of dynamism within the surrounding environment increased due to their financial constraints (Companies No. 15, 17 and 18).

The managers interviewed were also asked to describe the level of competition which surrounded their companies, and whether or not their adoption of some AMA practices was motivated by the level of competition which they faced. Additionally, the managers interviewed were asked to describe the type of competition which their companies faced at present. The vast majority of the firms interviewed (Companies No. 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 16, 19 and 20) indicated that they operated in a competitive environment, and that they faced rigorous competition in terms of product price and quality, so they adopted some AMA systems as a response, in order to accommodate the competition which existed within their market. Three managers emphasised similar ideas, which were that:

"We adopted TC system because our companies face intense price and quality competition."

(Companies No. 9, 16 and 19)

Some of the other firms interviewed (Companies No. 3, 5, 6, 10 and 13) indicated that their adoption of some AMA systems was due to market competition. One manager stated that:

"The spread of electronic commerce in the Eastern part of SA was one driver that led price competition to be existed. He further explained in recent years customers can distinguish between the existed prices in the market and s/he can select the price that satisfies his/her financial ability.

Therefore, we adopted TC system and some of non-financial measures (i.e., customer satisfaction) in response mainly to price completion for the purpose of maintaining our existence in the market."

(Company No.6)

Contrary to previous views, two managers indicated that their companies were still able to compete in the market by depending on TMA practices (Companies No. 11 and 18). Both managers from these two companies indicated that they did not adopt any AMA systems, because they always compared their prices with the dominant prices, so were still able to compete and achieve the planned target. At the same time, these two managers indicated that their firms always paid much attention to the service after the sale, and that this was the main reason which led them to success with their businesses, as they stated.

The firms interviewed were also asked whether or not the Saudi government joining the World Trade Organisation (WTO) would put pressure on their companies to adopt more AMA practices. None of the firms interviewed indicated that this move would motivate them to adopt more AMA practices. One manager interviewed commented on this issue by stating that:

"Joining Saudi government to WTO will only allow foreign firms to invest in SA. If these new firms use some AMA practices our firm will not going to imitate them because there is a possibility the adopted systems by foreign firms are not suitable to our firm."

(Company No.12)

Similar to the view above, all of the firms interviewed indicated that imitating other firms was not considered a driver for adopting some AMA practices, and that this

may lessen the influence of some institutional aspects on firm's decisions regarding the adoption of AMA practices.

The managers interviewed were also asked how common it is that the Saudi government imposes particular MAS in their firms as a response to change occurring in the international business environment. Again, none of the firms interviewed indicated that the Saudi government requested they adopt a particular MAS, but as they indicated, each firm has the full autonomy to select the MAS which satisfies its needs.

The aforementioned discussion gives a clear picture regarding the influence of some external aspects on firms' decisions as to whether or not they should adopt AMA practices. To clarify that, several managers indicated that a change in technology and competition were considered as motives which triggered their firms to adopt some AMA practices in their organisations. In addition, some of the firms interviewed indicated that the adoption of some AMA practices also resulted from increasing the level of environmental uncertainty, and this result partly fits with the Kattan *et al* (2007) findings.

At the same time, some firms interviewed had clearly indicated that, despite the tremendous change within the surrounding environment, they did not adopt any AMA practices, and they were able to run their business by depending on TMA systems without any fear. Hence, it can be said that the external contingent aspects, such as task uncertainty and competition, may or may not lead firms to adopt AMA practices, at least in the case of the Eastern Province of SA.

9.3.2 The Relationship between the Firm's Size and the Adoption or Non-adoption of AMA Practices

Statement:

"Several management accounting scholars indicated large firms are more likely to adopt AMA systems compare to the small ones mainly due to their availability of financial resources and expertise."

At the beginning, the researcher asked all of the interviewees whether or not they agreed with the previous statement. All of the managers interviewed indicated that they fully agreed with the statement above. Also, the interviewees were asked whether or not the adoption of some AMA practices was related to the size of their organisations. Again, all of the interviewees indicated that the adoption of AMA systems, or even some of them, is costly and time consuming, and it requires well-planned decisions. One manager interviewed stated that:

"Extensive research was made before taking the decision to adopt the ABC system in our company. He further indicated when our company decided to install the ABC system, we sent members of our accounting department to train on how they can use or deal with the new system. Moreover, we have made a contract with consultant office to monitor the efficiency of this system in our company for three years and it is hard to do all of this without enough financial resources."

(Company No.2)

Another manager interviewed emphasised almost the same view, which was that:

"Before adopting some of the AMA practices (i.e., non-financial measures, ABC, ABB, ABM, TC, and TQM) we studied the costs required for adopting these systems and we compared it with the expected benefits that will be utilised from adopting these systems, then our top management took the decision

regarding the adoption to the proper system(s) and provided the needed financial resources. Hence, the availability of financial resources was the cornerstone that motivated our companies to adopt these practices."

(Companies No.1, 3, 4, 5, 6, 7, 8, 9, 10 and 12)

Contrary to the previous firms, only three medium-sized firms indicated that they adopted one AMA system (such as the TC system). The managers interviewed from these firms clearly indicated that, despite being satisfied with the existing MASs in their firms, they only adopted one type of AMA system (TC system), due to the limited financial resources at their organisations.

The discussion above gives a clear picture regarding the relationship between the firm size and the extent of adopting AMA practices. In other words, the previous theoretical analysis encouraged large firms to adopt more AMA practices compared with medium-sized firms, due to the availability of the financial resources.

9.3.3 The Relationship between Production and Technology, and the Decision Taken Regarding the Adoption or Non-adoption of AMA Practices

At the beginning, the managers interviewed were asked about the number of product lines currently existing in their companies, and the number of products which were currently manufactured by their companies. Thirteen managers interviewed indicated that they only had one product line which produced ten products or less in their companies, while the remaining firms interviewed (Companies No. 2, 3, 5, 9, 12, 13

and 14) indicated that they had either two or three product lines at their companies, and that they produced more than twenty products.

The interviewees were also asked to describe the level of automation within the production process at their companies. None of the managers interviewed described the production process in their company as being not automated or slightly automated, but the vast majority described it as partly automated or mostly automated, and only two firms (Companies No. 2 and 9) described it as completely automated.

The managers interviewed were also asked about the types of technological system(s) which were currently used in their organisations. All of the managers interviewed indicated that they used office automation, such as fax and email, for contacting their customers and suppliers, mainly for saving time. However, only four of the firms interviewed (Companies No. 2, 3, 9 and 12) indicated that they mainly adopted automated storage and material handling in their organisations for quality purposes.

All of the previous four managers interviewed indicated that the two technological systems they adopted saved their production time and reduced their costs in terms of labour and scrap. Only one firm interviewed (company No. 9) indicated that it adopted the ERP system for facilitating data processing amongst users. The researcher asked the manager interviewed from this firm whether or not the adoption of some of the AMA practices in his company was subjected to the installation of the ERP system.

The interviewee from this firm indicated that his company was currently using the ABC system, because it manufactured a wide range of products, but the adoption of

this system was not subjected to the adoption of the ERP system. In addition, he indicated that the cost report which was prepared based on the ABC system was not prepared within the ERP environment, but that it was always prepared outside the ERP system, and then interred to the ERP software for facilitating the access of data amongst different departments. Hence, it would be fair to say that the adoption of the ERP system had no impact on the use of ABC at this company, and this fell completely in line with that was found in Finland (see Granlund and Malmi, 2002).

In general, all of the firms interviewed indicated that they were fully satisfied with the type of technological production and administrative systems which they currently used. Additionally, the vast majority of firms interviewed indicated that the use of AMA system(s) was not subject to their use of some modern technological systems, but other aspects such as competition, strategy and environmental uncertainty were considered the main drivers which stood behind their adoption of some AMA systems at their firms. One manager interviewed commented on this issue by stating that:

"The manufacturing process in our company is automated and we are using the office automation for running our business but this use was not motivated us to abandon important systems such as SC system and traditional budgeting or even adopting several types of AMA practices. He further indicated we adopted only TC and TQM systems but this adoption was not due to the use of automation in our firm."

(Company No.3)

It is clear from the previous discussion that some companies adopted some modern technological system for satisfying specific purposes, such as saving time and reducing production costs. Also, some firms which currently used some modern

production technologies adopted some of the AMA practices, but this adoption was subjected to aspects other than advanced manufacturing technologies. At the same time, some companies adopted some AMA practices such as ABC, because they manufactured a wide range of products, as indicated earlier. Since product diversity is part of technology, then it would be fair to say that the adoption of technology has a partial effect on the adoption of AMA practices, at least in the case of the Eastern part of SA. The next topic focuses on culture.

9.3.4 The Relationship between the Firm's Culture and the Adoption or Non-adoption of AMA Practices

The interviewees were asked to describe the culture of their companies in terms of delegating authority and adherence to job rules. All of the managers interviewed from the non-Saudi firms indicated that they ran their businesses based on democratic managerial styles, and they used an informal structure. Hence, all of the managers interviewed indicated that they had the full autonomy for taking sensitive decisions such as the selection of new investment, pricing decisions, eliminating unprofitable products, manufacturing new products, allocating budget, and hiring and firing the required or surplus employees. In addition, their employees did not adhere to job rules, but could express their opinions without any concern, and they were always encouraged to do so. This finding was not unexpected, because all of these firms belonged to a democratic culture which was characterised by a low level of power distance and uncertainty avoidance. One manager interviewed stated that:

"The adoption to the ABC system in our company was not suggested by me or even by any other top managers in our company, but one employee under the supervision of the middle managers was behind this idea. He further indicated if our employees feel concern regarding expressing their opinions, ABC system was not adopted in our firm. Also, the interviewed manager indicated his company always

rewards any employee who suggests new beneficial idea because this rewarding as he said will encourage other employees to bring more new ideas for developing our business. Hence, if this door closed as he said we will lag behind development which in turn may affect our company performance."

(Company No.2)

Contrary to the view above, fourteen Saudi firms interviewed indicated that they did not delegate authority at all, and that employees must adhere to the job rules. Only one large Saudi firm (company No. 9) allowed limited permission to allow their subordinates to express their opinions without concern. Five managers interviewed expressed almost the same view, which was that:

"We live in non-democratic country and we impacted by the government managerial style for managing business in our entities".

(Companies No.6, 8, 11, 15 and 17)

Another manager interviewed at a large Saudi firm stated that:

"Giving the permission to work-shop employees' to participate in the decision-making may cause disaster to the company because they either not educated at all or have low level of education, so authority must be restricted only to the owner of the company or within the top level of the hierarchy due to their experience in managing business."

(Company No.10)

The other eight managers interviewed from Saudi firms emphasised a similar idea, which was that:

"Authority is considered as block book and it must not be delegated. Also, they indicated employees' must be adhered to strict rules in order to prevent the spread of any anarchy within entity."

(Companies No.7, 12, 13, 14, 16, 18, 19 and 20)

Since most AMA and TMA systems have originated in Western countries, one may expect language barriers to hinder the adoption of AMA practices, so the interviewees were asked whether or not the English language motivated them to adopt the AMA practices at their companies. All of the managers interviewed indicated that the English language was the predominant language in their organisations, especially amongst the top level of hierarchy, and the middle staff managers and employees. They also indicated that accounting transitions and reports were always prepared in English. Hence, none of the interviewees indicated that the English language was considered as an impediment which was behind their non-adoption of AMA systems at their companies.

Since all management accounting systems originated in non-Muslim countries, the interviewees were asked whether or not Islam was seen as the stumbling block behind the non-adoption of AMA practices at their firms. Again, none of the Saudi firms interviewed indicated that Islam was a religion which precluded the adoption of AMA practices in their organisations. Two managers interviewed from the non-Saudi firms (companies No. 1 and 3) indicated that they had no idea whether or not the adoption of the AMA practices collided with the core of Islam, or because they were not Muslim. However, three Muslim interviewees from non-Saudi firms indicated that they did not believe that Islam collided with the adoption of innovation in general, and AMA practices in particular. The researcher posed the same question to two professors who are experts in Islamic science, in order to make sure that Islam was not a religion which clashed with the adoption of innovation. Both of them indicated that Islam never ever discouraged adopting beneficial innovation, but that the opposite was true.

Interviewees were also asked whether or not the level of development within the society had an impact on their decisions regarding the adoption or non-adoption of the AMA practices in their organisations. Again, the vast majority of the firms interviewed indicated that there was no relationship between adopting AMA systems at their firms and the level of development within Saudi society, while managers from some firms (Companies No. 11, 15, 17 and 18) believed that this cultural aspect had some impact, and that it triggered them to not adopt any AMA systems. One manager interviewed stated that:

"Several Saudi firms are still running their business based on old mode, so adopting innovation whether in management accounting or something else involves first spreading innovative thinking in Saudi society similar to that exist in Western countries and Japan; otherwise Saudi firms will continue lag behind development."

(Company No.11)

The interviewees were also asked whether or not there was a legal institution in SA which could bring together academics and practitioners in order to explain and discuss new trends in business theory, and how necessary it was to have a meeting like this. Also, the interviewees were asked whether or not there was cooperation between them and academics, and whether or not this cooperation would lead to an increase in the adoption of AMA practices in their firms. Initially, none of the interviewees indicated that there was a legal institution in SA which focused on management accounting studies similar to those which exist in the UK and the USA.

All of the managers interviewed indicated that there was no such cooperation between them and academics, which meant that each group worked in isolation from each

other. Hence, the vast majority of interviewees believed that holding a meeting between them and the academics was important and useful for exchanging the experience between both groups, which in turn could facilitate the adoption of several innovative ideas, including AMA practices.

It is clear from the previous discussion that Saudi culture within an organisation is similar to that which is described in the literature, in terms of the delegation of authority and uncertainty avoidance, and this undoubtedly confirms the accuracy of Hofstede's theory about the Arab culture more precisely than the Saudi one. Additionally, previous analysis revealed that some cultural aspects had some impact of the adoption of AMA systems, especially amongst Saudi firms, such as the level of development within society, the absence of legal institutions, cooperation between practitioners and academics, and decision-making styles within Saudi firms.

By taking the firms' nationality into consideration, the maximum number of AMA practices adopted by non-Saudi firms was four and the minimum number was one. In contrast, the maximum number of AMA practices adopted by Saudi firms was four and the minimum number was zero (four companies). Therefore, it would be fair to say that the limited use of AMA systems, particularly in Saudi firms, was partially due to some cultural aspects.

9.3.5 The Relationship between the Firm's Strategy and the Adoption or Non-adoption of AMA Practices

As is commonly known, investing in new MASs is associated with some degree of risk because the outcomes are hard to predict, so all of the interviewees were asked to describe their firm's strategy in terms of carrying risk. Fourteen out of twenty managers interviewed clearly indicated that their firm's strategy tended not to carry risk, while the remaining indicated that it did (companies No. 1, 2, 4, 5, 7 and 9), due to the type of strategy being adopted (prospector strategy) by those firms.

The interviewees were also asked whether or not their top management provided the required facilities when they adopted new MASs, regardless of the level of risk which was associated with this adoption. Again, six firms interviewed (Companies No. 1, 2, 4, 5, 7 and 9) indicated that their top management always provided the required facilities, such as training programs and relevant software, regardless of the level of risk associated with the adoption of the new MAS, while thirteen managers interviewed indicated that their firms provided the necessary facilities if the adoption of the new MAS had a low degree of risk. Two managers stated almost the same view, which was that:

"The top managements in our companies always make balance between the benefits and the risk associate with the adoption to the new MAS and if the anticipated benefit is much more than the risk, they provide the minimum important facilities required for adopting the new system, otherwise they do not."

(Companies No.5 and 16)

On the other hand, one manager interviewed indicated that his company (Company No. 18) never invested in any new MAS, because the owner did not want to carry any

risk, regardless of the benefits which might have been utilised from the adoption of the new MAS.

The managers interviewed were also asked whether or not the focus of their firms' strategy was short-term or long-term. Most of the managers interviewed clearly indicated that their firm's strategy focused on the short-term, so they tried to compete by concentrating solely on the Saudi market, and provide their customers with high quality products, low costs and service after the sale.

Only six firms interviewed (Companies No. 1, 2, 4, 5, 7 and 9) clearly indicated that their strategy focused on the long-term, and they always searched for market opportunities in Saudi and in the international market, and invested large amounts of money in research and development within their firms. Also, the last six firms indicated that emphasising the efficiency of the existing operations within their firms, and providing customers with low costs and service after the sale, were not objectives of their strategy.

The managers interviewed were also asked about the type of strategy being adopted by their firms, and how satisfied they were with their strategy. As mentioned, only six firms indicated that they followed the prospector strategy, mainly due to their focus on the domestic and international markets, while the remaining clearly indicated that they followed the defender one strategy.

All of the managers interviewed indicated that they were able to accomplish their target successfully by their firms following the strategy, and this may have decreased

the effects which the adopted strategy had on the extent of adoption or non-adoption of the AMA practices. In other words, one may ask that, if firms which follow the defender strategy are able to compete well domestically and achieve large amounts of profits, then why should they invest in AMA systems and carry some degree of risk resulting from this investment? Here, it can be argued that the firm's vision may determine the type of firm strategy.

The managers interviewed were also asked whether or not the adoption or non-adoption of the AMA practices was related to the type of strategy being adopted by their firms. Four of the firms interviewed (Companies No. 2, 4, 5 and 9) clearly indicated that the nature of their strategy necessitated the adoption of some relevant AMA practices in order to maintain their survival in the market, while the other two firms interviewed (Companies No. 1 and 7) indicated that their chosen type of strategy and other contingent aspects motivated them to adopt some AMA practices. On the other hand, the remaining firms interviewed indicated that the adoption or non-adoption of the AMA practices was not due to their chosen type of strategy, but related to something else, such as the inappropriateness to their business or their satisfaction with the existing systems.

The managers interviewed were also asked how frequently they revised or evaluated their firm's strategy. Only three firms (Companies No. 1, 10 and 13) indicated that they evaluated their strategy every three years, while the remaining companies indicated that they evaluated their firm's strategy every five years, and made the necessary changes to their strategy if continuing to use the current strategy threatened their existence in the market.

The discussion above reveals that most firms tried to avoid investment in AMA systems, due to the risk associated with this investment, while some firms invested in these systems regardless of the level of risk. Also, when comparing the number of AMA systems adopted by firms which followed the prospector strategy with those which followed the defender strategy, the result of the comparison showed some differences amongst firms. To make that clear, the maximum number of AMA systems adopted by some firms which followed the prospector strategy was five, while none of the firms which followed the same strategy indicated that they did not adopt any AMA systems.

In contrast, the maximum number of AMA systems adopted by some firms which followed the defender strategy was three, whereas five firms which followed the same strategy indicated that they did not adopt any AMA practices, and this result unquestionably indicates that firms which follow the prospector strategy are more likely to adopt more AMA practices as compared with firms which follow the defender strategy.

9.4 Summary

Based on data collected from 20 semi-structured interviews, this chapter provides additional details about the current applications of management accounting practices in Saudi and non-Saudi manufacturing firms which operate in the Eastern part of SA on the one hand, and discusses in depth the drivers which triggered these firms to adopt or not adopt the AMA practices, on the other.

Another aim of conducting the semi-structured interviews was to confirm or refute the results of the questionnaire analysis. As mentioned earlier in this chapter, the analysis of the first part of the interview booklet was presented in chapter six, so the focus of this chapter was restricted to the second and third parts illustrated in the interview booklet.

In general, the analysis of the second part of the interview booklet revealed that the vast majority of the companies interviewed were still loyal to their TMA practices, and some of these firms used both TMA and AMA systems side-by-side. At the same time, only a limited number of the firms interviewed moved towards adopting the new trends in management accounting. Several patterns can prove the previous result. For example, almost two-thirds of interviewees believed that they could run their businesses without concerns for different purposes, based on the information provided by one accounting system, mainly due to the simplicity of production in their firms. At the same time, the type of strategy being adopted, competition and expansions in business were emphasised as the main drivers which triggered some firms interviewed to adopt multiple accounting systems, or set a plan to adopt more than one accounting system for the purposes of enhancing their internal control.

In terms of the usage of traditional allocation methods, most the firms interviewed believed that there was no need to invest in more sophisticated costing allocation methods such as ABC, due to the limited products being manufactured and the proportion of overhead costs to total product costs in their firms. Therefore, most of the firms interviewed used traditional allocation methods. Interestingly, the previous analysis revealed that there was a clear variation based on nationality, in terms of the

use of a single recovery base. To clarify that, none of non-Saudi firms used a single recovery base, while several large and medium-sized Saudi firms use it. Only two firms adopted the ABC system as a response to some contingent aspects (increasing the number of products being manufactured), so it is fair to say that the contingent aspect may trigger firms to adopt or not adopt AMA systems.

Previous analysis exposed that the vast majority of the firms interviewed depended on traditional tools for setting their product prices, such as cost-plus for the new manufactured products, and they commonly used cost-plus, target profit and market price as methods of setting their product prices. Only five Saudi firms interviewed used the TC system as a response to the competition which they faced or due to their chosen type of strategy, so it can be said that these two contingent aspects were considered to be the drivers which motivated these firms to adopt TC. By taking firms' nationalities into account, none of the non-Saudi firms used the TC system, and this non-use does not necessarily mean that Saudi firms use AMA practices in general more than non-Saudi ones.

None of the firms interviewed indicated that they used game theory or regression analysis for evaluating their investment decisions, but that the payback and internal rate of return were the two methods which were widely used, as emphasised by most the firms interviewed. Furthermore, most of the firms interviewed regarded both the SC system and budgeting as important practices for their firms, mainly for setting their budgets, controlling their costs and evaluating their performance. Hence, it too much to say that Saudi and non-Saudi manufacturing firms will stop using these two particular practices in the near future.

Previous analysis also shows that there is a noticeable and slow move towards adopting non-financial measures side-by-side with financial measures in the Eastern part of SA, due to the type of strategy being followed, market competition and task uncertainty. However, the majority of the firms interviewed believed that they could compete well without using any types of non-financial measures.

With regards to some managerial approaches, such as VBM, ABM, JIT and TQM, the analysis divulges a limited use of these systems, except for growth in the use of the last approach. Based on the patterns presented above, it can be said that the case of the Eastern part of SA follows the mainstream in terms of the wide use of TMA systems, and that this use will continue in the near future, as most of the firms interviewed indicated. Hence, the view proposed by some researchers regarding the inappropriateness of the TMA systems for today's business environment should be taken with caution (Johnson and Kaplan, 1987).

The analysis of the last part of the interview shows several drivers which motivated some firms to adopt or not adopt AMA systems. For example, most of the firms interviewed agreed that the rapid change in technology made the business environment in the Eastern part of SA uncertain, so some firms tried to accommodate this level of uncertainty through adopting some AMA practices, in order to maintain their survival. Also, the instability within the political system surrounding this area of SA motivated some of the firms interviewed to adopt more AMA systems. Moreover, market competition in terms of quality and price was another driver which triggered some firms to adopt some AMA practices, such as the TC system.

With regards to the size of the firm, all of the firms interviewed indicated that the availability of enough financial resources was considered one of the main drivers which motivated them to adopt some AMA systems. A few firms indicated that the limited financial resources in their firms precluded the adoption of some AMA systems.

In terms of technology, several firms described the production process in their firms as moderately automated or automated, and they generally use office automation. However, this use did not motivate them to adopt the AMA systems, as they indicated. However, the number of products being manufactured was seen as a motive to adopt some AMA systems, such as ABC, as indicated by some firms. Therefore, it can be said that the technology has some impact on the adoption of AMA systems in the Eastern Province of SA.

As for the effect of the cultural aspect on the extent of adoption of AMA systems, the analysis shows that non-Saudi firms use more AMA practices compared with Saudi ones, because the first group tends to delegate authority and use informal job tasks, while the opposite condition applies to almost all of the second group. Hence, it would be fair to say that the extent of adoption of AMA systems in Saudi firms is less than that for non-Saudi firms, and this was due to the effect of some cultural aspects which differentiate between both groups.

The last analysis reveals that firms which follow the prospector strategy use more than the defender strategy, because firms which follow the last type of strategy tend not to carry risk compared with firms which follow the first type of strategy. Also, firms which follow the defender strategy only focus on the Saudi market and depend

on a short-term focus, in order to minimise the level of risk, while the firms which follow the prospector strategy focus on the Saudi and international markets, and depend on a long-term focus, regardless of the level of risk. Thus, the last group uses more AMA systems compared with the first one, in order to maintain their survival and lead in the market.

With regards to the obstacles which motivate some firms to not adopt some or all AMA systems, the satisfaction with the existing systems, financial constraints, non-trust of the AMA systems and the unsuitability to the nature of firms' businesses were suggested as the main reasons which motivated some Saudi and non-Saudi manufacturing firms to not adopt a wide range of AMA systems or even some of them. The next chapter focuses on the main findings, suggestions for future research and a conclusion.

Chapter Ten: Research Conclusions and Recommendations

10.1 Introduction

This chapter aims to present the research conclusions by discussing the main findings of the research and suggesting some avenues for future research.

10.2 Discussing the Research Findings

As mentioned earlier, the current research aims to study the current applications of management accounting amongst Saudi and non-Saudi manufacturing firms which operate in the Eastern province of SA on the one hand, and the drivers which trigger these firms' decisions as to whether or not they will adopt AMA systems on the other. The triangulation methodology (questionnaires and semi-structured interviews) was used in order to overcome the shortages of each single method. A brief summary and discussion of the findings now follows.

The analysis of both the questionnaire and the interviews reveals that over two-thirds of Saudi and non-Saudi manufacturing firms which operate in the Eastern Province of SA use a single accounting system, mainly due to the simplicity of its production. Only a few of these firms use multiple accounting systems or have plans to adopt more than one accounting system for the purpose of enhancing the internal control for their business activities.

Based on this result, we can say that the case of the Eastern part of SA is similar to that found in some places around the world in terms of the wide use of a single accounting system for satisfying several purposes within organisations. At the same

time, around 19% of the surveyed firms and two interviewed companies clearly indicated that they adopted multiple accounting systems, so it hard to say that there is a complete rejection of the suggestion stated by Johnson and Kaplan (1987) regarding the necessity of adopting two accounting systems - one for internal activities and another for external ones.

With regards to the main reason behind the extensive use of a single accounting system in the Eastern part of SA, the analysis exposed that all of the interviewed firms and most the surveyed companies indicated that the simplicity of production was the main motive which triggered Saudi and non-Saudi firms to not adopt multiple accounting systems. Surprisingly, no-one from the previous studies presented in chapter three found that the simplicity of production was the reason behind the non-adoption of multiple accounting systems. Based on this result, one may ask if the nature of production processes within Saudi and non-Saudi organisations is characterised by the how important it is for these firms to adopt multiple accounting systems.

The analysis of both the quantitative and qualitative data divulges that the vast majority of Saudi and non-Saudi manufacturing firms use the traditional allocation methods for allocating overhead costs, despite the severe criticisms levelled at these methods. To clarify that, the result of the questionnaire analysis shows that only one non-Saudi firm uses the single plan-wide rate as a base for allocating overhead costs to total product costs, while 69 large and medium-sized Saudi firms use it.

Interestingly, none of the interviewed non-Saudi firms indicated that they use this allocation method, while 10 Saudi firms (5 large and 5 medium-sized) indicated that

they did, mainly due to the limited number of products being manufactured and the low proportion of overhead costs to total products at their firms. Here, it would be necessary to mention that the variation between Saudi and non-Saudi firms in terms of the use of a single plan-wide rate does not necessarily mean that non-Saudi firms are more advanced compared with Saudi ones, but that non-Saudi firms might be using other traditional allocation methods.

