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The Contingent Factors that Affect the Use of Performance Measurement Systems in the Egyptian Medium and Large Sized Manufacturing Companies

Amr ElSayed A. E. Youssef

Thesis submitted in fulfillment of the Degree of

Doctor of Philosophy (Ph.D)

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University of Durham
Durham Business School
Durham, UK

March 2007

UNIVERSITY OF DURHAM

18 APR 2007

Dedication

To my family and my best friends for their love and ongoing support

Abstract

Performance measurement systems have been receiving a growing attention from academics and professionals as well (Eccles, 1991; Eccles and Pyburn, 1992; Neely, 1999; Chenhall, 2003; Franco-Santos and Bourne, 2005). Traditionally, management accounting has been operating on financial measures to provide managers with the financial information necessary for decision-making (Irvine, 1970; Cooper and Kaplan, 1991; Neely, 1999). Limitations and criticisms were increasing concerning the limited view of these financial measures, focusing on results only not the drivers of performance and the potential of these measures to encourage budget padding and slack (Kaplan, 1983; 1984; Johnson and Kaplan, 1987; Jensen, 2003). Thus, recent studies report the increasing use of non-financial performance measures such as customer, internal business, learning and innovation and environmental measures (Kaplan and Norton, 1992; Atkinson *et al.*, 1997; Ittner and Larcker, 1998a; 1998b; Young and Welford, 1998). Most of these studies were developed in Western countries; little has been conducted in developing countries. This research attempted to investigate two main questions. Firstly, the current use of performance measures in medium and large sized manufacturing companies and, secondly, the factors that might affect the use of these measures in a developing country; namely, Egypt.

The main motivation for undertaking this research is to fill the gap in literature and providing some information that might benefit both academics and practitioners in this field. In addition, investors and potential investors might have a clearer picture about what is going on in medium and large sized manufacturing companies in Egypt.

A thorough revision to the literature suggested contingency perspective as the most appropriate theoretical framework for this type of research (Fisher and Govindarajan, 1993; Fisher, 1995a; 1998; Donaldson, 1996; Ittner and Larcker, 2001). Data were collected in this research by using both questionnaire and interviews. Responses from 73 medium and 67 large sized manufacturing companies and 10 interviews were analysed in order to explore the research questions.

The research findings have revealed that most of the medium and large sized companies apply hybrid performance measurement systems that incorporate a combination of financial and non-financial measures. However, the relative importance of each type of measure varies. Strategies, structure, competition, technology, management style, reward systems and environmental uncertainty were the contingent key variables that represent the core of the study. The variables were chosen on the premise of their importance to the use of performance measures in both medium and large sized manufacturing companies. The results revealed that all these variables were of great importance to the use of performance measures in the large sized manufacturing companies. All, except technology, also influence the use of performance measures in the medium sized manufacturing companies. Organisational size was used in this study as an intervening variable; however, the results of medium and large sized companies were consistent, except with technology variable.

This study enriches our understanding of how performance measures could be used more effectively and efficiently in the developing countries and participates in bridging the gap in performance measurement systems literature.

Declaration of Rights

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Due acknowledgment must always be made of any material contained in, or derived from, the thesis.

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List of Abbreviations

Activity-Based Budgeting	(ABB)
Activity-Based Costing	(ABC)
African Development Bank	(ADB)
American Accounting Association	(AAA)
Arab Republic of Egypt	(ARE)
Balanced Scorecard	(BSC)
Board of Directors	(BOD)
Cairo and Alexandria Stock Exchanges	(CASE)
Chief Executive Officer	(CEO)
Chief Financial Officer	(CFO)
Critical Success Factors	(CSFs)
Earnings per Share	(EPS)
Economic Value Added	(EVA)
Egyptian Environmental Affairs Agency	(EEAA)
Electronic Data Interchange	(EDI)
Exploratory Factor Analysis	(EFA)
Financial Accounting Standards Board	(FASB)
Flexible Manufacturing Systems	(FMS)
General Contingency Theory	(GCT)
General Motors Corporation	(GM)
Gross Domestic Production	(GDP)
Gross National Product	(GNP)
Hudson's Bay Company	(HBC)
Information Technology	(IT)
International Monetary Funds	(IMF)
Just In Time	(JIT)
Kaiser-Meyer-Olkin	(KMO)
Key Performance Indicators	(KPIs)
Management Accounting Systems	(MAS)

Management Control Systems	(MCS)
Middle East and North Africa	(MENA)
Ministry of State for Environmental Affairs	(MSEA)
Net Income	(NI)
Newly Industrialised Countries	(NICs)
North West Company	(NWC)
Operations Management Systems	(OMS)
Performance Measures	(PMs)
Principal Components Analysis	(PCA)
Rapidly Changing Environment	(RCE)
Research and Development	(R&D)
Residual Income	(RI)
Resource Planning Systems	(RPS)
Return on Assets	(ROA)
Return on Investment	(ROI)
State-Owned Enterprises	(SOEs)
Total Quality Management	(TQM)
Variance Inflation Factor	(VIF)
World Bank	(WB)
World Trade Organisation agreement	(WTO)
Zero-Base Budgeting	(ZBB)

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Chapter One

Introduction and Overview

1.1 Research Background

'Performance measurement is a fundamental cornerstone of modern management' (Franco-Santos and Bourne, 2005: p. 114). Performance measurement issue has been of growing importance to both academics and practitioners. As Azofra *et al.* (2003) contend that the design and use of performance measurement systems in business organisations continues to be one of the areas that attract a great deal of interest. Ghalayini and Noble (1996: p. 63) point out that performance measures are used to evaluate, control, improve production processes and compare the performance of different organisations, plants, departments, teams and individuals, and to assess employees should companies achieving their goals and objectives. They stated that performance measurement literature underwent two main phases. The first phase began in the late 1880s and went through the 1980s, which witnessed the domination of the traditional financial measures such as profit, return on investment and productivity. Performance measurement system prevailed in that period, mostly, was 'budgeting' that depend mainly on financial measures. Barsky and Bremser (1999: p. 3) stated, 'Budgeting has traditionally served as high profile process in organisations. Resource allocation decisions, performance target settings and spending limitations have been the primary focus of corporate budgeting processes. Thus, it has stood as a hall mark, highly visible process at many corporations'.

The second phase started from mid-1980s as a result of changes in the world market. Criticisms have been made to traditional financial measures as companies began to lose market share to overseas competitors who were able to provide higher-quality products with lower costs and more variety. In summary, traditional financial measures were criticised because they encourage short-termism (i.e. the delay of capital investment); lack strategic focus and fail to provide data on quality, responsiveness and flexibility; encourage local optimisation; encourage managers to minimise the variances from standard rather than seek to improve continually; focus on historical data and do not provide any prediction to future performance and fail to provide information on what

customers want and how competitors are performing (Hayes and Abernathy, 1980; Richardson and Gordon, 1980; Hall, 1983; Hopwood, 1984; Miller and Vollmann, 1985; Goldratt and Cox, 1986; Johnson and Kaplan, 1987; Berliner and Brimson, 1988; Hiromoto, 1988; Schmenner, 1988; Turney and Anderson, 1989; Dixon *et al.*, 1990; Kaplan and Norton, 1992; Ghalayini and Noble, 1996; Neely, 1999).

In the same vein, Neely (1999: p. 210) asserted that the limitations of traditional financial measures have been known for some time. However, he argues that evidence suggests that there are seven main reasons which made many people become so interested in business performance measurement recently. He identified them as 'the changing nature of work; increasing competition; specific improvement initiatives; national and international awards; changing organisational roles; changing external demands; and the power of information technology'.

As a result of these limitations and for companies to regain a competitive edge, the implementation and development of new performance measurement systems were required for success (Ghalayini and Noble, 1996). Companies considered integrating non-financial measures along with their financial measures. Barsky and Bremser (1999) stated that, recently, firms have shifted away from budgeting as a unidimensional financial model to integrated frameworks to measure performance. Also, Azofra et al. (2003: p. 368) stated, 'In order to overcome the limitations of financial indicators, the need arises to complement them with a monitoring of non-financial indicators—quantitative and qualitative—which, given their very nature, seem to be more appropriate, to follow operations closely and in real time, thus making it possible to carry out revisions and corrections as needed'. From reviewing the literature, they highlighted some interesting tools, which suggesting a balanced use of financial and non-financial performance such as the Dash Board, the Performance Pyramid and the Balanced Scorecard that try to focus managers' attention on the strategy's key success factors and communicate them throughout the whole organisation.

One of the most popular performance measurement systems that incorporate non-financial measures with financial measures is the Balanced Scorecard (BSC). It was introduced as a model for implementing strategy by Kaplan and Norton (1992, 1993 and 1996a). Kaplan and Norton (1996b) designed the BSC framework to assess organisation's performance from four perspectives. The financial perspective addresses the ways in which the organisation can maximize value creation for shareholders. The customer perspective helps the organisation to fulfill customers' needs and to maintain their loyalty. The internal business process perspective addresses the topics in which the organisation can have competitive advantages. The learning and innovation perspective helps the organisation to know how to sustain its ability to change and improve. Thus, the BSC is considered a framework that incorporates financial and non financial measures.

The topic of the current study emerged to be of crucial importance to the activities of managers in organisations and it was implied from the literature that the research could be committed to a prior theory, which is the contingency theory, at the outset of the research. Because, simply, it has been argued that a completely 'clean' state is difficult to achieve and that unfocused data collection may overwhelm the researcher with information (Eisenhardt, 1989).

The use of a contingency framework for the analysis of management accounting systems started in the early to mid 1970's. However, since then it has come to dominate the published work on the behavioural and organisational aspects of management accounting. Otley (1980: p. 413) stated, '*The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting system which applies equally to all organisations in all circumstances. Rather, it is suggested that particular features of an appropriate accounting system will depend upon the specific circumstances in which an organisation finds itself. Thus, a contingency theory must identify specific aspects of an accounting system which are associated with certain defined circumstances and demonstrate an appropriate matching*'. Also, Otley (1980) argued that the justification for adopting a contingency theory of management accounting is that it emerged as a necessary means of interpreting the results of empirical research.

He concluded that the relevance of organisation theory to management accounting is being increasingly recognised and contingency formulations have been prominent in organisation theory. There thus appears to be a *prima facie* case for the development of a contingency framework for management accounting (p. 425).

The main motive for this research was the gap in performance measurement systems literature in developing countries. Literature on management control processes and the contingency approach are mainly based in developed countries. In recent years, there has been a growing interest in performance measurement research in the developed countries. While there is an expanded research of this issue in Anglo-American countries, developing countries lag far behind. Despite the wide spread use of performance measurement systems in developed countries and the promised benefits of these systems for management accounting, little research has been conducted to explore these benefits in developing countries. Kiggundu *et al.* (1983) stressed the importance of conducting research in developing countries, highlighting over 70 percent of the world's population live in developing countries and, due to globalisation and internationalisation, this part of the world gains more importance. In addition, due to economic growth, developing countries such as Egypt are becoming major locations for foreign and multinational companies. Thus, there is an urgent need to understand these management accounting practices in developing economies, as the nature of application of performance measurement systems is still unclear. This research focuses on expanding the management accounting literature in general, and performance measurement literature in particular, by exploring the current status of performance measurement systems in Egypt and identifying the contingent factors that might have an effect on the use of these performance measures.

Thus, to maintain the right balance between open-mindedness and focus, the research design was set up in such a way that allows determining some preliminary factors from which an exploration to their significance and importance to the topic could be established. For example, Langfield-Smith (1997) suggested important links between strategy, environment, technology, organisational structure and management control

systems (MCS). Also, recent research has considered the relevance of additional contextual variables to the design and use of MCS. Perhaps the most important new stream of literature has been that related to the role of strategy. For example, Chenhall (2003) stated that many researchers have attempted to explain the effectiveness of management control systems (MCS) by examining the relationships between some key factors such as the environment, technology, size, structure, strategy and national culture and the design and use of management control systems (MCS).

Therefore, the set of statements in the questionnaire was structured around a number of key factors that were stemmed from the broad literature. These factors that were widely discussed in the literature are strategy (Miles and Snow, 1978; Porter, 1980; Dent, 1990; Brignall and Ballantine, 1996; Langfield-Smith, 1997; Ittner and Larcker, 2001); organisational structure (Burns and Stalker, 1961; Khandwalla, 1977; Otley, 1980; Slevin, 1989; Hoskisson et al., 1990; Penrose, 1990; Covin *et al.*, 1994; Kauffman, 1995; Miles et al., 1997); competition (Khandwalla, 1972; 1973; Langfield-Smith, 1997; Donaldson, 2000; Nahm and Vonderembse, 2002); technology (Woodward, 1965; Otley, 1980; Skinner, 1985; MacDuffie et al., 1996; Nahm and Vonderembse, 2002); management style (Purcell and Grey, 1986; Purcell, 1987; Fowler and Fowler, 1996; Biddle, 2005; McGuire, 2005; Connolly, 2006); reward systems (Merchant, 1989; Govindarajan and Fisher, 1990; Fisher and Govindarajan, 1993; Buchanan and Huczynski, 1997; Kerr and Slocum, 2005) and environmental uncertainty (Waterhouse and Tiessen, 1978; Otley, 1980; Hirst, 1981; Govindarajan, 1984; Jauch and Kraft, 1986; Matthews and Scott, 1995). In addition, organisational size was used in this study as a sole intervening variable as Otley (1980) who stated that it may be sensible for research to be content with the measurement of intervening variable(s), that is, variables which are thought to pre-dispose an organisation towards effective rather than ineffective operation (p. 421). However, the operationalisation of these variables in this research were measured primarily as the perceptions of the respondents in the pilot study phase, but, where possible, were supported by the literature review. As Chenhall (2003) stated, 'Generic definitions attempt to capture the effects of specific attributes in a more generalized way. Generic definitions enable designers and researchers of management

control systems (MCS) to discuss the influence of contextual variables without having to identify the particular details of individual organisations' (p. 136).

In this research, triangulation approach was adopted that incorporate both quantitative and qualitative methods in data collection. The basic idea behind the integration of the two instruments was that the limitations of one instrument would be compensated for by the strengths of the other instrument. As Webb *et al.* (1966) and Jick (1979) defined triangulation as mixing quantitative and qualitative methods, advocating that both should be viewed as complementary instead of rival methods. Mainly, a questionnaire was developed, refined and distributed, which in turn resulted in 140 usable responses of medium and large sized manufacturing companies that have been analyzed by using the SPSS package. This was followed by 10 semi-structured interviews that initially were used to provide further evidence to the results from the questionnaire.

1.2 Objectives of the Study

This study sought to address two questions: (1) what are the performance measures that currently applied in the medium and large sized manufacturing companies in Egypt?; and (2) what are the factors that might affect the use of these measures?

The researcher investigated the current use of performance measures in the medium and large sized manufacturing companies in Egypt to be aware of the *status quo* of these measures in these companies. As Chenhall (2003) stated that performance measures can readily establish targets that require continuous improvement, as in today's environment of intense competition and global operations, requirements for substantial continuous improvement may mean that difficult standards based on continuous improvements are required to survive.

The researcher, then, examined the effect some contingent key factors might have on the use of different performance measures to reach a conclusion of what is worth taking into account when using these performance measures. As Chenhall (2003) points out that the ultimate goal of management control systems (MCS) research is to provide findings that

assist managers achieve their goals or those of their organisations; therefore, MCS research has continued to include dimensions of MCS, their use and usefulness, as the outcome variable.

Also, it is noteworthy that performance has not been included as an outcome variable, as this contingency-based study addresses performance measures as the outcome variable. According to Chenhall (2003: p. 134), 'it is implied that associations between context and MCS reflect equilibrium conditions, or indicate optimal solutions because of survival of the fittest conditions'. Studying performance, in this case, is inappropriate as every firm has optimal performance given its situation. In addition, researchers studying MCS as the outcome variables, also, note that this approach is justified by assuming that rational managers are unlikely to adopt or use MCS that do not assist in enhancing performance. Thus, MCS studies can provide important insights into the extent of adoption, use and usefulness of MCS; however, it should not be assumed that the models necessarily lead to enhanced organisational performance. As Chenhall (2003) argues that particular MCS may be perceived as not useful, rate low in satisfaction or benefits but organisational performance may be high due to the supply of required information from other sources, either formal or informal.

In summary, this study will assist managers to determine if their management control systems (MCS) are used in a useful way or not, because performance measures if used in an appropriate way, then they are likely to provide satisfaction to individuals, who then presumably can approach their tasks with enhanced information. As a consequence, these individuals take improved decisions and better achieve organisational goals (Chenhall, 2003).

1.3 The Importance and Motivation of the Study

The motives behind conducting this study stem from the need to understand the current application of performance measures in medium and large sized manufacturing companies and the factors that might affect the use of these measures. It was apparent that there is a growing attention in the literature on performance measurement systems.

However, most of the literature was developed in Western countries with little conducted in developing ones.

With the rise of *Globalisation* and *Internationalisation*, it became very important to know what is going on in the developing countries. Egypt, as one of the emerging economies, underwent several economic phases in its recent history. Especially, after 1990, Egypt has passed a series of legislation that promotes and encourages potential investors to consider Egypt. This was done mainly to reorient the economy towards an open market system and globalisation. This included the promotion of the private sector and liberalizing the public sector so they can compete in the open market efficiently and effectively (Sherif, 1990; Tessler *et al.*, 1991; Hegazy, 1991; Hatem, 1994). Thus, this study investigates this very complicated issue that might be of interest for academics and investors (current and/or potential as well).

Therefore, findings of this research contribute to bridging the gap in developing countries literature concerning performance measures and the factors that might affect the use of these performance measures in medium and large sized manufacturing companies.

1.4 Structure of the Thesis

This thesis is organised into seven chapters. Following this introduction, chapter two provides an overview of the literature related to budgeting as the traditional performance measurement system that relies on financial measures only. The main aim of this chapter is to give a historical feedback about the evolution of performance measurement systems. Also, the chapter provides answers to what is budgeting and why it was a well-established performance measurement system. In addition, it discusses the pros and cons of this system that would give some explanation why companies were adhered to such system. Some key studies, then, were discussed to enrich our understanding of how the key authors were studying this issue.

Chapter three includes a review of contemporary performance measurement systems. It discusses the reasons that encouraged the need of new performance measures (non-

financial measures). Also, the chapter discusses a broad literature that would help in drawing the factors that affect the use of performance measures. In addition, it critically assesses the pros and cons of one of these contemporary performance measurement systems; namely, the Balanced Scorecard (BSC) as one of the most recent developments in the area of performance measurement systems.

Chapter four reviews the contingency theory as the theoretical framework of this study. It starts with the evolution of this perspective to enhance our understanding with the reasons that supported the emergence of this approach. The chapter assesses the strengths and limitations of the contingency approach and it discusses thoroughly the contingent variables of this research. Also, some key contingency studies were discussed to maintain our understanding of this approach. The main aim of this chapter is to clarify how contingency theory fits the nature of this research; in addition to highlight the importance of the contingent factors in this research.

Chapter five discusses Egypt as the context of this study. It gives a detailed review of the geographical, demographical, cultural, political, economic and accounting aspects of Egypt. It reviews some previous studies on performance measures in the Egyptian society. In addition, it discusses some contingent variables of this research within the Egyptian context. The main aim of this chapter is to provide evidence of why Egypt was chosen to be the context of this study.

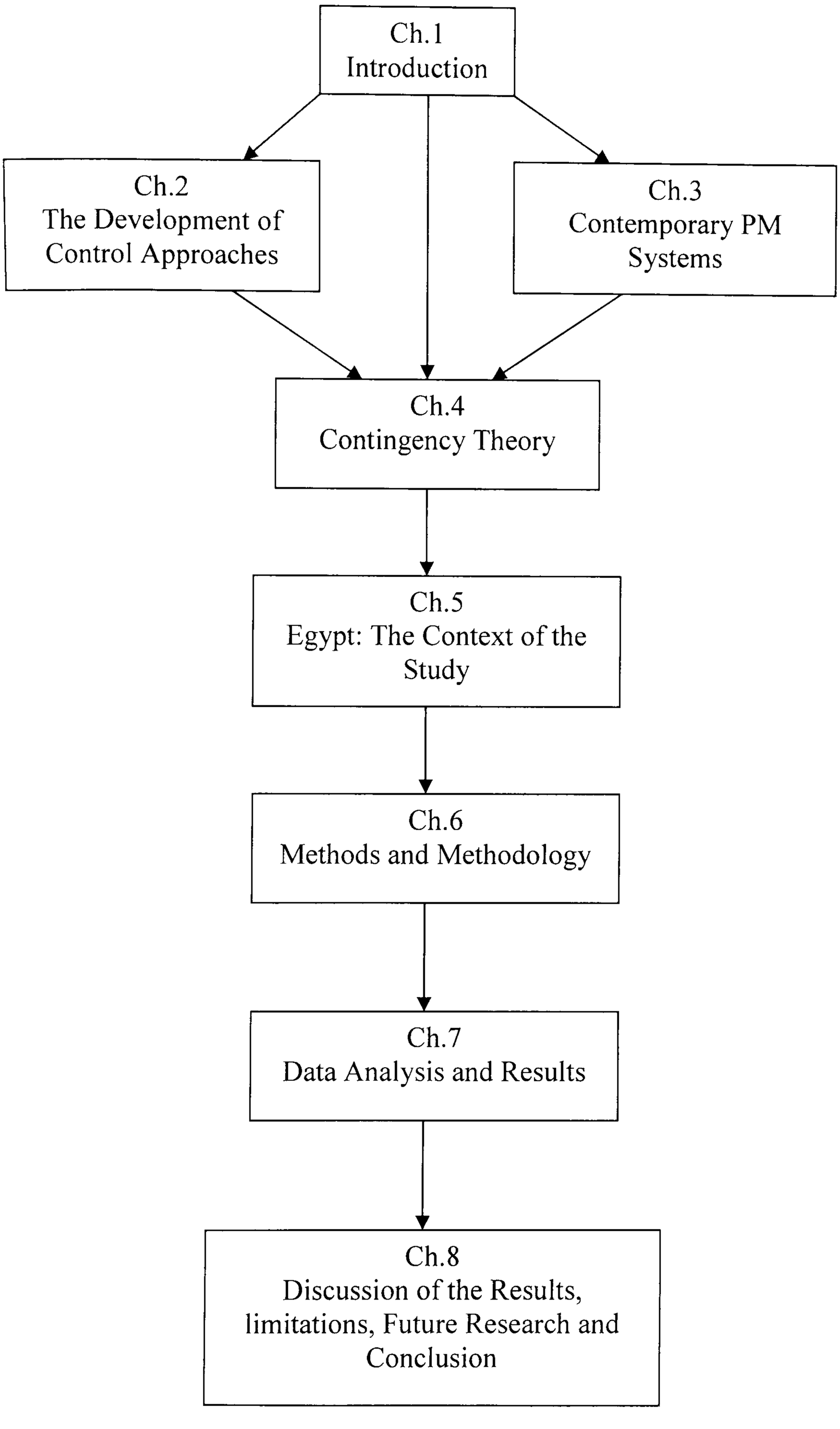
Chapter six introduces the methodology and methods adopted in this research. It provides evidence that supports the chosen methods and justifies the research design. The chosen data collection methods utilised in this research, were questionnaire survey and interviews, both of these methods were used as complementary methods that enhance the reliability and validity of this research by trying to compensate to each other's limitations. The chapter describes the steps of developing the data collection instruments and how the sample size was determined. Lastly, the chapter describes the types of statistical analyses followed in analyzing the data and the coding process of the research variables suggested from the broad literature. Factor analysis would be utilised to extract

the relevant number of the dependent and independent factors according to respondents' beliefs and opinions. The main aim of this chapter is to provide a link between the theoretical and the empirical stances of this study.

Chapter seven explains how the data was analyzed through the use of the statistical tests such as exploratory factor analysis, correlation and regression in order to reach answers for the research questions. In addition, it addresses important issues such as reliability and validity. Moreover, it checks some major methodological assumptions for such type of social research. The chapter reviews the results of the research. The main aim of this chapter is to answer the two research questions concerning the use of performance measures in medium and large sized manufacturing companies in Egypt and the factors that might affect the use of these measures.

Finally, chapter eight discusses the research findings and results. It compares the findings of this research in terms of contingency perspective with other previous studies. In addition, it draws on the relationship that exists between the current research findings and the literature review. Also, it critically reviews the current research findings and determines the research limitations. It draws some themes for future research that linked to the current research limitations. Lastly, it provides a conclusion of the study. Figure (1.1) presents an overview of the structure of the thesis.

Figure (1.1) The Structure of the Thesis



Chapter Two

The Development of Control Approaches

2.1 Introduction

The second chapter provides an overview of the relevant literature in the area of control theories and management control as they relate to budgeting. The purpose of this chapter is to look at the arguments that budgeting, as an established traditional control technique, is still relevant and alive. This is, especially, after a number of criticisms have been levelled at the role of budgets in measuring performance. In addition, this chapter aims to address the argument that budgets cannot be ignored and that they could be complemented within a wider performance measurement system.

The chapter consists of six sections of literature review, right after this introductory section:

- The second section discusses the importance of control behavior and control theories;
- The third section provides a background of historical control management and performance measurement;
- The fourth section discusses budgeting as an established performance measurement system;
- The fifth section discusses the criticisms of budgeting with a focus on *budgetary slack*;
- The sixth section discusses the *beyond budgeting* debate; and
- Finally, the seventh section of this chapter reviews some of the pioneering studies of budgeting.