The analysis of the questionnaire showed that 50% of the surveyed firms use direct labour hours/costs, 20.5% use direct materials and 14.8% use unit of output as bases for allocating overhead costs, while the results of the qualitative analysis revealed that four non-Saudi firms and four Saudi firms, other than those who use the plan-wide rate, were allocating overhead costs at their firms based on direct labour hours/costs (4 non-Saudi firms), direct materials (3 Saudi medium-sized firms) and units of output (1 large Saudi firm).

The analyses of both the questionnaires and the interviews show that Saudi and non-Saudi manufacturing firms were reluctant to adopt modern allocation methods such as the ABC one. The result of the questionnaire shows that no more than 9% of the surveyed firms adopted the ABC system, and that only two interviewed managers at the two large firms (one Saudi and the other non-Saudi) clearly indicated their companies have adopted the ABC.

Despite the analysis, the descriptive data did not give a specific reason behind the use of the ABC system in the Eastern part of SA, because the focus was on several AMA systems. The result of the qualitative analysis revealed that increasing the number of

products being manufactured, and enhancing the level of profitability analysis and managing the business as one entity were the two main drivers which stimulated some interviewed firms to adopt the ABC system.

One important thing which should be taken into account regarding the ABC system is that both the extent of usage and the level of the importance of adopting the ABC system have decreased in SA according to the results of the current research, as compared with Alebaish's (1998) findings. To make that clear, as indicated earlier in chapter four, Alebaish found that 30 out of 121 (27.8%) large and medium-sized Saudi firms were utilising the ABC system, while the current study found that only 14 out of 158 (8.9%) were using this system.

With regards to the importance level, Alebaish reported that around 41% of the surveyed firms regarded ABC as important or very important to them, while the results of this research revealed that only 13.3% of the respondents believed that the ABC system was important or very important to their firms.

By downgrading the variation in the sample size for the current research and Alebaish's study (260 surveyed firms vs. 200 firms), and the demographical aspects (focus on one part of SA vs. focus on the whole country), we will find a huge decline in the usage and level of importance of the ABC system in SA. This decline may indicate that some Saudi firms, in particular, were using ABC then subsequently abandoned it, so the researcher deems that identifying firms which adopted some AMA system(s) then decided not to continuing using them is a fruitful topic to be

researched qualitatively, in order to know whether or not the problem lies with these systems themselves or with the management within the entity.

The analysis of the questionnaires lets slip that the extent of usage of some modern costing techniques such as backflush, throughput accounting, lifecycle costing system and cost of quality reporting spans between 2.5% and 11.4%, while only two interviewed firms indicated that they adopted cost of quality reporting due to their adoption of the TQM technique. Only one interviewed Saudi medium-sized firm indicated that it adopted the life cycle costing system, due to the decision taken by the owner of the company.

Surprisingly, the analysis of the qualitative data showed that sixteen of the interviewed Saudi and non-Saudi firms indicated that they had never heard about throughput accounting or the backflush system, while the remaining interviewed firms deemed these two systems to not be relevant to their firms. Indeed, the limited adoption of these modern costing systems, including the ABC one, is not specific to the case of the Eastern Province of SA, but it matches results reported in some places around the world (see chapter four), so we can confidently say that the case of the Eastern part of SA is in line with the mainstream.

The most surprising result is that related to the life costing system. The analysis of the questionnaire showed that the extent of usage of the life costing system in the Eastern part of SA is no more than 10%, while Alebaish (1998) reported in his study that 35% of Saudi large and medium-sized firms were utilising this system. Again, similar to the ABC case, there is a huge decline in the extent of usage of the life cycle costing

system in SA, which necessitates studying in depth the factual reasons behind this sharp decline in practice.

It is clear from the previous findings regarding the number of accounting systems within Saudi and non-Saudi firms that the vast majority of these companies use one accounting system for several purposes. However, there is some variation between the questionnaire and the interviews results in terms of the function(s) of the product costing system within Saudi and non-Saudi firms. To make that clear, the result of the analysis of the quantitative data revealed that the vast majority of the surveyed firms (49.4%) use cost information to satisfy several purposes or functions, while all of the interviewed firms indicated that they used product costing data to satisfy two main goals at their firms, which were product pricing and control.

The allegation stated by Johnson and Kaplan (1987) regarding MASs following and becoming subservient to the external purpose cannot be rejected. Also, the analysis of both the questionnaires and the interviews made public that the vast majority of Saudi and non-Saudi firms believed that continuing to use traditional allocation methods did not affect the quality of their decisions, mainly due to the limited proportion of overhead costs to total product costs at their companies, so mangers within these firms were not keen to adopt sophisticated costing systems such as the ABC one, and regard the costing systems, in general, as being above their needs.

One final important point is that the result of the analysis of the quantitative and qualitative data revealed that most Saudi and non-Saudi firms are automated, and face real competition, especially in terms of price and quality (see tables 7-30 - 7-32, the

interviews analysis). Nevertheless, these firms were able to run their businesses through relying on one accounting system and using simple allocation methods. Hence, it is not unfair to say that some of the contingent aspects may or may not arouse firms to adopt modern costing practices, and this fact can be proven from two angles. Firstly, the result of both the analysis of the questionnaires and the interviews divulged that automation and competition did not trigger a large number of Saudi and non-Saudi firms to relinquish their traditional costing systems, which means that these systems still make sense to some Saudi and non-Saudi manufacturing organisations. Secondly, increasing the number of products being manufactured and expanding business has stimulated some Saudi and non-Saudi firms to adopt some advanced costing techniques such as the ABC system.

The analysis of the questionnaire shows that approximately 65% of Saudi and non-Saudi manufacturing organisations utilise the cost-plus method for setting their product prices, while the analysis of the interviews exposes that all non-Saudi and 7 Saudi firms (4 large and 3 medium-sized) only use this practice with their newly manufactured products to maximise their profit. Furthermore, the analysis of the questionnaire reveals that the vast majority of the surveyed firms (74%) compare their product's price to the market price, while the analysis of the interviews shows that the dominant price was one criteria used by twelve interviewed firms (5 non-Saudi and 7 Saudi) for setting their product’s price.

With regards to the adoption of the modern pricing technique (TC), the analysis of the questionnaire reveals this practice has been adopted across no more than 27% of the Eastern part of SA, while the analysis of the interviews divulges that price

competition and strategic planning were the two drivers which stimulated five Saudi firms (differing in size) to adopt TC. The unsuitability of TC was widely cited as the reason which motivated a large number of the interviewed firms to not adopt TC, and this view unquestionably affirms the solidity of traditional pricing practices, at least in the Eastern part of SA.

The result of the questionnaire shows that the two popular methods used for evaluating investment decisions in the Eastern part of SA were payback and net present value, with approximately 75% and 47% respectively, while nineteen out of the twenty interviewed managers stated that payback and IRR were the most common methods used at their firms. Only one interviewed manager indicated that his firm used net present value, so it is fair to say here that there is some variation between both results.

In brief, since all firms included in the current research are private and profitable, managers within these organisations are highly willing to cover their manufacturing and non-manufacturing costs, and capture acceptable proportions of profit. Hence, managers within these firms are in favour of using the cost-plus method and taking the market price into consideration for maintaining their competitiveness. On the other hand, the analysis of both the questionnaire and the interviews showed that some Saudi and non-Saudi firms started to set their product prices based on strategic decisions through adopting the TC system, mainly due to price competition and strategic consideration.

With regards to investment appraisal issues, the use of the payback method could be due to its simplicity, and the familiarity of Saudi and non-Saudi firms with this method, plus the result of the interviews, affirmed this justification. The analysis of the interviews clearly reveals that most of the interviewees are not knowledgeable in modern capital budgeting methods such as game theory or regression analysis, so these firms are still dependent upon traditional capital budgeting methods.

The analysis of the questionnaire shows that around 59% of the Saudi and non-Saudi manufacturing firms use the SC system, mainly for setting their budget and controlling their costs. By the same token, two-thirds of the interviewed managers indicated that they use SC for several purposes, but setting budget and controlling costs were the two main goals cited by these managers. At the same time, two interviewed firms indicated that they did not use the SC system, because they use different costing systems (ABC and life cycle costing system), while another two interviewed firms indicated that the absence of clear rules was the main reason which stimulated them to not use this system. Only one interviewed manager indicated that the SC system was not suited to his company.

Amazingly enough, despite the literature of management accounting revealing that the adoption of SC system collides with some modern management philosophies such as TQM and JIT, the analysis of the interviews refutes this proposition, because seven interviewed managers have clearly indicated that they currently use the SC system side-by-side with the TQM technique.

Approximately 82% of the surveyed firms indicated that they use traditional budgeting, mainly for controlling costs at their firms and evaluating their performance. The analysis of interviews is in line with the analysis of the questionnaire, in terms of the heavy use of traditional budgeting in the Eastern part of SA and its main objectives. Amazingly, sixteen interviewed managers have clearly indicated that their companies did not have a plan to weed out traditional budgeting during the next five years or to adopt ABB, mainly due to their satisfaction with traditional budgeting and a lack of knowledge about ABB.

Only two interviewed managers indicated that the use of the ABC system at their companies was the reason which prompted them to adopt the ABB practice, while another two interviewed firms indicated that neither traditional nor ABB was used at their firms, due to the decisions taken by the owners of the firms.

One interviewed manager indicated that the adoption of the life cycle costing system enabled his company to manage and control costs well without using any type of budgeting, while another interviewed manager indicated that depending on personal judgement for planning and performance evaluation was the reason which triggered his company to not use traditional budget or ABB. The limited adoption of ABB amongst the interviewed firms was not surprising, because the analysis of the questionnaire also shows that the extent of adopting this practice is across no more than 7% of the surveyed firms. In addition, the analysis of the questionnaire exposed that only 22% of the Saudi and non-Saudi manufacturing firms utilise flexible budgeting, while the analysis of the interviews shows that all firms which use traditional budgeting try to control the variance from budgets at their firms based on

monthly bases. In general, the analysis of both the questionnaire and the interviews reveals that managers within most Saudi and non-Saudi firms believe that continuing using traditional budgeting will not threaten the survival of their firms, even in the future.

The analysis of the quantitative data shows that the extent of usage of the transfer pricing system is no more than 37% in the Eastern Province of SA. The same analysis also divulges that around 59% of Saudi and non-Saudi firms are in favour of utilising cost of production as a method for transferring pricing between the seller and the buyer. Despite the cost of the production method, it will not allow the selling division to maximise its profit; this method, as the analysis exposed, was found to be popular in the Eastern part of SA. There is a possibility that practitioners did not recognise this question well, or regarded the cost of production as full product costs, so the result of this question should be taken with care.

The analysis of the questionnaire exposes that approximately 79% of the surveyed firms highly depend on financial measures, especially ROS, for evaluating their performance. The analysis of the interviews was not much different from the result of the questionnaire, because 13 interviewed managers clearly indicated that they only use ROS as a measure for evaluating the performance of their firms. The extensive use of financial measures in the Eastern Province of SA may indicate that managers within these firms deemed that there was no need to adopt two types of measures for evaluating their performance, because they were able to accomplish their target without any concern, so they regarded the adoption of non-financial measures as a waste of money. On the other hand, the analysis of the questionnaire reveals that 39%

of Saudi and non-Saudi firms have adopted non-financial measures, and almost 13% of these firms adopted BSC. The analysis of the interviews lets slip that only seven interviewed managers at large Saudi and non-Saudi firms have unambiguously mentioned that their firms are currently using financial (ROS) alongside some non-financial measures, such as customer and employee satisfaction.

The interviewed managers also indicated that market competition, task uncertainty, type of strategy (prospector) and firm size were the drivers which motivated their firms to adopt both types of measures. Surprisingly, the analysis of the interviews also reveals that none of the interviewed managers, including managers from firms which are currently using some non-financial measures, indicated that their company adopted BSC or had a plan to adopt it during the next five years, mainly due to satisfaction with their current performance measures or a lack of knowledge about BSC.

Based on the last analysis, we can say that there is a noticeable variation between the quantitative result and the qualitative findings in terms of the extent of usage of BSC in the Eastern part of SA. In general, despite the analysis of both the questionnaires and the interviews showing that the vast majority of Saudi and non-Saudi manufacturing firms depend on financial measures for evaluating the performance of their firms, there is a growing interest amongst firms in the Eastern part of SA in adopting both types of measures, and this may indicate that some firms started to maintain their existence in the market through the adoption of a long-term vision or strategy.

The analysis of the questionnaire shows that the extent of adopting modern managerial philosophies, except the TQM approach, is very rare in the Eastern part of SA. To clarify that, only 3.8% of Saudi and non-Saudi firms adopted ABM, while the extent of usage of both VBM and JIT techniques is 2.5% and 4.4%, respectively. Astonishingly, there is a tremendous variation between the results of the current study and Alebaishi's (1998) findings regarding the extent of usage of the last technique (50%), which may motivate us to study in-depth why this huge decline in the adoption of JIT has occurred. In the same way, the analysis of the interviews fits in line with the questionnaire results in terms of the rarity of adopting modern managerial philosophies. Only two interviewed firms indicated that they use ABM because they adopted the ABC system, while none of the interviewed firms indicated that they use VBM or JIT, mainly due to the unsuitability of these techniques to their firms.

Unexpectedly, the result of the questionnaire divulges that around 40% of the surveyed firms adopted the TQM system, and this may indicate that managers within some Saudi and non-Saudi firms have recognised the necessity of running their business using a quality mode in order to maintain their competitiveness. The analysis of the interviews also shows that there is a growing interest amongst some Saudi and non-Saudi firms to adopt TQM.

Seven out of twenty interviewed managers indicated that they adopted TQM, and three interviewed managers stated that their firms are on the way towards adopting this system. The interviewed managers indicated that competition, uncertainty and rapid change in the Saudi business environment were the drivers which triggered their firms to adopt a TQM philosophy. On the other hand, managers within firms which

did not adopt the TQM indicated that, since they have an ISO certificate, there is no need to invest in a complex system like TQM.

With regards to the benefits utilised from adopting AMA practices, the Mann-Whitney *U* test shows that there is a significant difference (U (158) =755, W=11195, Z=-1.7295, p<.05, 1-tailed) between the adopters and non-adopters of the ABC system in terms of growth in the total assets. The same statistical test also reveals that there are significant differences between the adopters and non-adopters of ABC (U (158) =720, W=11160, Z=-1.96, p<.05, 2-tailed), and adopters and non-adopters of TQM (U (158) =2606, W=7071, Z=-1.58, p<.05, 1-tailed), in terms of the growth in the number of customers. No significant difference was found between the adopters and non-adopters of the AMA systems in terms of growth in total revenues, and this result may lead us to put a question mark against the alleged benefits utilised from adopting the AMA systems as a whole.

Generally speaking, the previous descriptive analysis reveals that Saudi and non-Saudi firms which operate in the Eastern Province of SA are still loyal to their TMA practices, due to the limited use of AMA systems, and this may lead us to raise this question: do AMA systems have real benefits? If yes, why are the vast majority of organisations, including those located in the Eastern part of SA, reluctant to adopt the AMA systems? If no, why are the supporters of the AMA systems continuing to market these systems as life buoys which will maintain the existence of the organisations in today's business environment?

With regards to the reasons which stimulated the vast majority of Saudi and non-Saudi firms to not adopt the AMA practices, the analysis of both the questionnaires and the interviews showed that the satisfaction with the existing MASs, a lack of knowledge and the unsuitability to the nature of firms' businesses were the reasons which justified the limited adoption of AMA systems in the Eastern part of SA, so the case of the Eastern part of SA goes with the mainstream regarding the limited use of AMA systems.

Some may argue that the limited use of AMA systems, including the modern managerial philosophies, could be due to the absence of legal institutions or experts who may facilitate the adoption of these systems. However, evidence from the two most industrial countries in the world (the UK and the USA) also divulged the limited use of most of these systems. Hence, there is a possibility that practitioners do not trust the anticipated benefits which might be utilised from using these systems, especially if the practitioners were able to achieve their goals through using TMA systems.

Two types of statistical tests were used to test the research hypotheses, which were the bivariate (correlation) and the multivariate one (logistic regression). The first one was used to test the direct relationship between the dependent variable (the extent of adopting AMA practices) and each single independent variable. However, the second test was not used directly for testing the relationship between the dependent and independent variables.

To clarify this, several statistical tests (see the appendix D, page 455-497) were performed in order to first study the inter-relation amongst the new predictors, and then to test the association between the dependent variable and the new predictors through utilising the logistic regression at the second step. The result of the analytical and the theoretical part can be summarised in the following points.

The result of the correlation test reveals that there was a positive and significant relationship between the dependent variable and the PEU, but the result of the logistic regression shows that there was no relationship between the dependent variable and the new predictor presenting the PEU aspect. The analysis of the interviews divulged that twelve interviewed managers indicated that the rapid changes in the surrounding environment, especially changes in technology and the increasing the level of task uncertainty, resulted from the military actions near this area of SA during the 90s and the beginning of the new millennium, which were the two main drivers which stimulated their firms to adopt some of the AMA practices.

Seven interviewed managers have clearly indicated that if the level of dynamism increased within the surrounding environment, then this increase will motivate them to adopt more AMA practices in order to maintain their competitiveness. Therefore, we can certainly say that the result of the theoretical part, in terms of the relationship between the dependent variable and the PEU, fits with the correlation result, but not with the logistic one.

The result of the correlation test also revealed that there was a positive and significant relationship between the dependent variable and the competition. However, the

analysis of the logistic regression reveals that there was no relationship between the dependent variable and the new predictor presenting the competition aspect. Fifteen interviewed managers indicated that they adopted some AMA practices because they faced rigorous competition in terms of product price and quality. Surprisingly, none of the interviewed managers indicated that the Saudi government joining the World Trade Organisation will put pressure on their firms to adopt more AMA systems.

None of the interviewed managers indicated that imitating other successful firms was seen as a driver for adopting some AMA practices at their firms, and that this supports the influence of some contingent aspects on the decision of the firms as to whether or not they adopt some of the AMA practices. Hence, we can say that the result of the interviews is partially in line with the correlation result, but not with the logistic one.

The result of the correlation test shows that there is a positive and significant relationship between the dependent variable and the size of the firm. In the same way, the logistic result reveals that there is a positive and significant relationship between the dependent variable and the new predictor presenting the size of the firm. All of the interviewed managers indicated that size was one driver which prompted their firms to adopt some AMA practices. Therefore, we can confidently say that the size of the firm is considered an important aspect which may drive the adoption of some AMA practices.

The result of the correlation shows that there is no relationship between the dependent variable and the product range or number, while the result of the logistic test reveals that there is a positive and significant relationship between the dependent variable and

product diversity. Two-thirds of the interviewed managers indicated that they had one product line which produced ten products or less at their firms. Based on the result of the interviews, it can be said that the limited products being manufactured by Saudi and non-Saudi firms partially justifies the correlation result. At the same time, the result of the interviews did not partially fit with the logistic result.

The result of the correlation shows that there is a partial positive and significant relationship between the dependent variable and technology or automation, while the result of the logistic test exposes that there is no relationship between the dependent variable and the new predictors of technology aspect. The result of the interviews reveals that all Saudi and non-Saudi firms utilise customer technology.

The vast majority of the interviewed managers described the production process in their firms as either automated or mostly automated, and only one firm adopted the ERP system. However, none of the interviewed managers indicated that the adoption of some AMA practices in their companies was due to any type of technology. Therefore, the result of the interviews fit completely in line with the logistic result, and did not partially fit with the correlation result.

The Mann-Whitney *U* test revealed that non-Saudi firms tend to delegate authority more than Saudi firms in terms of pricing decision, budget allocation, selection of new investments and development of new products. Additionally, Saudi firms showed greater levels of uncertainty avoidance than non-Saudi firms based on the same statistical test. It is necessary to mention here that the aim from conducting the comparison between both groups (Saudi firms vs. non-Saudi firms) was to verify the

credibility of Hofstede's perspective regarding Arab culture, or more precisely Saudi culture, in terms of power distance and uncertainty avoidance.

The result of the correlation showed that there was a positive and significant relationship between the dependent variable and the level of delegating authority within non-Saudi firms. In other words, delegating the authority enabled non-Saudi firms to adopt more AMA practices compared with Saudi ones. Also, the correlation statistical test divulged that there was a reverse significant relationship between the dependent variable and the type of organisational structure (formal vs. informal). To clarify that, in non-Saudi firms, the higher the use of formal structure, the lower the number of AMA practices which were adopted.

In Saudi firms, no relationship was found between the extent of adopting the AMA practices and the formalisation level. The result of the logistic regression showed that there was no relationship between the dependent variable and the new predictor of culture aspects. The analysis of the interviews fits with the result produced by the Mann-Whitney test. Almost all interviewed managers from Saudi firms indicated that they never delegate the authority, while the opposite condition applies to the non-Saudi firms. In addition, the interviewed managers in Saudi firms indicated that they use a formal structure and that employees must adhere to the job rules in their companies, and that the inverse is true for non-Saudi firms.

Interestingly, none of the interviewed managers from Saudi firms indicated that language and belief were seen as barriers which motivated their firms to not adopt the AMA system. Only four interviewed managers from Saudi firms indicated that the

level of development within Saudi society impacted their firms to not adopt AMA practices. Generally, the limited adoption of the AMA practices, especially amongst Saudi firms, was due to the absence of legal institutions, cooperation between academics and practitioners, and the decision-making style within Saudi firms.

One important point is that the analysis of the interviews showed that the maximum number of AMA practices adopted by non-Saudi firms was four and the minimum number was one. However, the maximum number of AMA practices adopted by Saudi firms was four and the minimum number was zero (four interviewed firms). Based on the final result, it can be said that the result of the interviews fits with the correlation result, but not with the logistic one.

The result of the correlation test showed that there was a positive and significant correlation between the dependent variable and the prospector strategy. In contrast, the same analysis revealed that there was a significant reverse correlation between the score of firms in the defender composite and the dependent variable. The result of the logistic regression showed that there is a positive and significant relationship between the dependent variable and the new predictor presenting the prospector strategy, while the same statistical test found no relationship between the dependent variable and the new predictor presenting the defender strategy.

Based on the above result, it can be said that firms which follow the prospector strategy use more AMA practices compared with firms which follow the defender one. The analysis of the interviews made public that only 6 interviewed managers indicated that their firms follow the prospector strategy, while the remainder follow

the defender one. With regards to the extent of adopting AMA systems based on the type of strategy being followed, the maximum number of AMA practices adopted by firms which followed the prospector strategy was five, while none of the firms which followed the same strategy indicated that they did not adopt any AMA practices. By way of contrast, the maximum number of AMA practices adopted by firms which followed the defender strategy was three, whereas five firms which followed the same strategy indicated that they did not adopt any AMA practices. Therefore, the last finding goes in line with the results of both the correlation and logistic one.

Finally, one important thing which should be re-emphasised here is that the analysis of the interviews was used to confirm or refute the results of the questionnaires. As a consequence, the adoption or non-adoption of the AMA systems in the Eastern Province of SA was due to the effect of some contingent aspects. Despite the limitations of the current research which were mentioned in chapter six, the result of the current research should be treated with caution, mainly due to the limitations relating to the questionnaire instrument, so it would be beneficial to repeat this study.

10.3 Recommendations for Future Research

It was mentioned earlier that this research focuses on firms which operate in the Eastern Province of SA, due to their long history in the industry. However, according to the Ministry of Economics and Planning (2005), both the public and private industrial sectors in the Western area of SA have rapidly flourished since the end of the previous century, so there is a possibility that this was due to practicing business using an innovative mode. Since MAS is considered part of any organisational

structure, it would be recommended to study MAS within these firms and compare the results with the current research findings.

The literature of management accounting is characterised by dearth in terms of conducting comparative studies amongst countries. Brierley *et al.* (2001) only studied the applications of product costing amongst European countries. Hence, it would follow that there is no intensive exploratory study which covers several countries so far, so it would be beneficial to carry out a large scale exploratory study which covers several management accounting issues, in order to represent the similarities and differences amongst countries.

Prior research conducted in SA, including this one, focused only on exploring the views of practitioners regarding both TMA and AMA systems. However, we need to know how academics within universities regard these systems, particularly the modern ones. In other words, we need to explore whether or not academics teach AMA systems to students. If not, then this can be considered to be a motive or contingent driver which may stimulate managers within firms to not adopt AMA systems.

To the best knowledge of the researcher, prior research conducted in SA focused on profitable manufacturing firms. Nothing is known about other profitable non-manufacturing firms such as banks, insurance firms, private hospitals and universities, so it is time to uncover how management accounting is practiced within these firms.

As mentioned in chapter nine (page 441), some interviewed managers deemed that some AMA practices were marketed upon sound consultancy, so it would be interesting if the next research extended the contingency framework to include terms such as trust, human aspects, legal institutions and education.

The results of the correlation test and the interviews showed that the public business environment in the Eastern Province of SA is uncertain. Thus, the researcher concludes that it is time to study innovation in management accounting from a fad and fashion perspective.

Appendix A

Durham
Business School

26/1/ 2008

Dear Sir

I am conducting research under the supervision of Professor Rob Dixon and Ms. Anne Woodhead at the Department of Economics, Finance and Management of the University of Durham (United Kingdom). My research is broadly focused on studying the changes in management accounting that have occurred in domestic and foreign manufacturing firms in the Eastern Province of Saudi Arabia. More precisely, this research aims to investigate (1) the extent of the current usage of both traditional and modern management accounting practices and (2) the internal and external aspects that have stimulated your company and others regarding whether to adopt or not adopt modern management accounting techniques. I would therefore be very grateful if you could spend a few minutes to complete the enclosed questionnaire and return it to the researcher. Please be assured that all information relating to your company will be treated with care and strict confidentiality. Please could you ensure that you answer **all** the questions illustrated in this questionnaire. If you have any questions or concerns you can reach me by one of the methods below.

1- email: sas53@hotmail.com
2- Home Tel. No. 03/ 5380034
3- Mobile No. 0504920176
4- Fax No. 03/ 5869884
5- Postal address: Alhassa, P.O. Box 50253

Yours sincerely,

Ibrahim K. AL- Meaidi

***Please note that the last two pages of this questionnaire contain a glossary for the purpose of clarifying the meaning of four of the questions (three of these are in part 2 and one in part 3). Please read the glossary BEFORE answering these questions:**

Part	Section	No. of the question
Two	**One**	**1**
Two	**Three/B**	**3**
Two	**Four**	**1**
Three	**-**	**1**

Part One: Background Information

This section contains six general questions about you and your company. Please answer **all** these questions.

1. The name of your company is.....

2. What is your position in the company?

(Please put a √ in the appropriate cell)

1.	CEO		2.	General manager	
3.	Head of accounting & finance department		4.	Chief accountant	
5.	Chief management accountant		6.	Controller of the company	
Other (please explain)					

3. How many years in this position?

Less than 5	6 – 10	11 – 15	More than 15

4. Under what type of ownership is your company?

1.	Solely government owned	
2.	Solely Saudi privately owned	
3.	Solely foreign privately owned	
4.	Joint venture	
Other (please explain)		

5. What type of industry does your company belong to?

(Please put a √ in the appropriate cell)

1.	Food & beverage		2.	Textiles & leather	
3.	Wood & furniture		4.	Paper & printing	
5.	Chemical products		6.	Engineering products	
7.	Building material - non-metallic products				
Other (please explain)					

Part Two: Traditional Management Accounting Practices (TMA):

This part contains four sections. Please answer **all** questions in each section.

Section one: Costing practices:

1. Does your company utilise a single accounting system, or multiple systems?

(Please put a √ in the appropriate cell)

1.	Single system	
2.	Multiple systems, each for specific functions	
3.	Single, but plan to implement multiple	
Other (please explain)		

2. If your company is currently utilising a single accounting system, please indicate the main reasons behind not using multiple systems.

1.	Time-saving	
2.	Financial constraints	
3.	Simplicity of production process	
4.	Current system, although not perfect, is adequate	
5.	Avoiding conflict that may arise from adopting more than one system	
Other (please explain)		

3. What are the functions of your company's product costing system?

(Please circle one or more as appropriate)

1.	Product pricing	
2.	Product control	
3.	External financial reporting	
4.	Evaluation of new product cost	
Other (please explain)		

4. What type of product costing system is currently used by your company?

1.	Job order costing	
2.	Process costing	
3.	Batch	
Other (please explain)		

5. What type of costing method is currently used by your company for calculating product costs?

1.	Full product cost	
2.	Variable cost	
3.	Variable cost and full cost	
Other (please explain)		

6. How often does your company divide product costs between the following resources?

	The type of AMT	Never	Rarely	Sometimes	Often	Always
1.	Direct labour costs					
2.	Direct material costs					
3.	Other production costs					
4.	Other non-production costs					

7. Approximately by how much do each of the following elements participate in the total product cost in your company?

	Product cost elements	Less than 10%	11% - 25%	26% - 50%	51% - 75%	76% - 100%
1.	Direct labour					
2.	Direct material					
3.	Overhead costs (production & non-production)					

8. Does your company use single plant-wide overhead rate for allocating overhead costs to a product?

Yes	
No	

9. Which of the following cost drivers is most typically used by your company for allocating overhead costs?

1.	Direct labour hours	
2.	Machine hours	
3.	Direct labour costs	
4.	Machine set-ups	
5.	Units of output	
6.	Direct material cost	
Other (please explain)		

Section two: information tools for decision making

1. Does your company utilise a cost-volume-profit (CVP) relationship system?

Yes	
No	

2. Does your company currently use the cost-plus method for setting prices for the product(s) price(s) manufactured by your company?

Yes	
No	

3. How often are your company's product costs compared with market determined selling prices for major products?

Never	Rarely	Sometimes	Often	Always

4. Please indicate the importance of the following criteria used as evaluation measures to justify investment decisions in your company.

	Criteria	Not important at all	Below average importance	Average importance	Above average importance	Very important
1.	Economic evaluation					
2.	Corporate strategy					
3.	Competitiveness					
4.	Customer service					
5.	Quality					
6.	Market share					

5. How important to your company are the following methods for analysing capital investment decisions?

	Methods	Not important at all	Below average importance	average importance	above average importance	Very important
1.	Payback					
2.	Discounted payback					
3.	Accounting rate of return					
4.	Net present value					
5.	Internal rate of return					

Section three: planning and control practices:

This section covers two sub-sections (a) standard costing and (b) budgeting practices.

(A) Standard costing

1. Does your company currently utilise a standard costing system?

Yes		
No		If no, please go to sub-section (B)

2. How frequently does your company use a standard costing system for the following goals?

(Please put a √ in the appropriate cell in each row)

	Goals	Never	Rarely	Sometimes	Often	Always
1.	Transfer pricing					
2.	Setting budgets					
3.	Decision making					
4.	Evaluating investments					
5.	Controlling cost (variance analysis)					
6.	Evaluating managerial performance					

(B) Budgeting practices

1. Does your company currently use annual budgeting systems?

Yes		
No		If no, please go to the fourth section

2. How important is it for your company to utilise a budgeting system for the following objectives?

	The objectives	Not important at all	Below average importance	Average importance	Above average importance	Very important
1.	Planning day-to-day operations					
2.	Strategic analysis					
3.	Controlling costs					
4.	Judging performance					
5.	Motivating managers within the firm					
6.	Coordinating activities across business units					
7.	Communication (linking top level and lower level managers)					

3. To what extent is flexible budgeting used by your company?

Never	Rarely	Sometimes	Often	Always

Section four: transfer pricing and financial performance practices

1. Does your company (division) utilise a transfer price system?

Yes	
No	

If yes, what is the common transfer pricing method that is currently used by your company (division)?

1.	Transfer pricing based on market price	
2.	Transfer pricing based on cost of production	
3.	Negotiation of transfer prices	
Other (please explain)		

2. To what extent does your company use the following financial measures for evaluating its economic performance?

	Financial measures	Never	Rarely	Sometime	Often	Always
1.	Return on investment (ROI)					
2.	Return on sales (ROS)					
3.	Residual income (RI)					
4.	Variance analysis					
5.	Divisional profit					
6.	Contribution margin					

Part Three: Advanced Management Accounting Practices (AMA)

1. Several AMA practices have been listed in the table below as alternatives to traditional practices. Please indicate **first** whether your company currently employs these practices or not, then how important each one is to your company in both cases (employed/not employed)? Please **do not** leave out each practice.

The level of importance is: 1 = not important at all, 3 = average importance, 5 = very important

	AMA practices	Currently employed	Currently not employed	The level of importance				
1.	Activity-based costing							
2.	Target costing							
3.	Life cycle costing							
4.	Cost of quality reporting							
5.	Backflush costing							
6.	Activity-based budgeting							
7.	Non-financial measures such as manufacturing lead time, employees' attitudes and customers satisfaction)							
8.	Balanced scorecards							
9.	Activity-based management							
10.	Total quality management							
11.	Value-based management							
12.	Throughput accounting							
13.	Just-In-Time (production)							

2. If your company **employs** all or some of the aforesaid AMA practices, please indicate what are the main motives that have stimulated your company to adopt these new practices?

(Please select as appropriate)

1.	To compete strategically	
2.	To ensure the company's survival in the long-run	
3.	In response to changes occurring in the business arena	
4.	The dissatisfaction of the company's senior managers regarding the usefulness of TMA practices	
5.	Imitating other successful Western and Eastern companies who have benefited from adopting such practices	
Other (please explain)		

3 If your company **does not employ** the aforesaid AMA practices, please indicate which of the following have been the main barriers hindering management accounting change in your company?

(Please select as appropriate)

1.	Cost of change related to equipment, people and time		2.	Satisfaction with the existing costing systems	
3.	Lack of relevant skills		4.	Lack of relevant software	
5.	Management inertia		6.	Fear of failure	
7.	Governmental regulations		8.	Cultural norms	
9.	The absence of training programmes		10.	The level of development within society	
Other (please explain)					

4. How would you best describe the growth in the following areas in your company during the last five years? (2002 – 2006)

	Items	Sharply decreased		Stayed approximately stable		Sharply increased
1.	Total revenues					
2.	Total assets					
3.	The number of customers satisfied with your company's products					

Part Four: The Internal and External Aspects

This section deals with some internal and external aspects that may influence the decision firms regarding adopting/non-adopting AMA practices. Again, please answer **all** questions illustrated below.

1. How many new products has your company produced or marketed during the past five years?

None				Many
1	2	3	4	5

2. How stable/dynamic is the external environment (economic and technological) facing your company?

	Items	Very stable				Very dynamic
1.	Economic	1	2	3	4	5
2.	Technological	1	2	3	4	5

3. During the past five years, how hard or easy has it been to predict the tastes and preferences of your customers?

Much easier to predict				Much harder to predict
1	2	3	4	5

4. During the past five years, have the legal, political and economic constraints surrounding your company changed?

Remained about the same				Have proliferated greatly
1	2	3	4	5

5. How intense is each of the following items in your main industry?

	Items	Of negligible intensity				Extremely intense
1.	Bidding for purchase or inputs	1	2	3	4	5
2.	Competition for manpower	1	2	3	4	5
3.	Quality competition	1	2	3	4	5
4.	Price competition	1	2	3	4	5

6. How large is your company (number of current employees)?

Least than 20	21 – 100	101 – 500	501 – 1000	More than 1000

7. By the end of year 2006, what was the approximate value of each of the following items in your company?

	Items	
1.	Total assets (approximately)	
2.	Annual sales revenue (approximately)	

8. How many different types of products does your company currently produce?

Less than 5	6 – 10	11 – 20	More than 20

9. Please indicate which point in the following scale best describes the whole range of products marketed by your company.

Highly standardised		Neutral		Wholly customised
1	2	3	4	5

10. How automated is the production process of your company?

Not automated at all		Moderately automated		Completely automated
1	2	3	4	5

11. How frequently are each of the following technologies used in your company?

	The type of technologies	Never	Rarely	Sometimes	Often	Always
1.	Customer technology					
2.	Small batch, job shop					
3.	Large batch technology					
4.	Mass production technology					
5.	Continuous process technology					

12. To what extent does your company use the following types of advanced manufacturing technology (AMT) in its operations?

	The type of AMT	Never	Rarely	Sometimes	Often	Always
1.	Computer aided design					
2.	Computer aided engineering					
3.	Computer integrated manufacturing					
4.	Enterprise resource planning					
5.	Material requirements planning					
6.	Manufacturing resource planning					

13. To what extent does your company use electronic data processing for performing its activities?

Not used at all				Used for almost all of the firm's internal and external transactions
1	2	3	4	5

14. How often has your operations technology (the machine-based processes involved in your operations) undergone significant changes during the last five years?

No changes at all				At least 5 significant changes in the last 5 years
1	2	3	4	5

15. To what extent has authority been delegated to the appropriate senior managers for each of the following classes of decisions in your company? (Please rate actual, rather than stated, authority).

	Classes (types) of decisions	No delegation				Complete delegation
1.	Pricing decisions					
2.	Budgeting allocation					
3.	Selection of new investments					
4.	Development of new products					

16. Which of the following best characterises the specification of actual job tasks in your company?

Formal description of job tasks exists				No formal description of job tasks exists
1	2	3	4	5

17. How important are the following strategy objectives to your company's top management?

The level of importance is: 1 = not important at all, 3 = average importance, 5 = very important

	The objectives	1	2	3	4	5
1.	Concentrating on a broad market domain					
2.	Searching for market opportunities					
3.	Emphasising the efficiency of the existing operation					
4.	Engaging extensively in product market research					
5.	Offering the customer a high quality of product with a lower price					
6.	The firm's believes in being 'first-in' in the industry in development of new products					
7.	Customising products and services to meet customers' needs					
8.	Providing prompt deliveries to customers					
9.	Providing an effective after-sale service and supporting product availability					
10.	Maintaining market strength in all areas in which the company operates					

- Please add any additional comments that you feel should be taken into consideration when studying change in management accounting.

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- If you would like to receive a copy of the outcomes of this study, please give your work e-mail address and telephone number.

Work telephone no.	
Work e-mail	

Thank you very much for your cooperation and time spent filling in this questionnaire

Ibrahim Khalid AL- Meaidi

Alhassa, P.O. Box 50253

Glossary

	Part two	Section one	Question No. 1
Clarifying the meaning of this question	According to Johnson and Kaplan (1987), the cost and management accounting system within an organisation should be isolated from the financial system because each serves a different purpose. The financial system normally serves the firm's external purposes, such as stock valuation, while the cost and management accounting system serves the firm's internal functions, i.e. cost control, cost analysis, budgeting control, performance appraisal etc. Johnson and Kaplan therefore advised companies to adopt multiple systems for different purposes. With this in mind, please indicate in the relevant part and section of the questionnaire whether your company is currently using (a) one accounting system for a variety of functions, or (b) multiple systems for each specific function or (c) one system, but planning to implement multiple systems or other.		

	Part two	Section three/B	Question No. 3
The meaning of flexible budgeting	**Flexible budgeting** means flexing variable costs from original budgeted levels to the allowances permitted for actual volume achieved while maintaining fixed cost at original budget level (The Charted Institute of Management Accountants, 2005, p. 6)		

	Part two	Section four	Question No. 1
The meaning of transfer price	**Transfer price** means price that one subunit (segment, department, division, etc.) of an organisation charges for a product or service supplied to another subunit of the same organisation. (Horngren *et al*., 2005, p. 903).		

Part 3, question No. 1

	AMA practices	Meaning
1.	Activity-based costing (ABC)	ABC is an approach to costing that focuses on activities as the fundamental cost objects. It uses the cost of these activities as the basis for assigning costs to other cost objects such as products, services or customers. (Horngren *et al*., 2005; p.891)
2.	Target costing (TC)	TC is a management method that allows firms to provide customers with products that they want, when they want them, at a price they can afford, and still earn adequate financial returns (Freeman, 1998, p.14).
3.	Life cycle costing	System that tracks and accumulates the actual costs attributable to each product from start to finish (Horngren *et al*., 2005; p.897).
4.	Cost of quality reporting	It's a report that indicates the total cost to the organization of producing products or services that do not conform with quality requirements (Drury, 2006, p.959)
5.	Backflush costing	Costing system that delays recording changes in the states of a product being produced until good finished units appear; it then uses budgeted or standard costs to work backwards to flush out manufacturing costs from the units produced (Horngren *et al*., 2005; p.891).
6.	Activity – based budgeting (ABB)	Approach to budgeting that focuses on the costs of activities necessary to produce and sell products and services (Horngren *et al*., 2005; p.891).
7.	Non-financial measures	Examples of non-financial measures are: manufacturing lead time, employees' attitudes, and customers satisfaction (e.g. on-time delivery rate, number of complaints from customers, satisfaction level with product features, etc)
8.	Balanced scorecards (BSC)	A measurement and management system that views a business unit's performance from four perspectives: financial, customer, internal business process, and learning and growth (Horngren *et al*., 2005; p.891).
9.	Activity-based management (ABM)	Management system which uses ABC information to improve profits and enhance value to customers (Horngren *et al*., 2005; p.891).
10.	Total quality management (TQM)	TQM is a term used to describe a situation where all business functions are involved in a process of continuous quality improvement (Drury, 2006, p.957).
11.	Value-based management (VBM)	VBM is management team preoccupation with searching for and implementing the activities which will contribute most to increase in shareholder value (The Charted Institute of Management Accountants, 2005).
12.	Throughput accounting (THC)	TC is not a complete cost accounting system as it does not include the double-entry bookkeeping logic of the other systems, however, it includes three measures-throughput, inventory and operating expense (T, I and OE)-which comprehend all the costs of a firm and which Goldratt believes allow management to see the effect of operating decisions on firm profitability (Boyd and Cox, 2002, p. 1881).
13.	Just-In-Time production (JIT)	Production system in which each component on a production line is produced immediately as needed by the next step in the production line (Horngren *et al*., 2005; p.897).

Appendix B

Durham
Business School

السيد / **المحترم**

التاريخ: 2008/1/26

تحية طيبة،

أود أن أفيد سعادتكم بأنني المدعو/ إبراهيم خالد أحمد المعيدي، طالب في مرحلة الدكتوراه في جامعة درم بالمملكة المتحدة (University of Durham) تحت إشراف كل من البروفسور روبرت ديكسون و آن وودهد، وحالياً أنا بصدد جمع البيانات اللازمة لبحث الدكتوراه والذي يتعلق بدراسة نُظم المحاسبة الإدارية المُطبقة حالياً في الشركات الصناعية (السعودية والغير سعودية) الموجودة في المنطقة الشرقية من المملكة العربية السعودية والعوامل (الداخلية/الخارجية) التي دفعت بهذه الشركات إلى تغير أو عدم تغير النُظم التقليدية في المحاسبة الإدارية في هذه الشركات.

أرجو التكرم بالإجابة على جميع الأسئلة الموجودة بهذا الاستبيان وإرساله في المظروف البريدي المُسبق الدفع المرفق بهذا الاستبيان على عنوان الباحث، ويتعهد الباحث المذكور بعاليه بأن البيانات المُرسلة له من قِبل شركتكم سيتم التعامل معها بكل سرية تامة وسوف يقتصر استخدامها فقط على هذه الدراسة. كما يتمنى الباحث من سعادتكم عند مصادفتكم لأية صعوبة في فهم المقصد الأساسي من أي نقطة في هذا الاستبيان الاتصال بهِ لتوضيح المقصد الأساسي لتلك النقطة على الأرقام المُرفقة أو من خلال البريد الالكتروني.

ت. المنزل 03/ 5380034 – ت. الجوال 0504920176 – sas53@hotmail.com

فائق الاحترام والتقدير لسعادتكم على التكرم بملء هذا الاستبيان

*** يوجد مُلحق تعرفي للمقصود من بعض الأسئلة والمصطلحات الموجودة في هذا الاستبيان كما هي موضحة في الجدول التالي، أرجو التكرم بقراءتها قبل الإجابة على هذه الأسئلة.**

الجـزء	القسم	رقم السؤال
الثاني	الأول	1
الثاني	الثالث/ الفرع الثاني	3
الثاني	الرابع	1
الثالث	-	1

الباحث:

إبراهيم خالد المعيدي
الاحساء – ص. ب. 50253

الجزء الأول: معلومات عامة

هذا الجزء يحتوي على خمسة **أسئلة** عامة تخص الشخص الذي يقوم بتعبئة هذا الاستبيان، كما يتضمن معلومات خاصة بالشركة. الرجاء التكرم بالإجابة على **جميع** الأسئلة.

1. اسم شركتكم هو.....

2. ما هو منصبك داخل الشركة؟

(الرجاء وضع علامة (√) داخل المربع المناسب أو وضع دائرة حول الرقم المناسب)

1.	المدير التنفيذي للشركة		2.	المدير العام للشركة	
3.	رئيس قسم المحاسبة والمالية بالشركة		4.	رئيس المحاسبيين بالشركة	
5.	رئيس المحاسبيين الإداريين بالشركة		6.	المراقب العام للشركة	
7.	أخرى (الرجاء إيضاح طبيعة المنصب)				

3. كم سنة قضيتها في هذا المنصب؟

(ا الرجاء وضع علامة (√) في المربع المناسب)

أقل من 5 سنوات	6 – 10 سنوات	11 – 15 سنة	أكثر من 15 سنة

4. ما طبيعة ملكية الشركة؟

1.	هل هي شركة حكومية مملوكة للدولة السعودية بالكامل	
2.	هل هي شركة خاصة سعودية بالكامل	
3.	هل هي شركة خاصة غير سعودية بالكامل	
4.	هل هي شركة ذات أعمال مشتركة (سعودية و أجنبية)	
أخرى (الرجاء الإيضاح)		

5. تحت أي نوع من القطاعات الرئيسة التالية تدرج طبيعة نشاط أو عمل شركتكم؟

1.	المواد الغذائية والمشروبات		2.	المنسوجات والملابس والجلود	
3.	الخشب ومنتجاته والأثاث		4.	الورق ومنتجاته والطباعة والنشر	
5.	المنتجات الكيماوية		6.	المنتجات الهندسية (حديد ، المنيوم، الخ)	
7.	مواد البناء (منتجات غير معدنية)				
أخرى (الرجاء الإيضاح)					

الجزء الثاني: النُظم التقليدية في المحاسبة الإدارية:

◄ **هذا الجزء يظم أربعة أقسام، الرجاء التكرم بالإجابة على جميع الأسئلة الخاصة بكل قسم.**

القسم الأول: النظام المحاسبي وتطبيقات محاسبة التكاليف:

1. هل شركتكم لديها نظام محاسبي واحد فقط أو أنظمة محاسبية متعددة؟

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

.1	نظام محاسبي واحد فقط يُستخدم لأغراض محاسبية ومالية مختلفة	
.2	أنظمة محاسبية متعددة، كل نظام يُستخدم لغرض خاص به	
.3	حالياً نظام واحد، لكن الشركة لديها خطة لتطبيق أو استخدام أنظمة محاسبية متعددة	
أخرى (الرجاء الإيضاح)		

2. إذا كانت شركتكم لديها نظام محاسبي واحد فقط، ما هي الأسباب التي دفعت بشركتكم لعدم استخدام أنظمة محاسبية متعددة.

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

.1	توفير الوقت والجهد	
.2	معوقات وصعوبات مالية	
.3	بساطة وسهولة العملية الإنتاجية حيث لا يتطلب الوضع تطبيق أنظمة محاسبية متعددة	
.4	على الرغم من أن النظام المحاسبي الحالي غير دقيق بما فيه الكفاية ، لكن يعتبر مقبول ومناسب	
.5	تجنب حدوث التضارب الذي قد يحدث من تطبيق أكثر من نظام محاسبي واحد	
أخرى (الرجاء الإيضاح)		

3. ما هي الوظيفة أو الوظائف الأساسية لنظام التكاليف الخاص بشركتكم؟

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

.1	تسعير المنتج	
.2	ضبط التكلفة الخاصة بالمنتج	
.3	خدمة إعداد التقارير المالية التي تحتاجها الأطراف الخارجية	
.4	تقيم تكلفة المنتج الجديدة	
أخرى (الرجاء الإيضاح)		

4. ما نوع نظام تكاليف الإنتاج الحالي المُستخدم في شركتكم؟

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

.1	نظام تكاليف الأوامر الإنتاجية	
.2	نظام تكاليف المراحل الإنتاجية	
.3	نظام تكاليف الدفعة الإنتاجية	
أخرى (الرجاء الإيضاح)		

5. ما نوع طريقة التكاليف التي تستخدمها شركتكم في تجميع تكلفة المنتج؟

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

.1	طريقة التكلفة الكلية	
.2	طريقة التكلفة المتغيرة	
.3	طريقة التكلفة الكلية والمتغيرة معاً	
أخرى (الرجاء الإيضاح)		

6. كيف يتم في الغالب تقسيم أو توزيع تكلفة إنتاج المنتج في شركتكم بين عناصر التكاليف المدرجة بالجدول؟

	عناصر التكاليف	إطلاقاً	نادراً	أحياناً	غالباً	دائماً
1.	تكاليف الأجور المباشرة					
2.	تكاليف المواد المباشرة					
3.	تكاليف إنتاجية أخرى					
4.	تكاليف غير إنتاجية أخرى					

7. بشكل تقريبي، كم تشكل تكلفة كل عنصر من العناصر المدرجة بالجدول بالنسبة للتكلفة الإجمالية لإنتاج المنتج أو المنتجات في شركتكم؟

	عناصر التكلفة	أقل من 10%	11% - 25%	26% - 50%	51% - 75%	76% - 100%
1.	الأجور المباشرة					
2.	المواد المباشرة					
3.	التكاليف الغير مباشرة (الإنتاجية والغير إنتاجية)					

8. هل شركتكم تستخدم حالياً معدل تحميل واحد للتكاليف الصناعية غير المباشرة لكافة الأقسام بداخل الشركة؟

نعم	
لا	

9. أي من الأسس الموجودة بالجدول غالباً تستخدمه شركتكم كأساس لتوزيع تكاليف مراكز الخدمات الإنتاجية على مراكز الإنتاج؟.

(الرجاء وضع علامة (√) داخل المربع المناسب في يسار الجدول أو الإيضاح)

1.	ساعات العمل المباشر	
2.	ساعات دوران الآلات	
3.	تكلفة العمل المباشر	
4.	عدد مرات ضبط الآلات	
5.	عدد الوحدات المنتجة	
6.	تكلفة المواد المباشرة	
أخرى (الرجاء الإيضاح)		

القسم الثاني: نظم اتخاذ القرار:

1. هل تستخدم شركتكم حالياً أسلوب تحليل التكلفة – الحجم – الربح في اتخاذ القرار؟

نعم	
لا	

2. عند تسعير منتجات شركتكم، هل يستخدم حالياً في شركتكم نظام تغطية تكاليف المنتج مضافاً إليه نسبة ربح محددة؟

نعم	
لا	

3. إلى أي مدى تقوم شركتكم بمقارنة السعر الذي تحدده لبيع منتجاتها بالأسعار الدارجة في السوق؟

إطلاقاً	نادراً	أحياناً	غالباً	دائماً

4. الرجاء بيان أهمية كل معيار من المعايير المدرجة بالجدول بالنسبة لشركتكم في حالة رغبتها في اتخاذ قرار الاستثمار.

	المعايير	غير مهم أبداً	أهمية أقل من المتوسط	أهمية وسطى	أهمية أعلى من المتوسط	مهم جداً
1.	التقييم الاقتصادي					
2.	استراتيجيات الشركة					
3.	المنافسة					
4.	خدمات المستهلك					
5.	الجودة					
6.	الحصة السوقية					

5. يتضمن الجدول التالي مجموعة من الطرق المستخدمة في تقييم قرارات الاستثمار داخل الشركات، الرجاء بيان أهمية كل طريقة من الطرق المدرجة بالجدول بالنسبة لشركتكم.

	الطُرق	غير مهم أبداً	أهمية أقل من المتوسط	أهمية وسطى	أهمية أعلى من المتوسط	مهم جداً
1.	فترة استرداد الاستثمار Payback					
2.	فترة استرداد الاستثمار المخصومة Discounted payback					
3.	معدل العائد المحاسبي Accounting rate of return					
4.	صافي القيمة الحالية Net present value					
5.	معدل العائد الداخلي Internal rate of return					

القسم الثالث: نظم التخطيط والرقابة:

هذا القسم يتكون من فرعين (التكاليف المعيارية والموازنة):

الفرع الأول: التكاليف المعيارية:

1. هل شركتكم حالياً تستخدم نظام التكاليف المعيارية؟

نعم		
لا		إذا كانت الإجابة **بلا**، الرجاء الذهاب مباشرة للفرع الثاني

2. الرجاء بيان مدى استخدام شركتكم نظام التكاليف المعيارية لتحقيق الأهداف التالية:

(الرجاء وضع علامة (√) داخل المربع المناسب في كل صف)

	الأهداف	إطلاقاً	نادراً	أحياناً	غالباً	دائماً
1.	أسعار التحويل					
2.	إعداد الموازنة					
3.	اتخاذ القرارات					
4.	تقييم الاستثمارات					
5.	ضبط التكاليف من خلال تحليل الانحرافات					
6.	تقييم الأداء الإداري					

الفرع الثاني: تطبيقات الموازنة:

1. هل شركتكم حالياً تستخدم نظام الموازنة السنوية؟

نعم		
لا		إذا كانت الإجابة **بلا**، الرجاء الذهاب مباشرة للقسم الثالث

2. ما مدى أهمية استخدام نظام الموازنة السنوية في شركتكم لتحقيق الأهداف التالية:

	الأهداف	غير مهم أبداً	أهمية أقل من المتوسط	أهمية وسطى	أهمية أعلى من المتوسط	مهم جداً
1.	تخطيط العمليات الإنتاجية اليومية					
2.	تحليل الاستراتيجيات					
3.	ضبط التكاليف					
4.	تقييم الأداء					
5.	تشجيع المدراء في الشركة					
6.	تنسيق الأنشطة المختلفة داخل الشركة					
7.	ربط الإدارة العليا بالإدارة الدنيا					

3. ما مدى استخدام نظام الموازنة المرنة في شركتكم ؟

لا تستخدم إطلاقاً	نادراً ما تستخدم	تستخدم أحياناً	تستخدم غالباً	تستخدم دائماً

القسم الرابع: أسعار التحويل و المعايير المالية المستخدمة في قياس الأداء:

1. هل تستخدم شركتكم حالياً نظام أسعار التحويل بين الفروع المختلفة للشركة؟

نعم	
لا	

إذا كانت شركتكم **تستخدم هذا النظام** الرجاء بيان أي من طرق التحويل التالية تستخدمها شركتكم حالياً.