2.2 Theory of Control Behaviour

"Control" is a term with a large number of different shades and nuances of meaning. Rathe (1960) listed "57 varieties" of its connotations. Webster's Dictionary definition for control is the "Application of policies and procedures for directing, regulating and coordinating production, administration and other business activities in a way to achieve the objectives of the enterprise". Hofstede (1968) and Otley and Berry (1980) stated that "control" emphasises the idea of regulating and monitoring activities and then taking action in order to ensure that desired ends are attained. Arno *et al.* (1999) stated that like planning, control is a core management activity. It is a purposeful activity following the introduction of strategic and other plans in the organisation, thus enabling the execution of the plans which are drawn up to attain the goals of the organisation. Management must ensure that members of their organisation contribute to goal achievement. For this, they introduce rules that prescribe which actions of the members are allowed, required or prohibited in the interest of goal attainment. Control is carried out either by direct supervision or by indirect means such as informal relationships among staff (Kaufmann, 1991).

Weber (1969) stated that, essentially, the concept of control of behaviour depends on ensuring that all actions by members of the organisation are in accordance with the rules and lead to goal achievement. To control behaviour, managers must possess power. "Power" is defined here as the chance that one actor within a social relationship is able to carry out his or her own will, even against the resistance of other actors. Otley (1994) points out that the environment is very dynamic and changing rapidly, so empowerment has been suggested as a means to enable as large a number of individuals to engage in the task of adapting the organisation to meet the needs of such an environment. Therefore, the objective of the control system becomes the encouragement of work groups at all levels to take control into their own hands to be able to maintain the viability of their units. Anthony and Govindarajan (2000) stressed that a hierarchy of managers leads organisations, with the chief executive officer (CEO) at the top. The complexity of the organisation determines the number of layers in the hierarchy. All managers are both

superiors and subordinates; they supervise the people in their own units, and they are supervised by the managers to whom they report.

Otley (2003) stated that the central problem of management control is how organisations can ensure that managers and workers act in the organisational interest. He added that there are two main aspects of this problem. The first is behavioural in nature; how could managers be motivated to do what is best for the organisation, this is the core importance of accounting systems. The second is one of information and accountability systems; how could systems be designed that would always indicate appropriate action and report when it is being attained.

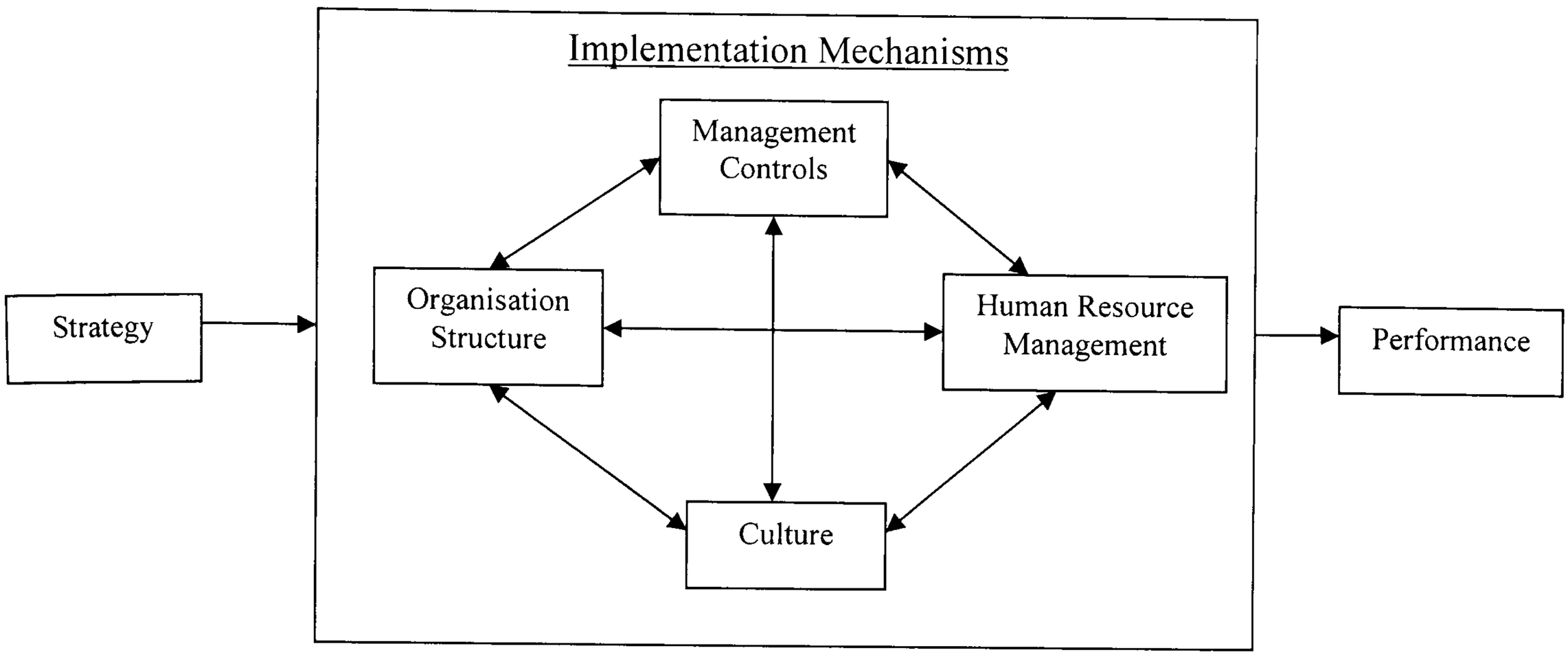
To address the first part of this problem, Posner (1980), Jonides (1981) and Pashler *et al.* (2001) analyse the human behavior which emerges from the interaction of the goals that people have and the stimuli that impinge on them. Behaviours are commonly viewed as lying along a continuum reflecting the relative influence of these two factors in their causation. At one extreme are reflexes, which occur in direct response to certain classes of stimuli sometimes called extrinsic incentives. At the other extreme are voluntary behaviours, which are not directly and reliably triggered by any particular incoming stimulus sometimes called intrinsic incentives. Most human behavior would seem to lie in between these two extremes, reflecting the joint impact of high-level goals and recent stimuli.

Anthony and Govindarajan (2000) argue that management control systems should be designed and operated with the principle of goal congruence in mind. Goal congruence means that the goals of an organisation's individual members should be consistent with the goals of the organisation itself. Arno *et al.* (1999) added that execution of plans requires performance, which is the behaviour that corresponds with the rules and is goal directed, of organisation members. They also state that a common proposition in theories of control behaviour is that employees' performance derives from their levels of ability and motivation. First, employees must be able to do what the rules state. For this, they must be informed as to what is expected of them. Unless the members of an organisation

know what they are supposed to be doing, there is little chance of their doing it properly. Confusion will arise, which may result in stress and low job satisfaction. Tasks, responsibilities, roles and rules, therefore, must be clearly defined. In addition, members must be given realistic and challenging tasks with the authority to carry them out (Menzies Lyth, 1988). Ability refers to the appropriate talents, skills and competences which members must possess and they must rely on adequate management support. Second, employees must be willing to apply or follow the rules in order to perform. If they are willing to do so, they will be considered motivated. As mentioned above, motivation can be intrinsic, which means that employees are self-motivated, due to an inborn desire to perform in certain ways, to professional training, or otherwise. Motivation can also result from extrinsic incentives, which is from rewards and punishments by managers. To provide such incentives, the managers must have powerful means such as financial resources (Nystrom and Starbuck, 1981).

To address the second part of this problem, there is a need to construct a suitable accounting control system, which is appropriately related to the implementation of the organisation strategy. The design of such a system is inseparable and interdependent on a variety of contingent variables such as organisational structure as shown in figure (2.1). Anthony and Govindarajan (2000) stated that management control systems help managers move an organisation toward its strategic objectives. If these systems ensured the correct action for all situations, there would be no need for human managers. Therefore, managers depend, among other factors, on the skills and personalities of managers and employees, their relationships with one another, and the environment in which these systems were designed and operated. Organisation theories have developed through a human relations phase into what has been described as a systems approach, behavioral science approach, and contingency theory approach, which will be discussed in depth in chapter four (Hopwood, 1974b; Otley and Berry, 1980; Horngren, 1982).

Figure (2.1) Framework for Strategy Implementation



Source: Anthony and Govindarajan (2000)

Management control is concerned with how an organisation can ensure that all its employees and workers act in its best interest (see for example, Emmanuel *et al.*, 1990; Macintosh, 1994). However, to understand the current management practices in general, and performance measurement in particular, a historical background is required, because such an understanding positively influences researchers' conception of the origin of these practices and how they came to be used in the way they are.

2.3 Performance Measurement Historical Background

This section provides a brief review[1] of the development of performance measurement from the sixteenth century until now. Parker and Yamey (1994) Zan (2004) stated that the development of accounting practices in the 16^{th} and the 17^{th} centuries was limited to the spread of double entry book-keeping; then the closing of the book for the mercantile business and afterward some other kind of businesses.

[1] See for a detailed review of performance measurement history Alenizi (2001; pp. 17-34).

In Zan's (2004) study, on Venetian state shipyard 'the Arsenal' in the period from the end of the sixteenth century till the mid of the seventeenth century, he stated that there were very simple accounting innovations in managerial measures of control. These measures had begun to appear in relation to materials and components such as the measurement of work-in-progress that was not developed only for ships as a whole but for key components as well. At the end of the eighteenth century, accounting in Britain was influenced by the Scottish. Mepham (1988a; 1988b) stated that the 'Italian Method of Bookkeeping' had moved across Europe to Holland, and then to Scotland, where most of practitioners and academics received it with enthusiasm. J. Crawford stated, "The first Scottish book on accounting was published in 1683. That book heralded a century during which Scotland established its reputation as a land of accountants: a steady stream of textbooks, including some which ran to so many editions that they could be called classics, appeared from Scottish presses (Cited in Mepham, 1988a: p. 152)". Hunter (1972) argued that the Scottish education system was quite advanced, compared to the contemporary systems in England and North America. However, concerning the real evolution of management accounting practices, Parker and Yamey (1994) Zan (2004) argued that the real revolution in the costing and other management accounting practices were seen emerging in the 19th century.

Parker (1969), Johnson (1981) and Fleischman and Tyson (1993) argued that firms in the eighteenth-century were insufficiently complex to justify sophisticated management accounting techniques, but larger enterprises of that period were very substantial in terms of capital invested, personnel employed, and the number of integrated productive processes. As Fleischman and Parker (1990) hypothesize that by that time accounting innovations were not the product of professionals, managerial or financial, but of 'perceptive businessmen' who did these innovations to maintain the success of their businesses. However, Pollard (1965), Parker (1969), Hudson (1977), Fleischman and Tyson (1993) point out that business entrepreneurs in the eighteenth-century were attentive to only one aspect of performance measures, which was profits because profit margins were so substantial. Mepham (1988a; 1988b) argued that the European merchants in the eighteenth century who were interested mainly in profits whether to

measure their divisions or voyages performance developed a financial measure such as 'Rate of Return'. Then, the use of this performance measure was prevailing in the European agricultural enterprises and mining as an effective performance measure.

In the same vein, Chandler, (1966) and Johnson and Kaplan (1987) stated that in the late eighteenth century and early nineteenth century the administrative requirements to be successful in the business world were very well defined due to the relatively small size and management style of family enterprises. The large family businesses such as mining, manufacturing and transportation were managed by either family members or trustable managers. Chandler (1966) stated that the management accounting operations that include purchasing, accounting, financing and selling was limited to either the owners or the agents of the owners. Chapman (1974) and Chandler and Daems (1979) point out that Adam Smith mentioned the importance of performance evaluation in his early economic writings. They stated that he mentioned the 'monitoring' activity, which meant the process of checking the performance, function and rewarding of individual units for outstanding performance.

Pollard (1965) stated that at the end of the eighteenth century, many London merchant organisations were large, integrated, multi-unit, and dispersed internationally. He argued that with these new organisations, sub-units were managed explicitly, and accounting shifted from audit or stewardship to management control, essentially to manage the variety of business activities and inventory lines. He pointed out that these emerging management accounting practices were evolved because of practical needs and the innovating attitudes of the organisations concerned. In the same vein, Carlos and Nicholas (1988) concluded that early trading companies were forced by the volume of transactions to replace owner-managers by teams of salaried managers organised hierarchies, which differentiated the modern multinationals from earlier firms because those owners unable to handle the high number of transactions themselves.

Wilcox and Bourne (2003) stated that during the phase 1850-1925, the main accounting techniques were developed. Johnson (1981) showed how initial cost systems were

developed as manufacturing moved from the domestic system of manufacturing at homes to the mills. As soon as labour was paid by the hour and not by the unit, the double entry book keeping became insufficient for costing and control. Chandler (1966; 1977) finds the origins of management control practices in the heyday of American railway management. He explained that, in the mid nineteenth century, American managers of transportation and communication organisations first developed the performance measurement activities such as coordinating and monitoring the performance. Managers invented new managerial control tools that ensure the appropriate running of trains and communication lines as well as the flow of funds from the employees in different sites. He also stated that the need for these tools was urgent to control the very large regions these railway lines were covering in the United States. In addition, these huge investments required managing multiple branches and led to the delegation of some managerial tasks, which necessitated the development of management control and accountability. Moreover, Chandler (1977) stated that the traditional accounting histories suggest that the era of Frederick W. Taylor in late nineteenth century saw the emergence of modern management practices. Chandler & Daems (1979) and Johnson & Kaplan (1987) stated that managers, like Taylor, developed new scientific methods depending on time and motion studies. They said that he developed systematic production and inventory controls to help him in determining overhead costs in order to relate such costs to fluctuations in volume. Taylor, alongside with other scholars, developed a number of effective concepts that relate to cost accounting and affect performance measurement systems. Such as operating ratio, unit costs, standard costs, and burden but these concepts were not yet refined enough to administer resource allocation. However, by no doubt, these concepts helped in evaluating functional managers' performance and guided the organisation's overall performance.

On the contrary, Spraakman and Margret (2005) argued that the management accounting practices were transferred from London counting houses to the British North American fur trade during the late eighteenth and early nineteenth centuries. They stated that this transfer involved a set of practices that was more effective for implementing the strategy being pursued at the time than the set used with the previous strategy. They highlighted

the development of management accounting practices by London counting houses to facilitate their backward integration strategies with America and the West Indies. They also stated that this development required a level of sub-unit accountability and responsibility. Spraakman (1999) found that in the 1820s the Hudson's Bay Company (HBC) had extensive management accounting practices that were comparable to those that Johnson and Kaplan (1987) observed to have existed in the US in 1925. He gave examples of the management accounting practices that were applied by Hudson's Bay Company such as organisation hierarchies, organisational departments, centralized control, budgets, standards of trade, inventory records, and accounting records. He argues that management accounting practices developed in this company were in comparable fashion to deal with uncertainty in business. Spraakman (2002) subsequently found that the North West Company (NWC) had similar management accounting practices to those of the Hudson's Bay Company (HBC) as both companies competed in the British North American fur trade in the first two decades of the nineteenth century. Nonetheless, he added that the management accounting practices in Hudson's Bay Company had been significantly refined[2] in 1810 by Andrew Wedderburn, a shareholder of the Hudson's Bay Company and a partner in a counting house involved with the West Indies sugar trading business. However, he points out that the genesis of the changes to the Hudson's Bay Company's management accounting practices is uncertain.

Fleischman and Tyson (1993) argued that during the industrial revolution there was less need than there is today to use management accounting both as a tool and a rationale for decision making. Johnson and Kaplan (1987) argued that the recent management accounting practices developed as a rational business response to opportunities involving new technologies and markets. Moreover, they emphasize efficiency improvement as a means of explaining accounting change. Fleischman and Parker (1990) similarly conclude that the profit-motivated behaviour of entrepreneurs was a significant driving force in management accounting practices developments. Chandler and Daems (1979) point out that the main reason for developing management control practices was the huge

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[2] See Spraakman and Margret (2005) for a detailed review of the changes suggested by Andrew Wedderburn to the management accounting practices in Hudson's Bay Company.

improvements in either the enterprises or the management systems. They argued that the increase of the complexity of organisations lead to delegation of the authority and separation between ownership and management. This had a large impact on performance measurement that necessitated building effective systems to assess and monitor management performance.

However, Hofstede (1968) claimed that the first industrial use of budgetary control was in the USA during the 1920s and the Du Pont example clearly predated this. In the early of the twentieth century, Chandler (1962) argued that it witnessed the emergence of complex structures of firms. Companies like Du Pont, Sears Roebuck and General Motors diversified in the 1920s and they discovered that sophisticated management accounting systems were pivotal for the co-ordination of multi-divisional organisations. Johnson (1975; p. 445) stated, 'The Du Pont Powder Company exemplifies the early use of accounting data for management control in vertically integrated industrial firms. In order to assess the development of the accounting practices which enabled management to govern the complex operation of this integrated firm'. He points out that the centralized accounting system applied by Du Pont had two major objectives: firstly, to enable top management to control, coordinate, and assess the horizontal flow of operations among the company's three main departments (manufacturing, sales, and purchasing); secondly, to enable top management to plan the company's long-range development. In the same vein, Chandler (1977) gave an example of General Motors Corporation (GM) as a multidivisional firm established in the 1920s. Johnson (1983) point out that General Motors' performance evaluation system was guided, mainly, by financial measures. Therefore, all the divisional managers were under pressure to meet their financial targets, which in turn improved the operational performance. As mentioned earlier, the role of businessmen and entrepreneurs in developing recent accounting concepts cannot be denied. Sloan (1963) and Kaplan (1984) argued that General Motors accounting departments have developed many of the management accounting techniques that are still used in the current modern enterprises. Examples of these management accounting techniques developed by General Motors to enhance its financial position are budgeting, flexible budgeting and target Return on Investment

(ROI) amongst others. In addition, Sloan (1963) and Kaplan (1984) indicated that the incentive system applied in General Motors was very effective, in terms of rewarding different administrative levels that contributed to the outstanding performance of the company. This incentive system was designed to monitor some specific financial performance targets that, if met, would help in determining and then rewarding the performance of each individual in the company.

Kaplan (1984) stated that after the Second World War, management accounting control began to flourish again, especially some financial concepts such as the Residual Income (RI). He said that whilst residual income roots can be traced to the early years of the 20th century, it appeared recently to flourish as an analytical technique and as a solution to the ROI drawbacks. In the 1960s, he added, the focus of management accounting literature has widened to include many quantitative models that could be utilised in empirical studies such as regression analysis, linear and non-linear programming, probability theory, hypotheses testing and decision making theory. These models were applied to all aspects of management accounting as the new solution to various difficulties in planning, evaluation and controlling. Some firms also used these methods to control and assess their performance.

In the early 1970s, the main intellectual foundation for management control systems design and use was that provided by Anthony (1965), where he separated it from both strategic planning and operational control. He defined management control as 'the process by which managers assure that resources are obtained and used, effectively and efficiently, in the accomplishment of the organisation's objectives'. He also stressed the importance of the behavioural sciences, particularly social psychology; in understanding how control systems actually impacted the actions managers took within organisations (Anthony, 1965). Thereafter, came Lowe's (1971) wider definition of management control, who stated it as 'A system of organisational information seeking and gathering, accountability and feedback designed to ensure that the enterprise adapts to changes in its substantive environment and that the work behavior of its employees is measured by reference to a set of operational sub-goals (which conform with overall objectives) so that

the discrepancy between the two can be reconciled and corrected for'. Which includes parts of both strategic planning and operational control. But again, the definition was incomplete because he assumed a relatively constant environment in which operational sub-goals have a degree of stability (Otley, 1994).

Wilcox and Bourne (2003) stated that, although, the use of budgetary planning and control spread widely, it came under criticism from the late 1970s onwards. Until the beginning of the 1990's, traditional management accounting had been providing managers with information expressed mainly in terms of monetary values to be used as a decision-making guide (Peters, 1987; Cooper and Kaplan, 1991; Kida and Smith, 1995; Neely, 1999). However, from the mid- 1980's onwards there were several criticisms made of the traditional financial performance measurement techniques such as lacking strategic focus, encouraging short-termism, driving inappropriate behaviour such as budgetary slack, encouraging local rather than organisational optimisation and not being externally focused (see for example: Hopwood, 1974a; Kaplan, 1983; 1984; Millar and Vollmann, 1985; Johnson and Kaplan, 1987; Hiromoto, 1988; Simons, 1990; Kaplan and Norton, 1992; Bruns and McKinnon, 1993; Gosse, 1993; MacArthur, 1996). Furthermore, high environmental uncertainty, increasing competition, technological developments, improvement initiatives, changing organisational roles and changing external demands provided other motivations for organisations to change their traditional financial performance measurement techniques (Nanni *et al.*, 1990; 1992; Otley, 1994; Brancato, 1995; Fisher, 1995b; Neely, 1999; Vaivio, 1999).

Levitt (1975: p. 174) argued that the business environment in the 1920s was relatively stable compared with the 1980s. He stated that some major changes in the business environment have occurred that include the re-balance of power from producer to consumer as the realisation of customer satisfaction concept was flourishing. In addition, Johnson and Kaplan (1987) stated that the global competition and the reduction of trade barriers brought different opportunities and problems. Moreover, Peters (1997) stated that the rate of technological advances, in particular in computing and communications served to revolutionise the way firms functioned. In summary, as Wilcox and Bourne (2003)

claimed that the late 1980s and 1990s have reflected these multiple changes, and as a result, the nonfinancial performance indicators as well as the attempts to create forward looking performance measurement systems and frameworks that address the needs of multiple stakeholders were developed.

In 1991, Eccles predicted that within the next few years a need for a dramatic change would force companies to redesign their performance measurement techniques to take all these changes and variables into consideration. Otley (1994) stated that 'management control is a key activity for every business organisation as it provides the focus for all those activities designed to help ensure that overall operating coherence is maintained and that the organisation retains a capability to survive in its uncertain environment. It is thus intimately bound up with both strategic decisions about positioning and operating decisions that ensure the effective implementation of such strategies'. Otley (2003) addresses that there is a movement from 'management control' to 'performance management', although the central issue in management control can be seen as remaining the same, that is in helping ensure that an organisation achieves its purposes, the way it is expressed has changed as has the context within which organisations operate. Major changes have been mainly in the philosophy of organisational structure. Whereas in the 1960s and 1970s the route to organisational control was seen to be in vertical integration and divisionalization, in the 1990s this reversed into outsourcing, business process re-engineering and value chain management. Thus, the control problem, which was initially seen as a primarily internal matter, has been transformed into having to deal with the connections between enterprises linked in a business process or value chain.

Otley (1994) stated that due to these changes, it would be a mistake to concentrate on performance measurement mechanisms that depend on financial control such as budgeting. But an integration of both financial and nonfinancial mechanisms, which is aligned with organisational strategy, is required such as the balanced scorecard, which will be discussed in detail next chapter. Wilcox and Bourne (2003) stated that starting from 1992; the use of the Balanced Scorecard spread widely, and has been developing through use. In addition, a significant development is the use of business models (Eccles

and Pyburn, 1992) or success maps (Kaplan and Norton, 1996a; 2000). These managerial tools depend on the translation of 'leading and lagging indicators' concept that each one of them attempts to draw a testable cause and effect diagram where each element of performance is linked to another. For example, in an attempt to link performance to reward system, Lavin (1994) reported that Chrysler Corporation paid bonuses to its 200 top executives based on the accomplishment of nonfinancial performance measures such as vehicle quality and customer satisfaction measures in addition to financial measures.

Several studies attempted to address the relationship between organisational change of performance measurement technique and organisation's share prices, especially stock prices or market-to-book ratios on nonfinancial measures. Larcker (1983) found that firms adopting incentive performance plans experienced an increase in capital investment and a positive security market reaction on disclosure of the plan to the market. McConnell and Muscarella (1985) report positive associations between announcements of increases in capital investment plans and changes in management control systems and share price movement.

An increasing trend among companies is to disclose some nonfinancial performance measures in their financial reports and disclosures. Fornell *et al.* (1996) investigated the possible consequences of releasing customer satisfaction indicators on a company's stock market price. They concluded that disclosing nonfinancial performance measures provided effective information that was not available under the traditional financial performance measurement techniques. Ittner and Larcker (1998a) study the relevance of a published customer satisfaction measure that represents an aggregation of customers' responses to 15 questions related to overall customer satisfaction, confirmation of expectations, and comparison to ideal. They find this measure to be positively related to market value, and that this relation varies by industry.

Amir and Lev (1996) examine two nonfinancial measures used in the cellular telephone industry: total population in a service area, which is a measure of potential growth, and the ratio of subscribers to total population, which measures operating and competitive

success. They find that both measures are positively associated with stock prices. They also find a complementary relation between nonfinancial and financial information, with the value relevance of financial measures such as earnings and book value emerging only when combined with the nonfinancial information.

Hughes (2000) documents a relation between measures of sulfur dioxide emissions, which considers one of the environmental measures, and the market value of equity for electric utilities. He finds that this relation varies over time in response to changes in both environmental regulation and utilities' production processes. Finally, Hirschey *et al.* (2001) examine whether nonfinancial information on the quality of patents influences the relation between R&D expense and market value. They document a stronger relation between R&D expense and market value for firms with more successful patents, as indicated by nonfinancial information such as patent citation, median age of new patents, and closeness of patents to leading-edge research.

These studies amongst others, explore the effects between the adoption of financial and/or nonfinancial measures of management control systems and equity value (represented by share price movement). The main difficulty of undertaking such research is in isolating the effects of adopting different management control systems on share prices from other variables and events that may be associated with share price movements. Table (2.1) shows briefly how performance measurement systems have evolved through time in the nineteenth and twentieth centuries.