1.	طريقة أسعار التحويل على أساس سعر السوق	
2.	طريقة أسعار التحويل على أساس تكلفة الإنتاج	
3.	طريقة أسعار التحويل على أساس المفاوضات	
أخرى (الرجاء الإيضاح)		

2. ما مدى استخدام شركتكم للمقاييس المالية المدرجة بالجدول لتقييم الأداء الاقتصادي لشركتكم بشكل عام ؟

	المقاييس المالية	إطلاقاً	نادراً	أحياناً	غالباً	دائماً
1.	العائد على الاستثمار Return on investment					
2.	العائد على المبيعات Return on sales					
3.	الدخل المتبقي Residual income					
4.	تحليل الانحرافات Variance analysis					
5.	ربح الفروع أو الأقسام Divisional profit					
6.	هامش المساهمة Contribution margin					

الجزء الثالث: التطبيقات الحديثة في المحاسبة الإدارية:

1. الجدول التالي يتضمن مجموعة من النُظم الحديثة في مجال المحاسبة الإدارية، الرجاء **أولاً** بيان ما إذا كانت شركتكم حالياً تستخدم هذه الأنظمة أم لا، **ثانياً** بيان مدى أهمية تطبيق كل نظام من هذه الأنظمة بالنسبة لشركتكم.

مستوى الأهمية: الرقم (1) يشير إلى عدم الأهمية على الإطلاق ، الرقم (3) أهمية وسطى ، الرقم (5) يشير إلى أهمية بالغة لهذا النظام.

	النظم الحديثة في المحاسبة الإدارية	مُطبق حالياً في الشركة	غير مُطبق حالياً في الشركة	مستوى أهمية النظام بالنسبة للشركة				
				1	2	3	4	5
.1	نظام التكاليف حسب الأنشطة Activity-based costing							
.2	نظام التكاليف المستهدفة Target costing							
.3	أسلوب دورة حياة المنتج Life cycle costing							
.4	تقارير تكلفة الجودة Cost of quality reporting							
.5	نظام تحديد التكلفة إرتجاعياً Backflash costing							
.6	نظام إعداد الموازنة حسب الأنشطة							
.7	مقاييس الأداء غير المالية مثل سلوك الموظفين – رغبات المستهلك – التصنيع الوقتي.							
.8	نظام بطاقة مقياس الأداء المتوازن Balanced Scorecard							
.9	نظام الإدارة حسب النشاط							
.10	نظام إدارة الجودة الشاملة Total quality management							
.11	الإدارة على أساس القيمة Value-based management							
.12	محاسبة الإنتاجية Throughput accounting							
.13	نظام المخزون الصفري Just-In-Time							

2. إذا كانت شركتكم **تطبق** حالياً النظم الحديثة السابق الإشارة إليها في الجدول السابق أو بعض منها، الرجاء بيان السبب أوالمُحفز الذي دفع بشركتكم **لتطبيق** هذا النظام أو الأنظمة.

.1	حتى تستطيع الشركة المنافسة في السوق استراتيجياً	
.2	حتى تضمن الشركة بقائها في السوق لأطول فترة ممكنة	
.3	استجابة للتغيرات التي طرأت على بيئة الأعمال بشكل عام داخليا وخارجياً	
.4	عدم رضا مدراء الشركة عن الأنظمة التقليدية للمحاسبة الإدارية	
.5	محاولة تقليد الشركات الناجحة في الدول الغربية وشرق آسيا	
سبب آخر (الرجاء الإيضاح)		

3. إذا كانت شركتكم **لا تطبق** حالياً النظم السابق الإشارة إليها في الجدول السابق أو بعض منها، الرجاء بيان السبب أوالمُحفز الذي دفع بشركتكم **لعدم تطبيق** هذه الأنظمة.

1.	التكلفة المتعلقة بعملية التغير مثل (تكلفة تدريب العمال – تكلفة المعدات – الوقت)		2.	الرضا والقبول التام بالأنظمة المحاسبية والإدارية الحالية المطبقة في الشركة	
3.	عدم توافر المهارات المناسبة للتعامل مع هذه الأنظمة الحديثة		4.	عدم توافر البرامج الالكترونية التي تتطلبها عملية تطبيق هذه الأنظمة	
5.	عدم اهتمام إدارة الشركة بهذه الأنظمة أو إدارة الشركة تتسم بعدم الحيوية ومكتفيه بما هو معتاد ومألوف لديها		6.	الخوف من الفشل في تطبيق هذه الأنظمة	
7.	معوقات حكومية		8.	معوقات متعلقة بثقافة المجتمع	
9.	غياب برامج التدريب		10.	مستوى التقدم في المجتمع	
أسباب أخرى (الرجاء الإيضاح)					

4. في آخر خمس سنوات من ممارسة شركتكم لنشاطها ، ما طبيعة النمو الذي طرأ على العناصر الثلاثة الموجودة بالجدول؟ (2002 – 2006)

	العناصر	انخفضت بشدة		تقريباً شبه ثابت		ازدادت بشدة
1.	إجمالي إيرادات الشركة هل					
2.	إجمالي أصول الشركة هل					
3.	إجمالي عدد المستهلكين لمنتجات الشركة هل					

الجزء الرابع: العوامل الداخلية والخارجية:

هذا الجزء يتناول مناقشة أو دراسة أهم الأسباب الداخلية والخارجية الطارئة و التي يمكن أن تؤثر على قرار شركتكم حيال تطبيق أو عدم تطبيق النظم الحديثة في المحاسبة الإدارية. الرجاء التكرم بالإجابة **على جميع الأسئلة**.

1. كم منتج جديد أنتجته أو سوقته شركتكم للمستهلك خلال الخمس السنوات الماضية؟

ولا منتج على الإطلاق				منتجات عديدة
1	2	3	4	5

2. ما مدى ثبات أو عدم ثبات بيئة العمل الخارجية التي تمارس شركتكم فيها نشاطها من الناحية الاقتصادية والتكنولوجية؟ **بمعنى** هل البيئة الخارجية المحيطة بشركتكم تتميز بالتغير السريع من الناحية الاقتصادية والتكنولوجية أم ثابتة؟ الرجاء اختيار الرقم المناسب (1 – 2 – 3 – 4 – 5).

	العناصر	ثابتة جداً				ديناميكية أو متغيرة جداً
1.	من الناحية الاقتصادية	1	2	3	4	5
2.	من الناحية التكنولوجية	1	2	3	4	5

3. خلال الخمس سنوات الماضية، ما مدى السهولة أو الصعوبة التي واجهتها شركتكم في عملية التنبؤ بأذواق المستهلكين لمنتجات شركتكم؟

كان من السهولة جداً التنبؤ بأذواق المستهلكين لمنتجات شركتنا				كان من الصعوبة جداً التنبؤ بأذواق المستهلكين لمنتجات شركتنا
1	2	3	4	5

4. خلال الخمس سنوات الماضية، ما مدى حجم التغير الذي طرأ على السياسات أو القوانين الحكومية و المعوقات الاقتصادية في بيئة العمل لتي تمارس فيها شركتكم نشاطها؟

تبقت كما هي دون تغير				تغيرت وتجددت بشكل كبير
1	2	3	4	5

5. ما مدى حدة المنافسة التي تواجهها شركتكم في السوق بالنسبة لكل بند من البنود المدرجة بالجدول؟

	بنود المنافسة	منافسة ضعيفة				منافسة قوية
1.	حدة المنافسة في شراء المواد الخام اللازمة لعملية إنتاج المنتج	1	2	3	4	5
2.	حدة المنافسة في الحصول على العمالة البشرية	1	2	3	4	5
3.	حدة المنافسة في جودة المنتج	1	2	3	4	5
4.	حدة المنافسة في السعر (لمنتجات الشركة)	1	2	3	4	5

6. عدد الموظفين الحاليين في شركتكم بشكل مجمل يتراوح بين:

أقل من 20 موظف	100 – 21	500 – 101	1000 – 501	أكثر من 1000 موظف

7. الرجاء الإيضاح بشكل تقريبي للعناصر المدرجة بالجدول في شركتكم في آخر السنة المالية 2006.

	العناصر	
1.	إجمالي أصول الشركة تقريباً	
2.	إجمالي إيرادات الشركة السنوية تقريباً	

8. كم عدد أنواع المنتجات المختلفة التي تنتجها شركتكم حالياً؟

اقل من 5 منتجات	10 – 6	20 - 11	أكثر من 20 منتج

9. الرجاء إيضاح أي نقطة من النقاط الموجودة في الجدول توضح نمطية أو طبيعة إنتاج المنتج أو المنتجات في شركتكم.

الإنتاج موحد بشكل عام		حيادي بمعنى الجمع بين الطريقتين		الإنتاج يتم حسب رغبة المستهلك
1	2	3	4	5

10. إلى أي مدى يمكن وصف طريقة تصنيع المنتج في شركتكم من ناحية الاعتماد على الميكنة الآلية؟

غير معتمده على الميكنة الآلية بتاتاً بمعنى أن العمل يدوي بشكل تام		نصف آلية		معتمده على الميكنة الآلية بشكل تام
1	2	3	4	5

11. إلى أي مدى يتم استخدام العناصر التكنولوجية المدرجة بالجدول في شركتكم؟

	العناصر التكنولوجية	إطلاقاً	نادراً	أحياناً	غالباً	دائماً
1.	استخدام التكنولوجيا في خدمة المستهلكين					
2.	استخدام التكنولوجيا في حالة الإنتاج بدفعات صغيرة					
3.	استخدام التكنولوجيا في حالة الإنتاج بدفعات كبيرة					
4.	استخدام التكنولوجيا في حالة الإنتاج الشامل					
5.	استخدام التكنولوجيا في عمليات الإنتاج بشكل مستمر					

12. إلى أي مدى تستخدم شركتكم النظم التكنولوجية الحديثة المدرجة في الجدول في عملياتها الإنتاجية؟

	أنواع النظم التكنولوجية الحديثة في الإنتاج	إطلاقاً	نادراً	أحياناً	غالباً	دائماً
1.	التصميم باستخدام أو بمساعدة الكمبيوتر Computer-aided design					
2.	هندسة العمليات الإنتاجية باستخدام الكمبيوتر Computer-aided engineering					
3.	التصنيع المتكامل باستخدام الكمبيوتر Computer integrated manufacturing					
4.	تخطيط موارد الشركة باستخدام الكمبيوتر Enterprise resource planning					
5.	تخطيط احتياجات الشركة من المواد باستخدام الكمبيوتر Material requirements planning					
6.	نظام تخطيط الموارد الصناعية Manufacturing resource planning					

13. إلى أي مدى تستخدم شركتكم النظام الالكتروني في نقل وتبادل المعلومات بين أقسام الشركة المختلفة داخلياً، والتعامل مع الأطراف الخارجية الكترونياً؟

لا يستخدم النظام الالكتروني على الإطلاق				يستخدم النظام الالكتروني بشكل تام
1	2	3	4	5

14. إلى أي مدى أدخلت شركتكم تطوير وتغير تكنولوجي على عملياتها الإنتاجية أو الآلات التي تستخدم في العملية الإنتاجية خلال الخمس سنوات الماضية؟

لم يتم إدخال أي تغير أو تعديل تكنولوجي نهائياً				على الأقل تم إدخال 5 تغيرات تكنولوجية رئيسية على العملية الإنتاجية
1	2	3	4	5

15. إلى أي مدى تم تفويض ومنح كِبار المدراء المناسبين في شركتكم سلطة اتخاذ القرار فيما يتعلق بالقرارات المدرجة بالجدول الموضح أدناه (الرجاء إيضاح وتقدير مدى التفويض الممنوح لهؤلاء المدراء بالشكل الذي يعكس الواقع الفعلي لمدى تفويض السلطة داخل شركتكم).

	أنواع القرارات	لا يوجد تفويض بشكل قطعي					تفويض كامل
1.	تسعير منتجات الشركة	1	2	3	4	5	
2.	توزيع وتحديد بنود الميزانية للشركة	1	2	3	4	5	
3.	اختيار مصادر الاستثمارات الجديدة للشركة	1	2	3	4	5	
4.	تطوير منتجات جديدة للشركة	1	2	3	4	5	

16. أي من المستويات أو النقاط المدرجة بالجدول تعكس مدى توصيف طبيعة العمل الخاص بكل موظف في شركتكم والتقيد به؟

يوجد وصف رسمي واضح لطبيعة العمل الخاص بكل موظف في الشركة				لا يوجد وصف رسمي واضح لطبيعة العمل الخاص بكل موظف في الشركة
1	2	3	4	5

17. الرجاء بيان أهمية كل هدف للإستراتيجيات المدرجة بالجدول بالنسبة للإدارة العليا لشركتكم.

مستوى الأهمية: الرقم (1) يشير إلى عدم الأهمية على الإطلاق ، الرقم (3) أهمية وسطى ، الرقم (5) يشير إلى أهمية بالغة. الرجاء وضع علامة (√) داخل المربع المناسب في كل صف.

	الأهداف الخاصة بكل استراتيجية	1	2	3	4	5
1.	التركيز على توزيع منتجات الشركة في أسواق متعددة داخل البلد وخارجها					
2.	البحث المستمر عن الفرص التسويقية داخل السوق لتوزيع منتجات الشركة					
3.	التركيز المستمر على فاعلية وكفاءة العمليات الإنتاجية الحالية للشركة					
4.	الاهتمام البالغ والصرف بسخاء على عمل البحوث التسويقية لضمان استمرارية الشركة في السوق					
5.	توفير للمستهلكين منتجات ذات جودة عالية بأقل الأسعار بشكل دائم					
6.	الريادة الدائمة من ناحية تقديم منتجات مبتكرة لأول مرة في السوق					
7.	التركيز على إنتاج منتجات أو تقديم خدمات تتوافق مع رغبات المستهلك					
8.	التركيز بشكل مستمر على تقديم خدمات توصيل منتجات الشركة للمستهلك مجاناً					
9.	التركيز بشكل مستمر على تقديم خدمات ما بعد البيع للمستهلك لضمان ولاء المستهلك لمنتجات الشركة بشكل دائم					
10.	الحِفاظ على مكانة الشركة في السوق في حدود المنطقة الجغرافية التي يتم توزع منتجاتها فيها بشكل مستمر					

- **الرجاء التكرم بإضافة أي ملاحظات أو تعليقات ترى أنها من الضروري أخذها في الحسبان عند دراسة التغير أو عدم التغير في المحاسبة الإدارية والعوامل المؤثرة في هذا التغير من عدمه.**

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- **إذا كانت شركتكم ترغب في الحصول على نسخة من نتائج التحليل لهذه الدراسة، الرجاء التكرم بوضع البريد الالكتروني الخاص بالشركة ورقم الهاتف.**

رقم الهاتف الخاص بالشركة	
البريد الالكتروني	

جزيل الشكر والعرفان مقدم لسعادتكم على التكرم بملء هذا الاستبيان.

الباحث: إبراهيم خالد المعيدي

الاحســاء – ص. ب. 50253

ملحق

	الجزء الثاني	القسم الأول	السؤال الأول
إيضاح المقصود أو الهدف من هذا السؤال	أشار الباحثان جونسون و كابلن في اطروحتهما المنشورة عام 1987 أن المنشأة يجب أن يكون لديها أكثر من نظام محاسبي على أقل تقدير نظام محاسبي داخلي يهتم بشؤون تقيم الأداء ، تحليل التكاليف ، ضبط كل ما يتعلق بموازنة الشركة ، الخ ونظام محاسبي يتعلق بتعاملات الشركة الخارجية. بمعنى آخر أن الشركة يجب أن تفصل نظامها المحاسبي الإداري الداخلي عن نظامها المحاسبي المالي الخارجي وأن الدمج بين النظامين يخضع النظام المحاسبي الإداري الداخلي لخدمة أغراض النظام المالي الخارجي للمنشأة. بناءً على هذا المنظور هل شركتكم تستخدم (أ) نظام محاسبي مالي واحد يخدم جميع وظائف أو الأهداف الداخلية والخارجية لشركتكم، (ب) نظامين محاسبيين منفصلين إحداهما لوظائف الشركة الداخلية وآخر للخارجية ، (ج) حالياً نظام واحد ولكن لدى شركتكم التوجه في استخدام نظامين محاسبيين منفصلين. الرجاء عدم الإجابة هنا بل في الجزء والقسم المحدد.		

	الجزء الثاني	القسم الثالث/الفرع الثاني	السؤال الثالث
إيضاح المقصود من الموازنة المرنه	كما هو متعارف أن الموازنة التقليدية يتم إعدادها لتغطي سنة مالية بأكملها للمنشأة و في نهاية العام يتم مقارنة المنجز بالمخطط خاصة في جانب التكاليف وعلى ضوء ذلك ه تتم عملية تقيم الأداء العام للمنشأة، لكن الموازنة المرنة يتم إعدادها على عدة مستويات أو مراحل خلال السنة المالية للمنشأة وفي نهاية السنة يتم عمل تسوية للتكاليف لتوافق ما تم انجازه فعلاً. (معهد شارتد للمحاسبين الإداريين في بريطانيا, 2005, ص. 6		

	الجزء الثاني	القسم الرابع	السؤال الأول
إيضاح المقصود من أسعار التحويل	هو السعر الذي يعرضه أحد فروع الشركة (البائع) على فرع آخر تابع لنفس الشركة (المشترى) عندما يرغب الأخير شراء بضاعة كاملة التصنيع أو نصف مصنعة أو أي أصل من الأصول أو حتى خدمة من الطرف الأول. (هورنقرن وآخرين,2005, ص. 903)		

الجزء الرابع – السؤال الأول

	نوع النظام المحاسبي الإداري الحديث	المقصود بكل نظام
.1	نظام التكاليف حسب الأنشطة Activity-based costing	نظام التكاليف على أساس النشاط هو نظام تكاليفي يقوم على أساس أن تخصيص التكاليف يجب أن يمر بمرحلتين. الأولى الربط بين الموارد المستخدمة بمسبباتها أي بالأنشطة التي استخدمت هذه الموارد، وفي المرحلة الأخيرة الربط بين تكاليف هذه الأنشطة وبين المنتج النهائي.
.2	نظام التكاليف المستهدفة Target costing	هو نظام إداري يُخول المنشأة بتزويد المستهلكين بالمنتجات التي يرغبونها في الوقت الذي يحددونه وبالسعر الذي يرونه ومع ذلك يسمح للمنشأة بتحقيق هامش ربحي مناسب لها.
.3	أسلوب دورة حياة المنتج Life cycle costing	نظام تكاليفي يقوم بحصر وتجميع كافة التكاليف الخاصة بكل منتج تنتجه الشركة من البداية حتى النهاية.
.4	تقارير تكلفة الجودة Cost of quality reporting	هو تقرير شامل يفيد إدارة المنشأة في معرفة إجمالي تكاليف المنتجات أو الخدمات التي تقوم بها المنشأة و التي لا تتفق مع معايير الجودة المأخوذ بها داخل هذه المنشأة.
.5	نظام تحديد التكلفة إرتجاعياً Backflash costing	نظام محاسبي تكاليفي يقوم على أساس تأخير تسجيل الانحرافات والتي تحدث أثناء المراحل المختلفة لتصنيع المنتج حتى يصبح منتج نهائي ومن ثم الرجوع بشكل عكسي لهذه المراحل حتى يتم استبعاد تكاليف الانحراف من تكاليف التصنيع الإجمالية لهذا المنتج.
.6	نظام إعداد الموازنة حسب الأنشطة	نظام موازنة يقوم على أساس تحديد تكاليف الأنشطة الضرورية لإنتاج و بيع المنتجات أو الخدمات.
.7	مقاييس الأداء غير المالية مثل سلوك الموظفين – رغبات المستهلك – التصنيع الوقتي.	هي مقاييس غير مالية تستخدمها الشركة في تقييم الأداء
.8	نظام بطاقة مقياس الأداء المتوازن Balanced Scorecard	أسلوب إداري يرتكز عل أساس أن فكرة تقيم الأداء داخل الشركة يجب أن يتم من خلال تحقيق تكامل بين أربعة عناصر ضرورية وهي المستهلكين،والمقدرة المالية للشركة ، النظام الإداري الداخلي في الشركة و تطلعات إدارة الشركة في تبني مفهوم الابتكار والتطوير بشكل عام.
.9	نظام الإدارة حسب النشاط	نظام إداري يقوم على أساس استخدام المعلومات التي ينتجها نظام التكاليف حسب النشاط في تحسين مستوى الربحية للمنشأة واعتبار العميل ذا قيمة جداً هامة بالنسبة للشركة.
.10	نظام إدارة الجودة الشاملة Total quality management	مفهوم يستخدم عندما تشترك كافة المستويات (الإدارية والغير إدارية) في تحقيق هدف ما داخل المنشأة بغرض التطوير المستمر للشركة وفقاً لمعايير الجودة.
.11	الإدارة على أساس القيمة Value-based management	نظام إداري يرتكز على فكرة تعزيز المنافع بشكل عام للمستثمرين داخل الشركة أو ملاك الشركة من خلال البحث وتطبيق النظم التي تؤدي إلى تحقيق هذا الغرض.
.12	محاسبة الإنتاجية Throughput accounting	هو نظام محاسبي إداري غير مكتمل لأنه لا يأخذ بفكرة القيد المزدوج ولكنه يرنو إلى تعزيز ربحية مبيعات الشركة من خلال العمل على تقليص العقبات التي تعترض تحقيق هذا الهدف إلى أدني حد ممكن.
.13	نظام المخزون الصفري Just-In-Time	نظام إنتاجي يرتكز على فكرة عدم الاحتفاظ بأي مخزون تتطلبه العملية الإنتاجية داخل المنشأة و أن أنتاج المنتج لا يتم إلا بعد استلام طلب العميل ولابد من تحديد الأنشطة التي يتطلبها إنتاج هذا المنتج بشكل دقيق والانتهاء من كل مرحلة إنتاجية وتسليمها للمرحلة التي بعدها في الوقت المحدد حتى يتم تسليم المنتج بشكله النهائي للعميل في الوقت المحدد ووفقاً للشروط المتفق عليها.

Appendix C

Durham
Business School

Dear Sir,

This is a PhD research that seeks to investigate the application of management accounting practices within Saudi and non-Saudi manufacturing firms that operate in the Eastern Province of Saudi Arabia. The researcher has applied two methods for collecting the research data: questionnaires and semi-structured interviews.

Since your company has completed and returned the questionnaire, the next step is to hold a personal interview with you in order to investigate in depth your opinions about the current application of management accounting practices in your company. The aim is also to determine the internal and external drivers that have prompted your company to adopt or not to adopt modern management accounting practices.

I would be very grateful to you if you would allow me to meet you to conduct this interview. I can guarantee that all data given to me will be treated with the highest level of confidentiality and will only be used for the purposes of the current research. It will not be given to anyone else under any circumstances. I eagerly await your response; my contact details are given below.

1- email: sas53@hotmail.com
2- Mobile No. 0504920176

Yours sincerely,

Ibrahim K. AL- Meaidi

Part One

4. **Background information of the interviewee**

Name (optional)	
Position in the company	
Number of years in this position	
Education and practical qualification(s)	

5. **Background information of the company**

Name of the company	
Year the company was established	
Company's nationality	
Type of industry	
Company's structure (formal or informal)	
Number of employees	

Part Two: Discussing the argument concerning traditional and modern management accounting practices

1. Accounting systems within your company

Some Western management accountant scholars have widely emphasised that company should adopt one accounting system for external purposes and another for internal ones (Johnson and Kaplan, 1987). Based on this:

- How many accounting system does your company currently use?
- If your company is currently using a single accounting system, what are the reasons which stimulated your company not to use more than one accounting system? Does your company plan to adopt multiple accounting systems during the next five years?
- If your company is currently using multiple accounting systems, what are the reasons which stimulated your company to adopt more than one accounting system?
- What are the function(s) of your company's product costing system?
- Does your company use traditional allocation methods (for example, single blanket recovery base, direct labour costs/hours, direct material costs, and so on)? If you are using any of these methods, how efficient are they?

→ **There is a new trend in the literature that argues for the allocation of overhead costs based on activities (the ABC approach) instead of using traditional drivers such as direct labour hours/costs, direct material costs, machine hours, etc. The advocators of the new approach believe it gives more accurate information required for effective decision-making.**

- Has your company adopted the ABC system? **If yes**, what the driver(s) that motivated your company to adopt it? If your company has not adopted it, what are the main reason(s) for this decision? How about the future; is there any possibility that your company may adopt it during the next five years?
- Does your company use any of the AMA systems (life cycle costing system, cost of quality reporting, backflush costing or throughput accounting)? **If yes**, what are the driver(s) which motivated your company to adopt most or some of these systems? If no, what are the reason(s) which motivated your company not to adopt most or some of these systems?

2. **Decision-making practices**

- Based on what criteria does you company price its product(s)? Why did you use this criteria?

→ **There is a new trend in the literature that argues for setting product prices based on targets (the target costing approach). Drury (2006, p.945-46) summarised the mechanism of this approach in the following points:**

- "Determine the target price which customers will be prepared to pay for the product.
- Deduct a target profit margin from the target price to determine the target cost.
- Estimate the actual cost of the product.
- If when estimated, the actual cost exceeds the target cost investigate ways of driving down the actual cost to the target cost".

The questions that will be asked here are:

- Has your company adopted the target costing system? If yes, what the driver(s) that motivated your company to use this system?

- If you did not adopt it, what were the main reasons for not doing so?

- Does your company plan to adopt this system during the next five years?

- Companies use various methods (probability analysis, decision trees, sensitivity analysis, adjusting the payback period, adjusting the discount rate, and others) for measuring the uncertainty of project cash flows. Which method is most commonly used by your company? Why does your company use this method?

- Does your company have a plan to use sophisticated decision-making tools (for example, game theory, regression analysis, and so on) for evaluating its investment decision? If yes, why? If no, why not?

3. **The standard costing system**

It has been widely emphasised in the literature that the standard costing system provides senior management with the cost information required to attain several goals.

→ If your company is currently using the standard costing system, several questions will be discussed:

- For what main purpose does your company use this system?
- Does your company revise its standard each year?
- It has been said that the standard costing system collides with the use of some of the new management and production procedures, such as the total quality management (TQM) and just-in-time production (JIT) approaches. If your company is currently using any of these new approaches alongside the standard costing system, how would you refute the alleged inconsistency?

→ If your company is currently NOT using the standard costing system, several questions will be under focus such as:

- What is the main reason for your company not using this system?
- Does your company currently use any of the new procedures (eg TQM, JIT)? If yes, was this a reason for not adopting the standard system?

4. **The traditional budgeting system:**

It has been indicated in the literature that budgeting is commonly used as a system of planning and controlling on the one hand, and for judging managerial performance on the other.

→ If your company is currently using a budgeting system, several questions will be discussed:

- Would you briefly identify the main purpose(s) for which the budgeting system is used?
- Do you think evaluating the performance of managers based on meeting budgets is fair and should be used by your company?

- Does your company plan to abandon the budgeting system in the next five years?

It has been indicated in the literature that companies that use the ABC approach tend to use the Activity-Based Budgeting approach (ABB). According to Drury (2006), the ABB system focuses on the cost of the activities necessary to produce and sell products and services. To clarify, this system "separates indirect costs into separate homogenous activity cost pools and motivates managers to use cause-and-effect relationship criterion for identifying the cost drivers for each of these indirect-cost pools" (Horngren *et al*.,2005, p.189).

- Does your company currently use the ABB system? If yes, what the reason that motivated your company to adopt it?
- If no, what are the main reasons for not applying it?
- Does your company plan to adopt it in the next five years?

→ If your company is NOT currently using the budgeting system, several questions will be discussed:

- What are the main reasons for not using the budgeting system?
- How does your company plan and control its costs? What criteria are commonly used for evaluating the performance of managers? How successful is the use of this criteria or method in such evaluation?

5. **Non-financial measures**

There is a large volume of management accounting literature that advises companies to use non-financial measures side-by-side with financial measures. Several questions can be discussed regarding this idea:

- In your opinion, should non-financial measures, such as customer satisfaction, customer delivery efficiency, employees' attitudes, etc be used in parallel with financial measures? If yes, did your company applied any non-financial measures? What is it? Why did you use it?
- If you have not used them so far, what are the reasons for not applying these types of measures?

- Does your company currently use balanced scorecard? **If yes**, what the reason(s) stimulated your company to adopt it? **If no**, why did your company not apply it?

- Does your company plan to adopt it in the next five years?

6. **<u>Manufacturing systems within your company</u>**

It has been widely suggested in the management accounting literature that the use of the Just-In-Time (JIT) manufacturing system by some Japanese manufacturing firms has led those companies to become amongst the most successful firms in the world. Drury (2006, p.967) has summarised the main idea of this system in the following six points:

- "elimination of non-value added activities
- zero inventory
- zero defects
- batch sizes of one
- zero breakdowns
- a 100% on-time delivery service

→ **If your company currently <u>uses the</u> JIT production system, several questions will be discussed:**

- For what main purpose does your company use this system?

- When did your company start to use this system?

- How influential has it been?

- Does using this system generate real benefits for your company? Can you give an example?

→ **If your company is <u>NOT currently using</u> the JIT production system, several questions will be discussed:**

- What are the main reasons for your company not using this system?

According to Drury (2006), TQM is a term used to describe a situation where all business functions are involved in a process of continuous quality improvement. Several questions can be asked regarding this idea:

- Does your company currently apply the TQM system?
- If yes, what the reasons that motivated your company to adopt it?
- If no, what are the reasons for not applying it?
- Activity-based management is a method which can be used to describe the cost management applications of the ABC system (Drury, 2006). Does your company use this system? If yes, why? If no, why not?
- Value-based management is a discipline which focuses on the management of the organisation holistically. Does your company use this system? If yes, why? If no, why not?

Part Three Discussing some aspects that may or may not drive change within companies

(A) The relationship between the external business environment and the decision taken regarding adoption or non-adoption of AMA practices

It has been said that companies which operate in complex and dynamic environments have a tendency to adopt innovative practices in order to ensure survival, and that the opposite is the case with companies that operate in simple and static environments. Several questions can be raised regarding this issue:

- How would you describe the growth in the industry that your company operates? How about the rate of adopting innovation in this industry in general? How keen are your competitors in the same industry to adopt new techniques in their operations? How about your company?

- If you have adopted some AMA practices, do you think this adoption was motivated by the surrounding environment? Let's say, if the level of environmental dynamism surrounding your company increases in the future, will that increase dictate that your company will adopt more AMA practices in order to ensure its survival?

- How would you describe the level of competition surrounding your company? In your view, has this level of competition had any effect on the decisions taken by the senior management in your company to adopt AMA practices? What type of competition does your senior management usually focus on: product price, product quality, customer services, time etc?

- Two years ago, the Saudi Government joined the World Trade Organization (WTO). Do you think this will put pressure on your company to adopt more AMA practices as a way to survive?

- How likely is it that the Saudi Government will impose the adoption of advance accounting and managerial systems on industrial companies like yours as a response to changes occurring in the international business environment?

(B) The relationship between the firm's size and the adoption or non-adoption of AMA practices

Several management accounting scholars indicated that large firms are more likely to adopt AMA practices, due to the availability of financial resources, when compared with small firms. Based on this:

- Do you agree with the above view?
- If your company adopted AMA practices or even some of them, was this adoption related to the size of you company?
- If your company did not adopt AMA practices was this decision motivated by the size of your company?

(D) The relationship between production and technology and the decision taken regarding the adoption or non-adoption of AMA practices

- How many product lines currently exist in your company? How many products are currently manufactured by your company?
- How would you describe the manufacturing process in your company in term of automation?
- What type of technological system(s) are currently used by your company? For what reason(s) are they used? How would you evaluate the efficiency of these new production system(s)?
- Did the adoption of production and non-production technologies motivate your company to adopt or not adopt the AMA practices?

(E) The relationship between the firm's culture and the adoption or non-adoption of AMA practices

As is commonly known, the work culture of a subsidiary firm stems from its parent company. For example, if a foreign subsidiary is located in the Saudi market, the work culture of this subsidiary will largely follow that of its mother culture. Several questions can be asked regarding this issue:

- Please briefly describe your company's culture in terms of delegating the authority and the adherence to job rules.

- How would your company allow to it subordinates to participate in the decision making?. In other words, does your company allow to its employees to express their opinion without fear?

- It is clear that most management accounting practices, either traditional or modern, have been developed in Western countries. If you implemented any AMA practices, the original practice will have been set out in its original language. Have your employees found any difficulty during the implementation of the new system with regards the language? In your opinion, do you think the language might be considered as an impediment to implementing all or some AMA practices in Saudi culture?

- As you know, Islam as a religion plays a significant role in Saudi culture and most people fully obey the Islamic rules, which makes Saudi culture very sensitive regarding accepting any change even in its business practices. In your opinion, do you think adopting modern business practice in general, and management accounting practice in particular, into Saudi culture can be justifiably rejected because it originated in non-Muslim countries?

- The level of development within society is considered as a cultural aspect. In your view, what effect does this have on the decisions taken by the senior management in your company regarding the adoption or non-adoption of innovative practices in general and management accounting practices in particular?

- In most industrialised countries there is co-operation between academics and practitioners via legal bodies, such as CIMA in the UK and the IMA in the USA. The questions that can be asked here are:

    - Is there a legal institution in Saudi Arabia that can bring together academics and practitioners in order to explain the new trends in business theory? How necessary is it to have meetings like this?

    - Do you think these parties (academics and practitioners) work in isolation from each other in this country? Do you think practitioners really need more explanation regarding new trends in management accounting? In your opinion, would such cooperation lead to greater adoption of innovative systems by practitioners?

(F) The relationship between the firm's strategy and the adoption or non-adoption of AMA practices

As you know, companies, even in the most industrialised countries, try to avoid risk as much as they possibly can, and the initiative to invest in new systems is, in most cases, risky, costly and time consuming. Therefore, the questions which might be asked here are:

- Would you briefly describe your company's strategy with regard to its predisposition for carrying risk resulting from investing in new systems?

- If adopting a new system required setting up training programmes and installing new software, would you or the senior management in your company provide these facilities regardless of the level of risk that might be associated with using the new system?

- Referring again to your firm's general strategy, does the senior management in your company tend to focus on short or long-term strategies? What type of strategy does your company currently employ? How satisfied are you with it? Do you think your company adopted or not adopted AMA practices because of the type of strategy it employs?

- How often does the senior management in your company revise and re-evaluate its strategy?

Many thanks to you for your time and cooperation

Appendix D

App.D1 Factor Analyses: Introduction

Initially, exploratory factor analyses were conducted in order to reduce the total number of items for the independent variables included in the logistic regression analysis to a smaller set of factors. In exploratory factor analysis, the number of resultant factors is not predetermined. The final number of factors, as well as which variables load upon which factors, is determined during the process of exploratory factor analysis.

Additionally, principal-component factor extraction was utilised, as this is the standard method of factor extraction used in exploratory factor analysis. Tabachnick and Fidell (1996) stated that principal-component analysis (PCA) is most useful when the goal of the research is to reduce a large number of variables to a smaller number of factors, to concisely describe the relationships amongst observed variables, or to test the theory about underlying processes.

In order to determine the total number of factors to keep, three distinct methods were used. The first criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. The second criterion was the eigenvalues; eigenvalues correspond to the variance, as explained by the factors, and according to the Kaiser-Guttman criterion (Kaiser, 1960), factors with eigenvalues greater than 1.00 are considered to be significant, explaining an important amount of the variability in the data.

Eigenvalues less than 1.00 are considered insignificant, as they do not explain data variability. In addition, several studies demonstrated that when eigenvalues <1

(Kaiser, 1960) were used, it led to over-factoring, and such over-factoring could lead to factors which could have little theoretical value (Gorsuch, 1983; Velicer and Jackson, 1990; Fabrigar *et al*, 1999; Henson and Roberts, 2006), but it has also been reported that underfactoring in factor analysis can create significant errors in the interpreting of the factors (Wood *et al*., 1996). Therefore, only factors with eigenvalues >1.00 were considered.

The third criterion was the proportion of variance which is accounted for by each component, as generally, a total explained variance of approximately 60% is considered satisfactory. During factor selection, all of the aforementioned criteria were considered. Moreover, correlations between the constituent variables of factors were reviewed in order to ensure that these correlations were sufficiently high.

It has been recommended that correlations should generally be above 0.3, in order for factor analysis to be appropriate (Tabachnick and Fidell, 1996). This was determined to be the case for all factors included in these analyses. Finally, the method of regression was used to calculate factor scores, which were all standardised (having a mean of 0 and a standard deviation of 1).

Furthermore, before the factor analyses were conducted, a series of tests was run in order to ensure that none of the assumptions of factor analysis were violated. Bartlett's test of sphericity and the KMO measure of sampling adequacy were run, in order to ensure that the selection of factor analysis was justifiable (Pallant, 2001). In order for factor analysis to be considered appropriate, Bartlett's test of sphericity should be

significant at the .05 alpha level, while the KMO index should be at least .6 (Tabachnick and Fidell, 1996).

Additionally, data was checked for the presence of outliers, and linearity between the constituent variables was also determined. Factor analyses will be conducted for all internal and external contingent aspects, with the exception of product diversity, as this measure only incorporated two variables: the number of products and product standardisation. It is recommended that, when exploratory factor analysis is used, each factor should have at least three constituent variables (Kim and Mueller, 1978).

App.D1.1 Factor Analyses: Bartlett's Test of Sphericity

This section details the results of Bartlett's test of sphericity, which was conducted for all factors. This test is utilised in order to test whether or not the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate. The following table presents a summary of these analyses.

Bartlett's test of sphericity indicates that factor analysis is appropriate in situations where the test is found to be statistically significant (Tabachnick and Fidell, 1996). As shown in table App.D-1, this test was found to be significant for every factor, indicating that factor analysis is appropriate.

Bartlett's Test of Sphericity

Factor	Chi-square (*df*)
PEU	365.80*** (10)
Competition	482.07*** (6)
Size	453.49*** (3)
AMTs	906.22*** (91)
Culture	817.63*** (10)
Prospector Strategy	471.72*** (6)
Defender Strategy	542.41*** (15)

Table App.D-1

*Test is significant at the .05 level (2-tailed).
** Test is significant at the .01 level (2-tailed).
*** Test is significant at the .001 level (2-tailed).

App.D1.2 Factor Analyses: Kaiser-Meyer-Oklin Measure of Sampling Adequacy

Next, the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy was determined. This measure was used to predict whether the data was likely to factor well. This measure varies from 0 to 1, and the overall measure should be 0.6 or higher in order to proceed with factor analysis (Tabachnick and Fidell, 1996). Table App.D-2 presents a summary of these measures. As shown, the KMO measure of sampling adequacy was sufficient for all factors.

KMO Measure of Sampling Adequacy

Factor	KMO Measure
PEU	.779
Competition	.808
Size	.753
AMTs	.800
Culture	.910
Prospector Strategy	.825
Defender Strategy	.891
PEU	.779

Table App.D-2

App.D1.3 Factor Analyses: Outliers

Next, analyses were conducted, in order to determine whether any cases needed to be removed due to their status as outliers. First, linear regressions were conducted in order to determine the Mahalanobis Distance for each of the factors constructed. The Mahalanobis Distance is a measure used to identify outliers. Cases having higher values of this measure have values with regards to the factor components which diverge to a greater degree from average values, and indicate that these cases are outliers. The cases which are identified as outliers are removed from the analysis.

After the Mahalanobis Distance measures were calculated, logistic regressions were conducted, which are reported below. In these regressions, cases with high values for the Mahalanobis Distance, which was defined as values of 10 or greater, were coded as 1, while all other cases were coded 0. This method is commonly used in factor analysis to determine whether or not outliers appear at random (Organisation for Economic Co-operation and Development, 2008). These variables were included as the dependent variables, while the individual components of the factor were included as the independent variables. If these regressions were found to be statistically significant, or to have a high R^2 value, then this would indicate that outliers do not appear at random, which means that it may be beneficial to remove them.

Viewing the results presented in the table App.D-3, the logistic regressions were not significant for PEU or for culture. This indicates that no cases need to be removed for these two factors because of outliers. However, the regressions on competition, size, AMTs and prospectors, as well as the defender strategy, were all found to be

statistically significant. This suggests that it may be beneficial to remove several cases identified as outliers for these five factors.

Logistic Regressions (Mahalanobis Distance): Omnibus Tests and R^2

Factor	Chi-square (*df*)	Cox & Snell R^2	Nagelkerke R^2
PEU	7.109 (5)	.044	.101
Competition	13.965** (4)	.085	.278
Size	21.452*** (3)	.127	1.000
AMTs	35.619** (14)	.202	.275
Culture	10.937 (5)	.067	.139
Prospector Strategy	24.788*** (4)	.145	.440
Defender Strategy	15.117* (6)	.091	.180

Table App.D-3

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

After these logistic regressions were conducted, the values for the Mahalanobis Distance for the five factors found to be significant in the logistic regressions were analysed in closer detail, in order to determine which cases, in particular, could be considered outliers, hence removed from the analysis. In order to make this determination, cases which were found to have a statistically significant Mahalanobis Distance were identified. Specifically, this consisted of cases which had a Mahalanobis Distance which exceeded the critical Chi-Square value, with the degrees of freedom equal to the number of predictors, and alpha equal to .001. A summary of the critical Chi-Square/Mahalanobis Distance values are presented in table App.D-4 for those variables which were found to be significant in the logistic regressions presented previously.

Critical Chi-Square/Mahalanobis Distance Values

Factor	Critical Value (*df*)
Competition	18.47 (4)
Size	16.27 (3)
AMTs	36.12 (14)
Prospector Strategy	18.47 (4)
Defender Strategy	22.46 (6)

Table App.D-4

Notes: alpha = .001

Table App.D-5 displays the number of cases removed (based on significant Chi-Square/Mahalanobis Distance values) for these five variables. As shown, between 0 and 2 cases were removed in each of the five factors. This issue of having cases which were determined to be outliers which then needed to be removed from the analysis has been faced by other researchers as well (see Libby and Waterhouse, 1996).

Number of Cases Removed as Outliers

Factor	*n* Cases Removed
Competition	0
Size	1
AMTs	1
Prospector Strategy	1
Defender Strategy	2

Table App.D-5

Notes: alpha = .001

App.D1.4 Factor Analyses: Linearity

Next, analyses were conducted in order to ensure that the relationships between the variables composing the factors included in the factor analyses were linear, or near linear, as this is another assumption of factor analysis. In order to make this determination, line graphs were run for the constituent variables of the factors.

In cases where factors included a large number of constituent variables (more than 2 or 3), two line graphs were run (as opposed to all possible combinations), in order to have some assurance that the relationships between the variables, in general, were linear. It is suggested that, as long as the relationships between the variables are not clearly curvilinear, it is possible to proceed with the factor analysis.

First, line graphs were run on the variables composing PEU. As this factor had five variables in total, two line graphs were run in order to get a sense of the linearity or non-linearity of the relationships between the constituent variables. The first graph, shown below, focused on the means of four of the constituent variables (economic, technological, preferences and constraints variables) on the basis of new products. The relationships appear to be linear (see figure App.D.1).

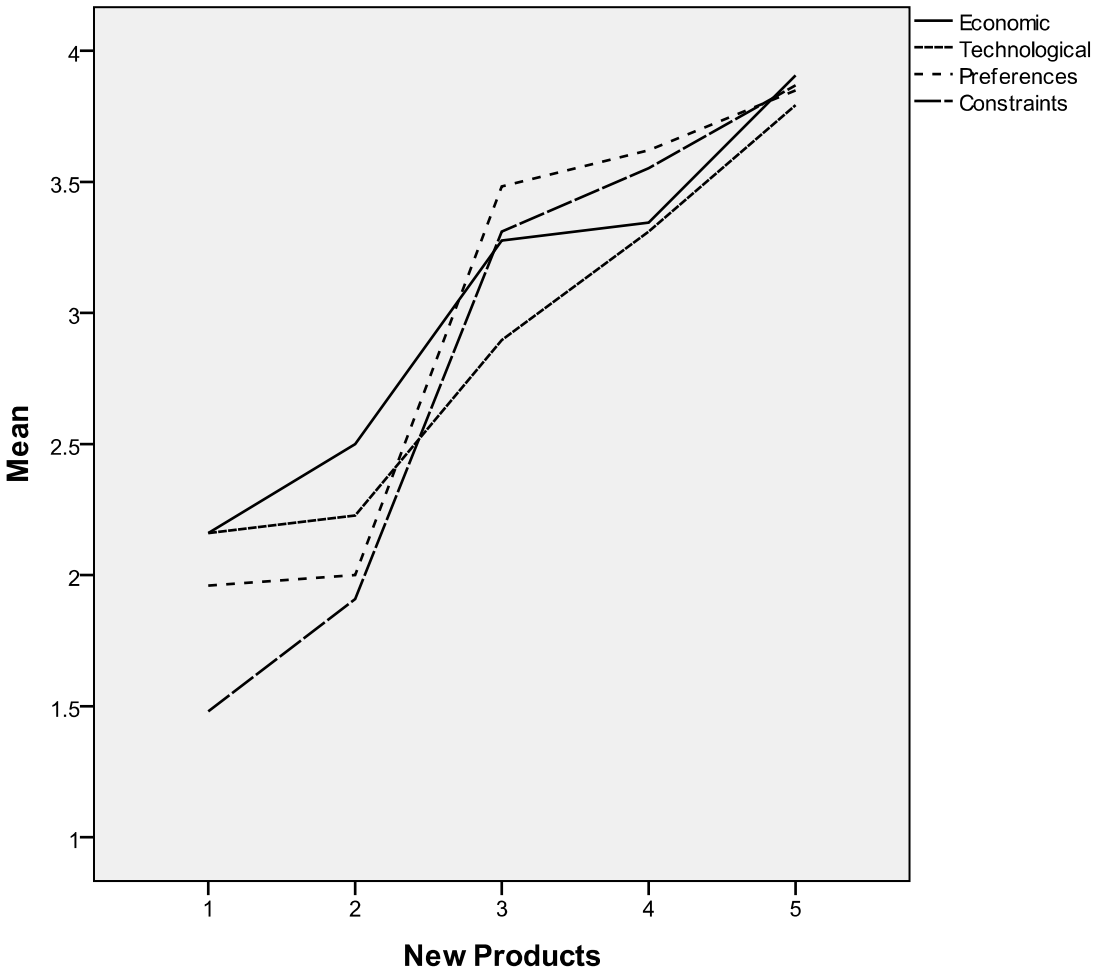

Figure App.D.1: Linearity Tests on PEU, New Products

The second line graph, presented below, illustrates the mean of four variables (new products, economic, preferences and constraints variables), on the basis of the technological variable. As shown, relationships appear to be linear, indicating no issues with these variables (see figure App.D.2).

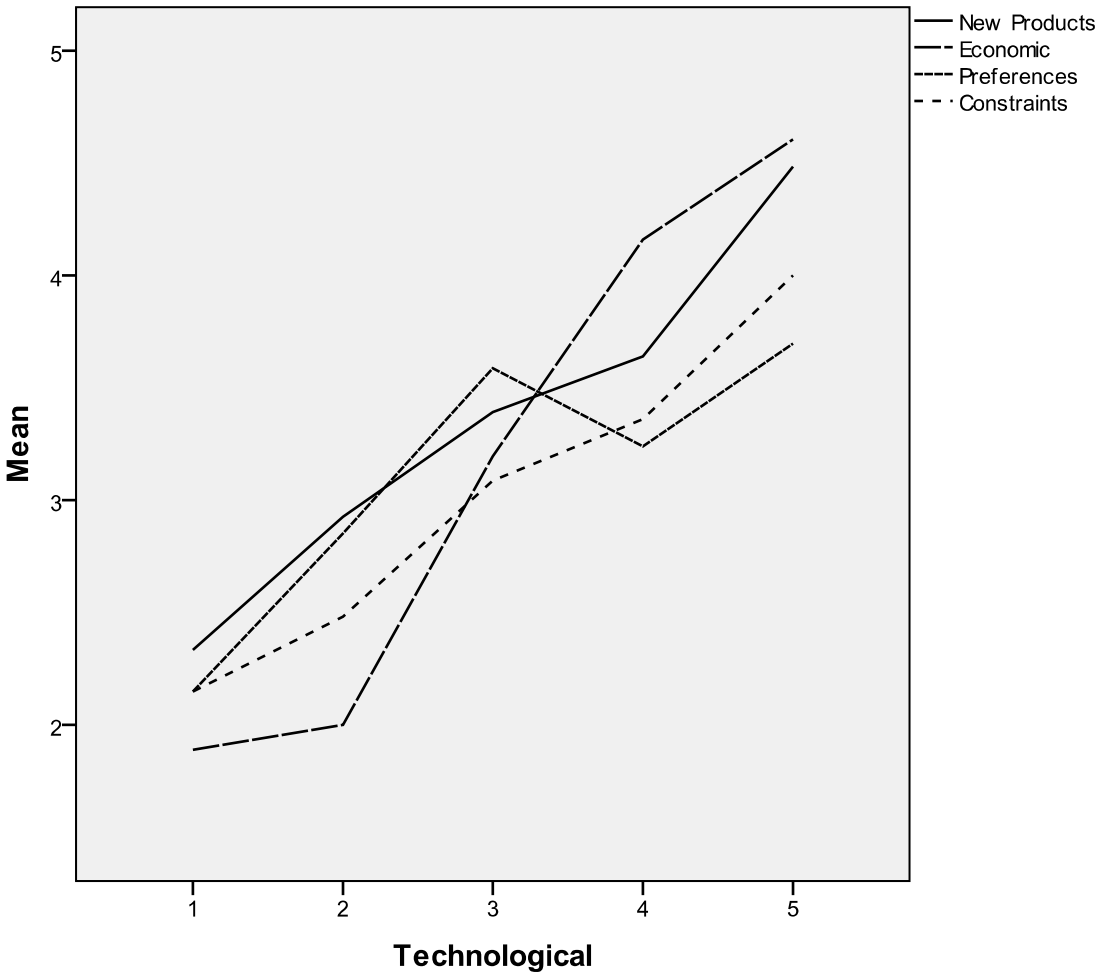

Figure App.D.2: Linearity Tests on PEU, Technological

Next, the focus was on competition. The following line graph presents means for three of the constituent variables (manpower competition, quality competition and price competition), on the basis of bidding for purchase. While the relationship was not found to be strictly linear, it was not strongly curvilinear, indicating no issues with these variables (see figure App.D.3).

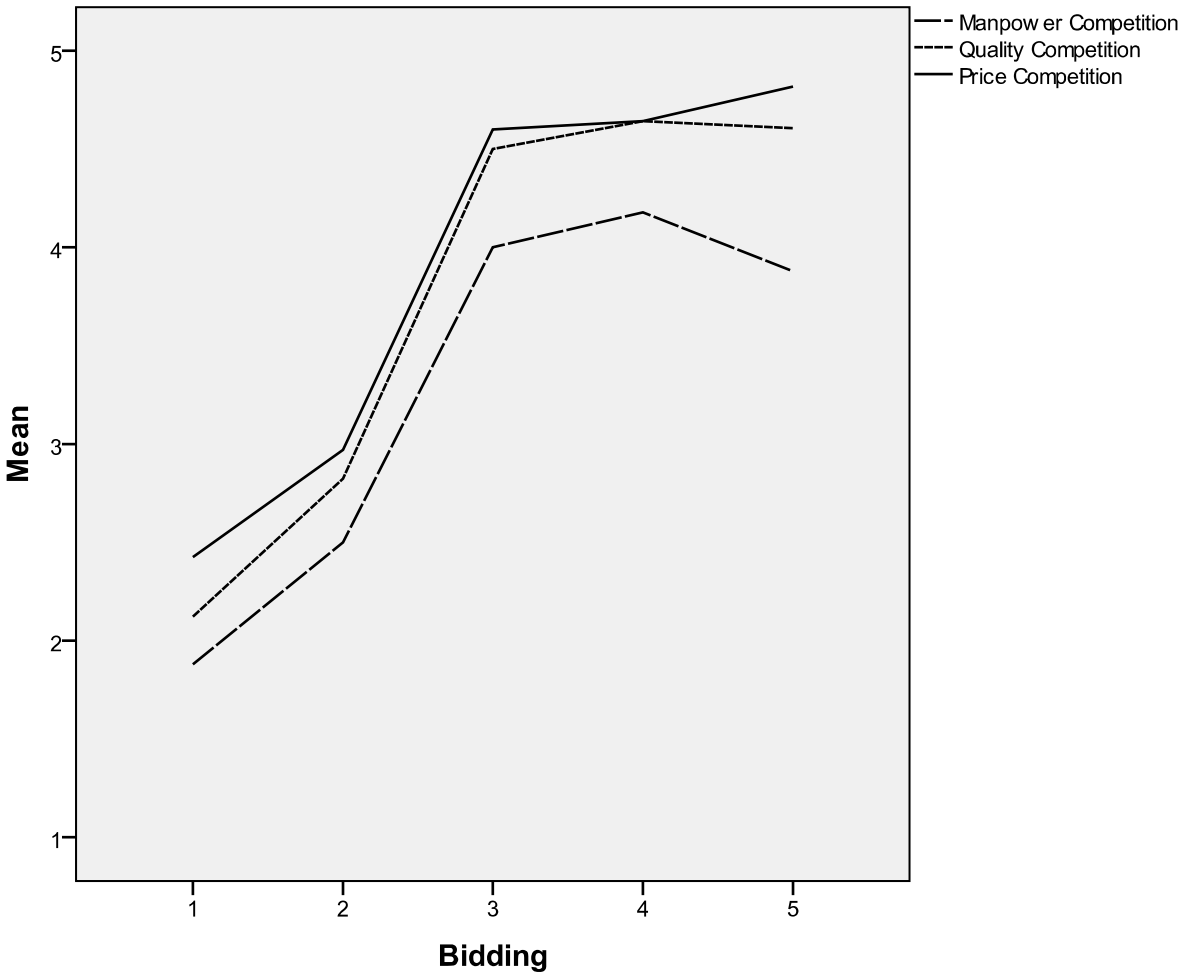

Figure App.D.3: Linearity Tests on Competition, Bidding

The line graph presented below presents the means of three of the competition variables (bidding for purchase, manpower competition and price competition), on the basis of quality competition. As shown, the relationships appear to be linear (see figure App.D.4).