Table (2.1) Performance Measurement Chronology

Origin	Measurement Areas	Thought Leaders
Pre-2Oth and Early 1900s Century	Financial, Core Processes and Tableau de Bord (Dashboard)	Frederick Taylor, Frank and Lillian Gilbreth, French process engineers, and other various scholars
1930s-1940s	Operational Processes and Employee Performance	W. Edwards Deming, Walter E. Shewart and others
1964 and onward	Human Resource and Accounting	Roger H. Hermanson and others
1970 and onward	Scenario Planning	Various scholars
1990s	Balanced Scorecard	Robert S. Kaplan and David P. Norton
1994	Economic Value Added	Stern, Stewart & Co.
1997	Intellectual Capital Approaches	Bontis, Edvinsson, Malone and Roos & Roos

Source: Achieving Measurable Performance Improvement in a Changing World, KPMG (in Drickhamer, 2002)

2.4 Budgeting: A Traditional Financial Performance Measurement System

Simons *et al.* (2000) stated that the term 'budget' refers to the resource plans of any organisational unit that either generates or consumes resources. He points out that this term can be used for both profit and cost centres and that the preparation of budgets

follows a consistent pattern in most organisations. He described the main theme of budgeting by saying '*several months before the beginning of each fiscal year, managers develop their own budgets. The objectives of this planning process are to translate the strategy of the business into a detailed plan to create value and to ensure whether sufficient resources are available to implement the intended strategy*'. Beside this planning role, Irvine (1970), Kaplan (1982) and Otley (1987) claimed that budget system should enable management more effectively to control and evaluate performance, coordinate activities, implement plans, communicate, motivate, and authorize actions. They point out that 'budgeting' has long been advocated for carrying out all these functions of the firm. Especially, control consequences, which are the more important aspects of budgeting. Because a budget plan exists, decisions need relevant information to be provided at the time to enable the decision-maker to choose among alternatives. They also added that another control process is the comparison of actual with budgeted performance after decisions have been made. This reveals to management the performance of the organisation as a whole and of the individual responsible members.

Another very important aspect of budgeting is performance evaluation. Magee (1986) stated that manager's performance is judged relative to the budget, which could be a target level of sales, costs, or profits. In some situations, the budget represents an authorized level of spending. This authorized level could also be thought of as a target maximum, with severe penalties if it is exceeded. Simply, as Irvine (1970) argued that when such an evaluation of performance is known to result in rewards and punishments, people are expected to be motivated to do their best. Traditionally, budgets have carried a negative meaning because some of the words historically associated with the term budget are imposed, dictated by the top, and authorized.

Irvine (1970) added that the budget can play an essential role in motivating people to achieve the organisation's objectives and to provide greater effectiveness in achieving organisational efficiency. He argued that the budget is in itself merely a quantified plan for future activities; however, the main strength of the budget is, when it is used for control, planning, and motivation. He explained that only then, budget becomes an

instrument that causes functional and dysfunctional consequences, which determine how successful the tool will be. Macintosh and Williams (1992) stated that the budget system is seen as an important means for assisting the manager to carry out the main traditional functions such as management, planning, organizing, coordinating, and controlling. They point out that managers of responsibility centres in an organisation should participate in preparing the budget in order to hold accountable for meeting it during the course of the year.

Barsky and Bremser (1999) argued that as long as budgeting is responsible of important functions such as resource allocation decisions, performance target settings and spending limitations; therefore, it should not be looked upon as a once-a-year operation. A regular update should be carried out against budget to ensure the validity of its limits. In the same vein, Perrin (1998) highlighted that regular review process should be scheduled with the responsible managers, depending on the size of the business. He added that this review could be structured around a regular meeting where managers report on performance, explaining budget deviations and discuss whether strategic action is required. Many other authors (e.g. Hansen and Mowen, 2002; Hilton, 2002; Garrison and Noreen, 2003) have highlighted the effective functions of budgets. They stressed the planning, interdepartmental communication, coordination, scarce resources allocation and performance evaluation functions.

Kaplan (1982) and Anthony and Govindarajan (2000) distinguished between a budget and a forecast. They explained that budget is a management plan, for planning and controlling, with implicit assumption that positive steps will be taken by the budgetee - the manager who prepares the budget- to make actual events correspond to the plan. But the forecast is merely a prediction of what will most likely happen, carrying no implication that the forecaster will attempt to shape events that the forecast will be realised. They, also, added that all budgets include elements of forecasting, in that budgetees cannot be held responsible for certain events that affect their ability to meet budgeted objectives and that one possibility for reducing the managerial distortion of budgets and forecasts is to evaluate managers on their forecasting ability as well as their

actual performance. Therefore, Kaplan (1982) argued that the main problem remains of how to establish budgets that can both facilitate the planning process (including coordinating the activities of diverse but interacting organisational units), and permit a realistic appraisal of managerial performance.

However, accounting and management models should be studied in the context and environment that they are supposed to operate in (Hopwood, 1983). Therefore, in order to have an efficient budgetary control, some of the contingent variables that affect these performance measurement systems need to be studied. For example, Bruns & Waterhouse (1975) provided evidence to show that budgetary control was contingent upon various aspects of organisation structure such as centralization, autonomy and the degree to which activities are structured. They described two types of control strategy, administrative and interpersonal, which were found to be associated with different types of organisational structures. Moreover, Anthony and Govindarajan (2000) argued that because a budget is a predetermined plan, such a plan is based on environmental circumstances believed to exist at the time it was formulated. If these environmental circumstances have changed at the time of implementation, the actions dictated by the budget may no longer be valid. Therefore, this means that budget rules need to be revised to make sure that they are still valid and no better approach to achieve organisational goals.

If accounting is shaped by the environment, then one would expect there to be differences emerging in the adoption of the various management accounting tools by companies in different countries. For example, various authors have undertaken studies to investigate the management accounting practices in four developing Asian countries: Singapore, Malaysia, China and India. The primary objective of their studies was to identify and highlight the management accounting practices applied in developing countries. For example, Abdul Rahman *et al.* (1998) and Sulaiman *et al.* (2002) surveyed Malaysian companies, Ghosh and Chan (1996) and Ghosh *et al.* (1987) surveyed companies in Singapore, Firth (1996) in China and Joshi (2001) in India. Sulaiman *et al.* (2004) examines the extent to which traditional and contemporary management accounting tools

are being used in these four Asian countries studies. Overall, the evidence reviewed suggests that the use of contemporary management accounting tools is yet to be matured in those four developing countries. The use of traditional management accounting techniques remains strong. It was concluded from their studies that the use of budgets for planning, controlling and performance evaluating is still outweighed the use of contemporary performance measurement systems, such as the balance scorecard, in those four developing countries. Tho *et al.* (1998) provide various reasons as to why traditional management accounting practices are still widely used in developing countries: the lack of awareness of new techniques, the lack of expertise and, perhaps, more importantly, the lack of top management support. Additional factors include the high cost of implementation and the fact that there simply was "no reason to change" from the traditional technique to the new tool.

In summary, there is supportive evidence that the use of budgets as a traditional performance measurement system, over the years, has not disappeared. However, there have been numerous criticisms levelled at traditional management accounting techniques such as traditional budgeting, standard costing and variance analysis and cost volume profit analysis are said to be less useful in the present manufacturing environment.

2.5 Budgeting Criticisms

Numerous authors discuss the problems with performance measures based only on financial measures such as budgets. Binnersley (1996) points out that in a context where the environment is extremely dynamic, the central role of budgeting as a financial control technique has declined. Amaratunga *et al.* (2001) argued that companies that work in this dynamic environment are searching for ways to incorporate non financial measures, such as quality management, customer retention, research and development and innovation, into their regular performance measurement system in order to better adapt with the current turbulent environment. Kanji (2002b) stressed the tendency of the financial measures to be focused on the individual or the function, not the processes that are at the core of management. Hence, he proposed that process management requires more transversal measures, which traditional systems do not provide.

Eccles and Pyburn (1992), Binnersley (1996) and Kanji (2002a; 2002b) agreed that one of the most important limitations of budgeting is that it consists of lagging indicators. Whilst the financial measures are very crucial for any company, they do not provide much insight into what must be done differently in future. They are showing the result of management action and organisational performance, not the cause of it. They tell managers the consequences of decisions that already have been made, but show little that helps predicting future performance. Thus, financial measures, due to the lack of strategic focus, have a backward-looking focus that lacks the explicative and predictive power and, therefore, encourage a short-term vision. Czarniawska-Joerges and Jacobsson (1989, p. 29) depicted budgets as 'a symbolic performance rather than a decision-making process, a means of conversation rather than a means of control and an expression of values rather than an instrument for action'. Boland (1993, p. 139) concluded that the budgeting system mediated the influence of interpretive possibilities but did not carry a 'single, unambiguous interpretive scheme that it imposes on the situation'.

Eccles and Pyburn (1992) and Goulian and Mersereau (2000) stated that another limitation in most systems that emphasize financial measures is that they have an internal rather than an external focus. They point out that managers have argued for some time that financial numbers fail to provide a complete view of the organisation's progress, and that their predominance in management information pushes organisations away from making long-term investments in value. For example, the current period figures are compared to internally developed standards such as the same period last year; this might be because of the difficulty of getting detailed comparative measures for competitors. However, performance relative to competitors is at least as important as performance relative to one's own expectations, in order not to miss the whole picture. In the same vein, Brignall and Ballantine (1996) stated that this criticism of traditional PM systems stems from their failure to measure and monitor multiple dimensions of performance, by concentrating almost exclusively on financial measures.

Hayes and Abernathy (1980), Prendergast (2000) and Jensen (2001) point out that the budgeting process is so deeply embedded in corporate life that the attendant lies and

games are simply accepted as business as usual, no matter how destructive they are. They also added that the counterproductive actions are also a negative aspect related to budget, but the budget process itself is not the root cause of this problem; rather, it is the use of budget targets to determine compensation. They argued that when managers are told they will get bonuses if they reach specific performance goals, two things inevitably happen. First, they attempt to set low targets that are easily achievable. Then, once the targets are in place, they do whatever it takes to see that they hit them, even if the company suffers as a result of this short-term orientation for the decision-making process. Thus, Preston *et al.* (1992, p. 562) showed how 'new patterns of language, meaning and significance emerged through the fabrication of accounting and budgeting systems'.

Kaplan (1982) and Waller (1988) stated that once managers learn that information being provided for planning, decision-making, and coordination will also be used to evaluate their performance, an incentive is created for them to distort or bias the information in ways that will make their performance measure more favorable. Because when managers are aware that the private information they communicate is used in standard setting and subsequent performance evaluation, potentially they have an incentive to bias their communication to allow a relatively easy standard to be set. Brunsson (1989, pp. 105, 106) saw the budget principally in terms of talk and decisions: 'Because of its relatively loose links with action, budgeting provides a good instrument for conducting politics and producing hypocrisy'.

Thus, budgetary slack is considered another limitation of budgets that needs more discussion. Chow *et al.* (1988) defined budgetary slack as the discrepancy between a subordinate's best estimate of performance based on his/her private information and the budgeted level of performance. In other words, the express incorporation of budget amounts that makes the targets easier to attain. Managers may build slack into budgets by strategies that understate revenues and overstate costs. In another attempt to define budgetary slack, Merchant (1985a) proposed that it is the difference between the amount budgeted for an area and that which is necessary. Also, Moene (1986) defined slack as 'the difference between the appropriated budget and true minimum costs'. Young

(1985b) proposed that slack is the amount by which subordinates understate their productive capability when selecting work standards against which their performance will be evaluated. Waller (1988) regarded slack as the excess of resources over and above those required to complete a task. These perspectives suggest first, that slack is the intentional underestimation of revenues and productive capabilities and/or overestimation of costs and resources in the budget and second, that slack is dysfunctional. This dysfunctional organisational consequence arises from a lack of control or distortion in information used in decision-making.

Schiff and Lewin (1970) argued that if subordinates view their rewards as being dependent on budget achievement, they might see it as advantageous to have slack in their budgets. Dunk (1993) stated that the primary argument for managers' efforts to build slack in their budgets is to enhance their compensation prospects. If subordinates perceive their rewards as dependent on budget attainment, they may try to build slack into their budgets through the participation process. Thus, budget emphasis in performance evaluation induces the creation of budgetary slack. Also, Lukka (1988) argued that additional participation by managers in budget-setting leads to additional budgetary slack. Contingency theories suggest that the relationship depends on the environment amongst other variables. For example, Bruns and Waterhouse (1975) found that organisational context such as organisational size and technology can influence the extent of dysfunctional behaviour. Hopwood (1972) and Leavins *et al.* (1995) suggested that budgetary pressure leads to job-related tension, which in turn, increase the propensity to create slack. In the light of this, one might be tempted to conclude that managers will always act in their own interests and that budget padding is thus inevitable.

Magee (1986) stated that the problem of slack stems from budget setting process. Because setting a budget for a manager is essentially the same as setting a standard for any employee that receives a bonus if the standard is exceeded. He argued that as a manager's responsibilities increase, the standard setting becomes more complex because there are a variety of factors beyond the manager's control that can affect costs or profits,

and these uncontrollable factors affect whether a budget is tight[3], loose or somewhere between these two extremes in a given period. Therefore, there are some expectations about a manager's budget-oriented behavior. If the target is too tight, the manager will view it as unattainable (i.e. the rewards from meeting the target do not warrant the effort necessary to achieve the target), and will not work to achieve it. On the other hand, if the standards are too loose, the bonus can be obtained with relatively little effort, and there is no incentive to work harder.

Numerous studies have been conducted to understand the relationship between the slack, as a major dysfunctional aspect of budgeting, and other variables, such as participation, budget emphasis, supervisor's evaluative styles, uncertainty, information asymmetry, task difficulty and others (see for example; Hopwood, 1973; Macintosh, 1985; Dunk, 1995; Lau *et al.*, 1997). Macintosh (1985) proposed that the relation between participation and slack might not be a simple direct one, as it may be dependent on a number of factors. Hopwood (1973) pointed out that participation is a complex social process which is related closely to other phenomena including situational needs and superiors' evaluative styles. It has been suggested that superior' evaluative styles and information asymmetry are two factors which may influence the relation between participation and budgetary slack. The mechanism, however, by which they may exert an influence, is unclear, since the cross-sectional evidence also conflicts regarding the nature of the impact of evaluative style and information asymmetry on the association between participation and slack.

Murray (1990) argued that a low budget emphasis provides fewer incentives to introduce slack. He proposed that participation coupled with a low budget emphasis should result in less slack and more difficult goals than when there is a high budget emphasis. Dunk (1995) found that the availability of slack diminished the detrimental effect of high task difficulty on performance. Moreover, if the organisational commitment of managers is

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[3] A *tight budget*, is the budget that would be extremely difficult to achieve even with a high degree of cost control effort, a *loose budget*, is the budget that would be easily achieved with a low degree of effort.

high, participation is likely to result in a reduction in slack. In contrast, if that commitment is low, participation is likely to increase slack creation.

Merchant (1985a) and Ross (1995) concluded that managerial propensities to create slack might be enhanced or diminished by the ways and circumstances in which budgetary systems are designed and implemented. For example, in conditions of high uncertainty it is difficult to achieve budgets. To adhere rigidly to budgetary variances as a means of performance evaluation given conditions of high uncertainty would be unrealistic and unreasonable. Therefore, they argued that a more flexible evaluation based on reasonable explanations of the variances might lead to a reduction in the level of job related tension experienced by managers, which in turn will reduce their propensity to create a slack.

Chow *et al.* (1988) and Young (1985b) suggested that information asymmetry might influence the extent to which slack arises from the participation process. Magee (1980) and Murray (1990) proposed that budgets could be enhanced in terms of their accuracy if superiors were aware of their subordinates' private information prior to them being set.

Dunk and Perera (1997) conducted a study to investigate the nature of the relation between participative budgeting and budgetary slack. They found that there are two groups focused on this association; the first argues that managers intentionally use participation to create slack, while the other argues that managers, through anticipation, reduce slack in their budgets. In the same vein, Irvine (1970) and Kren (1992) stated that the original purposes of control are to eliminate or to reduce slack, to increase productivity, to secure conformance, to assure compliance, and to provide information about deviation. In order to overcome the slack problem, making managers participate in setting the budget provides an opportunity to influence the budget before it is finalized, in preparing a participatory budget, which gives the manager a more active role. Thus, the manager becomes more involved in considering and evaluating alternative budget goals. Participation may thus increase the manager's attempts to formulate accurate forecasts of environmental states and can focus the manager's attention on decisions and behaviours needed in future periods.

Onsi (1973) reported that participation promotes an attitude that the budget is neither a game nor an accounting tool, thus, making managers feel they are not under pressure to create slack. Fisher *et al.* (2002, p. 848) examined in their study, whether either of two practices—using budgets to allocate scarce resources, or providing information about co-workers—reduces budget slack and increases subordinate performance when organisations use budgets for performance evaluation. They concluded that using budgets for both resource allocation (planning function) and performance evaluation (control function) not only eliminates budget slack, but also increases subordinates' effort and task performance. In addition, they concluded that this complementary use of budgets and designing the internal information system to reduce information asymmetry among subordinates would lead subordinates to reveal their private information more truthfully and increase subordinates' incentives to provide more accurate budgets, which will result in increasing their effort and task performance. They explained these results by stating, '*when the firm uses budgets to allocate scarce resources, subordinates have incentives to overstate their productivity to acquire a greater share of fixed resources. Such motivations will counterbalance subordinates' incentives to understate their productivity in budget-based evaluation plans. Which causes subordinate performance to increase when superiors use the budget to allocate resources. This is because superiors can allocate more resources to more productive subordinates, and because subordinates will exert more effort to exceed their higher budget levels to signal high productivity in an effort to attract higher resource allocations in the future'.*

Another attempt to provide a solution to this limitation, Hopwood (1972), Bruns and Waterhouse (1975), Lukka (1988), Leavins, *et al.* (1995) and Prendergast (1997) stated that the only way to hinder the creation of budgetary slack is to have a finance department, which understand the operational business very well. Thus, cost centre managers would be clearly aware that the finance department understands their budgets, and that any budgetary slack would become apparent to them. They also added that top management need clearly to support accounting involvement in the business at this detailed level in order for operational managers to accept this involvement. This tight control appeared successfully to limit budgetary slack. Even with the motivation and

opportunity to insert slack, managers would be reluctant to do so where the chances of being caught are so high.

In summary, despite all these criticisms having been made, financial measures are still essential to assess performance in any company. However, they need to be used with cautious. Simons *et al.* (2000) point out that 'financial measures help the organisation to transmit its strategies among employees because strategies may sound attractive when described by proponents in bright words and colourful phrase, but strategies need to be translated into accounting numbers to evaluate how they actually create value'. In addition, Binnersley (1996) explained that performance measures when used correctly help everyone in the company focus on the right things in the right place at the right time. However, focused in the wrong way, measures may do more harm than good. Thus, there was a relatively new stream of literature identifying a new concept called 'beyond budgeting'.

2.6 Beyond Budgeting

Kaplan (1983), McNair and Mosconi (1989), Bromwich and Bhimani (1994), Lucas (1997), Barsky and Bremser (1999) and Jensen (2001) amongst others argued that the traditional budget acts as a barrier to effective management, particularly in the present dynamic business environment. They claim that budgeting process, as traditionally practised, is simply an exercise in justifying the increase and decrease in the previous year's spending, as a result, companies are better off without budgets. Berland (2001) proposed that recent research in management accounting has shown that turbulent environments make it difficult to plan ahead. Budgetary control, since it relies on accurate forecasting, can therefore be seen to be an outdated management tool. Therefore, to succeed in the present dynamic business environment, tools or strategies, such as JIT, ABC, TQM, process re-engineering, life cycle assessment and target costing, should be deployed which will greatly enhance the ability of corporations to meet global competition. Johnson and Kaplan (1987) considered changes in the environment as one of the six possible explanations for understanding the contemporary criticism of the

approach to management based on a consideration of figures (i.e. budgeting) (see also Kaplan, 1984).

In the same vein, Binnersley (1996) sets out that many existing systems of performance measurement have been designed and overseen by financial experts. Such systems have had a strong control bias and have not required any significant input from senior management outside the finance function. These traditional financial performance measures may have worked for the industrial era but are out of step as worldwide events have a more dynamic impact on companies, as product life cycles have shortened, and as a high level of skills and competencies are required by companies. Consequently, a major question is being highlighted, "is budgeting still relevant to be applied in organisations?" To answer this question, it is necessary to clarify what is meant by the environmental turbulence or changes, as it has often been cited that accounting is a product of its environment (Perera, 1989; Choi and Mueller, 1992; Radebaugh and Gray, 1993).

Berland (2001) stated that changes in the competitive environment, in the macro-economic environment and in the world-wide development of new technologies are among the explanations for what is sometimes seen as the lack of accuracy, and hence relevance, of present management tools. This irrelevance might be due to the changes which have occurred since these tools were first developed. Environment as a contingency factor has an impact on budgetary control and planning which is multi-faceted. A predictable environment makes it easier to plan, as evidenced by previous historical studies (e.g. Gordon and Miller, 1976; Ansari 1977; Otley, 1978; 1980; Macintosh, 1981; Govindarajan, 1984; 1988) which have shown the importance of stability for the development of certain management practices.

Bunce *et al.* (1995) point out that the new feature of today's environment is turmoil. In contrast, traditional management tools were devised for relatively stable environments dominated by producers. He added that the traditional budgeting process would thus correspond to an old-fashioned conception of management that is function-oriented. However, the current environment encourages managers, on the contrary, to think in

terms of process rather than of function. Nevertheless, Hopwood (1974a) investigated the state of budget use depending on the environment. He points out that budgets, which are easy to formulate in stable and predictable environments, would be very useful in unstable environments in which there is a strong need for control. However, the more useful budgets are, the more difficult they are to formulate and so the less reliable and relevant they may become. Thus, Binnersley (1996) stated that the business paradigm has changed with the increasing trend towards 'beyond budgeting', which fits with all types of businesses, such as manufacturing, service and non-profit organisations, that rely on relationships with customers, suppliers and employees, organised as processes rather than functions. Therefore, Horngren *et al.* (1997), Merchant (1998), Pierce and O'Dea (1998) and Clarke and Toal (1999) stated that budgets are one of the most widely used tools for planning and controlling organisations, however, the issue is not whether to prepare a budget or not, but rather how to do it. Evidence, from their studies, shows that the budget is still an essential part of most businesses.

In an attempt to revive the essential role of budgeting, Jensen (2001; 2003) suggested a consideration of the link between budgets and bonuses. He argued that by rewarding people purely for their accomplishments not for their ability to hit targets, only then, the budgeting incentives that drive individuals to act in ways that destroy corporate value would be eliminated. Jensen also stated that the key lies not in destroying the budgeting systems, but in changing the way organisations pay people. In particular, to stop this highly counterproductive behavior, using budgets or targets in the compensation formulas and promotion systems for employees and managers should be stopped. Such purely linear compensation formulas provide no incentives to lie, or to withhold and distort information, or to manipulate the system. Moreover, eliminating target manipulation from the management system will eliminate one of the major forces leading to the general loss of integrity in organisations.

Prendergast (2000) stated that some techniques such as the balanced scorecard have a financial section. Clearly, a budget can still be a component part of the financial section of the balanced scorecard. He argued that, even in the early 1980s, many monthly

management reports contained hybrid information, in addition to the financial figures; there were sales returns, orders and efficiencies, which could also be considered part of any balanced scorecard. However, Prendergast highlighted that the budgeting behavioural problems mentioned earlier must be resolved before applying the new system because they might resurface to corrupt the new system.

As shown earlier, the concerns regarding the number of limitations and weaknesses that have been linked to traditional budgeting processes are becoming increasingly widespread, with the primary concern that they could potentially hinder and damage an *organisation*'s performance (Bunce and Fraser, 1997). The limitations of the traditional budgeting methods that they are too time consuming, costly and unresponsive to today's competitive and turbulent environment start to represent a burden on top management. Neely *et al.* (2003) found that the literature research uncovered five principal approaches and techniques that can aid improved budgeting and planning processes, which is so-called *beyond budgeting*. As shown in figure (2.2), these approaches were; activity based budgeting, zero base budgeting, value-based management, profit planning, and rolling budgets and forecasts. Neely *et al.* stated, 'All of which represents a radical departure from traditional annual budgeting and performance management mind-sets' (p. 27). Fanning (1999) stated that it has been suggested that it may be possible to meet the budgetary needs of organisations in the current information age through adopting 'better budgeting' processes including, for example, activity based budgeting (ABB) and zero-base budgeting (ZBB). In Neely *et al.*'s study on a number of the Scandinavian companies - including Svenska Handelsbanken, Borealis and Skandia, they found that very few companies, the Scandinavian pioneers apart, have truly reached a state of 'beyond budgeting', although, few companies have eliminated budgets altogether, some have managed to do so. They concluded that many of the companies that were the subject of their research still have some way to go before their efforts will allow them to let go of the reins of budgeting malpractice. They argued that the tendency is simply to eradicate the term 'budgeting' and soften some of its past negative connotations.

In the same vein, Hope and Fraser (2003) stated that the 'Beyond Budgeting' approach replaced traditional budgeting to reduce the costs of budgeting and implement more adaptive planning processes. They argued that this approach attempts to provide some solutions for the limitations in budgeting. For example, it has a strategic orientation and supports evaluation and rewards on relative improvement contracts with hindsight rather than on fixed performance contracts agreed upon in advance to overcome the dysfunctional behavioural aspects of the traditional budgeting. The evidence from their investigated cases suggests that there are different ways to align rewards with performance, all of which avoid forming fixed performance contracts. They gave examples of companies that do not link rewards to fixed targets such as a company focuses on the relative success of teams based on different performance measures. Another company is rewarding individuals based on bonus package with elements related to the performance of different units. However, they stressed the common principle of not linking rewards to fixed targets agreed to in advance.

Finally, Brown and Atkinson (2001), in their study on Lakefront hotel as a company that works in the hospitality industry, found evidence of beyond budgeting application. They stated that a fresh approach to the main purposes of budgeting within the hospitality industry was found. This approach supports the purpose of forecasting, resource allocation and performance measurement and control aspect of budgeting systems. In addition, this approach incorporates strategic indicators of an operation's drivers of future performance as well as shorter-term measures regarding results actually achieved. They also stated that Lakefront has established a culture of continuous improvement, including the active encouragement of empowerment and teamwork and the exercising of initiative to 'add value'. Moreover, the hotel has also begun to incorporate and develop a number of more advanced control tools - including TQM, ABC and benchmarking.