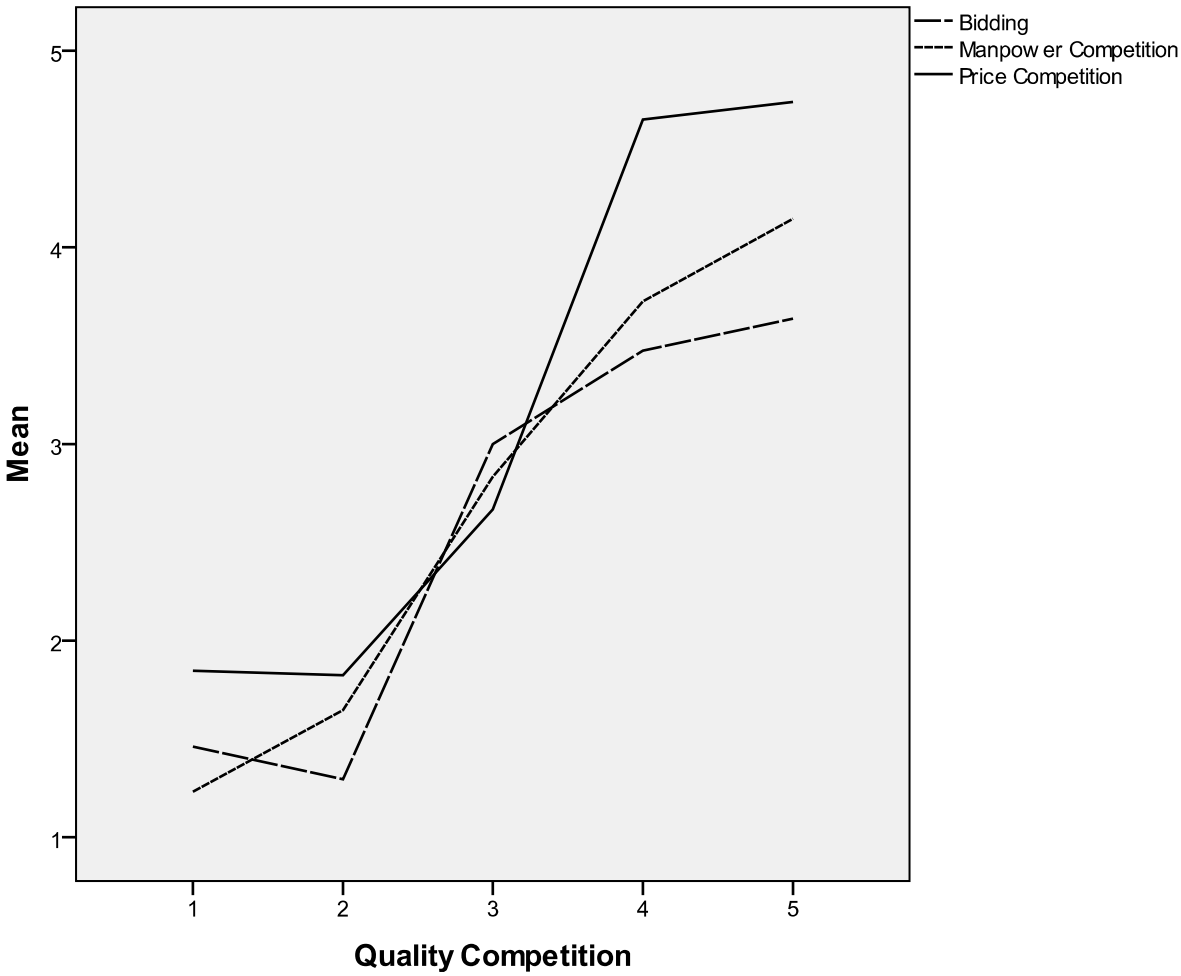

Figure App.D.4: Linearity Tests on Competition, Quality Competition

Next, the factor of size was focused upon. Natural logs of the three size variables were first taken, as this was necessary for the factor analysis. The following line graph presents the mean of the total number of employees and total assets, on the basis of total revenue. As shown, the relationships appear to be linear (see figure App.D.5).

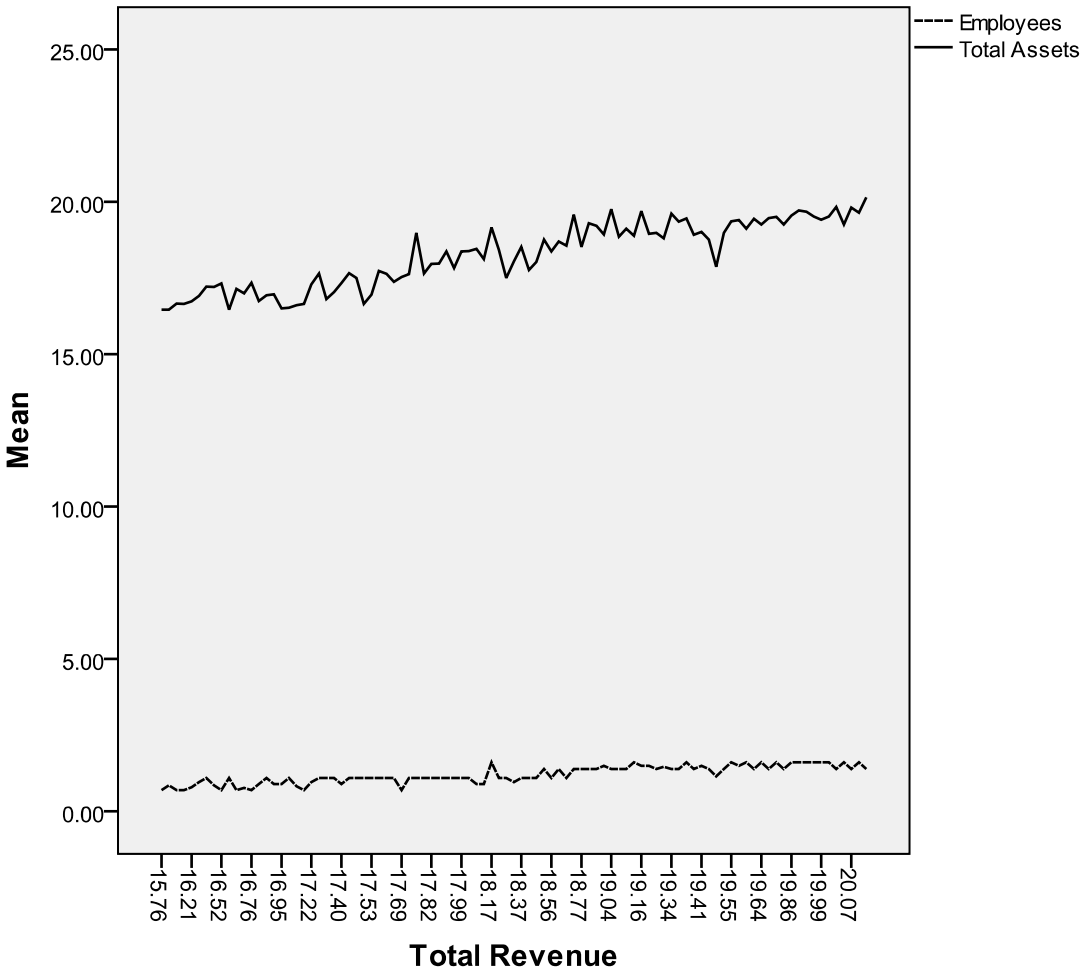

Figure App.D.5: Linearity Tests on Size, Total Revenue

The following line graph presents the mean values for the total number of employees and total revenue, on the basis of total assets. These relationships appear to be linear, indicating no issues with these variables (see figure App.D.6).

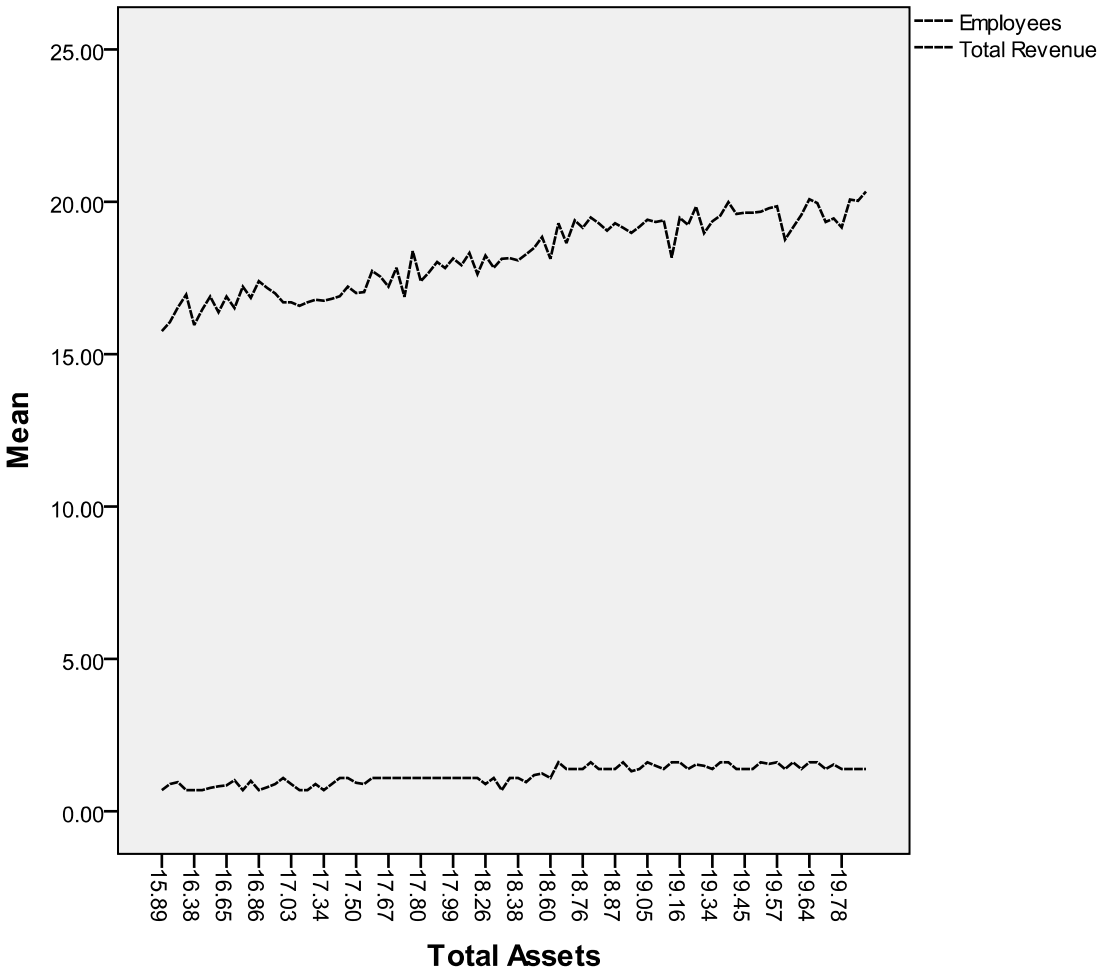

Figure App.D.6: Linearity Tests on Size, Total Assets

Following this, AMTs were focused upon. The following line graph presents the mean values for a number of the AMT variables, on the basis of the automation variable. As shown, in general, relationships appear to be fairly linear (see figure App.D.7). No strong evidence of curvilinear relationships was found.

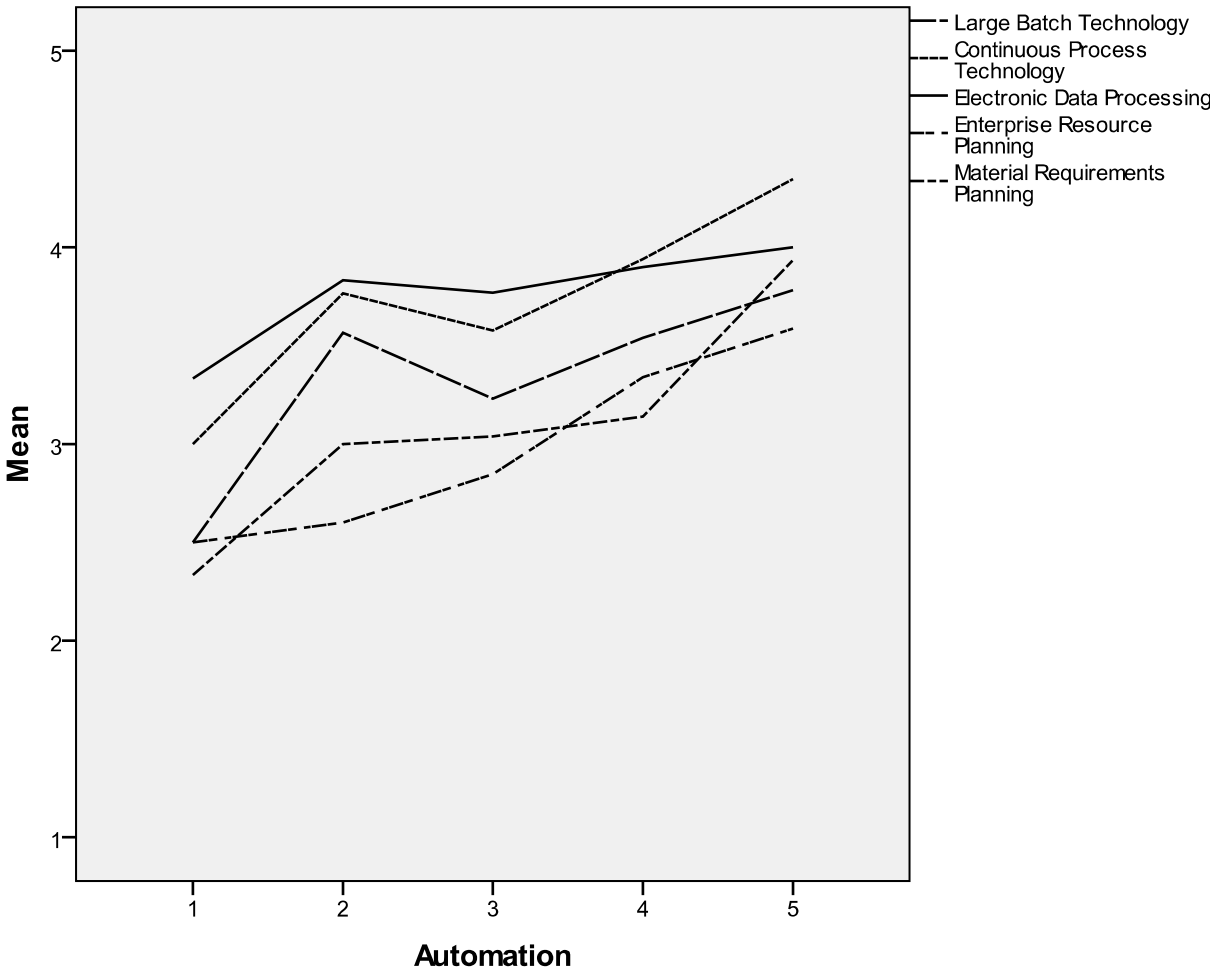

Figure App.D.7: Linearity Tests on AMTs, Automation

The following line graph presents mean values for a number of the AMT variables, on the basis of computer aided engineering. As shown, again, relationships appear to be close to linear in general. No strong evidence of curvilinear relationships was found, indicating no issues with this set of variables (see figure App.D.8).

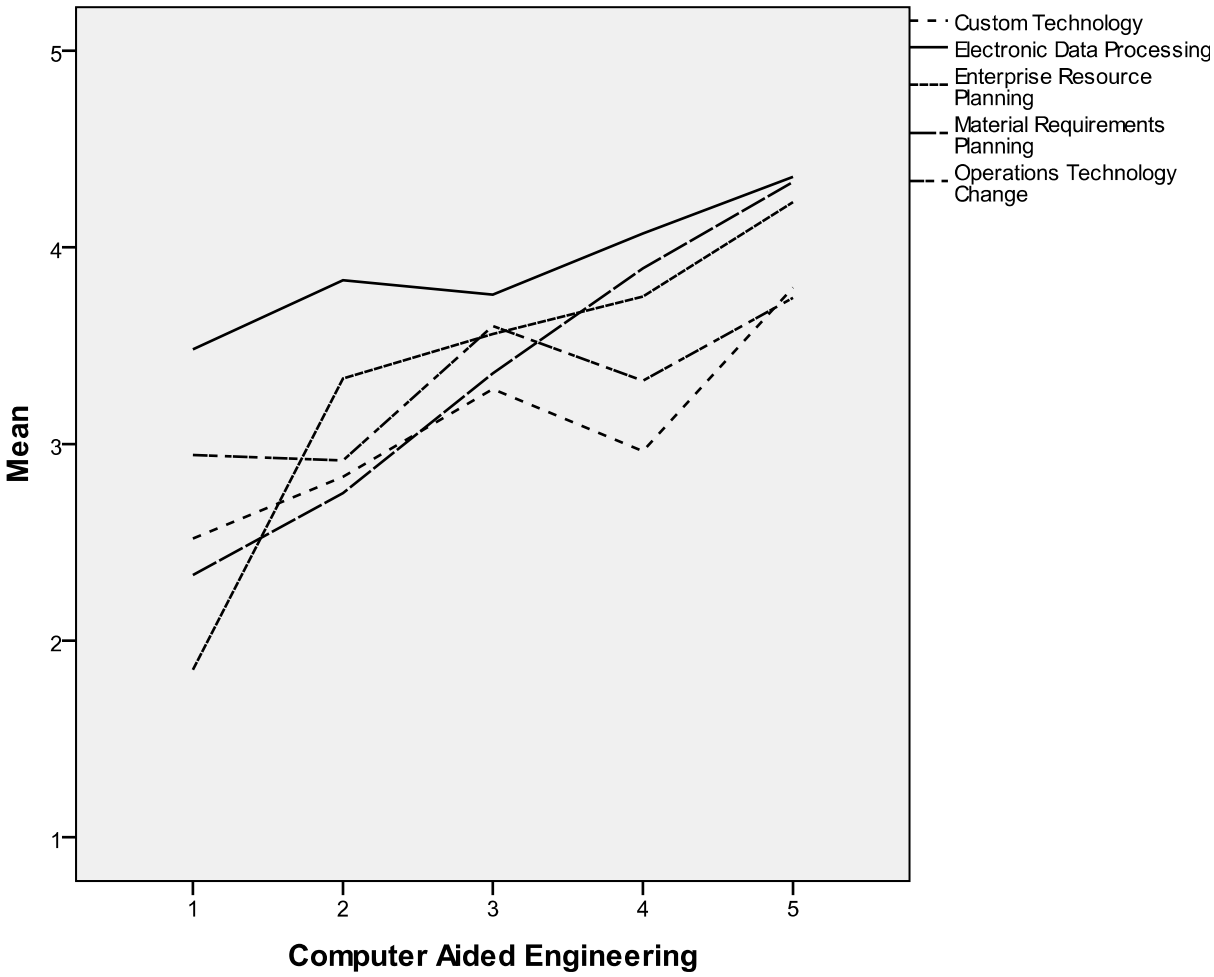

Figure App.D.8: Linearity Tests on AMTs, Computer Aided Engineering

The following line graphs focus upon culture. First, the line graph shown below illustrates the mean levels of four of the culture variables (authority empowerment), on the basis of pricing decisions. While not strictly linear, no evidence of curvilinear relationships was found (see figure App.D.9).

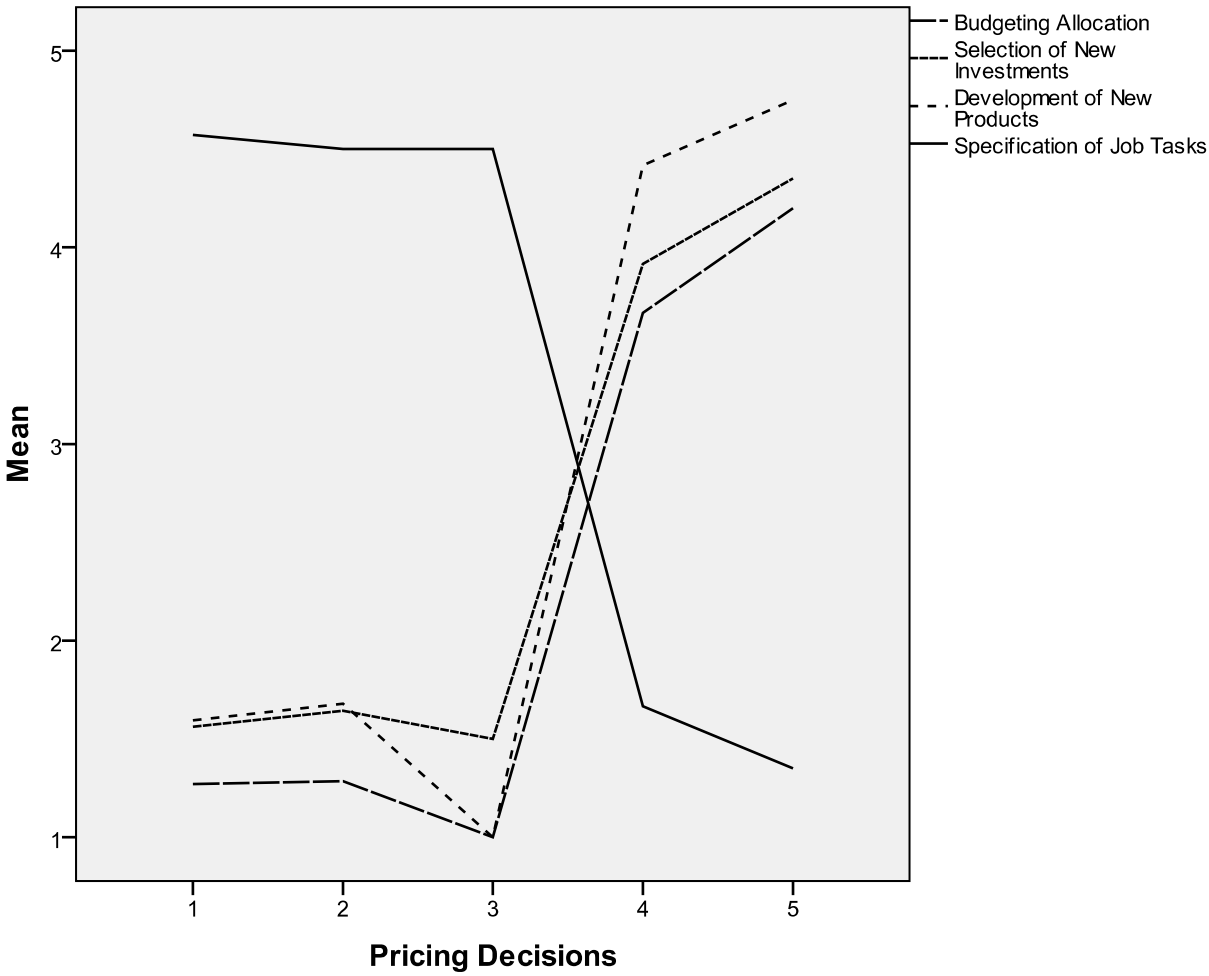

Figure App.D.9: Linearity Tests on Culture, Pricing Decisions

The following line graph presents mean levels for four of the culture variables, on the basis of the variable measuring selection of new investments. Again, no evidence of curvilinear relationships was found, indicating that there were no issues with these variables (see figure App.D.10).

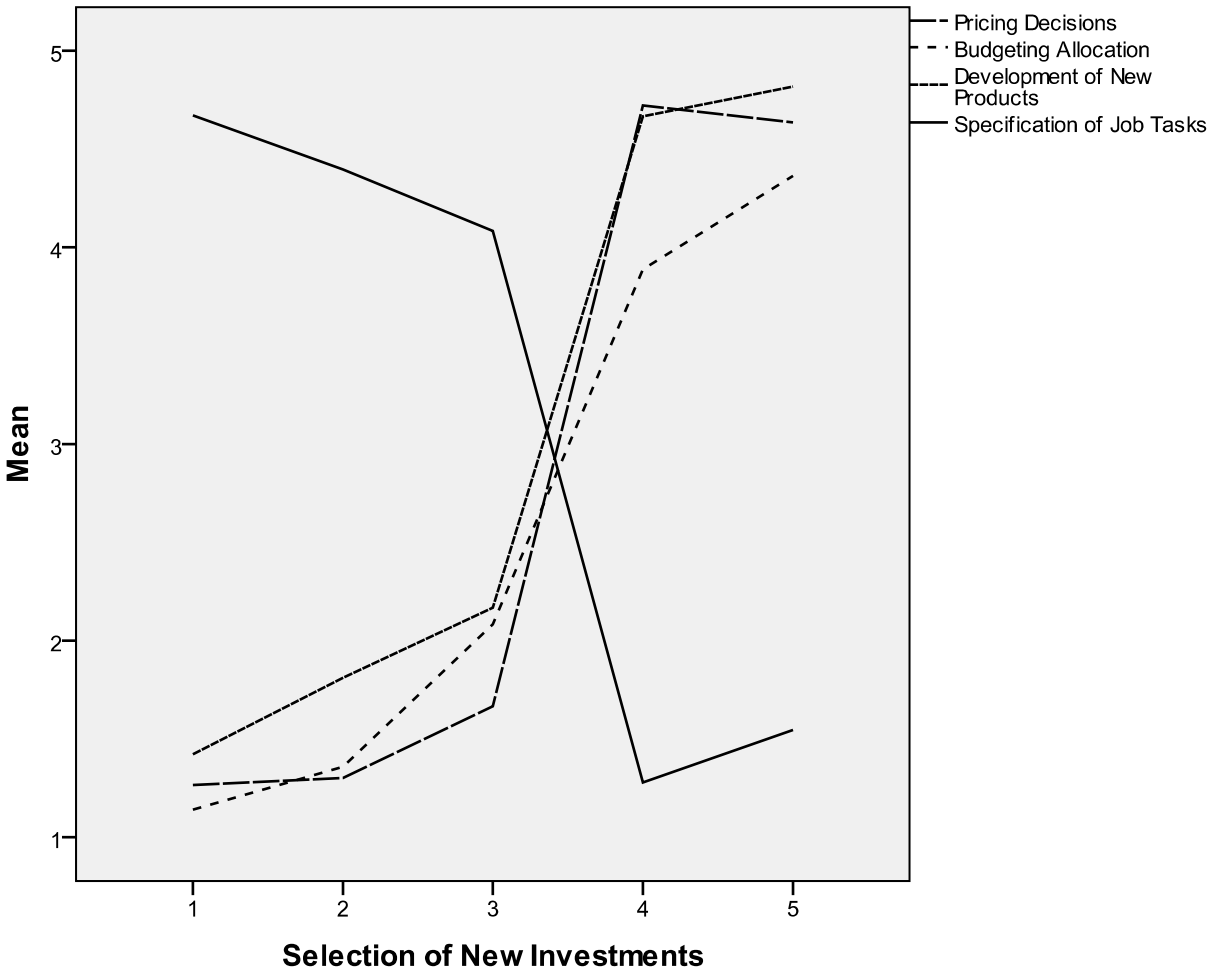

Figure App.D.10: Linearity Tests on Culture, Selection of New Investments

Next, the prospector strategy was focused upon. The following line graph presents mean values for three of the prospector strategy variables, on the basis of the variable measuring concentration on a broad market domain. As shown, the relationships appear to be quite linear (see figure App.D.11).

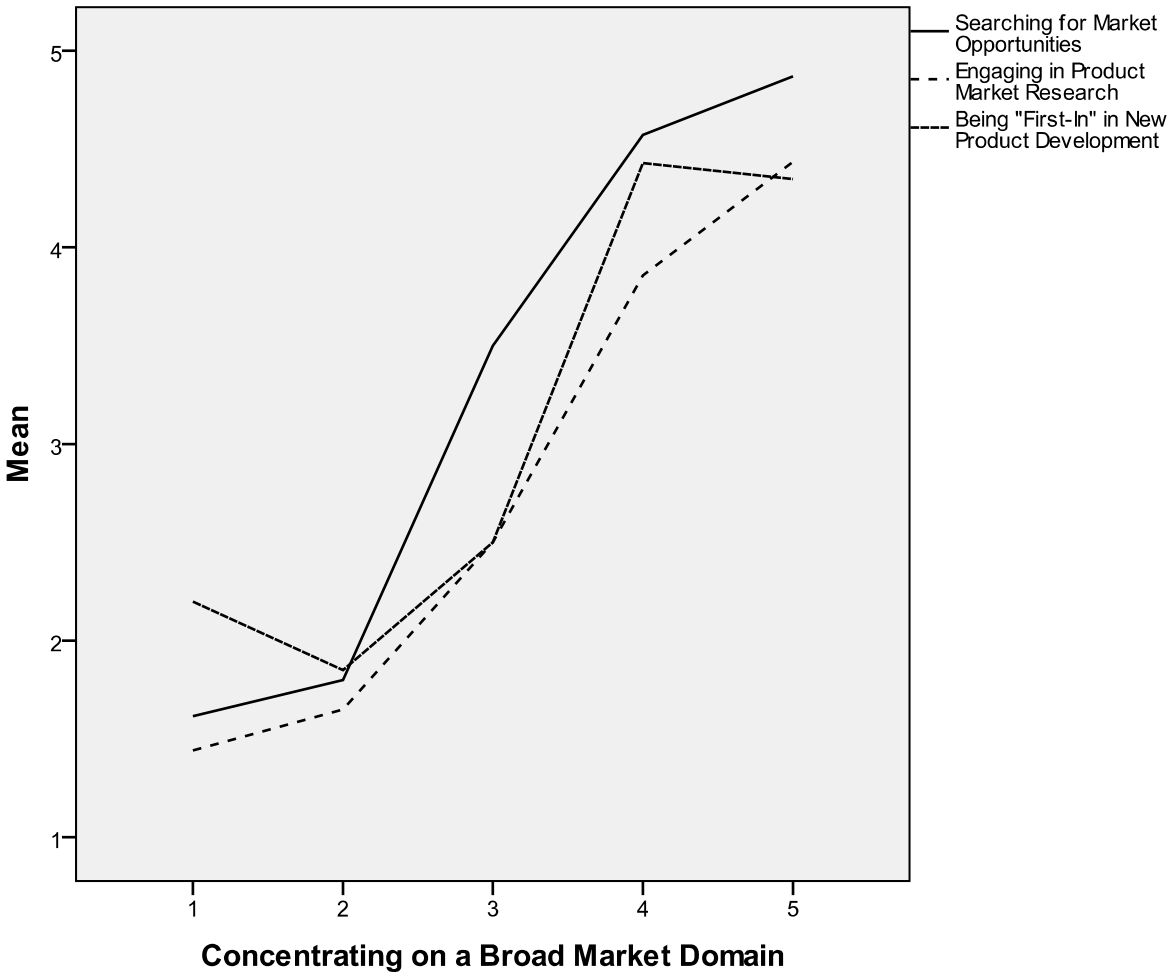

Figure App.D.11: Linearity Tests on Prospector Strategy, Concentrating on a Broad Market Domain

The next line graph presents mean values for three of the prospector strategy variables, on the basis of the variable measuring the engagement in product market research. As shown, relationships appear to be fairly linear, and no evidence of curvilinear relationships was found, indicating that no issues with linearity existed for this set of variables (see figure App.D.12).

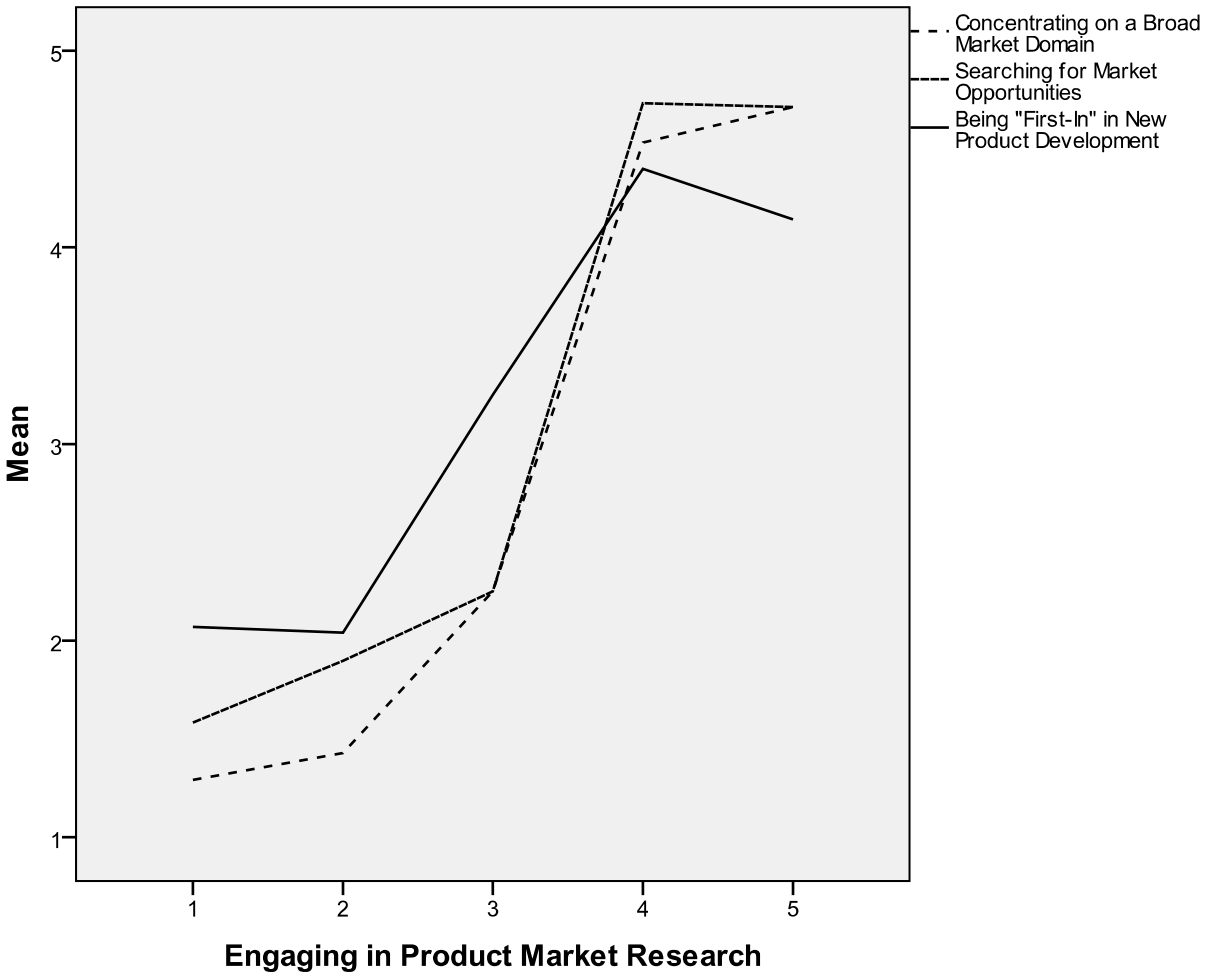

Figure App.D.12: Linearity Tests on Prospector Strategy, Engaging in Product Market Research

Finally, the focus was on the defender strategy. The following line graph presents mean levels for five of the defender strategy variables, on the basis of the variable measuring the emphasis on existing operation efficiency. As shown, four out of the five relationships were quite linear in nature, and no strong evidence of curvilinear relationships was found (see figure App.D.13).

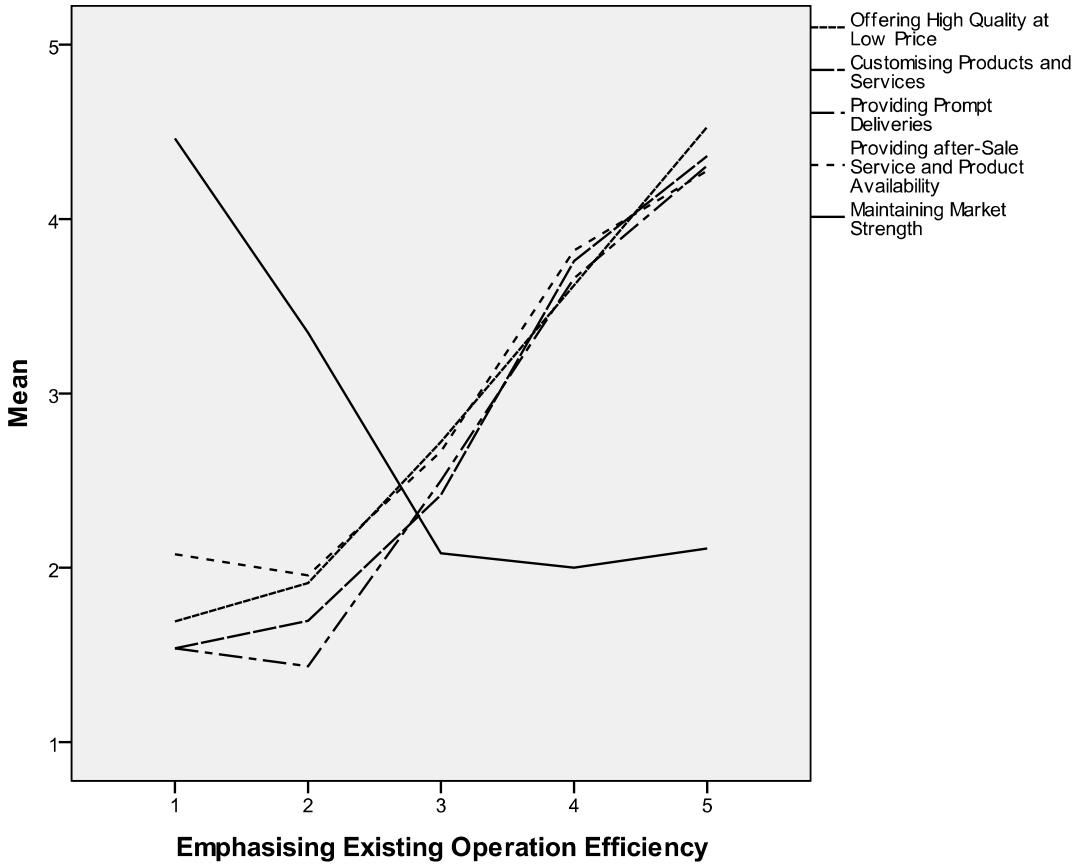

Figure App.D.13: Linearity Tests on Defender Strategy, Emphasising Existing Operation Efficiency

The next line graph presented for this section, included below, presents mean levels for five of the defender strategy variables, on the basis of the variable measuring prompt delivery. As shown, the majority of relationships appear to be quite linear, and no strong evidence of curvilinear relationships was found. This indicates that no issues with regards to linearity existed for this set of variables (see figure App.D.14).

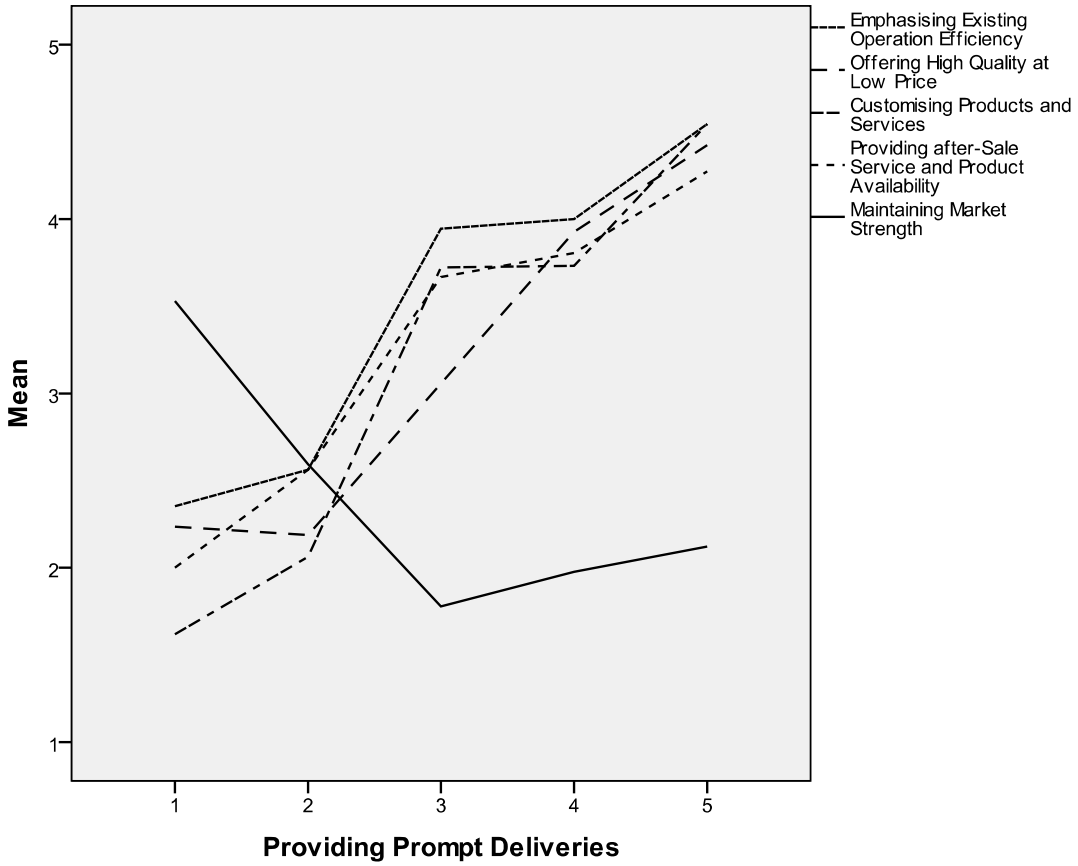

Figure App.D.14: Linearity Tests on Defender Strategy, Providing Prompt Deliveries

App.D2 Factor Analyses Results

The first factor analysis was conducted on perceived environmental uncertainty (PEU). In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90, or those which did not correlate well with any other items (Field, 2005).

No issues with these items were found, hence no changes needed to be made. Therefore, responses for 5 items which were collected from a sample of 158 foreign and Saudi companies were used as the item pool for the factor analysis. The participant to variable ratio was 31:1. This ratio was satisfactory in keeping with the

recommendations made by Kass and Tinsley (1979), Tabachnick and Fidell (1996), Comrey and Lee (1992), and Guadagnoli and Velicer (1988), which advise a 6:1 ratio between the factors and the sample size. Table App.D-6 presents the eigenvalues resulting from this analysis. Kaiser's criterion would suggest that only a single factor be kept.

PEU: Eigenvalues

Factors	Eigenvalue
Factor 1	3.105
Factor 2	0.930
Factor 3	0.381
Factor 4	0.306
Factor 5	0.279

Table App.D-6

Notes: Only positive eigenvalues shown

The second criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.15 presents the scree plot of the eigenvalues presented above. The scree plot may suggest that two factors be kept in total.

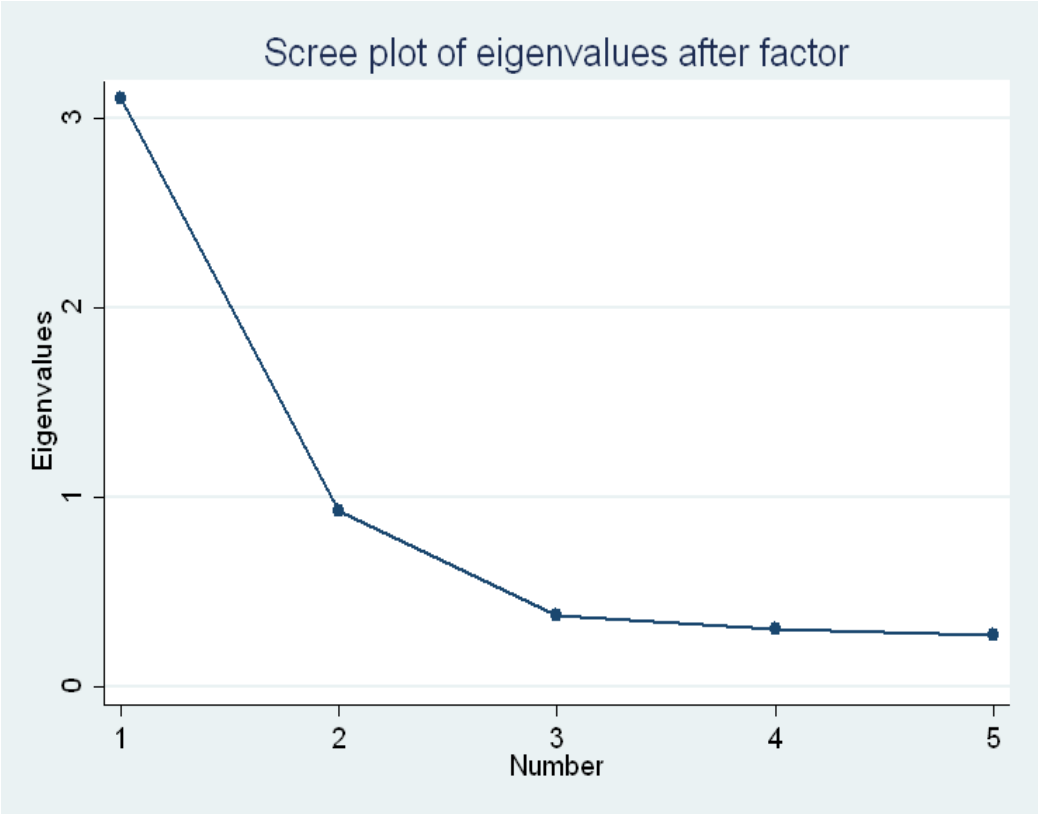

Figure App.D.15: Scree Plot for PEU

Table App.D-7 presents the factor loadings for the first factor. As shown, all variables load strongly for this first factor. Based on this set of results, only one factor will be kept for PEU.

PEU: Factor Loadings

Variables	Loading
New Products	0.820
Economic	0.741
Technological	0.769
Preferences	0.764
Constraints	0.841

Table App.D-7

The second factor analysis was conducted on competition. In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90 or those which did not correlate well with any other

items (Field, 2005). No issues with these items were found, hence no changes needed to be made. Table App.D-8 presents the eigenvalues resulting from this factor analysis. Kaiser's criterion would strongly suggest that only the first factor be kept in this analysis.

Competition: Eigenvalues

Factors	Eigenvalue
Factor 1	3.158
Factor 2	0.467
Factor 3	0.259
Factor 4	0.117

Table App.D-8

Notes: Only positive eigenvalues shown

The second criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.16 presents a scree plot of the eigenvalues presented above. This scree plot may suggest that two factors be kept in total.

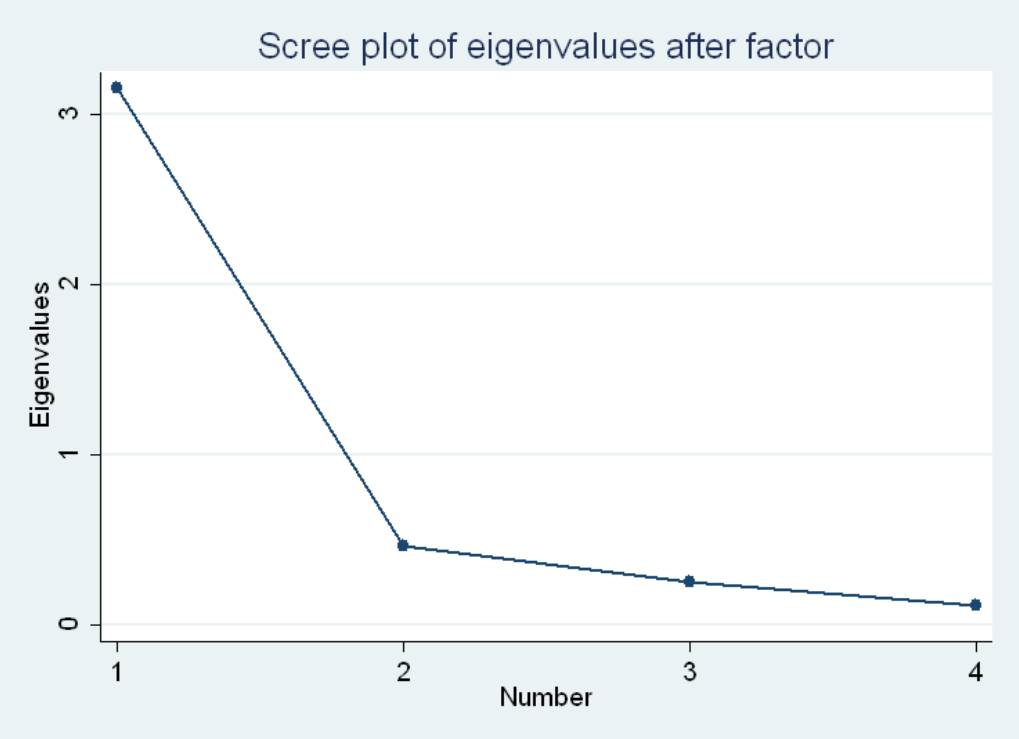

Figure App.D.16: Scree Plot for Competition

The factor loadings for this initial factor are presented in table App.D-9. It was found that all variables load strongly upon this first factor. Based on this set of results, a single factor was chosen for competition.

Competition: Factor Loadings

Variables	Loading
Bidding for Purchase	0.796
Manpower Competition	0.888
Quality Competition	0.944
Price Competition	0.920

Table App.D-9

The next factor analysis was conducted on size. As the variables relating to size had different ranges, the natural logs of these variables was first taken and used for the factor analysis. In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90 or those which did not correlate well with any other items (Field, 2005). No issues with these items were found, hence no changes needed to be made. Table App.D-10 presents the eigenvalues resulting from this factor analysis. Kaiser's criterion would very strongly suggest that only the initial factor be kept.

Size: Eigenvalues

Factors	Eigenvalue
Factor 1	2.717
Factor 2	0.202
Factor 3	0.081

Table App.D-10

Notes: Only positive eigenvalues shown

Next, the scree plot was analysed. The point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.17 suggests that one or two factors be kept in total.

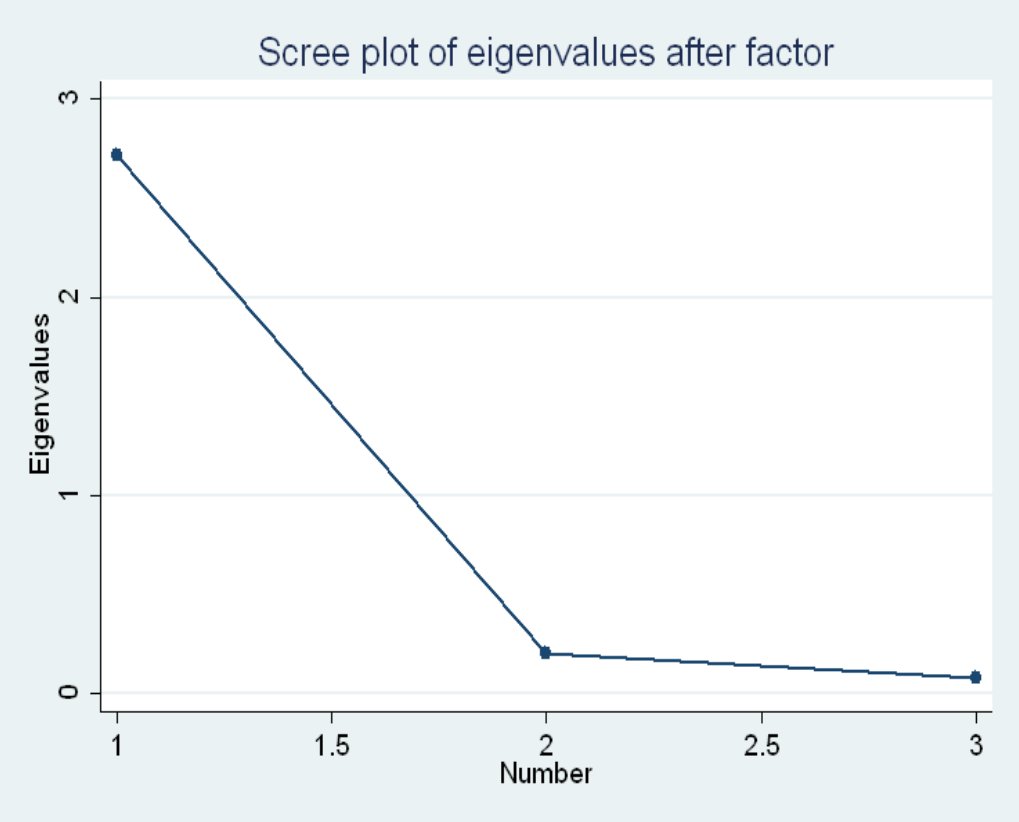

Figure App.D.17: Scree Plot for Size

Finally, the factor loadings for the initial factor are presented in table App.D-11. All variables were found to load strongly upon the first factor for size. Based on these results, a single factor was chosen for size.

Size: Factor Loadings

Variables	Loading
Number of Employees	0.929
Total Assets	0.960
Sales Revenue	0.966

Table App.D-11

The next factor analysis was conducted on advanced manufacturing technologies (AMTs). In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90 or those which

did not correlate well with any other items (Field, 2005). No issues with these items were found, hence no changes needed to be made. The eigenvalues resulting from this factor analysis are presented in table App.D-12. Kaiser's criterion would suggest that the first three factors be kept.

AMTs: Eigenvalues

Factors	Eigenvalue
Factor 1	5.097
Factor 2	1.960
Factor 3	1.174
Factor 4	0.953
Factor 5	0.879
Factor 6	0.746
Factor 7	0.686
Factor 8	0.607
Factor 9	0.486
Factor 10	0.405
Factor 11	0.333
Factor 12	0.262
Factor 13	0.234
Factor 14	0.179

Table App.D-12

Notes: Only positive eigenvalues shown

Next, the scree plot, presented below, was analysed. The point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.18 presents a scree plot of the above eigenvalues. This scree plot would suggest that three factors be kept in total.