Figure (2.2) Better budgeting techniques

1. Activity Based

- similar to ABC and ABM
- involves planning and controlling along the lines of value -adding activities and processes
- resource and capital allocation decisions are consistent with ABM analysis, which involves structuring the organisation's activities and business processes so that they better meet customers and external needs

2. Zero Base

- expenditures must be re -justified during each budgeting cycle, rather than basing budgets on previous years or periods
- avoids building on the inefficiencies and inaccuracies of previous history
- value of this approach depends on stability of operating environment

3. Value Based

- formal and systematic approach for managing the creation of sha reholder value over time
- all expenditure plans evaluated as project appraisals and assessed in terms of the shareholder value they will create
- helps to link strategy and shareholder value to planning and budgeting

4. Profit

- 'profit wheel' method for planning future financial cash flows of profit centres
- assesses whether an organisation or unit generates sufficient cash, creates economic value and attracts sufficient financial resources for investment
- ensures consideration of an organisation's short- and long -term prospects when preparing its financial plans

5. Rolling Budgets and

- solves problems associated with infrequent budgeting and hence result in more accurate forecasts
- more responsive to changing circumstances, but requires permanent resource to administer
- also overcomes problems linked to budgeting to a fixed point in time – i.e. the year-end and the often dubious practices that such cut -offs encourage

Source: Neely *et al.* (2003)

2.7 Budgeting Pioneering Studies

The literature of budgeting is wide-ranging; there have been studies of dysfunctional behaviour as a response to the way supervisors used budgetary information to evaluate employees' performance (Argyris, 1952); bias (Lowe and Shaw, 1968); supervisory style and participation (Hofstede, 1968); budgetary slack (Schiff and Lewin, 1968); budgets as behavioural tools (Buckley and McKenna, 1972); budget constrained and profit conscious styles of performance evaluation (Hopwood, 1972; 1973; Otley, 1978); single point estimates and aggregation (Berry and Otley, 1975); dysfunctional behaviour (Birnberg *et al.*, 1983); the impact of environmental uncertainty (Govindarajan, 1984); the achievability of budget targets (Merchant and Manzoni, 1989); budgets as symbol (Czarniawska-Joerges and Jacobsson, 1989); the power of budgets (Covaleski and Dirsmith, 1988; Ezzamel, 1994; Llewellyn, 1998); and risk in the process of budgeting (Collier and Berry, 2002).

In addition, budgeting studies have investigated the effect of various contingency variables on the relationship between budget emphasis and both intervening and dependent variables. These studies have sought to explain the relationship between a budget emphasis style of evaluation and job related tension by reference to contingent variables. The contingent variables include the accuracy of accounting information (Otley, 1978); task uncertainty (Hirst, 1981; 1983; Imoisili, 1985); budgetary participation (Brownell, 1982; Hirst, 1987); budgetary participation and task uncertainty (Brownell and Hirst, 1986); the degree of environmental uncertainty facing the business (Govindarajan, 1984), environmental uncertainty and budgetary participation (Brownell, 1985; 1987); the national culture in which the business operates (Harrison, 1992), the organisation's strategy (Merchant, 1984), the functional structure (Brownell, 1985), technology (Otley, 1980; Brownell and Merchant, 1987); the level of automation (Dunk, 1992) and business strategy (Govindarajan and Gupta, 1985). These variables reflect strategic and operational decisions that need to be taken into account when deciding how to use the budget to evaluate a subordinate and/or manager's performance. Implicit in some of these approaches (e.g. Govindarajan, 1984) is the assumption that a match between budget emphasis and contingency factors will have a beneficial effect. Such an

approach has also led to design issues becoming more salient and, more specifically, a stronger focus on antecedent variables.

Selected seminal studies of relevance to this topic have been identified, which are Argyris (1952), Hofstede (1968), Hopwood (1972) and Otley (1978). An overview for each of these studies would be provided in the following section.

2.7.1 Argyris (1952)

Chris Argyris' (1952) seminal work on the impact of budgets on people examined what "budget people" think of budgets, and how factory supervisors think differently about budgets. The pioneering work of Argyris who observed that the way in which people expressed interest in budgets, and the ways in which they described and used them were directly related to the individual's personality and their pattern of leadership at work. As a behavioralist, he combined a study of accounting practices with a sociological concern with groups. Argyris stressed that the budget is a tool, which cannot exist without people. In simple words, his main idea was that budget is prepared by people, revised by people and, at the end, it should be met by people too, therefore, he stressed the human aspect of the budget.

Argyris (1952) examined an extensive range of variables associated with supervisory style. The variables included supervisory style and antecedent variables such as differentiation and general leadership style. He also examined the impact of supervisory style on a number of intervening variables such as job related tension and, in turn, their effect on various dependent variables such as the dysfunctional behaviour and managerial performance. He also proposed budgetary participation as a possible moderator variable, which might have a positive effect on performance. Argyris (1952) reported that subordinate feelings of tension or budget pressure derived from two main factors, namely, budget emphasis (the propensity of supervisors to emphasize the need to meet the budget) and the blurred nature of budget documents which failed to disclose the real reasons for the budget variances. Argyris argued that this pressure and tension had dysfunctional consequences including increased frustration, resentment and mistrust

together with a possible deterioration in long run performance. He described the interaction between people and budgets as one of the reasons for creating groups because where budget pressure is felt by the workers they will form groups to share and thus relieve the pressure. He argued that if management puts increased pressure on individuals, groups are likely to form. These groups can in turn help absorb the increased pressures placed by management on individuals. Once formed, such groups can persist even after the initial pressure to produce them has disappeared.

Argyris (1952) argued that budgetary participation could be used as a means of addressing the differentiation problem and hence as a possible moderator variable. He noted that while top management emphasized the need for budgetary participation, subordinates were reluctant to express their opinions at the budget meetings and so were not fully participating in the process, which he called 'pseudo-participation'. He suggested that full budgetary participation would help top management gain subordinate acceptance of the budget. He concluded that the greatest contribution from budgeting activities would occur if subordinates were allowed to participate in the activity of budget creation. He also added that budgets set under participatory conditions would broaden the scope of the foremen's concern and could have beneficial effects on employee performance.

Argyris (1952) argued that through participation, each group is getting to understand the other point of view, which reduces stress. He suggested two other antecedent variables, economic conditions and general leadership style. Budget personnel acknowledged that when the economic environment was uncertain, in terms of sales and profits, the budget pressure was increased, which in turn caused the job related tension to increase too. Argyris also reported that budgetary pressure was influenced by general leadership style; for example, an aggressive leader was likely to project an aggressive style upon the use of budgets as a control mechanism and vice versa. In summary, as Briers and Hirst (1990) stated, Argyris' study provided a milestone in behavioural accounting research. That relates in this early study some major variables to each other such as outcomes of

supervisory style, uses of accounting information in performance evaluation, budget participation, economic conditions, dysfunctional behaviour and others.

2.7.2 Hofstede (1968)

Hofstede's (1968) study, '*The game of budget control*', also concerned the effects of supervisory style and the role of budgetary participation. As with Argyris' study, group process and dynamics appears to be the key factor in explaining the budget process. Hofstede went one-step further by depicting the budgetary process as a game, which people play for their own sake. The study examined the effects of various aspects of superior-subordinate budgetary communication on pressure. He considered some aspects of supervisory style such as the extent to which these results were used in performance evaluation (budget emphasis) and budget variances. In addition, Briers and Hirst (1990) stated that Hofstede considered two aspects of budgetary participation, namely, the use of departmental meetings and the creation of a "game spirit". This game spirit is a key ingredient with which managers entered the "budget game". This budget game referred to the conflict between the individual's need for autonomy and the system's need for coordinative control, which can only be reconciled in a game context in which achieving budgeted targets is considered sport.

Hofstede's research revealed that budget participation was the variable with the strongest effect on all measures of motivation. Whilst Hofstede found some evidence that participation in the budgetary process was positively associated with motivation to meet budget targets, the results were mixed. Participation appeared to be a necessary but not sufficient condition for high budget motivation because of other factors such as target levels achievability and the supervisory style. Hofstede's (1968) results indicated that while budget emphasis increased budget motivation, pressure was also raised. He also found that the comments of a 'cost-conscious boss' regarding negative variances results are interpreted as being punitive rather than corrective. This attitude led to feelings of higher pressure and lower job satisfaction. He argued that while at least some pressure may have beneficial effects, too much pressure has adverse effects such as anxiety, stress and fear of failure and also results in dysfunctional behaviour such as absenteeism and

interpersonal conflicts. This is consistent with the last study of Argyris (1952) (Briers and Hirst, 1990: p. 376).

Hofstede (1968) alluded to the moderating status of budgetary participation and its role in addressing the differentiation problem, which is consistent again with Argyris (1952). He argued that pressure might be relieved by upward communication. He found that budget participation has positive effects on managerial motivation and satisfaction. There is likely to be greater acceptance of budget goals if they are perceived as being under managers' personal control, rather that being imposed externally. This leads to higher personal commitment to achieve the goals and to make budgets more attainable. Hofstede's general conclusion was that the creation of a "game spirit", which in turn depends on the leadership skill of the budgetee's superior, has the most beneficial overall effects.

2.7.3 Hopwood (1972)

Hopwood's (1972) seminal work was the study that explored the role of accounting data in managerial performance evaluation. In his study on different cost centres in a large American manufacturing company, Hopwood (1972) identified three distinct evaluative styles used by senior managers in holding subordinates accountable for their performance. These styles depended upon both the extent and the manner in which budgetary information was used (Briers and Hirst, 1990).

Hopwood identified three distinct ways of using budgetary information in the evaluation of managerial performance. He identified a "budget constrained" style, a "profit conscious" style and a "non-accounting" style. Budget Constrained style refers to the use of budgetary information that formed a central part of the evaluative process in a rigid manner, so that reasonable explanations of failure to meet budget targets were not accepted. Profit-Conscious style refers to the flexible use of budgetary information, which was still an important indicator of good performance. This style utilises the budgetary information and considers it one indicator of a longer-term concern with costs and efficiency. Thus, it would be possible to be positively evaluated despite showing a

cost over-run against budgetary targets if there were reasonable explanations for such an outcome, and that a corrective action was being taken to ensure adequate long-term performance. Non-Accounting style refers to the use of budgetary information was seen as being of secondary importance and performance was evaluated by reference to other information. Although, Hopwood defined this category, it had a little value in the study and was not widely used. He concentrated on the difference between the budget constrained and profit-conscious styles (Otley and Fakiolas, 2000).

Empirical evidence indicated that both the "budget constrained" and "profit conscious" styles of evaluation resulted in a higher degree of involvement with costs than the "non-accounting" style. Only the "profit conscious" style, however, succeeded in achieving this involvement without defensive behaviour or undue tension and worry on the part of the managers in charge of the cost centres. The "budget constrained" style often resulted in manipulation of accounting reports, incorrect charging to budgets, delays in carrying out repairs until the money was available in the budget, and a general deterioration in the relationships between managers and those to whom they reported. Briers and Hirst (1990) stated that Hopwood provided some suggestive evidence that tension and conflict may influence long-term performance and success. They added that he conjectured that while a profit conscious style is likely to result in greater efficiency than the budget constrained style, both were likely to result in greater efficiency than the non-accounting style because "the possibility does remain that it is still better to place at least some emphasis on the accounting data" (Hopwood, 1972: p. 176).

Hopwood therefore reports results where managers perceive that budgetary information plays an important part in the evaluation of their performance, and distinguishes between a rigid, short-term orientation and a more flexible, longer-term use of budgetary information. In both cases, extensive use is made of budgetary information in performance evaluation; the two styles differ in the way in which that information is used in coming to an overall assessment of managerial performance. The results of Hopwood's (1972) study provided support that cost centre heads with budget constrained supervisors experienced higher job related tension, poorer relations with both supervisors and peers,

and were more likely to engage in invalid data reporting and dysfunctional behaviour than those with profit conscious or non-accounting supervisors. This was primarily because the budgetary information captured only part of the information necessary to make an overall assessment of managerial performance in the interdependent situation studied (Otley and Fakiolas, 2000). It should be noted that Hopwood (1972) did not directly test the relation between supervisory style and managerial performance (Briers and Hirst, 1990). Hopwood (1972) concluded that his results might not generalize to other settings, that is, from an uncertain and highly complex situation to a stable and technologically simple situation.

This was the threshold for the adoption of a contingency perspective by subsequent researchers[4] as the behavioural aspects of budgeting and related evaluation mechanisms transformed the discipline of accounting. Accounting was no longer to be perceived as a purely technical process, but was to be viewed as organisational and behavioural. This meant that accounting, and specifically management accounting, was soon to change in line with developments in sociology and the wider social science environment.

2.7.4 Otley (1978)

Otley's (1978) study was a replication and extension of Hopwood's (1972, 1973) work. Otley (1978) study was conducted in a single organisation to avoid the mismatch between accounting performance measures and overall performance. He thus chose an organisation having independent profit centres as production units. The selected organisation was working in the mining industry in the UK. Because the operation of each coalmine was largely independent of other mines, and because the coal produced was sold to commercial customers in a marketplace, the profitability and other performance measures relating to each coalmine can be evaluated in isolation (Otley and Fakiolas, 2000).

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[4] See for example, Hopwood (1974b) who extended this line of reasoning significantly by drawing explicitly on sociological and administrative theories of groups and organisations. He problematized the link between participation and budgeting, arguing that participation can mean almost anything to anyone and adding that much of the debate had turned inquiry into dogma.

The categorisation procedure followed that of Hopwood, except that the Budget–Profit category was split into two [BP and PB] depending upon whether the budget or efficiency item was ranked more highly when both appeared in the top two ranks. Otley adopted Hopwood's definition of supervisory style but Otley followed a continuum of style, which he categorized as A, B, C, D, and E, ranging from a budget constrained style (A) to a non- accounting style (E) (Briers and Hirst, 1990; Otley and Fakiolas, 2000).

Otley's (1978) study attempted to replicate Hopwood's (1972) study on the effectiveness of accounting for managerial performance evaluation. His results conflicted with those of Hopwood, and Otley argued that a contingency theory approach might explain the differences. Otley stated that the research sites in the two studies had very different technologies and managerial interdependencies. In addition, the research site for Otley's study was a profit centre, which he claimed that it was well suited to the use of budgetary control systems. However, in Hopwood's study all his sample was cost centres units. A further difference was that there were fewer managers (3%) in Otley's study in the non-accounting category (E) than in Hopwood's study (44%). Otley's analysis is therefore reasonably comparable with Hopwood's in concentrating only on accounting-based styles of evaluation, although, the evaluative styles are represented by more of a continuum than a dichotomy. Briers and Hirst (1990) stated that in Otley's (1978) study there was some support for a positive relationship between supervisory style and poorer interpersonal relations, however, the relationship between supervisory style and job related tension was insignificant. Therefore, this latter result is not supportive of Hopwood's (1972) findings. Moreover, Otley found that there was a significant positive relationship between supervisory style and budgetary performance but not with longer term indicators of performance such as levels of absenteeism. Otley concluded that the relationship between the evaluative style and performance is not direct and there should be some other factors that affect this relation indirectly (intervening and moderating variables). There was some evidence to suggest that some other factors, such as the expected profitability of the operating unit, affect the evaluative style used by the superior. In any event, Otley's results did not replicate those of Hopwood, so he concluded that Hopwood's results were driven by the technical inadequacies of the

accounting system as a means of performance evaluation in the interdependent cost centres studied by Hopwood (1972).

The aim of this review of some key studies in the management control area, namely budgeting, despite the differences in methods followed and conflicting results among them, is to stress the importance of supervisory style as a predictor of behaviour in organisations. Therefore, as long as, management control systems are the systems that have to monitor employees' behaviour to result in the planned functional aspects. Therefore, as shown earlier, there are various contingent factors, must be taken into consideration, including task uncertainty, budgetary participation, the environment and strategy. Moreover, unit size, environmental and economic conditions, general leadership style and organisational structure amongst others.

Chapter Three

Contemporary Performance Measurement Systems

3.1 Introduction

The third chapter continues the discussion about performance measurement techniques to examine more recent developments. The main purpose of this chapter is to achieve two objectives:

1. To demonstrate the need for new measures.
2. To complete the overview of the performance measurement literature.

In order to achieve this, a critical discussion is presented concerning contemporary performance measures that play a crucial role in organisations along with a critical review for this topic. Therefore, this chapter has been divided into six sections:

- The first section investigates the need for new performance measures;
- The second section discusses the contemporary performance measurement techniques;
- The third section addresses the criticisms of these techniques;
- The fourth section reviews the contingent factors that affect the use and the design of these techniques;
- The fifth section discusses the Balanced Scorecard (BSC) as an example for the contemporary performance measurement techniques; and
- Finally, the sixth section provides a comparison among different performance measurement techniques.

3.2 The Need for New Performance Measures

Eccles and Pyburn (1992) point out that the inherent historical nature of financial accounting measures means they provide delayed information as to performance and therefore lack the capacity to anticipate future performance. The attention they pay to the past prevents them from helping to elucidate questions relative to the way in which value is generated and the interests of the different stakeholders can be satisfied and, in short, fail to reveal the factors which lead an organisation to succeed. Anthony and Govindarajan (2000) and Kanji (2002a; 2002b) stated that, traditionally, performance measurement has focused on financial measures, such as sales turnover, profit, debt and return on investment. However, relying solely on these financial measures is inadequate and can be dysfunctional, especially, because these measures encourage short-term actions that may be not in the company's long-term interests. Also, as shown in the previous chapter, financial measures have been criticized because they are *lagging indicators* that reflect the consequences of the decisions after the decisions were made, with a lack of explicative and predictive power. Furthermore, traditional measures have a tendency to be focused on the individual or the function, not the processes that are at the core of management. Process management requires more transversal measures, which traditional systems do not provide.

Otley (2001) argued that budgetary control appeared to work satisfactorily in a relatively stable environment with well-codified budgets. However, increasing problems have become evident. He highlighted budget as a uni-dimensional representation of a more complex reality that became unwanted. He stated that changes in organisational strategies are accompanied by changes in performance evaluation and incentive systems to derive higher performance that enable companies to act in new competitive realities. Therefore, he points out that companies have to shift from treating financial figures as the foundation for performance measurement to treating them as one element in a broader set of measures (e.g., Eccles, 1991; Parthasarthy and Sethi, 1993; Abernethy and Lillis, 1995; Milgrom and Roberts, 1995; Simons, 1995). Some writers, for example Bunce *et al.* (1995), have made a critique of the usefulness of budgeting as a means of management control in contemporary organisations, mainly because of the increased rate

of change most organisations now have to cope with. However, in general, it is claimed that these recent changes have been described as a performance measurement revolution that seeks to redress the insufficiency of traditional performance measures for evaluating advanced manufacturing techniques (Neely, 1999).

Scarlett (1996) argued that during the last 30 years there have been a number of significant changes that have influenced management practices. These include an increase in product diversity, shortening of product life cycles, widespread adoption of robotics and information technology in manufacturing operations, and the globalisation of markets in products and components as a result of erosion of barriers to trade. As a consequence, management accounting has responded to the demand for continued changes in management practices in order to assist managers in making strategic decisions. Therefore, management accounting has become even more crucial as an ingredient in the success of any organisation.

Otley (1994) stated that the main environmental changes, which led to the changes in the nature of contemporary business enterprises, were environmental uncertainty, organisational size, concentration and alliances, and decline of manufacturing. He explained that environmental uncertainty is related to rapid change in the environment that makes the future difficult to predict, in which budget relies on. Any reduction in the ability to predict the consequences of change reduces an organisation's ability to control its future performance. He points out that this uncertainty could be due to technological, social, political or ethical changes. He concluded that the result is that the world is becoming less predictable, and that organisational control is becoming more complex. Otley (1994) argued that the technological changes[5] help to reduce the size of business units, in terms of the number of people employed. Otley, also, stated that *concentration and alliances* and *decline of manufacturing* are indications of the current new era. He argued that most of the manufacturing companies are now shifting away from the

[5] These technological changes facilitated the shift from physical capital industries to knowledge-based capital industries that are currently prevailing.

traditional methods of production to modern methods so that they could generate sustainable competitive advantages.

Ghalayini and Noble (1996) stated that the changes in today's environment have revealed that traditional performance measures have many limitations and the development of new performance measurement techniques is required for success. They summarized the differences between traditional and non-traditional performance measures in Table (3.1).

Table (3.1)

A comparison between traditional and non-traditional performance measures

Traditional performance measures	Non-traditional performance measures
Based on outdated traditional accounting system	Based on company strategy
Mainly financial measures	Mainly non-financial measures
Intended for middle and high managers	Intended for all employees
Lagging metrics (weekly or monthly)	On-time metrics (hourly, or daily)
Difficult, confusing and misleading	Simple, accurate and easy to use
Lead to employee frustration	Lead to employee satisfaction
Neglected at the shopfloor	Frequently used at the shopfloor
Have a fixed format	Have no fixed format (depends on needs)
Do not vary between locations	Vary between locations
Do not change over time	Change over time as the need change
Intended mainly for monitoring performance	Intended to improve performance
Not applicable for JIT, TQM, CIM, FMS, RPR, OPT, etc.	Applicable
Hinders continuous improvement	Help in achieving continuous improvement

Source: Ghalayini and Noble (1996)

Fullerton and McWatters (2002) stress the increasingly competitive marketplace and the move towards vertical and horizontal alliances place more pressure on a firm's ability to achieve a value added chain. They claimed that to build and strengthen long-term competitive advantage, firms must provide low cost, high-quality products under time-

based demands. They stated that it is necessary for firms to develop some operational measures, which will help firms to measure and propel future financial performance and to manage vital resources. These operational measures include financial measures and nonfinancial measures, which help the company to have feedback concerning different aspects of the business. They gave examples that nonfinancial aspects include customer satisfaction, quality, cycle time, employee motivation and innovation capabilities, which work complementary with the financial measures.

The importance of nonfinancial measures has been highlighted in previous studies, for example, Barsky and Bremser (1999) gave an example of Microsoft Corporation as a knowledge-based company. This company applies customer and innovation measures beside financial ones. The market value of Microsoft Corporation exceeded $200 billion. Although, the firm shows very few 'productive' assets on its balance sheet and its largest asset as of September 30, 1998 was $13 billion of cash, the long-run value of Microsoft is based on its intellectual capital resources and its continued innovation ability, which could not be reflected by the financial measures. Thus, it can be said that there is a growing importance of nonfinancial measures as the global economy continues to shift away from physical capital towards a knowledge-based economy, and manufacturing shifts away from traditional mass production towards modern production (see for example, Milgrom and Roberts, 1995; Veen-Dirks, 2005). Table (3.2) shows the different characteristic features of the traditional mass production and a more contemporary version, which identifies the need for new performance measures.

Table (3.2) Traditional mass production versus modern production

Characteristic features of traditional mass production	**Characteristic features of modern production**
Logic: The transfer line, interchangeable parts, and economies of scale	**Logic: Flexibility, speed, economies of scope, and core competencies**
Specialized machinery	Flexible machines, low setup costs
Long production runs	Short production runs
Infrequent product changes	Frequent product improvements
Mass marketing	Targeted markets
Low skill requirements for workers	Highly skilled workers
Specialized skill jobs	Cross-trained workers
Central expertise and coordination	Worker initiative
Hierarchic planning and control	Local information and self-regulation
Vertical internal communication	Horizontal communication
Sequential product development	Cross-functional development teams
Static optimization	Continuous improvement
Accent on volume	Accent on cost and quality
High inventories	Low inventories

Characteristic features of traditional mass production	**Characteristic features of modern production**
Logic: The transfer line, interchangeable parts, and economies of scale	**Logic: Flexibility, speed, economies of scope, and core competencies**
Supply management	Demand management
Make to stock	Make to order
Limited communication	Extensive communication
Market dealings: employees, suppliers	Long-term trust-based relationships
Vertical integration	Reliance on outside suppliers (Outsourcing)

Source: Milgrom and Roberts (1995)

In summary, a number of academics (e.g. Kaplan, 1983; 1988; Eccles and Pyburn, 1992; Otley, 1994; Bititchi, 1994; Medori *et al.*, 1995; De Waal, 2002) have pointed out that organisations need to move towards the idea of evolution by design; i.e. designing organisations that are capable of redesigning themselves. They claimed that the context and operation of contemporary organisations requires flexibility, adaptation and continuous learning in order to face the increasing trend of quality improvements, reduced inventory, more efficient production processes, and increased automation to fit with the new changing environment. They asserted that this situation is not supported by traditional control techniques that have many limitations and that any company in order to succeed, it must incorporate both financial and nonfinancial measures, so currently successful organisations are not caught out by more nimble competitors.

3.3 Contemporary Performance Measurement Systems

"Not everything that counts can be counted, and not everything that can be counted counts" Albert Einstein

Sellenheim (1991) and Anthony and Govindarajan (2000) stated that nonfinancial performance measures are not new and that companies in the past used financial and nonfinancial measures. However, companies tended to use nonfinancial measures at lower levels in the organisation for task control and financial measures at higher organisational levels for management control. Thus, nonfinancial measures have not been addressed or recognised as a reportable item. With the dynamic of today's world environment and increasing global competition, problems with the traditional performance measurements have occurred and the need for nonfinancial measures becomes greater than ever.

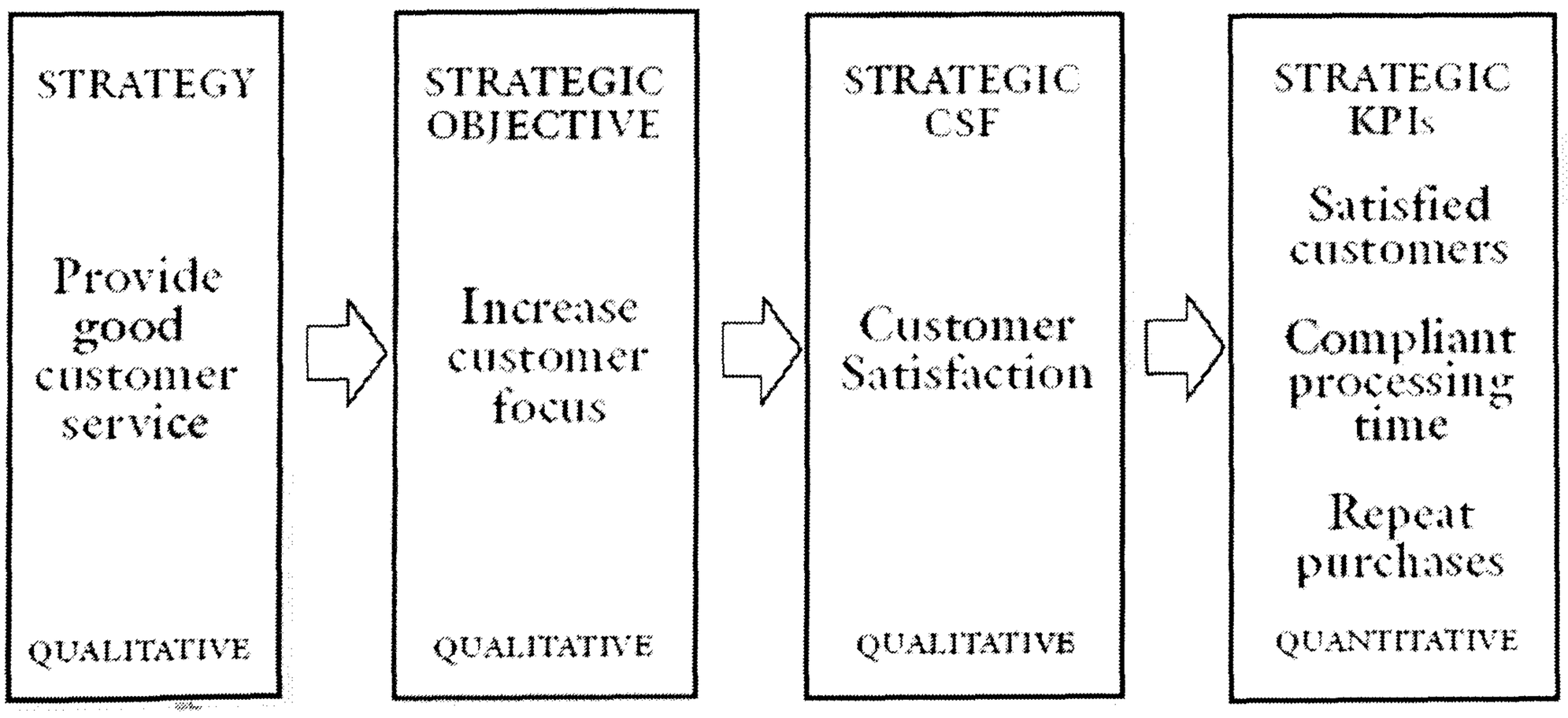
Said *et al.* (2003) argued that this emphasis reflects the shift from treating financial figures as the foundation of performance measurement to treating them as one element among a broader set of measures. This combination of both measures is needed at all levels in the organisation. They added that nonfinancial measures that support strategy implementation would be referred to as key performance indicators (KPIs). In the same vein, Rockart (1979) and De Waal (2002) differentiated between critical success factors (CSFs) and key performance indicators (KPIs). They define the former as the limited number of areas for any business, in which results, if they are satisfactory, would ensure successful competitive performance for the organisation. However, if results in these areas are not adequate, the organisation's efforts for the period would be less than desired. Thus, the critical success factors are areas of activity that should receive constant and careful management attention. The latter, which is the key performance indicators (KPIs), was defined as the prime measures that measure the critical success factors (CSFs). In other words, a critical success factor is a qualitative description of an element of the strategy in which the organisation has to excel in order to be successful. The critical success factor is made quantifiable through the key performance indicators. The

use of CSFs and KPIs enables measurement and, thus, control of strategic objectives see Exhibit (3.1) that gives an example of a CSF and its KPIs.

In this example, an organisation has a strategy of providing good customer service, which is of critical importance for the organisation's success. One way of achieving this strategy is to provide this service by increasing the focus on the customer throughout the organisation, thereby increasing customer satisfaction, which is a critical success factor. The only way to quantify this factor is through a KPI such as the number of customers that repeatedly buy products or services (i.e., repeat purchases) (De Waal, 2002).

De Waal (2002) explained that there are many customer-focused key variables such as market share, customer satisfaction, customer retention and customer loyalty that the company could utilise. In addition, he added that there is another critical success factor such as the internal business process that could be measured by some key variables including capacity utilisation, on-time delivery, inventory turnover, quality and cycle time.

Exhibit (3.1) CSF and the corresponding KPIs (Example)



Source: De Waal (2002)

Geanuracos and Meiklejohn (1993) stated that perhaps the most common frustration revealed in the area of performance measurement is that companies have no idea where to begin when initiating a review of performance measures. Many authors, e.g. Anthony *et al.* (1989) and Slack (1991), have revealed that performance measures are used to ensure that company's goals and objectives are achieved efficiently and effectively. They explained that efficiency is a measure of how economically the company's resources (inputs) are being utilized for a certain level of outputs. However, they defined effectiveness as a measure of the extent to which goals and objectives are achieved. They asserted that performance measures, which are used to evaluate, control and improve production processes and are also used to benchmark current performance levels either with the past levels or with competitors' levels, would help any company to achieve its objectives in an efficient and effective way.

The main problem for many companies, as stated by Davis and O'Donnell (1997) is how to establish an effective performance measurement technique. Problems arise especially that measures have often been added to an existing set simply as the need arose. The measures are not integrated and consequently do not provide a well-rounded view of how the business is performing at present, and the direction in which it is heading. Shaw and Ridgeway (1997) have identified that no blueprint of a common performance measurement technique has been developed. In a study conducted by CIMA[6] in 1993, it was found that there is no optimal set of measures in either practice or theory to monitor, improve or upgrade the performance of companies. Rather, the study found that each company has to find its balance of measures which is sufficient for the management of its operational activities.

Brooks and Coleman (2003) point out that 'A measurement system is considered "effective" if it drives desired behaviors and does little or nothing to drive undesired behaviors. Thus, what we measure drives behavior and an effective measurement system drives the right behavior; therefore, "what is measured" is a critical characteristic of a

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[6]Magazine for Chartered Management Accountants (1993). "Performance measurement in the manufacturing", Vol. 71, Issue 9, October, p9.

measurement system' (p. 30). Brooks and Coleman (2003) summarized in Exhibit (3.2) what Brown (1996) and Thor (1998) determined about the characteristics of an effective measurement system. The characteristics listed in Exhibit (3.2) could be used as the guidelines for evaluating the key performance indicators (KPIs) of any organisation. Brooks and Coleman (2003) stated that Brown and Thor agreed on most of the characteristics, but there are some differences in the characteristics they prescribe. For example, Thor (1998) emphasizes that measurements should be tied to the rewards and recognition system. These characteristics suggest implementing an integrated framework for performance measurement techniques, which could disclose specific nonfinancial performance measures and provide a description of the firm's business model in the context of these measures and how these measures map into firm value.

Rockart (1979) and De Waal (2002) stated that to design an effective performance measurement system, the company has to use a balanced set of key financial and nonfinancial critical success factors (CSFs) and key performance indicators (KPIs). This should enable the management to focus on the important issues that drive business performance and to monitor the achievement of strategic goals more closely. Therefore, the key issue is translating an organisational unit's vision and mission into a set of objectives, from which the unit identifies its critical success factors (CSFs), which in turn are translated into a series of quantitative key performance indicators (KPIs). To provide managers with the information they could use for decision making process. Geanuracos and Meiklejohn (1993) stated that performance measurement techniques are increasingly used as tools for decision making and not simply for record keeping or reporting. They highlighted that having an effective performance measurement technique based mainly on utilizing nonfinancial measures stimulates involvement in continuous improvement.

Exhibit (3.2) Characteristics of an effective organisational performance measurement technique

- Fewer are better (Brown, 1996; Thor, 1998).
- Measures should be linked to the factors needed for success, key business drivers (Brown, 1996; Thor, 1998).
- Measures should be a mix of past, present, and future (Brown, 1996).
- Measures should be based around the needs of customers, shareholders, and other key stakeholders (Brown, 1996).
- Measures should start at the top and flow down to all levels of employees in the organisation (Brown, 1996).
- Multiple indices can be combined into a single index to give a better overall assessment of performance (Brown, 1996).
- Measures should be changed or at least adjusted as the environment and your strategy changes (Brown, 1996; Thor, 1998).
- Measures need to have targets or goals established that are based on research rather than arbitrary numbers (Brown, 1996).
- Measures should be tied to the rewards and recognition system (Thor, 1998).

Source: Brooks and Coleman (2003)

In this context, a differentiation between a *performance measurement framework* and *performance measures* has to be made. According to Neely *et al.* (1994b), the former is

defined as a method or plan to aid companies to develop their own performance measures. In which the latter is defined as a set of metrics, or measures, from a variety of competitive priorities used to quantify both the efficiency and effectiveness of decisions. This line of thinking underlies frameworks like Kaplan and Norton's Balanced Scorecard (Kaplan and Norton, 1996a), which is discussed in detail in section (3.6). Lipe and Salterio (2002) find that organizing performance measures according to the Balanced Scorecard categories helps users recognize redundancies among performance measures and then adjust their assessments of performance. Grady (1991) stated that for these frameworks or tools to be successful, the company has to disseminate the required information throughout the organisation by providing employees with understanding of what are expected from them and how to relate their jobs to the overall strategy.

Many studies have reported the benefits of applying nonfinancial measures alongside with the financial measures. For example, Stivers *et al.* (1998) stated that firms seek to enhance their competitiveness by employing innovative quality-oriented management strategies and utilizing performance measurement systems that include a broad range of financial and forward-looking nonfinancial measures. The potential benefits of nonfinancial performance measures in management accounting in general and performance measurement in particular, have been widely cited (Johnson and Kaplan, 1987; Kaplan and Atkinson, 1989; Eccles, 1991; Schiff and Hoffman, 1996; Lambert, 2001; Azofraa *et al.*, 2003).

Massella (1994) and Hendricks *et al.* (1996) have stated that nonfinancial measures are more 'timely'[7] than financial ones, so that if they indicate poor performance, action often can be taken before adverse financial consequences occur. In other words, nonfinancial measures are contemporaneously available for purposes of evaluating the impact of current efforts. This affords the manager an opportunity to take immediate corrective action (Rees and Sutcliffe, 1994). Medori *et al.* (1997) point out that if the nonfinancial measurement procedures are well established, precise and accurate information could be provided. Luft and Shields (2002) stated that nonfinancial measures often create a focus

[7] The same concept of lagging and leading indicators.

on the future, as opposed to the historical focus of financial measures. They find that individuals' forecasts of future profits are more accurate when individuals base their forecasts on nonfinancial measures rather than financial measures. Although financial measures generally reflect past performance, nonfinancial measures may reflect actions that lead to future performance (Kaplan and Norton, 1992).

A number of prior studies, which investigated the relation between nonfinancial measures, such as customer satisfaction and firms' current performance, concluded that there is a positive relationship between them. For example, Anderson *et al.* (1994, 1997) concluded from their study, which used a cross-sectional data from 77 Swedish firms representing different industries, that nonfinancial measures, namely customer satisfaction, are positively associated with contemporaneous accounting performance. In the same vein, Perera *et al.* (1997) find that the use of nonfinancial measures is associated with enhanced performance for firms pursuing customer satisfaction through their manufacturing strategy. Furthermore, Behin and Riley (1999) find some evidence that customer satisfaction is associated with future financial performance in the U.S. airline industry. In a study of the use of nonfinancial measures, Foster and Gupta (1997) used two years of data from a wholesale beverage distributor to conclude that there is evidence of a positive relation between customer satisfaction and future profitability. Ittner and Larcker's (1998a) study found that customer satisfaction is positively related to future financial performance. Similarly, Banker *et al.* (2000) used time-series data covering 72 months for 18 hotels to provide evidence on the positive impact of nonfinancial measures on future financial performance. In summary, the results of these studies find a positive relation between future firm performance and current use of nonfinancial performance measures.

Other studies with a long-term focus attempted to explore the relation between nonfinancial measures, such as innovation and quality, and firms' future performance. They concluded that nonfinancial measures are primarily important and lead to better performance in the future (Banker *et al.*, 2000; Hemmer, 1996; Johnson and Kaplan, 1987; Kaplan and Norton, 1992).

Medori *et al.* (1997) stated that nonfinancial measures are easy to communicate across the organisation. Using a few well-understood nonfinancial measures at operational level would be of great benefit in enhancing and motivating the workforce. Especially, when nonfinancial measures are included in the compensation contract, managers more closely align their efforts along the dimensions emphasized by those measures, resulting in improvements in performance (Banker *et al.*, 2000). Compensation contract should not exclude a performance measure that provides incremental information about the dimensions of managerial action that the shareholders wish to encourage (Ittner *et al.*, 1997).

The performance measurement literature also assumes that the integration of nonfinancial measures in measurement systems allows managers to better understand the relations among various strategic objectives, to communicate the association between employees' actions and strategic goals, and to allocate resources and set priorities based on those objectives (Kaplan and Norton, 1996a). Nonfinancial measures could be easily consistent with long-term objectives, as long as they are addressing issues such as quality and cycle time which are already covered in company's strategy (Medori *et al.*, 1997). Also, Keigan *et al.* (1989) and Massella (1994) stated that as long as nonfinancial measures are more long-term oriented than the financial ones, such as costs and profits ratios, so they can aid to continual improvement in all firm's activity aspects.

Nonfinancial measures are less subject to manipulation since they are typically less dependent on managerial judgment than cost allocations and/or balance sheet valuations (Rees and Sutcliffe, 1994).

3.4 Nonfinancial Performance Measures Criticisms

Many authors have criticised nonfinancial measures for different reasons, for example, Kaplan (1983) and Massella (1994) argue that nonfinancial measures lack completeness. They stated that these measures are related to specific competitive dimensions such as customer satisfaction, which is difficult to aggregate into a single overall measure. A dilemma is being raised between focusing on a small number of nonfinancial measures,

which might cause loosing the global view of the firm, and focusing on a large set of indicators, which become more difficult to be handled and be understood by the employees.

Medori *et al.* (1995), Rangone (1996), Shaw and Ridgeway (1997) and Flapper *et al.* (1997) stated that the nonfinancial measures are too many and varied, which raises a problem of selecting the proper set of measures that suits the company. They stated that the problem of using nonfinancial measures is mainly associated with comparability across companies and time. Anecdotal evidence indicates that nonfinancial performance measures voluntarily disclosed by corporations vary across companies and over time (Eccles *et al.*, 2001; FASB, 2001; Upton, 2001; Hodder *et al.*, 2001). Such noncomparability reduces the likely value of nonfinancial performance measures and may lead investors to focus primarily on financial measures for assessing performance.

Whilst several studies (as shown earlier in section 3.3) showed significant relationships between nonfinancial measures such as customer measures and financial performance, Ittner and Larcker's (1998b) survey suggests that many firms do not experience a significant association between customer satisfaction and contemporaneous accounting and market returns.

Nonfinancial performance measure research studies, often, are descriptive in their approach and do not specify how nonfinancial measures should economically relate to financial performance and stock prices (AAA Financial Accounting Standards Committee, 2002). Nonfinancial performance measures studies have examined stock returns surrounding the release of nonfinancial information. Unfortunately, it is often difficult to identify the date such information first becomes available to the market. Additionally, companies often present financial information along with nonfinancial measures, making it difficult to isolate their separate effects (AAA Financial Accounting Standards Committee, 2002).

3.5 Factors that Affect the Use of Performance Measures

Some studies support the relevance of nonfinancial performance measures and that these measures predict future financial variables and that analysts and other market participants use nonfinancial measures to value stocks. Other contrary studies indicate that the market conditionally interprets nonfinancial information, taking into account some contingent factors such as firm-specific, industry, environmental, and regulatory factors (AAA Financial Accounting Standards Committee, 2002).

Contextual factors, environmental factors, and strategic plans vary across firms. Contingency theory suggests that the choice of appropriate techniques of managerial accounting depends on circumstances surrounding the firm (Gordon and Miller, 1976; Hayes, 1977; Otley, 1980). Therefore, the adoption and use of nonfinancial measures is an endogenous choice, and the expected benefit depends on the match or fit between these nonfinancial measures, as a management practice, and the firm's organisational environment and the surrounding contextual factors. Since the performance consequences of nonfinancial measures may be contingent on exogenous variables, the ability to draw inferences about the performance consequences of using those measures might be affected by specification errors. In general, it has been stated that there are no common efficacious nonfinancial measures for all firms (Said *et al.*, 2003).

Specific industry and/or competitive pressures may impact the choice of the performance measurement metrics. For instance, Ely (1991) finds that managers' accounting choices vary by the type of industry concluding that those choices reflect a potential impact of industry specifics on accounting choices. Ittner *et al.* (1997) argued that nonfinancial measures are extensively used in regulated industries, such as the utility industry, in which a great link between regulation level and the achievement of nonfinancial goals is realized. Moreover, government intervention in regulated industries may lead firms in these industries to place greater emphasis on nonfinancial measures. Ittner *et al.* (1997) and Bushman *et al.* (1996) provide evidence that regulatory and competitive pressures lead many utility and telecommunications firms to employ nonfinancial measures in their performance measurement techniques.

Said *et al.*'s (2003) study found some evidence of the impact of nonfinancial measures on future accounting-based performance. Their results also indicate that nonfinancial measure use is significantly associated with: (1) an innovation-oriented strategy; (2) a quality-oriented strategy; (3) the length of the product development cycle; (4) industry regulation; and (5) the level of financial distress. Finally, the association between nonfinancial measures and firm performance is contingent on whether the use of nonfinancial measures matches the firm's characteristics and the environmental factors.

The optimal choice of performance measures is a function of a variety of factors such as strategic plans and compensation systems (Ittner and Larcker, 1998b). Many researchers suggest that variables such as strategy, product life and technology, financial distress, as well as noise in financial measures affect performance consequences (Bushman *et al.*, 1996; Ittner *et al.*, 1997).

Anthony and Govindarajan (2000) stated that in order to design and implement an effective performance measurement technique successfully, there are some variables that must be taken into consideration. They determine s*trategy* as one of the important variables that have to be defined well. All goals must be explicit and targets developed and communicated throughout the organisation to ensure that all levels are aligned with this strategy. The next step, they suggest, is to develop the key performance measures to support the articulated strategy. These measures, which support the organisation's strategy, must be integrated with the organisation's formal and informal structures, culture, and human resource practices. Last but not least, these measures must be reviewed consistently and continually by top management to have feedback about how successful the strategy is.

Andrews (1996) points out that there are two critical factors that influence any type of measure used in any company. The first factor is *corporate strategy*; he argues that companies that pursued strategies founded on innovation and new product development[8] tended to favour nonfinancial measures. He added that the competitive strategies of

[8] Strategies which are fundamentally long-term in scope.

biotechnology companies, for example, are frequently based on the need to be first to market with new products developed through basic research. Because products take several years to get to market, accounting and stock market measures of performance do not reflect the current efforts of executives. He stated that, as a result, these biotechnology companies tend to evaluate managers' performance using nonfinancial measures, such as the number of patent applications and the completion of clinical trials.

However, other companies opt for financial metrics, for example, retailers who compete in environments characterized by short product-repurchase cycles and tight profit margins. Because efforts to improve profits through cost reductions are quickly reflected in accounting and stock market measures, managers' bonuses in the industry are based almost exclusively on such short-term financial measures (Andrews, 1996; Ittner *et al.*, 1997). Bushman *et al.* (1996) and Ittner *et al.* (1997) argued that the usefulness of nonfinancial performance measures is not universal, depending instead on firm-specific characteristics. Thus, for some industries and firms, models predicting future financial performance may not include nonfinancial performance measures. In the same vein, Banker *et al.* (2000) found an insignificant relationship between nonfinancial measures, such as customer satisfaction, and profitability. Managers did not understand either the timing or magnitude of this relation. Ittner and Larcker (1998b) found, in their study, that less than 55% of executives could relate their quality measures directly to operational, productivity, or revenue improvements.

The second factor that Andrews (1996) mentioned is the *corporate governance structure*. This factor also influences whether a company prefers financial or nonfinancial measures. He argues that those companies whose shares are owned mainly by external board members and institutional investors tended to favour nonfinancial measures less than counterparts whose equity is spread diffusely among many shareholders.

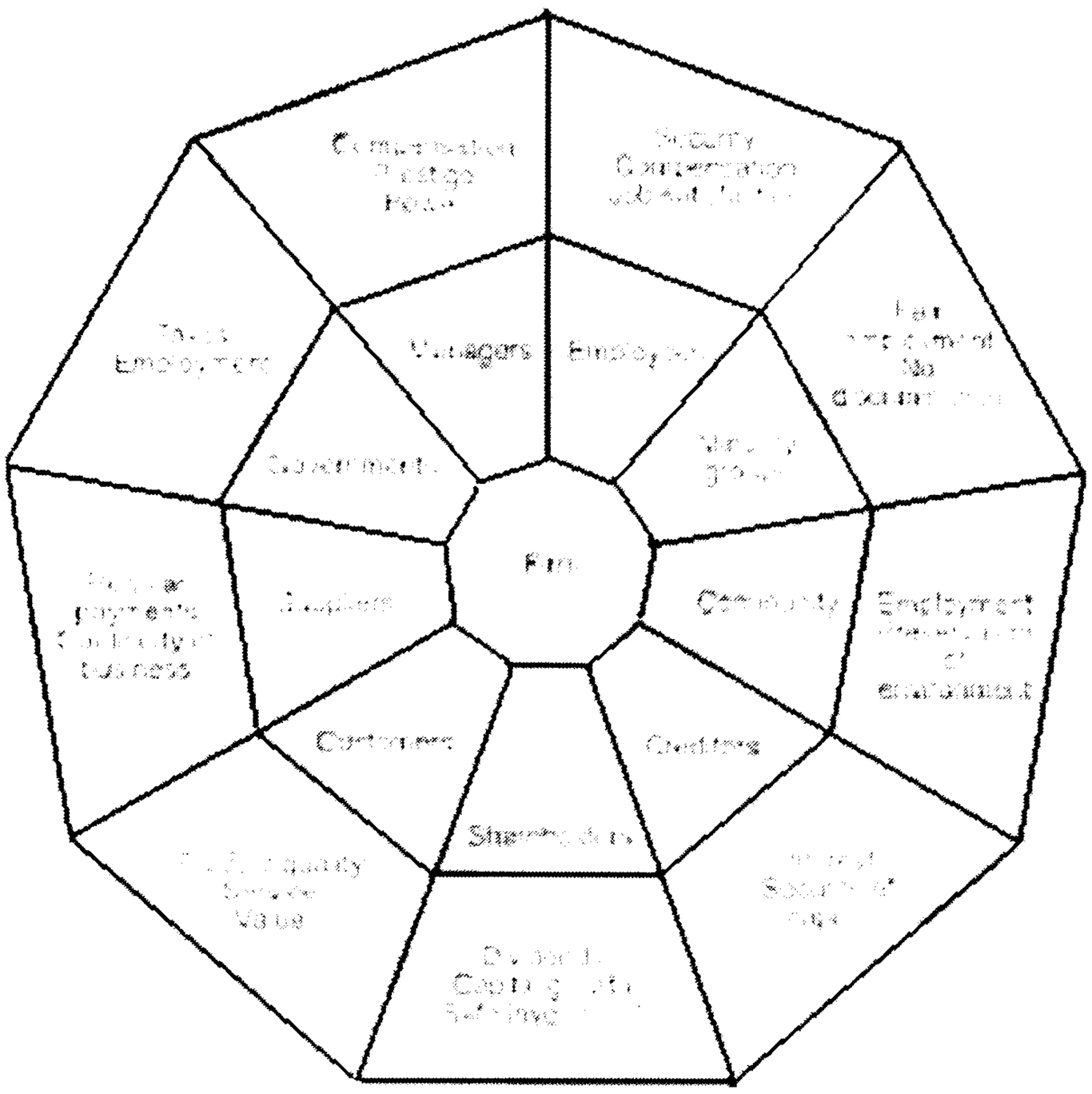
In summary, prior research suggests that organisations that align their performance measures appropriately with contingency factors achieve higher performance (Govindarajan, 1988; Simons, 1987). Evidence was found that the relationship between

the use of nonfinancial performance measures and related strategic plans, contextual factors, and the organisational environment depends on the fit status between them. Govindarajan and Gupta (1985) find that the benefits derived from nonfinancial performance criteria are contingent on the business unit's strategy. Said *et al.* (2003) concluded that firms that adopt nonfinancial measures and fail to improve performance may simply fail to match their characteristics and the use of nonfinancial performance measures. Conversely, firms that adopt nonfinancial measures and achieve higher performance are believed to have achieved the proper fit between their characteristics and the use of nonfinancial measures.