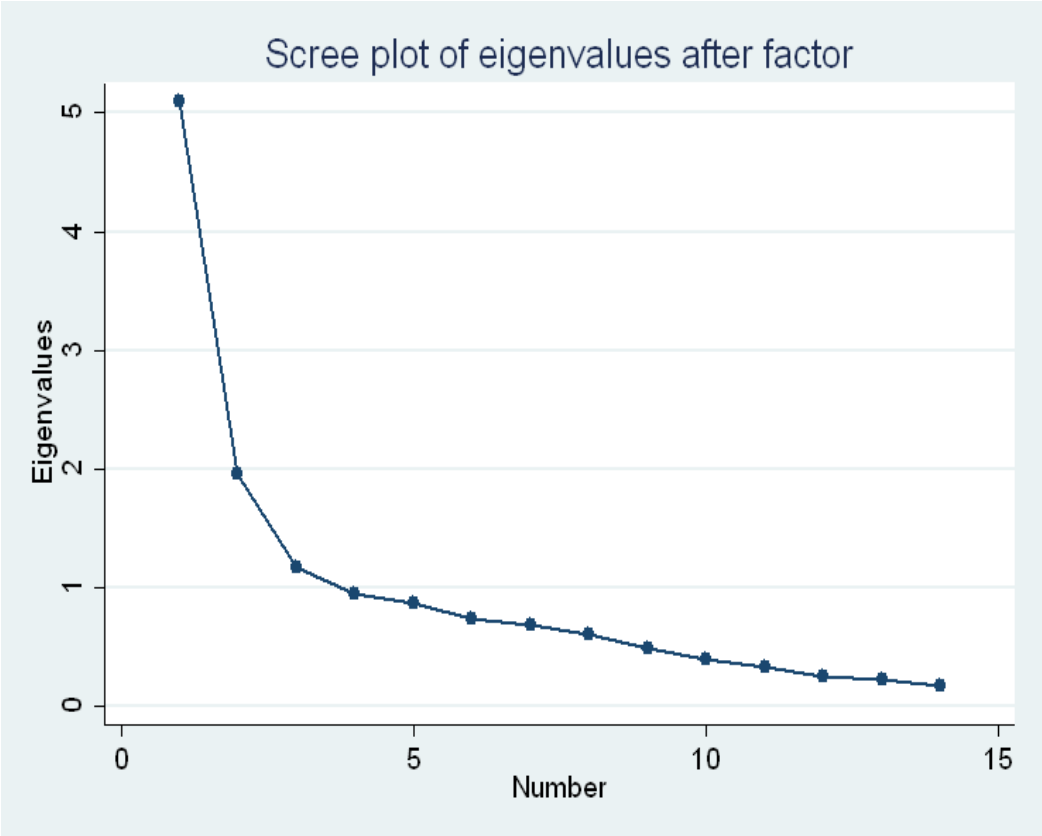

Figure App.D.18: Scree Plot for AMTs

Next, table App.D-13 presents the factor loadings for the first three factors. These factor loadings consisted of the Varimax rotated solution. As shown, the first factor is composed of six variables, which measure (1) the frequency of use of computer aided design, (2) computer aided engineering, (3) computer integrated manufacturing, (4) enterprise resource planning, (5) material requirements planning and (6) manufacturing resource planning.

The second factor was found to be composed of five variables, which focused on the frequency of use of (7) customer technology, (8) small batch/job shop, (9) large batch technology, (10) mass production technology and (11) continuous process technology. The third factor focused most heavily on the extent to which the company used (12) electronic data processing for performing its activities, and (13) how often their

operations technology has undergone significant changes during the last five years, respectively. The final variable, automation (14), most strongly loaded upon the third factor, though this factor loading was below 0.5.

Items loading upon the first factor were more strongly associated with Design and Administrative Technology (DAT). The items loading upon the second factor were focused upon Operational Technology (OT), while the items loading upon the third factor addressed Innovative-Administrative and Operation Technology (IAOT).

AMTs: Factor Loadings

Variables	Factor 1	Factor 2	Factor 3
Automation	0.163	0.211	0.442
Customer Technology	0.384	0.570*	-0.106
Small Batch, Job Shop	0.158	0.797*	-0.218
Large Batch Technology	0.134	0.845*	0.132
Mass Production Technology	0.123	0.763*	0.218
Continuous Process Technology	0.156	0.570*	0.420
Electronic Data Processing	0.393	-0.174	0.513*
Computer Aided Design	0.778*	0.041	-0.115
Computer Aided Engineering	0.812*	0.237	0.023
Computer Integrated Manufacturing	0.722*	0.250	0.191
Enterprise Resource Planning	0.755*	0.230	0.096
Material Requirements Planning	0.738*	0.082	0.304
Manufacturing Resource Planning	0.692*	0.103	0.373
Operations Technology Change	0.121	0.104	0.721*

Table App.D-13

Notes: *Loading > |.5|, [1]Unrotated

The next factor analysis conducted focused upon culture. In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90 or those which did not correlate well with any other items (Field, 2005). No issues with these items were found, hence no changes needed to be made. The eigenvalues resulting from this factor analysis are presented in table

App.D-14. The use of Kaiser's criterion would strongly suggest that only the first factor be kept.

Culture: Eigenvalues

Factors	Eigenvalue
Factor 1	4.243
Factor 2	0.232
Factor 3	0.213
Factor 4	0.175
Factor 5	0.138

Table App.D-14

Notes: Only positive eigenvalues shown

The next criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.19 presents a scree plot of the eigenvalues presented above. This scree plot would suggest that two factors be kept in total.

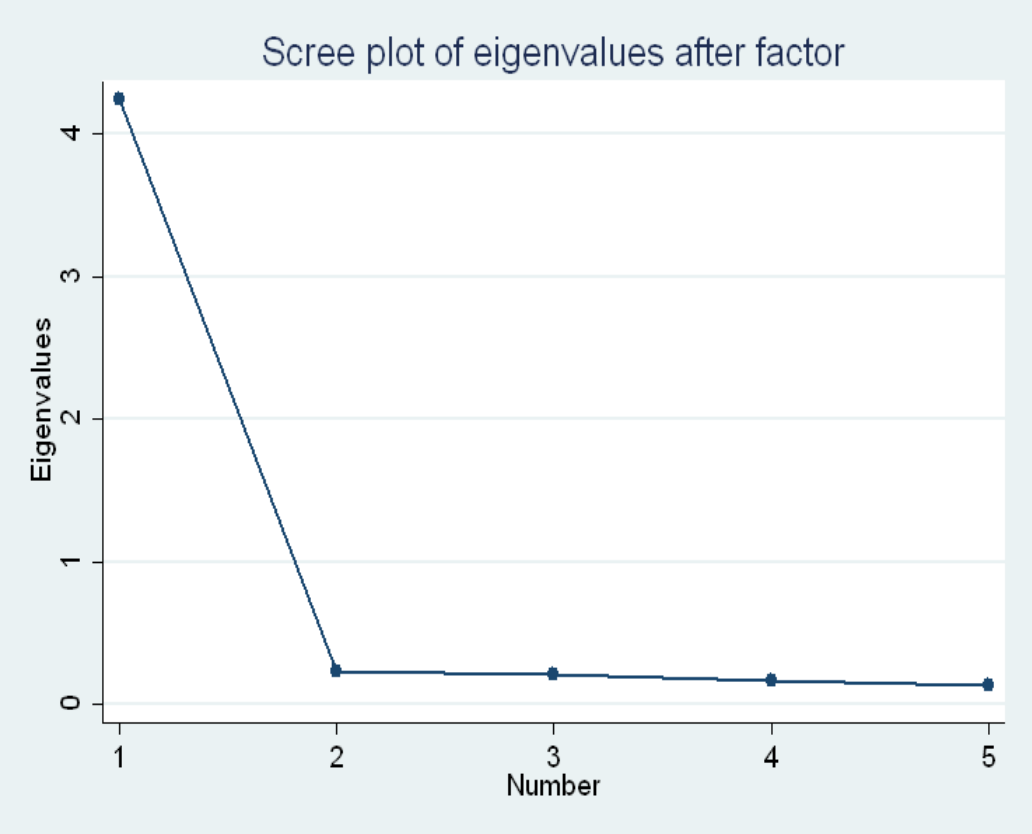

Figure App.D.19: Scree Plot for Culture

Next, table App.D-15 presents the factor loadings for the initial factor in this analysis. All variables were found to load strongly upon the first factor. The higher scores for this factor include greater delegation and less formalised job descriptions.

Culture: Factor Loadings

Variables	Loading
Pricing Decisions	0.936
Budgeting Allocation	0.921
Selection of New Investments	0.921
Development of New Products	0.915
Specification of Job Tasks	-0.913

Table App.D-15

The final two factor analyses were conducted on firm strategy. In order to achieve the factorial structure, these items were screened for multicollinearity by examining the inter-item correlations between the items, with the intention of removing those items with correlations greater than .90 or those which did not correlate well with any other items (Field, 2005). No issues with these items were found, hence no changes needed to be made.

As two distinct types of firm strategy were identified, the prospector and defender strategies, two separate factor analyses were conducted. First, a factor analysis was conducted on the prospector strategy. Table App.D-16 presents the eigenvalues resulting from this analysis. Kaiser's criterion would strongly suggest that only the first factor be retained.

Prospector Strategy: Eigenvalues

Factors	Eigenvalue
Factor 1	3.178
Factor 2	0.472
Factor 3	0.217
Factor 4	0.133

Table App.D-16

Notes: Only positive eigenvalues shown

The next criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.20 presents a scree plot of the eigenvalues presented above. This scree plot would suggest that two factors be kept in total.

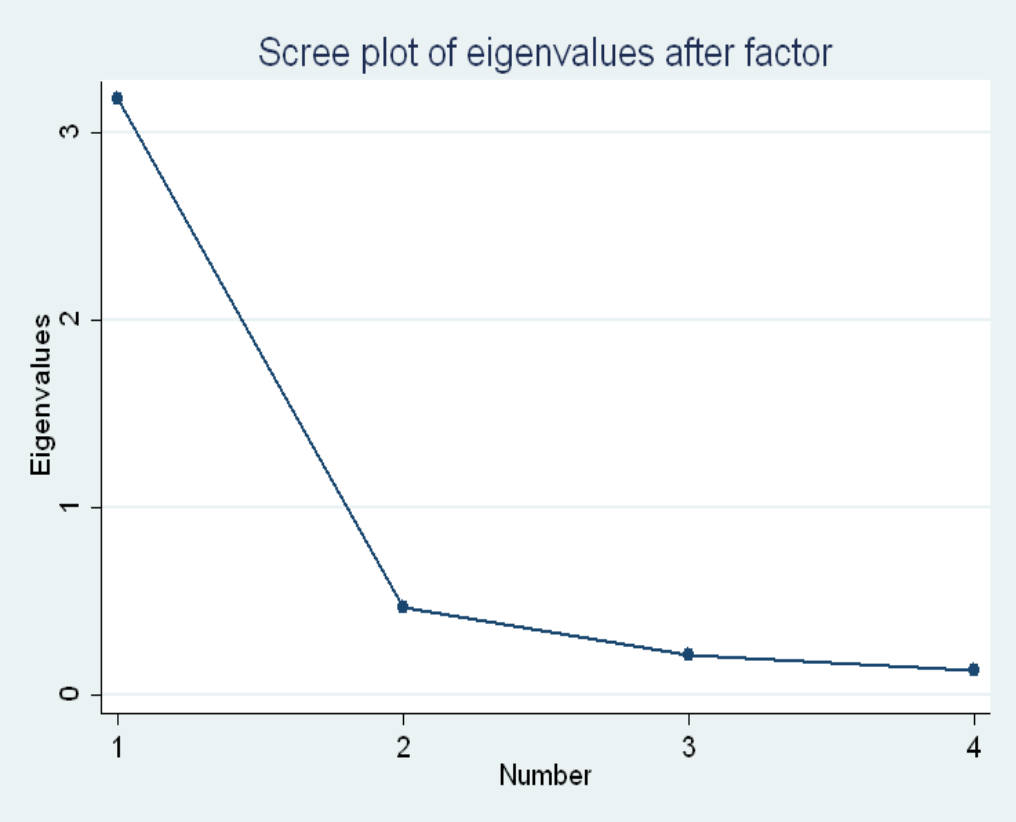

Figure App.D.20: Scree Plot for the Prospector Strategy

Next, table App.D-17 presents the factor loadings for the first factor in this analysis. All variables were found to strongly load upon the first factor in this analysis.

Prospector Strategy: Factor Loadings

Variables	Loading
Concentrating on a Broad Market Domain	0.931
Searching for Market Opportunities	0.921
Engaging in Product Market Research	0.916
Being "First-In" in New Product Development	0.790

Table App.D-17

The next factor analysis was conducted on the defender firm strategy. The eigenvalues resulting from this analysis are presented in table App.D-18. Kaiser's criterion suggests that only the first factor be retained.

Defender Strategy: Eigenvalues

Factors	Eigenvalue
Factor 1	4.025
Factor 2	0.756
Factor 3	0.379
Factor 4	0.359
Factor 5	0.252
Factor 6	0.230

Table App.D-18

Notes: Only positive eigenvalues shown

The next criterion was the scree plot; the point of inflexion on the scree plot was taken as the cutoff point (Cattell, 1966) for selecting the factors. Figure App.D.21 presents a scree plot of these eigenvalues. This scree plot would suggest that two factors be kept in total.

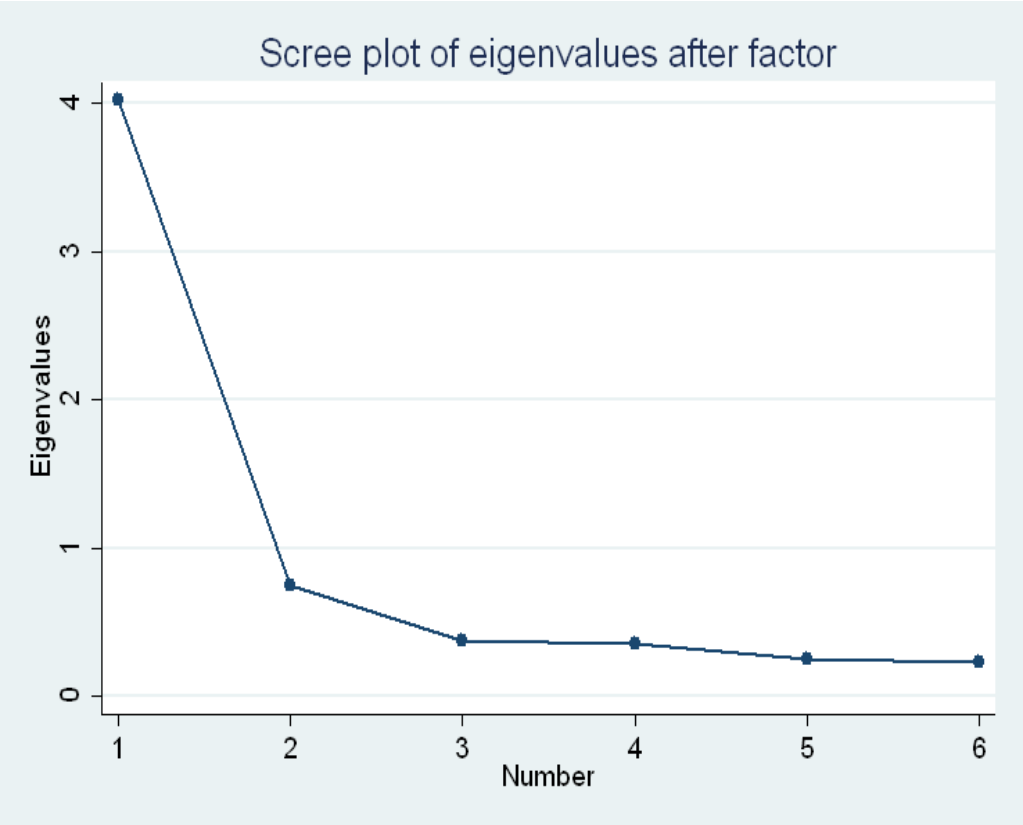

Figure App.D.21: Scree Plot for the Defender Strategy

Table App.D-19 presents the factor loadings of these variables on the first factor. All variables were found to load strongly upon the first factor. Based on these results, a single factor was retained. Higher scores on this factor were associated with higher scores on the first five variables and lower scores on the last variable, which focused on the importance of maintaining market strength in all areas in which the company operates.

Defender Strategy: Factor Loadings

Variables	Loading
Emphasising Existing Operation Efficiency	0.894
Offering High Quality at Low Price	0.833
Customising Products and Services	0.866
Providing Prompt Deliveries	0.873
Providing After-Sales Service and Product Availability	0.813
Maintaining Market Strength	-0.600

Table App.D-19

App.D3 Correlations between the New Predictors (Tests for Moderation)

Next, correlations were conducted between the new internal predictors (except product diversity) and the new external predictors. Initially, a set of correlations were conducted between PEU, an external predictor and all internal predictors. Next, a second set of correlations were conducted between competition, the second external predictor and all internal predictors. These correlations will be presented and summarised in this section.

First, the correlations between PEU and the internal predictors will be presented. Table App.D-20 presents the results of the correlations conducted between PEU and size. As shown, while not particularly strong, positive correlations between PEU and size were found.

PEU: Correlations with Size

Variable	Kendall's *tau*-b	Spearman's *rho*
Size Factor	0.273***	0.398***

Table App.D-20

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between PEU and product diversity. The results of these correlations are presented in table App.D-21. While significant correlations were not found between the number of products and PEU, weak but significant correlations were found between PEU and product standardization.

PEU: Correlations with Product Diversity

Variable	Kendall's *tau*-b	Spearman's *rho*
Number of Products	0.045	0.052
Product Standardisation	0.163**	0.222**

Table App.D-21

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between PEU and the AMT factor variables. Table App.D-22 summarises the results of these correlation analyses. While significant correlations were not found between PEU and the first two AMT factors, weak yet significant correlations were found between the third AMT factor, data processing/operations, and PEU.

PEU: Correlations with AMTs

Variable	Kendall's *tau*-b	Spearman's *rho*
Design & Administrative Technology	0.087	0.121
Operational Technology	0.092	0.134
Innovative-Administrative & Operation Technology	0.232***	0.345***

Table App.D-22

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Following this, correlations were conducted between PEU and culture. Here, correlations were conducted for Saudi companies, as well as non-Saudi companies, separately. Interestingly, correlations were found to be positive and significant for non-Saudi companies, but not for Saudi companies (see table App.D-23). PEU appears to have a positive relationship with culture in the case of non-Saudi companies only.

PEU: Correlations with Culture

Variable	Kendall's *tau*-b	Spearman's *rho*
Culture: Non-Saudi Companies	0.450**	0.607**
Culture: Saudi Companies	0.115	0.161

Table App.D-23

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between PEU and firm strategy. Initially, the factor representing the prospector firm strategy will be focused upon. These correlations are

presented in table App.D-24. Weak but positive and significant correlations were found between the prospector strategy factor and PEU.

PEU: Correlations with Prospector Strategy

Variable	Kendall's *tau*-b	Spearman's *rho*
Prospector Strategy Factor	0.139*	0.208**

Table App.D-24

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between the defender strategy factor and PEU. These results are presented in table App.D-25. These correlations were not found to be statistically significant.

PEU: Correlations with Defender Strategy

Variable	Kendall's *tau*-b	Spearman's *rho*
Defender Strategy Factor	-0.094	-0.141

Table App.D-25

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

In this section, the correlations between competition and the new internal predictors will be presented. Table App.D-26 presents the results of the correlations conducted between competition and size. As shown, while not particularly strong, positive correlations between competition and size were found.

Competition: Correlations with Size

Variable	Kendall's *tau*-b	Spearman's *rho*
Size Factor	0.296***	0.418***

Table App.D-26

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between competition and product diversity. The results of these correlations are presented in the following table (App.D-27). No significant correlations were found between competition and product diversity.

Competition: Correlations with Product Diversity

Variable	Kendall's *tau*-b	Spearman's *rho*
Number of Products	0.007	0.008
Product Standardisation	0.047	0.073

Table App.D-27

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between competition and the AMT factor variables. Table App.D-28 summarises the results of these correlation analyses. Weak but significant correlations were found between all three of the AMT factors and competition.

Competition: Correlations with AMTs

Variable	Kendall's *tau*-b	Spearman's *rho*
Design & Administrative Technology	0.140**	0.198*
Operational Technology	0.122*	0.180*
Innovative-Administrative & Operation Technology	0.172**	0.255**

Table App.D-28

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Following this, correlations were conducted between competition and culture. Here, correlations were conducted for Saudi companies, as well as non-Saudi companies, separately. Interestingly, correlations were found to be positive and significant for non-Saudi companies, but not for Saudi companies (see table App.D-29). Competition appears to have a positive relationship with culture in the case of non-Saudi companies only.

Competition: Correlations with Culture

Variable	Kendall's *tau*-b	Spearman's *rho*
Culture: Non-Saudi Companies	0.574***	0.738***
Culture: Saudi Companies	0.086	0.130

Table App.D-29

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between competition and firm strategy. Initially, the factor representing the prospector firm strategy will be focused upon. These correlations are presented in table App.D-30. Weak but positive and significant correlations were found between the prospector strategy factor and competition.

Competition: Correlations with Prospector Strategy

Variable	Kendall's *tau*-b	Spearman's *rho*
Prospector Strategy Factor	0.232***	0.343***

Table App.D-30

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

Next, correlations were conducted between the defender strategy factor and competition. These results are presented in table App.D-31. Weak but negative correlations were found between the defender strategy and competition.

Competition: Correlations with Defender Strategy

Variable	Kendall's *tau*-b	Spearman's *rho*
Defender Strategy Factor	-0.170**	-0.271***

Table App.D-31

*Correlation is significant at the .05 level (2-tailed).
**Correlation is significant at the .01 level (2-tailed).
***Correlation is significant at the .001 level (2-tailed).

App.D4 Tests for Mediation

Before the regression analysis was conducted, tests for mediation were conducted in order to ensure that the effect of the independent variables on the dependent variable was direct, and not mediated by a third variable. In these analyses, the factor of size was specifically focused upon, as a possible mediating variable. Variables which were focused upon as predictor variables of AMA consisted of the factors discussed earlier (PEU, competition, the AMT factors, culture, and the prospector and defender strategies), as well as product diversity and type of industry.

In order to test for mediation, the steps identified by Baron and Kenny (1986), and Judd and Kenny (1981) were utilised. These steps consist of the following: 1) show that the initial variable is correlated with the outcome: this establishes that there is an effect which may be mediated, 2) show that the initial variable is correlated with the mediator: in this analysis, the mediator is treated as the dependent variable, and the initial variable as the predictor, 3) show that the mediator affects the outcome variable, and 4) the effect of the initial variable on the dependent variable controlling for the mediating variable should be 0, in order to establish that the mediating variable completely mediates the relationship between these two variables.

The effects in both steps 3 and 4 are estimated as part of the same regression equation. If all four of these steps are met, then the mediating variable can be said to completely mediate the relationship between the predictor and the dependent variable. If only the first three steps are met, then only partial mediation is indicated.

The first test of mediation focuses on PEU as the initial variable. The results of these analyses, which consisted of three logistic regression analyses, are presented in the

table App.D-32. As in the final regression analysis, the mediator was not found to affect the dependent variable, and no effects of mediation were found.

Mediational Analyses: PEU and Size

Variable	Odds Ratio
PEU→ AMA	127.06***
PEU→ Size	2.13***
PEU→ AMA	132.58***
Size→ AMA	0.93
Table App.D-32	

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

The next test of mediation focused upon competition as the initial variable. The results of the analyses conducted are presented in table App.D-33. As size was not found to affect the dependent variable in the final regression analysis, this indicates that no effects of mediation were found.

Mediational Analyses: Competition and Size

Variable	Odds Ratio
Competition → AMA	344.00***
Competition → Size	2.32***
Competition → AMA	385.66***
Size→ AMA	4.00
Table App.D-33	

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Following this, the next set of tests focus on product diversity; first, the number of products currently produced by companies was focused upon. The results of the tests of mediation are presented in table App.D-34. As in the initial regression analysis, the relationship between the number of products and the dependent variable was not statistically significant; this indicates that there was no effect to be mediated.

Mediational Analyses: Number of Products and Size

Variable	Odds Ratio
Number of Products → AMA	0.62
Number of Products → Size	1.79*
Number of Products → AMA	0.39**
Size→ AMA	3.16***
Table App.D-34	

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Next, in terms of product diversity, the range of products marketed by companies was focused upon with regards to being standardised versus being customised. The results of these mediational analyses are presented in table App.D-35. As the second regression analysis conducted with product range as a predictor of size was not found to be significant, the indication is that the requirements of mediation were not met here.

Mediational Analyses: Product Range and Size

Variable	Odds Ratio
Product Range → AMA	1.44**
Product Range → Size	0.90
Product Range → AMA	1.72***
Size→ AMA	3.16***
Table App.D-35	

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Following this, tests of mediation were conducted with regards to the AMT factors. Initially, the first AMT factor was focused upon, which was most strongly associated with Design and Administrative Technology (DAT). The results of the analyses conducted are presented in table App.D-36. As the initial regression analysis conducted with DAT as a predictor of AMA was not found to be significant, this indicates that there was no effect to be mediated.

Mediational Analyses: DAT and Size

Variable	Odds Ratio
DAT → AMA	1.15
DAT → Size	1.58**
DAT → AMA	0.91
Size→ AMA	2.68***

Table App.D-36

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Next, tests of mediation were conducted on the second AMT factor, which was most strongly associated with Operational Technology (OT). The results of these analyses are presented in table App.D-37. The requirements of mediation were not met here, as the two initial regression analyses were not found to be statistically significant.

Mediational Analyses: OT and Size

Variable	Odds Ratio
OT → AMA	1.34
OT → Size	1.31
OT → AMA	1.29
Size→ AMA	2.61***

Table App.D-37

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

The next test of mediation focused upon the third AMT factor, which addressed Innovative-Administrative and Operation Technology (IAOT). The results of these analyses are presented in table App.D-38. All predictor variables were found to be significant for all three regressions conducted; however, the effect of the initial variable on the dependent variable when controlling for the mediating variable was substantially reduced, but was not found to be 0 in the final regression analysis. This suggests that size is a partial mediator with regards to the relationship between IAOT and AMA.

Mediational Analyses: IAOT and Size

Variable	Odds Ratio
IAOT → AMA	2.11***
IAOT → Size	1.89***
IAOT → AMA	1.61*
Size→ AMA	2.19***

Table App.D-38

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Next, mediational analyses were conducted which focused on culture. Table App.D-39 presents the results of the analyses conducted. The first two regression analyses were found to be significant, while in the third regression analysis, it was found that, when controlling for size as a predictor of AMA, the effect of culture on AMA was substantially reduced, and was also found to be non-significant. This suggests that size mediates the relationship between culture and AMA.

Mediational Analyses: Culture and Size

Variable	Odds Ratio
Culture → AMA	1.92**
Culture → Size	2.51***
Culture → AMA	1.38
Size→ AMA	2.36***

Table App.D-39

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Following this, mediational analyses were conducted on strategy. First, the prospector strategy was focused upon. The results of the analyses conducted are presented in the table App.D-40. The first two regression analyses were found to be significant, and in the third regression analysis conducted, size was still found to be a significant predictor of AMA, while the strength of the relationship between the prospector strategy and AMA was substantially reduced. This suggests that size is a partial mediator of the relationship between the prospector strategy and AMA practices.

Mediational Analyses: Prospector Strategy and Size

Variable	Odds Ratio
Prospector Strategy → AMA	2.83**
Prospector Strategy → Size	3.14***
Prospector Strategy → AMA	2.18*
Size→ AMA	2.12**

Table App.D-40

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

Finally, mediational analyses were conducted on the defender strategy. Table App.D-41 summarises the results of the analyses conducted. As the defender strategy was not found to be a significant predictor of AMA practices in the first regression analysis, the requirements of mediation were not met. Additionally, mediational analyses were conducted on the type of industry. As the logistic regression conducted with the type of industry as a predictor of size was not found to be significant, this indicates that the requirements of mediation were not met.

In conclusion, as size was found to be a mediator or partial mediator in several of the mediational analyses conducted, it will be included as a control variable in the final analysis, which consists of a logistic regression conducted on AMA practices.

Mediational Analyses: Defender Strategy and Size

Variable	Odds Ratio
Defender Strategy → AMA	0.91
Defender Strategy → Size	0.44***
Defender Strategy → AMA	1.46
Size→ AMA	3.08***

Table App.D-41

*Test is significant at the .05 level (2-tailed).
**Test is significant at the .01 level (2-tailed).
***Test is significant at the .001 level (2-tailed).

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