3.6 The Balanced Scorecard: An Example of a PM System

Many authors attempted to provide techniques that overcome the limitations of financial indicators and to complement financial and nonfinancial measures together. For example, Lebas (1994) and Epstein and Manzoni (1997) articulate the *dashboard*, also sometimes called instrument panel or, in French terms, Tableau de Bord. Lynch and Cross (1991) articulate the *Performance Pyramid*. Fitzgerald *et al.* (1991) and Moon and Fitzgerald (1996) discuss the *Performance Measurement System for Service Industries*. Kaplan and Norton (1992; 1996a; 1996b; 1996c; 1996d; 2001a; 2001b) introduce and develop the *Balanced Scorecard*. These are examples of the contemporary performance measurement techniques that suggest a balanced use of financial and nonfinancial performance measures. They attempted to focus managers' attention on the strategy's critical success factors and communicate them throughout the whole organisation. Undoubtedly, the Balanced Scorecard, which focuses on different dimensions of performance, is one of the most popular techniques. Otley (2001) affirms that the balanced scorecard is a stakeholder approach, where at least two stakeholder groups are explicitly mentioned (providers of finance and customers) and one is implicitly lurking in either the business process area or the innovation and learning area, namely employees, see figure (3.1).

Figure (3.1) Different Stakeholders and their Expectations



Source: Doyle (1994)

The past two decades have witnessed considerable change in management control and performance measurement techniques. From its traditional emphasis on financially oriented decision analysis and budgetary control to more strategic approach that emphasizes the identification, measurement, and management of the key financial and nonfinancial (operational) drivers of shareholder value such as the balanced scorecard (International Federation of Accountants, 1998; Institute of Management Accountants, 1999). Scholars and practitioners alike have argued that relying solely on accounting metrics to evaluate performance may not be adequate. Kaplan & Norton (1996a) argued that BSC, which was first introduced in 1992, attempts to give a holistic view of the organisation by simultaneously looking at the four important perspectives mentioned above (see figure 3.2). Kaplan & Norton (1992; 1996a) attempted to contribute to overcoming some of the limitations of traditional performance measurement systems by

seeking to link them to strategy through the introduction of the balanced scorecard (BSC). The balanced scorecard has a stakeholder theme and deploys both financial and nonfinancial measures together to incorporate them with the strategy. Kaplan & Norton (1992; 1996a) claimed that the balanced scorecard is a comprehensive performance summary that complements financial measures with operational measures, which are the drivers of future financial performance. They highlighted the word 'balanced' that calls attention to the fact that the system must combine financial and nonfinancial measures, which according to their perspective, can be grouped into four main measures: financial, customer, internal business process and innovation and learning measures. Kaplan & Norton (1992; 1993; 1996a) stated that they developed the balanced scorecard (BSC) to start with an organisation's mission, and progressively translate the strategy into more concrete sets of actions and measures, thus, the BSC achieved recognition as a strategic management system because it involves the entire organisation and facilitates the development of shared understandings.

Barsky and Bremser (1999) stated that in recent years firms have shifted away from one-dimensional financial models to integrated frameworks to measure performance. They point out that the implementation of the balanced scorecard raises a fundamental question with respect to budgeting. This question is how to use the budget to emphasize core beliefs and critical interactive controls, if the management seeks to better align employee actions with strategic goals. Thus, the focus of the budget shifts from governance towards an aligned focus for creating value. In terms of the budgeting process, this means moving beyond the financial targets to consideration of an integrated set of critical performance criteria. Therefore, they highlighted that it is important to develop benchmarks and nonfinancial performance measures that the firm can use to evaluate itself as the environment changes. De Waal (2002) simplified the developments in performance management systems area by stating that any organisation can update the traditional financial system they used by adding the required critical success factors and key performance indicators, which are included in management reporting to monitor strategic goals like quality, delivery time, client satisfaction, competitor ranking, and employee retention. He stated that strategy and critical success factors (CSFs) of an organisation

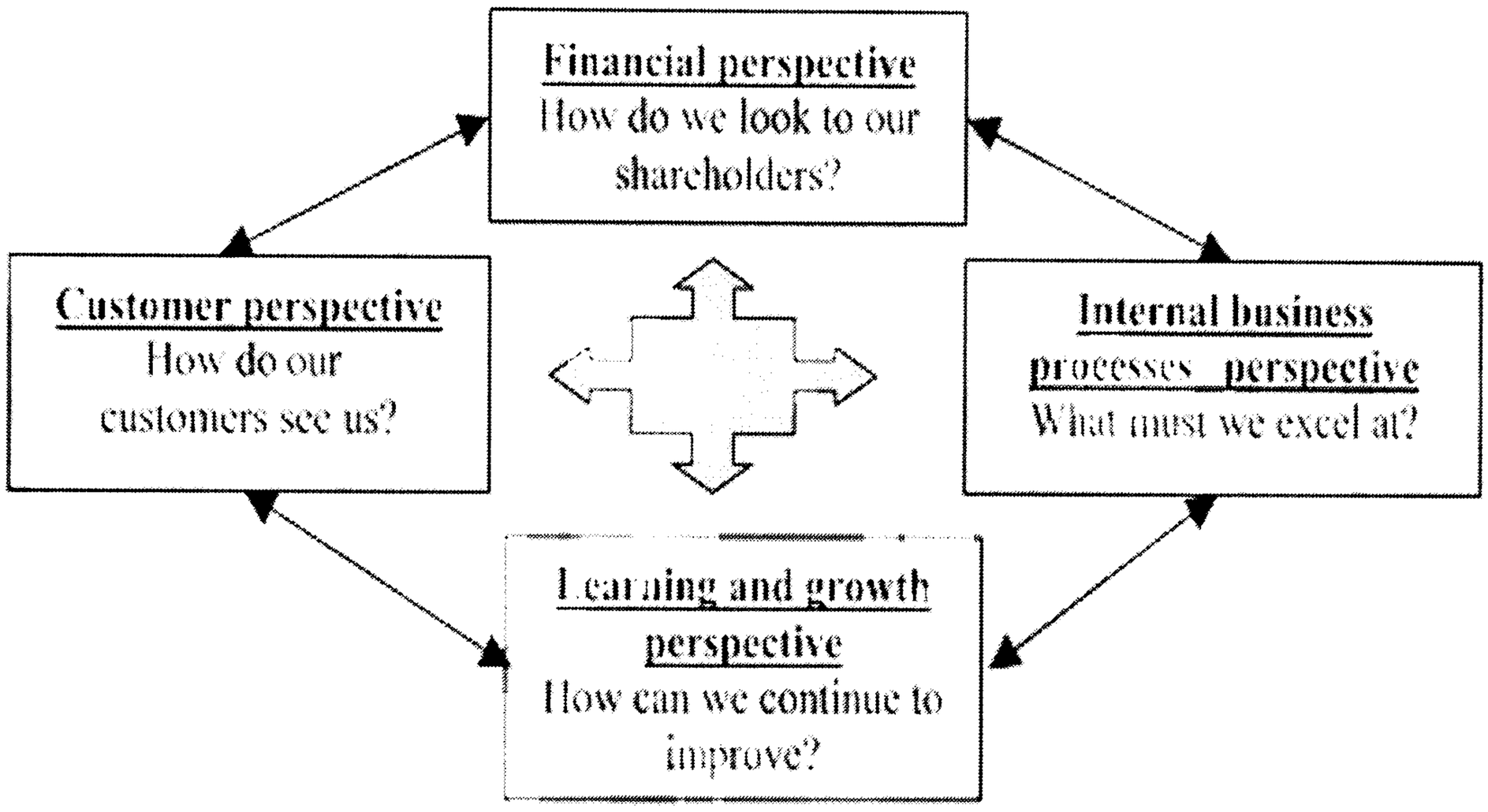
should take a central place and then the choice of key performance indicators (KPIs). As a result, it is claimed that organisations go from absolute to relative KPIs and from separate indicators to a coherent set of indicators, as the need arise.

Atkinson *et al.* (1997) proposed that Kaplan and Norton's balanced scorecard appeared to be a threat to the old style of budgeting and controlling. The idea is that companies should plan and monitor not just bottom-line profit or earnings per share (EPS) figures, but the overall progress of the company in a balanced way. They stated that in the balanced scorecard the company not only measures financial performance, but also customer satisfaction, innovation and learning, and the rest of key performance indicators (KPIs) such as cycle time, yield etc. Thus, the company as a whole can get a favourable score when doing well on both short-term performance and indicators of future success. Atkinson *et al.* (1997) argue that the BSC may be regarded as one of the most significant developments in management accounting. Venkatraman and Gering (2000) stated that the balanced scorecard is a management tool designed to deploy and monitor a strategy by using the appropriate mix of financial and nonfinancial measures. It provides a framework for the strategic dialogue itself. The resulted performance measurement system is typically a blend of lead and lag indicators with the potential to provide an advanced warning of looming issues long before a traditional, financially based management system.

Hoque and James (2000) agreed that 'using a BSC does not mean 'using more measures', rather it means putting a handful of strategically critical measures together in a single report, in a way that makes cause-and-effect relations transparent and keeps managers from sub optimizing by improving one measure at the expense of the others' (p. 3). Atkinson *et al.* (1997) stated that the importance of the balanced scorecard is that it ties strategy, process and managers together and, in so doing, provides an integrated system of planning and control. They argue that in the balanced scorecard view, the organisation's strategies and the organisational structure, which is implemented to pursue those strategies, define the nature and structure of the organisation information system. Therefore, they concluded that the balanced scorecard has the potential to provide

planners with a way of expressing and testing a sophisticated model of cause-and-effect in the organisation, which is a model that provides managers with a basis to manage results.

Figure (3.2) The Balanced Scorecard



Source: Kaplan & Norton (1996a)

Salterio and Webb (2003) stated that a number of benefits should be realised by any company that successfully implement the BSC. For example, having a better management understanding of the linkages between specific organisational decisions and actions, and the chosen strategic goals; redefining the relationships with customers; re-engineering of fundamental business processes; and the emergence of a new corporate culture emphasizing team effort among organisational functions to implement the firm's strategy. Therefore, many behavioural theorists certainly see merit in the balanced scorecard as a technique in which subsidiary objectives can be set down to operational level, helping employees understand how their contribution fits in with overall corporate strategy and success.

Binnersley (1996) stated that Kaplan and Norton's balanced scorecard is one of the most often quoted models, comprising a set of measures intended to provide top management with a fast but comprehensive view of the business. Whilst individual businesses must tailor the scorecard to fit their unique corporate cultures, strategic time horizons and business processes, it is nonetheless possible to define the balanced scorecard in generic terms.

It is worth noting here that the BSC, as a management control practice, is affected by different contingent factors, whether endogenous or exogenous factors. Ittner and Larcker (1998b) stated that the use and effectiveness of the BSC measures appear to be affected by organisational strategies and the structural and environmental factors confronting the organisation. In Hendricks *et al.*'s (2004) research on Canadian firms, they attempted to address some of the contingency variables associated with BSC adoption. They provide evidence about which factors motivate firms to adopt the BSC, and also provide a better profile of the type of organisation most likely to adopt a BSC. They found that BSC adoption was significantly associated with business strategy. Firms that followed an innovative strategy that looks for market opportunities were more likely to adopt the BSC than other firms. In addition, these firms were found to be significantly larger than non BSC adopters. Finally, they found evidence that when the environmental uncertainty is high, the adoption of the BSC increases, which might be due to incorporating the nonfinancial and future oriented information in the BSC.

Hoque and James (2000) found that there is a positive relationship between some contingent variables such as size and BSC usage. Hendricks *et al.* (2004) explain this by stating that as firms grow, problems in communication and control increase, so these organisations are more likely to adopt complex administration systems to face such problems. As a result, large sized organisations will likely depend on more sophisticated information and control systems that use diverse measures. In the same time, these systems are costly which will not be feasible for the small sized firms to adopt. The BSC represents an integrative management tool that is useful for coordinating cross-function and cross-level decisions and activities. Thus, the bigger the company, the more practical

the use of the BSC to support their strategic decision making. Joshi (2001), to some extent, supported this contention. He found that large sized companies tend to use newly developed management accounting techniques to a greater extent than medium sized companies. In Malaysia as one of the developing nations, Sulaiman *et al.* (2002) found very little usage of the BSC in the 61 companies that they surveyed. Only 13 per cent of the companies surveyed actually used a form of the BSC. Finally, Chenhall (2003) and Hendricks *et al.* (2004) amongst other researchers examined contingency factors such as business-level strategy, firm size, and environmental uncertainty. Most of these factors have been highlighted in the academic literature as being general considerations underlying decisions to adopt a management control system. The evidence revealed is that these contingency factors are of criticality to the choice of performance measures and to the adoption decision.

The balanced scorecard is not without drawbacks. For example, Atkinson *et al.* (1997) argued that the term 'scorecard' is misleading because the balanced scorecard is not a scorecard in the conventional accounting sense. Rather, it is a sophisticated information structure and management approach that links effects (which are the organisational objectives such as profit levels) with causes, such as customer or employee satisfaction. Kennerley and Neely (2000) note that there are a number of shortcomings of the balanced scorecard such as the absence of a competitiveness dimension; failure to recognise the importance of aspects such as human resources, supplier performance; and no specification of the dimensions of performance that determine success.

Venkatraman and Gering (2000) argued that the balanced scorecard has not been an unmitigated success. Despite its popularity, there have been as many unsuccessful implementations as successful ones. These include cases where a particular measure was accepted but never implemented or simply never caught on. They explained that in such cases, the implementation stalls as managers debate and argue about seemingly straightforward measures such as productivity, utilization and customer service indicators.

According to Kaplan & Norton (1996a), the main limitation of the balanced scorecard is because it is essentially a conceptual model, and can hardly be considered a measurement model since it does not identify clearly which are the variables, how they can be measured and how they relate to each other. They stated that the causality links suggested among the four perspectives are particularly problematic and ambiguous. It can be argued that there is an underlying reasoning: innovation and learning create the competencies and capabilities to improve internal business processes, which, in their turn, contribute to customer satisfaction, ultimately leading to financial success. However, they highlighted that the interactions between criteria are not clearly shown. Furthermore, it focuses primarily on top-down performance measurement and does not mention explicitly competition or technological development, making the model static to a certain extent. In the same vein, Venkatraman and Gering (2000) stated that many balanced scorecards are a confusing contradiction of measures; there are too many measures and they are not consistent. Managers do not know which measure is the most important one, or even the meanings of the measures, and inconsistent measures produce unpredictable behaviour.

Venkatraman and Gering (2000) added that one of the most common criticisms of the balanced scorecard is becoming a balanced brainstorm that features diverse inputs and modifications. Although, the organisation's input should be respected, organisation's overall measurement needs must be balanced with the needs of a specific department. They, also, point out that the performance measure must be aligned with the reward. The balanced scorecard lacks this alignment because to change strategy through performance measures requires a fundamental shift in behaviour, in which the appropriate behaviour should be rewarded.

3.7 Comparison among Different Performance Measurement Techniques

Kagioglou *et al.* (2001) stated that throughout the last two decades a number of manufacturing industries has introduced new methods and techniques for measuring the performance of a business unit to replace the traditional paradigms in order to improve performance. This has led to the creation of new philosophies such as the economic value

added (EVA)[9] (Stern Stewart & Co., 2004), the balanced scorecard (BSC)[10] (Kaplan and Norton, 1992; 1996a) and the total quality management (TQM)[11] (Oakland, 1989; Dale, 1994) amongst many others. According to Kagioglou *et al.* (2001), the main driver behind those philosophies is the optimization of an organisation's performance both internally and externally within its respective marketplace. Inevitably, this has led to the 'rethinking' of performance management systems through effective performance measurement. Otley (2001) stated that this might represent a change in emphasis in the use and application of management accounting information, rather than in very many specific new techniques. He points out that management accounting was to develop its traditional strengths with complementary emphases such as moving from historic to forward-looking perspective; from control function to strategic planning; from the financial internal focus of shareholders to external orientation towards customers, competitors and others; from cost management to value added perspective and from production and economies of scale to marketing and customer needs.

It should be highlighted that managers must determine which measure or combination of measures to employ, taking into their consideration the contingent factors that determine what technique(s) to be implemented such as organisational strategy, objectives, environment, technology, organisational size and reward systems amongst others, as mentioned earlier. Cates (1998) and Jalbert and Landry (2003) stated that these techniques differ, conceptually, insofar as the economic value added (EVA) focuses exclusively on financial measures while the balanced scorecard (BSC) considers financial measures as just one of several important perspectives. Total quality management (TQM)

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[9] EVA refers to the economic value Added. EVA was developed by Stern Stewart & Co. and has become a well articulated measure of firm performance since the early 1990s. EVA is measured as a company's net operating profit less the cost of capital employed to produce the earnings (in other words, an appropriate charge for the opportunity cost of all capital invested in an enterprise). EVA also is a performance measure that linked to the creation of shareholder wealth over time (For more details, see Stern Stewart & Co.'s website: http://www.sternstewart.com/evaabout/whatis.php).

[10] BSC is the balance scorecard shown earlier.

[11] TQM refers to total quality management. Oakland (1989); Dale (1994) and Huxtable (1995) define TQM as a management philosophy approach to improve competitiveness, efficiency and flexibility for a whole organisation through quality revolution. It supports the organisations in their efforts to obtain satisfied customers, whether external and internal customer.

needs organisations to invest considerable resources during implementation in order to adopt business improvement philosophies (Symons and Jacobs, 1995).

Cates (1998) and Jalbert and Landry (2003) argue that the EVA focuses on the interface between the shareholder and the firm and examines decisions with respect to how they affect shareholder wealth. Thus, managers compensated based on the EVA might be motivated to alienate customers in order to maximize the profits of current projects without the customer satisfaction perspective. However, the BSC emphasizes behavior at the customer interface level. By incorporating measures such as the value of a satisfied customer and innovation and learning perspectives into the performance measurement system, the balanced scorecard is more forward looking than the EVA. The innovation and learning perspective of the balanced scorecard influences the firm to make investments in people and systems that will allow it to continue to produce quality projects. The customer satisfaction perspective ensures that the firm places some focus on achieving a satisfied customer base that will participate in future projects.

Jalbert and Landry (2003) stated that the balanced scorecards should be considered when a *functional* focus is desired not when a *project* focus is desired. They proposed that firms should consider EVA when the desired focus is the interrelationship between managers and shareholders. Firms should consider balanced scorecards when the desired focus is to evaluate the interrelationships across all the perspectives of the balanced scorecard, namely, financial, customer, internal process, and innovation and learning, in creating firm value. They argue that, recently, some researchers recommend using combinations of the contemporary systems in the same firm, for example the BSC along with TQM or/and EVA, however, they cautiously stated that the benefit of multiple systems must be carefully balanced with the added cost, increased complexity, potential conflict and suboptimization of implementing multiple measures. Nonetheless, they suggested that a mix or combination of two or more measures could be used. For example, both BSC and EVA can be combined to create a measure of performance. Balanced scorecard includes measures of financial performance, so a firm might use EVA as one measure of financial performance. However, difficulties can arise when the matrix of performance measures

used because of the potential conflicts and contradictions. While it is not impossible to devise a combination of measures, great care must be taken in optimizing the mix.

Margavio *et al.* (1995) point out that total quality management (TQM) programs started, during the 1980's, in an effort to improve the global market and financial performance of corporations. TQM involves a new mindset for management, whereby the customer becomes the main focus of the business, quality becomes the responsibility of everyone in the organisation, and continuous improvement becomes the normal operating procedure. Chenhall (1997) and McAdam and Bannister (2001) stated that the literature indicates that TQM should be incorporated with a hard (consists of financial measures) and soft (consists of nonfinancial measures) measuring framework. TQM implementation approaches must have an appropriate measuring framework to measure the effect on the manufacturing processes and hence profitability (Symons and Jacobs, 1995). Hackman and Oldham (1976) and Goodman *et al.* (1998) argued that companies with TQM processes in place achieve profits, which derived from customers' satisfaction. They explained that while this emphasis on profit is due to the demanding shareholders, it does put an emphasis on hard benefits such as increase the quality of the products or services. McAdam and Bannister (2001) argue that emphasis in the softer measures such as attitudes and team working would lead to improved overall performance in general, and the financial performance in particular. Therefore, they concluded that quality, as one of the leading measures, focuses on understanding how processes could be better managed in order to deliver consistently higher quality goods and services to the end customer, which would be for the long-term health of the businesses.

If TQM is to be utilised with the BSC, an understanding is needed between the performance measures in a tool like the balanced scorecard and the less tangible attributes that affect quality such as control of internal processes, employees' training, and innovation and learning process. Because under TQM, customers are identified and their requirements understood, therefore, everything is entirely clear as to what the company is supposed to do or whom they are supposed to satisfy, which is not the case

with the BSC with multiple stakeholders (Kaplan and Norton, 1992; McAdam and Bannister, 2001).

Table (3.3) contains a simple comparison between two performance measurement techniques addressed in this study: budgetary control as opposed to one of the contemporary techniques, namely the Balanced Scorecard (BSC). In summary, although, the contemporary techniques have been explicitly devised to allow a more structured approach to performance management and to avoid some of the problems associated with the more traditional control techniques, such as budgeting (Otley, 1999), there are so many advantages of using these newly management control techniques. However, as De Waal (2002) stated that not every organisation has yet implemented these techniques. This could be because the implementation and use of these types of measures are not easy and require special knowledge and training, which probably not available for all organisations. However, for any organisation, it could use one measure or a combination of measures. Any number of combinations can be employed, but the crucial question, will employing a combination of measures be of the best interest of the organisation? Because utilizing multiple measures increases the complexity and costs associated with the performance measurement system. Therefore, management also can create combination measures but should take great care to ensure that the benefit of such a system outweighs the added cost and complexity of multiple measurement systems. Moreover, internal managerial conflicts can occur when multiple measures are implemented in the same company (Cates, 1998). Thus, companies considering multiple measures should ensure that the marginal benefits of having multiple measurements exceed the costs of establishing and operating the measurement system. Finally, managers should take care to ensure the system selected fits the unique requirements of the firm. Specifically, the performance focus desired should dictate the selection (Jalbert and Landry, 2003).

Table (3.3) A Comparison between Budget and Balanced Scorecard

	Strengths	**Weaknesses**
Budget	1. Best estimates for financial planning. 2. Financial objectives are well addressed. 3. Capable of integrating the whole gamut of organisational activity into a single coherent summary	1. Short-term feedback of budget variances. 2. Many rewards now being made contingent upon budget achievement, which is the main reason for budgetary slack. 3. Means/end relationships not formally considered due to the focus on financial results only. 4. Frequent budget revisions are proved to be time consuming and can lead to control loss. 5. The hierarchical nature of budgetary control is in stark contrast to the focus on value chains and business processes.

	Strengths	Weaknesses
Balanced Scorecard	1. Leading indicators that address the critical success factors (financial, customer, business process, and longer-term sustainability). 2. Multiple objectives based on strategy. 3. A dynamic tool that facilitate the change of its contents over time as strategies develop and key success factors change.	1. Strategies are implicit in selecting some performance measures and no formal procedures suggested. 2. Rewards are not addressed. 3. Reporting of performance assumed but no explicit guidance given. 4. A little detail is given to how to select specific performance measures, which should be placed in the scorecards' boxes. Setting performance targets is ambiguous, therefore, it does not specify how trade-offs are to be made between different measures used.

Adapted from Otley (1999) and Jalbert and Landry (2003)

Chapter Four

Contingency Theory

4.1 Introduction

This chapter reviews the literature related to contingency theory, explores its suitability for explaining the phenomena and variables related to performance measurement techniques. This chapter is organised as follows:

- The first section, after this introductory section, identifies the evolution of contingency theory in relation to the rest of theoretical perspectives in the area of behavioral sciences;
- The second section reviews the literature of contingency theory;
- The third and fourth sections show the strengths and criticisms of the contingency perspective, respectively;
- The fifth section reviews a number of influential pioneering contingency theory studies; and
- The sixth section of the chapter discusses the contingent variables of the research.
- Finally, the seventh section is a summary of the chapter.

4.2 Contingency Theory Evolution

Organisation theories flourished very early in the last century with bureaucratic approach emphasized by Taylor, Weber and Fayol. They have had some specific characteristics such as classical, theory X, authoritative and mechanistic in nature. Followed by the human relations approach of the 30s, 40s and 50s, which has the characteristics of being social, theory Y, democratic and humanistic in nature. In the 60s, the innovation approach emerged because of the shift in production techniques and the information revolution era. It was modern, enhancing group work and shared decision making and organic in nature (Taylor, 1911; 1947; Roethliesberger and Dickson, 1939; Weber, 1947; McGregor, 1960; Etzioni, 1961; Burns and Stalker, 1961; Woodward, 1965; Thompson, 1967; Lawrence and Lorsch, 1967; Kast and Rosenzweig, 1970; Joynt, 1977).

Miller and O'Leary (1989) state that Frederick W. Taylor's early seminal work about scientific management ushered in the monitoring of the individual worker, but ultimately contributed to the monitoring of work units within organisations as well. This was followed by human relations approach introduced by Mayo (1933) and Barnard (1938). Miller and O'Leary (1989) added that the fundamental insight of this human relations approach was provided by March and Simon (1958). They contribute to organisational analysis and organisational decision making by stating that some social and psychological attitudes were significant factors to be considered in the design of production processes and its related control systems. The human relations approach, in turn, extended the early scientific management work, which was concerned with the rationalization of work in order to maximize efficiency and productivity and, hence, profits.

Otley (1980, p. 416) stated, 'during the 1960s organisation theory underwent a major upheaval, which led to the construction of a thorough-going contingency theory'. He also argued that 'this initially stemmed from the pioneering work of Burns and Stalker (1961) and was reinforced by the work of Woodward (1965)'. Moreover, the contingency perspective began to be shaped by the work of corporate strategists such as Chandler (1962), which emphasised the relationship between the strategy an organisation selected

in order to achieve its goals and the organisational structure that was most appropriate for it to adopt. In general, Otley (1980) argues that contingency theory developed during the 1960s through various 'structural' approaches to organisational studies. Covaleski and Dirsmith (1996) stated that these studies suggested that organisations' structures are contingent upon contextual factors. These contextual factors including technology (Woodward, 1965), dimensions of task environment (Burns and Stalker, 1961), and organisational size (Pugh *et al.*, 1969a; 1969b; Blau, 1970). These contextual factors were hypothesized to influence dimensions of structure including the degree of formalization, specialization, differentiation and bureaucratization. Discussions about management control and performance measurement were sometimes elicited to explain some of the observed relationships among structural properties, but were not of a central importance (see for example, Woodward, 1965; Aiken and Hage, 1966; Hickson, 1966; Hage and Aiken, 1967; Pugh *et al.*, 1968; Blau, 1970, 1973; Child, 1972).

Miller and O'Leary (1989) stated that Barnard (1938) suggests that the human relations perspective brought forth and pervades through contingency theory, which was the depiction of corporations existing in a tentative equilibrium which is inherently fragile, short lived and ever subject to personal, social, physical and biological destructive forces. Miller and O'Leary (1989) argued that it was axiomatic for the human relations perspective that all organisations are founded on self-interest and a contractual principle; this is the core reason that they are so fragile. They stated that, according to the human relations perspective, an organisation exists in so far as individuals find it beneficial to assent to its authority. This characterization of organisations founded on self-interest and contractual principles becomes a major thrust of the organisational decision making perspective. Because the contractual foundation of cooperative organisation will not function alone nor will preoccupations with efficiency of integrative group unity suffice to bring about cooperation. In turn, Miller and O'Leary (1989) stated that contingency theory blended the insights on human behavior and individual decision making with the sociological functionalist concerns regarding the impact of such structural factors as environment, size, technology, etc., on organisational behavior. Important in this lineage of work were issues of organisational control and coordination, which are germane to

managerial accounting research (Barnard, 1938; Simon, 1957; March and Simon, 1958; Cyert and March, 1963; March and Olsen, 1976; Schreyögg, 1980).

By the early 1970s, contingency theory was firmly established as the dominant approach in organisation theory (Child, 1977). Contingency theory was perhaps influenced by the stream of work that emanated from the Aston School, which is summarised in the series edited by Pugh and others (Pugh and Hickson, 1976; Pugh and Hinings, 1976; Pugh and Payne, 1977). However, it subsequently became subject to increasing criticism (e.g. Wood, 1979), which is discussed in-depth in section (4.5). Otley (1980) argued that in the late 1960s and early 1970s accounting academics realised that the organisational context of an accounting system was of fundamental importance to its effectiveness. He stated that, previously, accounting systems had been designed on the implicit assumption that the classical theory of organisations was an adequate representation of the circumstances in which they were used. Although behavioural research had been progressing prior to 1960, it had focussed upon the impact of accounting information on individuals rather than the organisation as a whole. Otley (1980) points out that the field of accounting was tentatively developing contingency ideas and realising the importance of organisation structure.

In the same vein, Miller (1981) and Clegg and Hardy (1999) argued that contingency theory began as a synthesis between the universalistic but opposed ideas of the classical management and the human relations schools. They stated that, in its development, it helped establish, and strongly pushed, the open systems approach[12] of management. Contingency theory is aligned with the main themes of open systems approach, which depends on the importance of the organisation-environment relationship (Thompson, 1973; Otley, 1984; Otley *et al.*, 1995).

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[12] Scott (1981; 1998) explained organisational theory development using the opened and closed approaches. The open systems approach means that the organisation is highly interdependent with its environment, and that boundaries are both permeable and variable. In the contrary, the closed systems approach means that the organisations could be understood apart from their environments and that the most important processes and events are internal. The closed systems approach was based on the idea that the environment is primarily an enemy or a source of pressures and problems for the organisation (Selznick, 1949).

Thus, as mentioned by Dent (2001) (in Sorge and Warner, 2001), contingency theory appears to be based on an idea that all organisation management forms have latent strengths and weaknesses, and that a specific operating context (contingent factors) will draw out forth-specific strengths and weaknesses. Donaldson (1996) and Alum (1997) point out that the research and theorising on contingency factors has stretched over forty years. It forms a collection of theories and research, with researchers emphasising their own contingent factors and aspects of structure, albeit around a common theme. In essence, as they argue, contingency theory sees organisational effectiveness as dependant on the correctness of fit between the context in which the organisation works and the management form adopted. They concluded that the form of organisation that will be most efficient is contingent upon conditions relevant to the situation. Contingency theory offers specific advice as to which management form to adopt in relation to a range of contextual variables.

4.3 Contingency Theory Literature

Luthans (1973), Child (1974), Luthans and Stewart (1977) and Miller (1981) stated that the contingency approach is situated between two extremes, the universal approach and the situation-specific approach. They point out that, in contingency theory, the appropriateness of different control systems depends on the setting of the business. However, in contrast to the situation-specific model, control system generalisations can be made for major classes of business settings. They argued that creating an approach that avoids the negative aspects of both traditional approaches was not easy. Luthans and Stewart (1977) proposed that there is a need for a situational perspective to solve this problem, and that this situational approach argues that the most effective management concept or technique depends on the set of circumstances at a particular point in time. They also proposed that a contingency approach seems best able to accomplish this goal. The contingency approach is generically situational in orientation, but much more exacting and rigorous than both traditional approaches. Thus, according to Ittner and Larcker (2001), this theory contends that there is no universally applicable system of management accounting and control. The choice of appropriate accounting and control

techniques depends upon the circumstances surrounding an organisation and the factors that affect the use of these techniques.

Galbraith (1973) and Luthans and Stewart (1977) stated that contingency theory presents the argument that the optimum organisation structure depends on a number of contingent factors and functional relationships, rather than accepting a deterministic logic, all organisations should be centralized, or an every-case-is-different approach. These relationships are between the environmental, management and performance factors such as the complexity of the environment, the strategic positioning of the firm, or the technology used. Contingency theorists argue that there is a middle ground between these two extremes, in which it is possible to analyze the variation in organisation structures in a systematic way. Among the principal contingency variables identified are environmental complexity (Burns and Stalker, 1961; Lawrence and Lorsch, 1967), organisation strategy (Chandler, 1962; Child, 1972), technology (Woodward, 1965; Thompson, 1967), and organisation size (Hickson *et al.*, 1969). For example, Jaffee (2001) argued that resource dependency challenges the environmental determinism in contingency theory and emphasises the proactive strategies that managers can pursue to deal with internal and external contextual constraints.

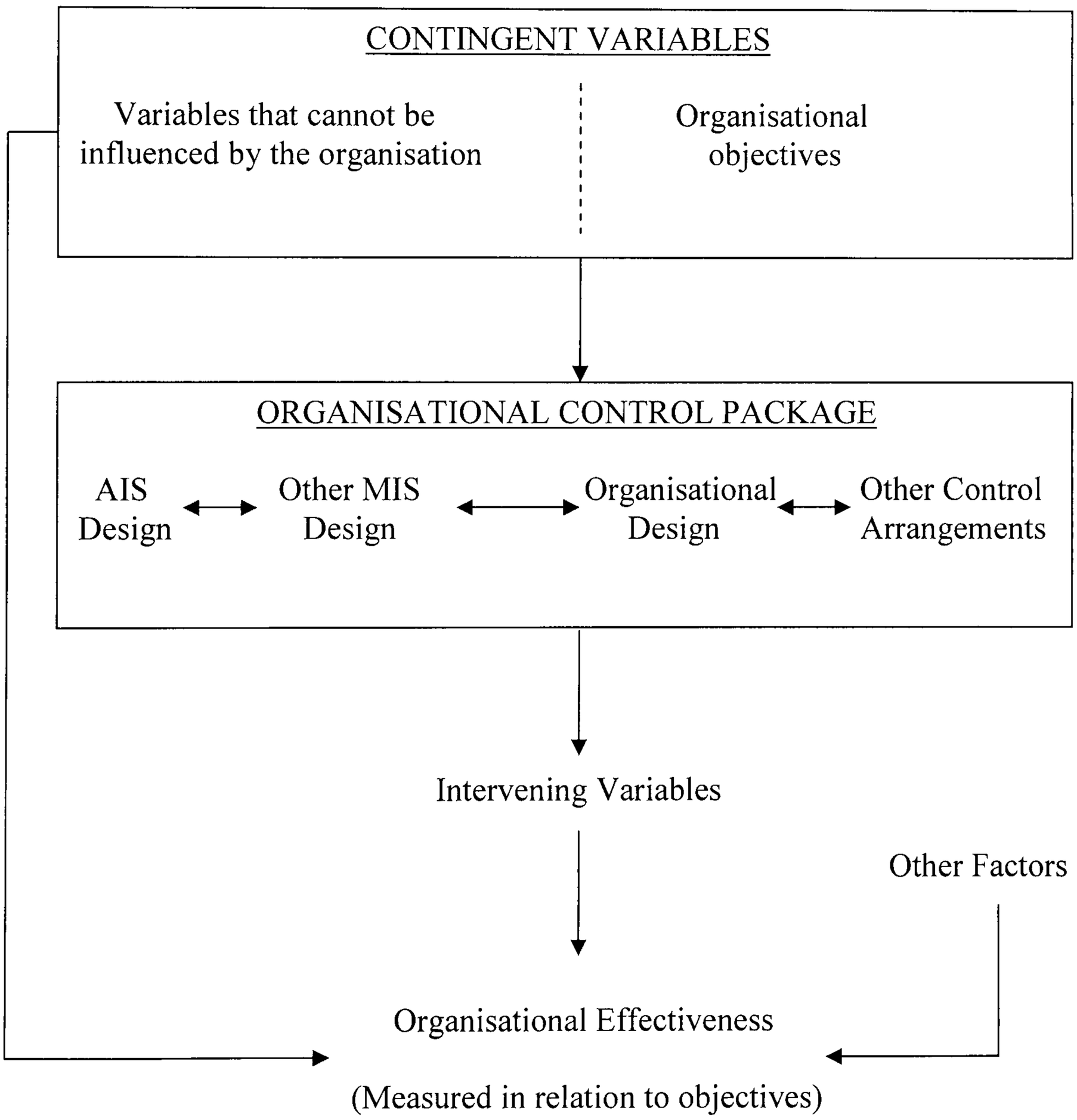
Donaldson (1996) stated that contingency theory lays claim to being strongly positivist in sociological terms. It therefore uses research, which is methodologically positivist (for example comparative empirical research) and sets out to construct scientific style theories closely informed by such research. Furthermore, he stated that it lays claim to producing law-like regularities applicable to all organisations for identified key variables. Among these prominent contingent variables, as for example, stated by Fisher (1995a) and Ittner and Larcker (2001), are the external environment (e.g., simple vs. complex; static vs. dynamic); technology (e.g., job shop to mass production; production interdependencies; automation); competitive strategy and mission (e.g., low cost vs. innovation); business unit and industry characteristics (e.g., size, diversification, firm structure, regulation); and knowledge and observability factors (e.g., knowledge of the transformation process; outcome observability; behavior observability).

Gresov (1989), Fisher and Govindarajan (1993) and Fisher (1998) argued that a company might design a control system to be consistent with one (dominant) contingency factor and ignore the others. However, ignoring a contingency factor may result in lower business unit performance. In addition, they have noted that when several contingency factors are entered simultaneously into the analysis, the demands placed on the control system may conflict. Designing the control system to simultaneously address several contingencies involves trade-offs that preclude a "fit" to all contingencies. If all contingent factors demanded the same type of control for optimality, then designing the control system would be straightforward. Conflicting contingencies result in demands that are not consistent. The presence of conflicting contingencies implies that the control system design will deviate from the demands of at least one contingency, making optimal control difficult. The conflicting contingency framework recognizes that some misfit, or design deviation, may occur as a functional response to multiple contingencies. The resolution of this conflict is not straightforward. Many researchers have used contingency theories in their management control studies. Contingency theory expanded the management planning and control framework by articulating some of the contextual or "contingent" factors influencing the entire organisational control "package" of accounting and non-accounting information systems, organisational design, and other control mechanisms (e.g., Gordon and Miller, 1976; Hayes, 1977; Waterhouse and Tiessen, 1978; Otley, 1980; Miller, 1981; Ittner and Larcker, 2001).

Many authors have suggested frameworks in their studies that capture many of the linkages highlighted in both management control and contingency theories, which would enhance understanding of the relationship between contingent variables and the management control system. Figures (4.1) and (4.2), illustrate representative economic and contingency frameworks developed by Otley (1980) and Brickley *et al.* (1995), respectively. Although the specific terminology and placement of variables vary somewhat, each framework suggests that managerial accounting and control should be viewed as a complete organisational control package consisting of accounting information systems, performance measurement and reward systems, and organisational design along with the performance consequences of these practices as a function of the

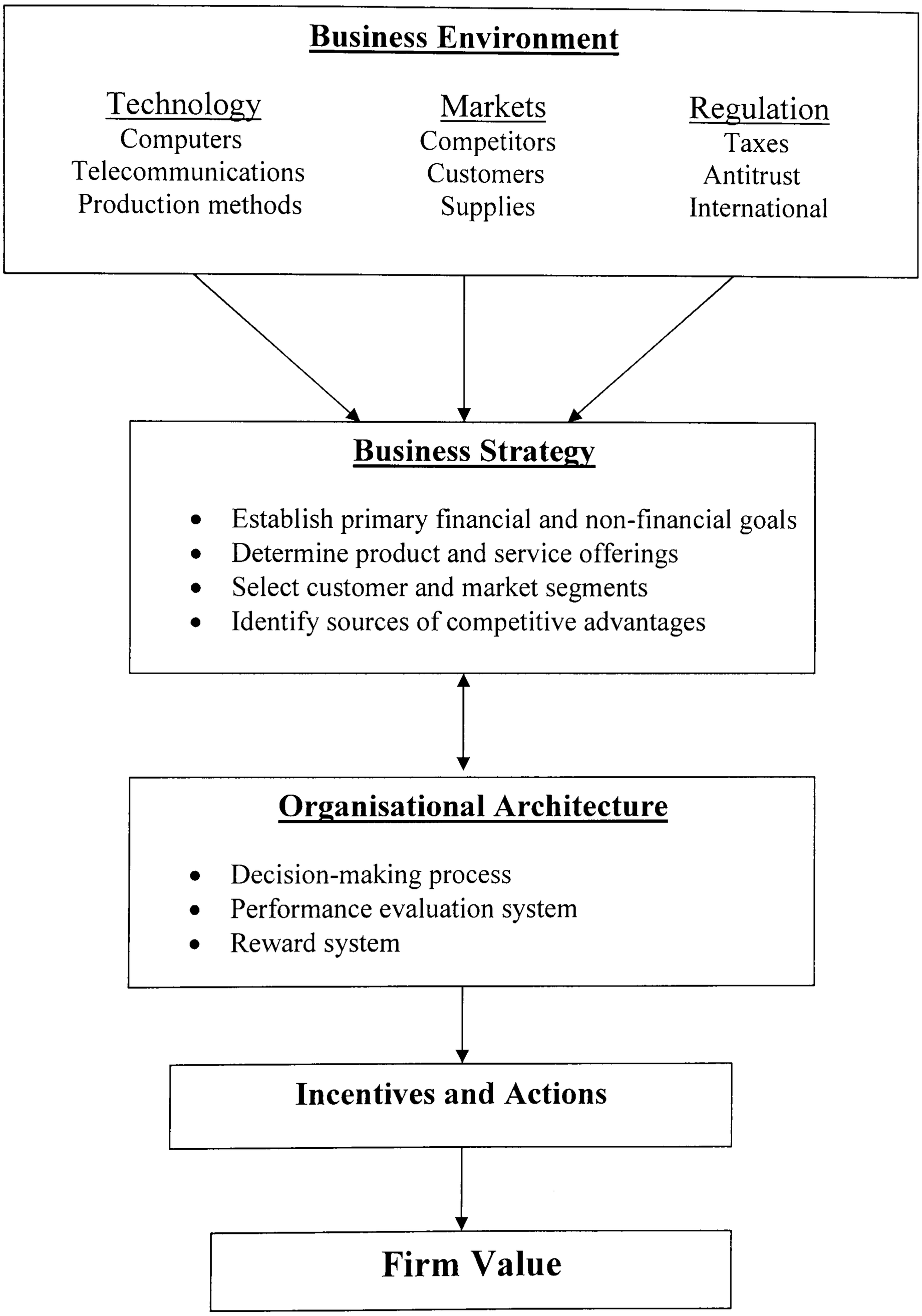
firm's external environment, organisational objectives, and strategies. The framework of Otley (1980) explains how contingent variables impact on the management control technique either through those that are related to organisational objectives, or those beyond organisation's control (see Fig. 4.1). Brickley *et al.*'s (1995) framework suggests that a firm's 'organisational architecture', including the assignment of decision rights to employees, is directly influenced by the firm's financial and nonfinancial goals and business strategy, which in turn is influenced by several contingent variables within the business environment (see Fig. 4.2).

Figure (4.1) A Contingency theory framework



Source: Otley (1980)

Figure (4.2) A Model of organisational architecture



Source: Brickley *et al.* (1995)

4.4 Contingency Theory Strengths

Drazin and Van de Ven (1985) and Selto *et al.* (1995), in their review of the extensive contingency literature, found contingency theory to have intuitive appeal in understanding broad issues of management controls. Selto *et al.* (1995) refer the suitability of the contingency theory, as a theoretical framework that investigates the performance measurement issue, to some reasons such as: (1) no other theory directly concerns fit state; (2) despite criticism, the intuition behind the theory continues to be appealing; and (3) several recent operationalizations of fit have overcome some previously voiced criticisms (see Otley, 1980; Schoonhaven, 1981).

Some of the main contingency theory's advantages could be summarised in the following points:

1. Contingency theory covers up some of the ambiguities and contradictory findings and results that exist in the universalistic approach (Otley, 1980).
2. Contingency theory has provided considerable inspiration to managerial accounting researchers through an elaboration of the basic theme that 'tight' control systems should be used in centralized organisations faced with simple technology and stable task environments. Whereas, 'loose' control systems should be used in decentralized organisations, presumably faced with dynamic, complex task environments (Covaleski and Dirsmith, 1996). In other words, as Rayburn and Rayburn (1991) stated that contingency theory identifies optimal forms of control under different operating conditions and attempts to explain how organisational control procedures operate. In general, contingency structure may provide a more holistic approach to the design of management accounting systems.
3. Organisations can be regarded as open systems, not closed systems, which means that they import energy, information and other survival requirements from its environment. In turn, they export some products or services into the environment. Thus, the conditions of environmental uncertainty that influence the measurability of an activity are of high importance to be measured and examined, which

contingency theory's framework suggests and takes into account (Ezzamel and Hart, 1987; Rayburn and Rayburn, 1991).

4. A contingency theory of management accounting has a great deal of appeal. It is in accord with practical wisdom and appears to afford a potential explanation for the bewildering variety of variables concerning management control systems in practice. In addition, the relevance of contingency theory to management accounting is being increasingly recognised and different formulations have been prominent in organisation theory. Contingency theory's interpretations and the development of a contingency framework depend on well-defined variables addressed in the study, in order to explain how management control system is affected by various contingencies and how it is integrated into its wider context of organisational control mechanisms (Otley, 1980).
5. Contingency approach emphasizes that contingencies must fit in a specific manner to achieve the optimal performance for the organisation. Therefore, it has the capacity for reorganizing, accepting and adjusting to new contingencies, whatever the type of company and its operating circumstances (Child, 1975).

4.5 Contingency Theory Criticisms

A number of cogent criticisms have been levelled at contingency theory. Attacks have been made on the strongly positivist stance taken by much of contingency theory. These attacks range from a rejection of the validity of a positivist approach through to those who take issue with the strength of the positivist stance, often in relation to one particular aspect of positivism as mentioned by Silverman (1996) (in Donaldson, 1996).

Longenecker and Pringle (1978) criticized General Contingency Theory (GCT) by stating, 'the theoretical structure is not simply a listing and crude classification of variables, but a statement of the form of the relationship among these variables. Therefore, simply stating that situational, management, and performance criteria variables interact to produce system performance does not indicate anything meaningful about the nature of the relationship among these variables' (p. 681). They also stated that the term 'contingency' implies that the structures and practices of an organisational

system depend on the way in which the environment becomes relevant to the system, while the reverse situation – the system is working on the environment – is usually not considered because the working division between independent and dependent variables would be jeopardized. This unilateral influence process is the weak link in contingency theory. In the same vein, Otley (1980) argued that the variables used as contingent variables to explain their effect on the use and design of managerial accounting systems are ill-defined and measured, and were not comparable across earlier accounting studies, thus yielding conflicted results. Moreover, Drazin and Van de Ven (1985) and Selto *et al.* (1995) argued that the extensive interaction of variables as well as continuous changes in organisations would make it difficult to apply contingency theory.

Child (1996) (in Donaldson, 1996) stated that contingency theory assembles its theories by finding strong statistical links between variables, and in particular variables from chosen organisations' contexts and variables from different forms of management existing in those organisations. He argued that statistical correlations of themselves do not simply lead to theory, because theory can only satisfactorily be produced, if there is an understanding of the processes that underlie. For example, the construction of both the contexts in which an organisation works and of the management form it adopts. He strongly argues that human agency plays a significant part in both helping to shape and alter an organisation's context and contingent variables, and in shaping the chosen management form of the organisation. Donaldson (1996) stated that contingency theory has also been attacked by the organisational systematic approach, that argues that each niche industry/organisation will have its own correlations and that generalisations of the link between context and management form cannot be made across these niches.

Two difficulties in traditional contingency theory are recognised by Donaldson (2001). He claimed that these two difficulties have not been dealt with to date that encouraged the emergence of *'neo-contingency theory'*. He stated that this neo-contingency theory is considered a new revision of contingency theory that leads to a more realistic and more dynamic approach. According to Donaldson (2001), the first problem is concerning the interaction of multiple causes of different contingencies to determine the overall effects

on organisation. Thus, it is suggested that multiple regression analysis is the best method to combine the effects of more than one variable to assess their total effects on the dependent variables. This is whenever there are a number of different contingent variables that have an effect on some dependent variables (see for example; El-Gendy, 2004). The other problem, as Donaldson (2001) states that the main theme of the theory relies on the idea of 'fit'. However, he argues that it is ambiguous how managers know how exact organisational structures fit their contingencies. He argues that contingency theory assumes implicitly that management knows the organisation fit situation they should be in, which might be unrealistic. He claimed that management might know the direction in which fit lay and head in that direction. Therefore, he explains that organisational adaptation is to move into quasi-fit rather than into full-fit. He claims that while managers try to achieve full-fit but they attain only quasi-fit. In turn, the organisation will then adjust the level of its structure to narrow the gap between its actual level and that required to fit its contingencies, without completely eliminating the gap. However, Donaldson (2001) and Chenhall (2003: p. 160) claimed that this move from misfit to quasi-fit will improve organisational performance and that this improvement in performance is sufficient to cause an effective feedback, which in turn encourages growing again. Donaldson (2001) explained that, then, the cycle will be repeated as an increase in the variability of the contingency, increases the misfit and begins to reduce performance, which in turn will trigger a further increase in the organisation structure. Hence, the organisation can go through the cycle of increasing the level of contingent variable, despite not attaining full-fit. However, the organisation needs only to attain quasi-fit for the feedback effect of performance on the contingency to cause another round of the cycle of growth (Donaldson, 2001).

Whilst having these mentioned criticisms, the argument of contingency theory that there is a best fit for each organisation depending on the contingent factors would seem to have sufficient validity and applicability to form the basis of giving clear guidance to reach the suitable performance measurement technique[13]. As Donaldson (2000) stated that

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[13] See for example, Luthans and Stewart (1978) who discussed the reality or illusion of the General Contingency Theory of management, in response to Longenecker and Pringle's critique (1978).

organisations possess many internal characteristics, such as their structures, their human resource management systems and their performance measurement systems. He points out that the contingency theory of organisations holds that the organisational characteristics need to fit the level of the contingency variables of the organisation for that organisation to have high performance because misfit leads to lower organisational performance than fit. He added that each time an organisation changes its strategy, technology, or other contingent variables; it may need to make adaptive changes to some organisational characteristic such as its performance measurement system. Therefore, the organisation will need to make these adaptive changes recurrently in order to regain fit each time it changes the level of one of its contingency variables. Only by making such adaptive changes and moving into fit can the organisation perform at a high level and continue growing because, conceptually, organisational performance is determined by how far the organisation attains its goals, which is usually monitored by the performance measures.

4.6 Prior Pioneering Studies of Contingency Theory

Covaleski and Dirsmith (1996) stated that contingency theory represents a rich blend of organisational theory and sociological functionalist perspectives of organisations (i.e., it has roots in the sociological concerns about organisational structure of the 1960s, for example, Burns and Stalker, 1961; Woodward, 1965; Lawrence and Lorsch, 1967). These studies are of great importance to shed some light on.

4.6.1 Burns and Stalker (1961)

Burns and Stalker in their work discussed that the structures and practices of an organisational system depend on the way in which the environment becomes relevant to the system. Which in turn will affect all systems of the organisation such as performance measurement system amongst other control systems. They argued that the utility of the notions of 'mechanistic' and 'organic' management structures resides largely in their being related as dependent variables to the rate of 'environmental' change. What they meant by 'environmental' is the technological basis of production and to the market situation. They argue that if the form of management is properly to be seen as dependent

on the situation the concern is trying to meet. Whilst they contend that there is no single set of principles for 'good organisation', an ideal type of management structure that can serve as a model to which administrative practice should follow. They stated that the overriding management task is to interpret correctly the market and technological situation, in terms of its instability or of the rate at which conditions are changing, then designing the management system appropriate to the conditions and making it work.

Burns and Stalker (1961) also stated that organisations are co-operative instrumental systems assembled out of the usable attributes of people. However, members of an organisation are considered co-operators in a common enterprise and, at the same time, rivals for the material and tangible rewards of successful competition with each other. They contend that the hierarchical order of rank and power, realized in the organisation chart that is organisational structure, which prevails in all organisations, is both part of a control system and a career ladder that helps in defining rights and responsibilities. Thus, they propose two divergent structures of management practice. The first type of structure, the 'mechanistic' structure, appeared to be operated under relatively stable conditions. The second type of structure, the 'organic' structure, appeared to be required for conditions of change. Burns and Stalker stated that neither of them was fully and consistently applied in any firm nor was openly and consciously employed as an instrument of policy, although many beliefs and empirical methods associated with one or another were expressed.

They suggested that the principal characteristics of each one of them as follows: In the mechanistic structures, the problems and tasks facing the organisation as a whole are broken down into individual tasks. Each individual pursues his/her task as something distinct from the real tasks of the organisation as a whole, as if it was the subject of a sub-contract. Certainly, somebody at the top is responsible for seeing to its relevance. The technical methods, duties, and powers attached to each functional role are precisely defined. Interaction within management tends to be vertical, i.e., between superior and subordinate. Operations and working behavior are governed by instructions and decisions issued by superiors. They stated that the command hierarchy is maintained by the implicit

assumption that all knowledge about the situation of the firm and its tasks is, or should be, available only to the head of the firm. Management, often visualized as the complex hierarchy familiar in organisation charts, operates a simple control system, with information flowing up through a succession of 'filters', and decisions and instructions flowing downwards through a succession of 'amplifiers'.

On the contrary, organic structures are adapted to unstable conditions, when problems and requirements for action arise which cannot be broken down and distributed among individual tasks within a clearly defined hierarchy. Therefore, individuals have to perform their special tasks in the light of their knowledge of the tasks of the firm as a whole. Jobs lose much of their formal definition in terms of methods, duties, and powers, which have to be redefined continually by interaction with others participating in a task. Interaction runs horizontally as much as vertically. Communication between people of different ranks tends to resemble horizontal consultation rather than vertical command. Omniscience can no longer be imputed to the head of the concern, which was the beginning of authority delegation to the lower levels.

In their review of Burns and Stalker's seminal work, Check-Teck and Tuck-Suen (2002) stated, 'Burns and Stalker's research informed us about the influences of the environment on manufacturing firms. After extensive, detailed, and empirically grounded investigations, they established a dichotomy between firms that were structurally *mechanistic* and those that were *organic*. Firms, according to Burns and Stalkers, that operated within a rapidly changing environment (RCE) shared a common attribute—"organicness". In sharp contrast, firms within a stable, thus predictable, environment were described as organisationally mechanistic. It is this "organicness" attribute identified by Burns and Stalker that inspires us in our own empirical research into the impact of the environment on firms' (p. 300).

Burns and Stalker (1961) explained that the differences between the two types of management structures seemed to resolve themselves into differences in the kind of relationships which prevail between members of the organisation, whether of the same or

of different rank, and thus into the kinds of behaviour which members of an organisation treat as appropriate in their dealings with each other.

Burns and Stalker (1961) argued that, in general, the dysfunctional aspects consist in both cases in making the individual or organisation less fit to survive in its environment than was its predecessor. They contended, 'Very often the environment of the person or organisation is itself changing, so that even to maintain the same degree of fitness for survival, people and institutions may have to change their ways. So, the risks attendant upon change may have to be weighed against other risks arising from maintaining the same state of affairs' (p. 21). Therefore, the creation of innovations and increasing pace of technology, in which they help organisations to face such reality, are a constant and important part of the total organisation.

4.6.2 Woodward (1965)

Woodward (1965) explored the link between technical complexity and a company's organisational strategies. In order to determine this link, Woodward carried out a comparative study. She examined the organisational structures and argued that her findings showed that, where the structure of the organisation fits its technology, then it achieves better performance than those organisations whose technology is in mismatch with their management organisation (Dawson (2001) (in Sorge and Warner, 2001). Woodward's stance on management was organic. She believed that there was a kind of relationship between the predictability of processes resulting from the technology adopted by the organisation and the organisation's structure. Increasing technology would lead first to mechanistic then to more organic forms of management (Donaldson, 1999) (in Clegg and Hardy, 1999). Woodward argued that in the future, organic styles of management would be forced upon organisations by technological changes.

However, there were considerable weaknesses with Woodward's work. She contended that technology influences the overall structure of an organisation. But, later work by many researchers, placed doubt and conflict on this argument, such as Donaldson (1995)

who have argued that technology affects the organisation at the level of the individual job rather than at the level of the overall organisational structure.

Woodward has achieved her main aim, which is establishing technology as a key contingent variable within contingency theory, though later researchers have considerably refined technology as a contingent variable. Donaldson (1995), for example, substitutes uncertainty as a variable that includes technology rather than using technology solely. Woodward's argument that organic forms of management would replace mechanistic, as technology advances, has been supported. As it was claimed that rational management models are increasing, as technology increases. Indeed the application of technology is a crucial component in these rational management models (Ritzer, 1998). Recently, firms face increasingly complex market and technological environments. In response, firms themselves became more complex and new forms of structure have emerged such as matrix, network and cellular organisational structure, in order to assist new organisations of adding economic value (Miles *et al.*, 1997).

4.6.3 Lawrence and Lorsch (1967)

Lawrence and Lorsch (1967) carried out a comparative study initially in several organisations in the plastics industry followed by two other firms. They sought to find what kind of organisation is necessary to cope with various market conditions. They concluded that, to be successful, organisations in uncertain environments must have within their organisation, greater differentiation and corresponding greater degrees of integration. Therefore, there was a clear finding that organisations are most effective when their management form fits with key contextual variables, in this instance, environment.

Lawrence and Lorsch were critical about aspects of their research and have referred to its "crudity" (Sorge and Warner, 2001). Researchers have frequently visited their contingent variable, which has become established as a core contingency factor. It is, however, often expressed in a wide variety of different ways, for example, environmental complexity, diversity, stability, uncertainty and degree of variability. Thus their aims, in significant

part, were achieved (see for example; Duncan, 1972; Child, 1975, Joynt, 1977, Otley, 1978; 1980).

4.6.4 Child (1975)

Child (1975) stated that contingency theory identifies, as the means to superior performance, those attributes that enable a company to cope better with its particular operating conditions. In other words, the factors associated with high performance are expected to vary along with differences in a company's context, especially with differences in its environment, size and technology.

On the contrary, he reported that the research does not demonstrate very strong relationships between managerial or organisational variables and company performance. There were some explanations such as, that this may reflect inadequacies in the measurements employed or in the choice of investigated variables. Another explanation is, as Boswell (1973) maintained, a large number of influences on performance are at work, then no single factor is likely to have much effect on its own. A third explanation for the lack of strong relationships with performance may lie in the fact that, over the course of time, managements are normally able to adopt strategies which are intended to modify the constraints otherwise imposed by the situation in which they find themselves. Child, also, added that management is an active and dynamic force rather than just a reactive and static one. He argues that managers can take various steps to modify the environment in which they operate and to manipulate factors such as the size of operating units and their technologies.

4.7 The Contingent Variables of the Study

Contingency theory is the theoretical framework that is followed in this research to help explain the relationships among the contingent variables and the use of performance measures, as one of the important managerial practices. The theoretical framework helps to identify the contingent variables that are relevant to the study. As Abdel Khalik and Ajinkya (1979) stated, the theoretical structure should give rise to identification of the

dependent and independent variables and should suggest forms for the relationships between them.

Many researchers provided evidence on the appropriateness of contingency theory to study the phenomenon of management control. For example, Fisher (1998) proposed that contingency theory argues that the use of control systems is contingent upon the context of the organisational setting in which these controls operate. A better match between the control system and the contextual contingency variable is hypothesized to result in increased organisational performance. Contingency theory is used in many researches, with researchers emphasising their own contingent factors and organisational aspects with different functional relationships among them. In addition, Joynt's (1977) study argued that there is no one best solution to the administrative and organisational issues managers face. Rather, questions of managerial behavior and organisational design must be considered in the light of total environment. He added that different factors are needed to be taken into consideration for successful administration, in which they are important determinants in describing and understanding organisation from a contingency point of view such as: environment, technology, structure and communication, motivation, leadership style, use of groups in decision making and job design and analysis. Moreover, Covaleski and Dirsmith (1996) stated that contingency theory is a theoretical perspective of organisational behavior that emphasizes how contingent factors such as technology, structure and environment affected the use of management practices in organisations.

Many authors argue that developing a contingency model requires a basis on which to divide competitive settings into discrete classes, and there has been very little work identifying relevant contingency variables. A contingent variable is relevant to the degree that businesses that differ on that variable also exhibit major differences in how control attributes or actions are associated with performance. Major categorisations of the contingent factors examined in some prior management control studies are followed.

The *first* category consists of variables related to uncertainty. The major sources of uncertainty include task and external environment uncertainty. Task uncertainty is a

function of the extent that an action by a manager results in an expected (predictable) outcome (Hirst, 1981; Brownell and Dunk, 1991). Joynt (1977) defined the *environment* as it covers topics such as stability of the market, the amount of competition and the amount of product changes necessary. Lawrence and Lorsch (1967) developed the fit between management practices and environments of organisations. The accounting information system could be designed to cope with environmental uncertainty by incorporating more nonfinancial data, increasing reporting frequency, and tailoring systems to local needs. Many researchers focused on the design of formal control systems in complex organisations, being concerned with the question of appropriate contingency principles underlying the design of such systems (Khandwalla, 1972; Perrow, 1972; Gordon and Miller, 1976; Ansari, 1977; Waterhouse and Tiessen, 1978; Macintosh, 1981; Daft and Macintosh, 1981; Dent, 1987; Covaleski and Dirsmith, 1996).

The *second* category consists of contingent variables related to firm technology and interdependence. Fisher (1994) stated that it includes the definitions of technology developed by Woodward (1965), Perrow (1967), Thompson (1967) and Child (1975). For example, Woodward (1965) introduced technology as a major explanatory variable of an effective accounting information system. Thompson (1967) attempted to link task environment and technological contingencies to various management practices, focusing particularly on the different mechanisms of coordination which were appropriate for more complex, dynamic technologies and task environmental conditions. Perrow (1967) focused on the congruence between different types of technologies and management practices, emphasizing that more flexible, loosely-structured arrangements were more appropriate for organisations with nonroutine technologies, while just the opposite type of organisational arrangements were more likely to fit routine technologies.

The *third* category consists of industry, firm and business unit variables, such as organisational size (Child, 1975), diversification and structure (Hoskisson *et al.*, 1990). Fisher (1998) stated that industry studies have examined control at manufacturing, financial services and research and development firms. Diversification refers to the level of diversity in a firm's product line and/or structure. Firm structure refers to the

arrangement of workflow, authority, and communication relationships within a firm, and it has been dichotomized into several forms. Thompson (1967) shows that different types of organisation structure are required for different types of technology. The structure includes factors such as amount of formal rules, levels in the hierarchy, spans of management, use of goals and size of organisation.

The *fourth* category of contingent variables includes competitive strategy and mission. Most contingent control research has focused on the differences between prospectors and defenders (Simons, 1987). The product life cycle classification consists of build, hold, harvest and divest strategy categories, which the firm can follow to face its competitors and to achieve its goals.

The *last* category that has been examined in the control literature consists of management and decision-making style (Waterhouse and Tiessen, 1978; Rayburn and Rayburn, 1991) and observability factors. These variables were originally proposed by Thompson (1967) and later refined by Ouchi (1977) and others such as Rockness and Shields (1984). In performance evaluation, the behavior of the worker or the outcome of the business unit is measured for evaluation and rewarding. Observability (of behaviour or outcomes) implies that control can be placed only on variables that are observable by the evaluator. Joynt (1977) stated that communication includes the use or non-use of computer technology to contact other people vertically or horizontally inside the organisation. He highlighted that motivation and leadership style involve in path-goal analysis where the leader assists and motivates the subordinate along the correct path towards goal achievement by providing the necessary support; clarification of goals; and help in the work situation. Finally, he proposed that job design includes factors such as building variety, task identity, autonomy, and feedback for an organisation participant to be satisfied with his job.

The concept of fit recognizes that organisations are systems, and that system effectiveness is contingent upon the existence of internally consistent and mutually reinforcing elements. Since strategic mission is but one element in an organisational system, its content alone cannot guarantee organisational effectiveness. Rather, such

effectiveness will result from the strategic mission being supported by other elements in the system stemmed from the previous categorization. Such as complementary organisation structure, acquiring competitive advantages, supported technology, suitable management styles, effective incentive and compensation system and, to somewhat, the predictability of the environmental uncertainty (Donaldson, 1987; Covin *et al.*, 1994). As a result of the previous discussion, a number of key contingent variables, which have been derived from a wide range of research on performance measurement system following a contingency perspective, are tested in this study. The contingent variables addressed are organisational strategies, organisational structure, competition, technology, management style, reward systems and environmental uncertainty along with the organisational size as an expected intervening variable. These variables were chosen for two reasons; the first one is their importance, which was highlighted in a wide range of contingency theory and management accounting literature (as shown in chapters two, three and four). The second reason is their suitability to the context of the research, i.e. 'Egypt' as a developing country (see Chapter Five). In this research, an attempt is made to define these contingent variables, because as Otley (1980) argued that the variables used as contingent variables to explain their effect on the use and design of managerial accounting systems are ill-defined and measured, and were not comparable across earlier accounting studies, thus yielding conflicted results.

1. Company Strategies

The managerial accounting literature classifies strategy according to several points of views. Fisher and Govindarajan (1993: p. 132) stated, 'Strategy has been conceptualized by various authors (Chandler. 1962; Hofer and Schendel, 1978; Miles and Snow, 1978) as the process by which managers, using a three to five year time horizon, evaluate external environmental opportunities and internal strengths and resources in order to decide on goals as well as action plans to accomplish these goals'. In addition, some researchers examine the association between strategic choices and the organisation's accounting and control system design. Many authors classified strategy in four differentiated types, which are *build*, *hold*, *harvest* and *divest* strategies (Hofer and Davoust, 1977; Henderson, 1979; Buzzell and Wiersema, 1981). These strategies also

correspond to the four stages of a business' (or product's) life-cycle: launch, growth, maturity and decline (Ward, 1993). Brignall and Ballantine (1996), in their review to these strategies, explained that a *build* strategy implies moves to increase market share in a fast-growing market, causing the company to be a net cash user. A *hold* strategy aims to protect the company's high market share and competitive position in a growing market, and implies broad cash neutrality. A *harvest* position implies a high market share in a flat or declining market, resulting in net cash generation for reinvestment in expansion projects. Finally, a *divest* position implies a declining market or market share with broad cash neutrality, the company being disposed of when appropriate.

Miles and Snow's (1978) pioneering classification of strategy forms the basis for many subsequent studies. It provides a framework for conceptualizing different strategies. They proposed four strategic types including defender, prospector, analyser, and reactor types. The Defender type has a narrow product market domain, a cost efficient technology and a specialized and formalized structure. By contrast, the Prospector type continually develops new markets/products by emphasizing flexibility in its technology and structure. The third strategic type, Analysers, is a unique combination of the Defender and Prospector types. Finally, the Reactor type is characterized by inconsistency in the way it responds to change in its environment, which implies lower performance and instability. In their review to Miles and Snow's classification, Gerdin and Greve (2004) stated that three of these strategic types, namely, the Defender, the Analyser, and the Prospector, are 'stable' forms of *organisation*s. That is, if management chooses to pursue one of these strategies, and designs the organisation accordingly, then the *organisation* may be an effective competitor in its particular industry over a considerable period of time (Miller and Friesen, 1983). On the contrary, if management does not choose to pursue one of these "pure" strategies, then the *organisation* will be slow to respond to opportunities and is likely to be an ineffective performer in its industry that called Reactors and argue that they are essentially "unstable" (Miles & Snow, 1978, p. 14).

Other researchers such as Geller (1980) described the appropriate organisation for an *invest/grow strategy* as being highly responsive, relatively flat, and offering great

freedom to act. The organisation types suited to *earn/protect strategies* were said to be moderately responsive, have a moderate organisation structure, and allow moderate freedom to act. Finally, appropriate organisations for *divest/harvest strategies* were described as hierarchical, permitting limited response and limited freedom to act.

Porter (1980) has proposed two generic ways to gain and retain a competitive advantage: "cost leadership", which means competition on price via low cost. However, the other type is product/service "differentiation", which means competition on one or more of three elements: quality, flexibility and innovation. However, Neely *et al.* (1994a) stated that companies that seek to use their performance measurement systems succesfully to influence the realization of their manufacturing strategies are those firms that choose to compete primarily on quality or time but not those that compete on price.

In summary, those researchers typically measure strategy as a continuum between firms following a "defender", "harvest", or "cost leadership" strategy and firms following a "prospector", "build", or "innovation" strategy (Dent, 1990; Langfield-Smith, 1997; Ittner and Larcker, 2001). The first type of strategy literature, a "defender", "harvest", or "cost leadership" strategy focuses on being the low cost producer of a narrow product range, while the other type, a "prospector", "build", or "innovation" strategy focuses on being first-to-market with a variety of innovative products or services (e.g., Miles and Snow, 1978; Porter, 1985). Ittner and Larcker (2001) argued that this simple continuum misses the multi-dimensional nature of strategic choices. There are viable strategies, other than strict cost leadership or innovation, such as providing higher quality than competitors, differentiating products through image, superior customer service, or focus on a particular market niche, or being more flexible in responding to customer demands or copying competitors' innovations (Miles and Snow, 1978; Porter, 1985).

2. Company Structure

Burns and Stalker (1961) established a dichotomy between firms, whether they are structurally *mechanistic* or they are *organic*. According to Burns and Stalkers, the organic firms are those operated within a rapidly changing environment. However, the

mechanistic firms are those operated within a stable and predictable environment. In addition, organic structures are characterized by such attributes as decentralized decision-making, informality, and flexibility. Mechanistic structures, on the contrary, are characterized by such attributes as centralized decision-making, strict adherence to formally prescribed roles and procedures, and clearly structured reporting relationships (Burns and Stalker, 1961; Khandwalla, 1977; Slevin, 1989; Covin *et al.*, 1994).

Chandler (1962), Davis and Lawrence (1977), Miles and Snow (1984, 1994), Porter (1986), Basil (1990), Hoskisson *et al.* (1990), Penrose (1990), Kauffman (1995), Mathews (1996) and Miles *et al.* (1997) amongst others stated that an organisational structural form is a hierarchical organisational ways of arranging assets and resources to produce the products and services that customers want and expect. Organisation structure can be defined as the arrangement of workflow, authority, and communication relationships within a firm. They stated that structure can be operationally defined in several ways: in terms of the organisation of departments or work units, as in functional structures, product structures, and matrix structures, and in terms of its core dimensions, like formalization and centralization. However, market forces and environmental changes pull forth new organisational structural forms as managers seek new ways to satisfy customers. Mintzberg (1983; 1996) proposes organisational structure as the sum of the ways in which its labor is divided into distinct tasks and its coordination is achieved among these tasks. This reflects a simple analysis of division of labor and management control, but only reveals functional relationship within the organisation. However, Schein (1971, 1988) identifies three dimensions of structure, which are the hierarchical dimension, the functional dimension, and the dimension of inclusion and centrality. He explained that the hierarchical dimension demonstrates relative ranks in a manner similar to the organisational chart. The functional dimension explains the different types of work to be done. The inclusion and centrality dimension exhibits the degree to which any given person is nearer to or farther from the central core of the organisation.

Waterhouse and Tiessen (1978: p. 68) stated, 'contingency theory suggests that efficient organisation structures and processes are contingent on an organisation's context'. In

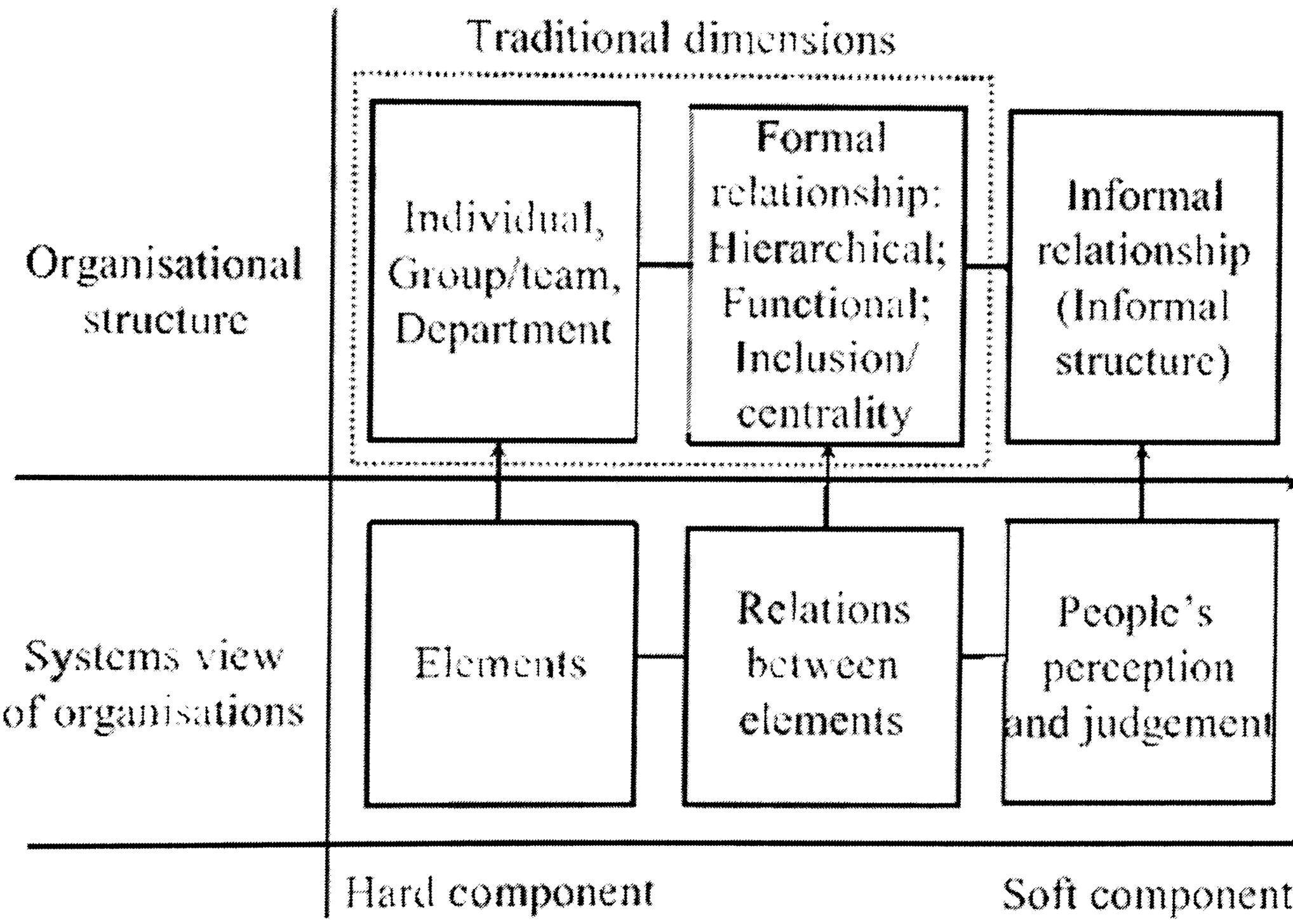
other words, efficient management processes are contingent on some properties of organisation structure such as centralization, procedure specification, or autonomy. Hickson *et al.* (1971) and Waterhouse and Tiessen (1978) argue that there is a need to discuss the authority distribution, which is legitimate and normatively expected within an organisation, in order to address issues related to organisational structural variables such as procedure specification and centralization of authority. They stated that authority is granted to individuals and groups so that they may realize ownership goals. The amount of authority distributed or realized by individuals within organisations does of course vary considerably and the form of authority distribution is one of the important elements of organisation structure. They added that the form of authority distribution is typically described in vertical terms, existing on a continuum ranging from centralized to decentralized.

Waterhouse and Tiessen (1978: p. 68-69) define decentralization as the authority granted to individuals in different managerial levels within the organisation of a broad scope or discretion over organisational activities, which give rise to the opportunity for those individuals to exercise discretion in developing and implementing policies or procedures. Waterhouse and Tiessen (1978) added that, in this sense, the need for a management control system arise as the goals of the individual might diverge from those of the organisation because of differential self interest. In this case, they explained, management control system would play a role in monitoring this leakage of authority. For this reasoning, they emphasized that the types of activities over which a person has authority must be specified before the concept of decentralization can be adequately operationalised.

Checkland (1999) stated that organisational structure reflects systems that consist of organisation's elements, relations between these elements, and relations as a whole that constitute one unit. In the same vein, Bunge (1979; 1985a; 1985b) and Wang and Ahmed (2003) pointed out that structure is the superior composition of relations. It is the relations between elements that capture the essence of organisational activities. Checkland (1999) explained that organisational structure not only consists of hard

components, such as individuals, groups, teams and hierarchical departments, but also soft components, such as the relations between organisational components. Moreover, Schein (1988) defines structure in terms of hierarchical dimension, functional dimension, and inclusion and centrality dimension. However, Schein's framework primarily explains formal structure in the organisation, and does ignore the informal one that refers to the relationships that flow behind the organisational chart. This informal structure, or informal relationship, plays a vital role in many new forms of organisations such as network or knowledge-based organisations[14].

Figure (4.3) The systems views and organisational structure



Source: Wang and Ahmed (2003)

[14] The increasing number of organisational forms that cannot be illustrated by an organisational chart gives rise to the importance of informal structure. This is evidenced by the emergence of networks (Powell, 1990; Jarillo, 1988), the knowledge-based organisation (Perez-Bustamante, 1999), and the virtual organisation (Davidow and Malone, 1992).

Vickers (1965), Harrington (1991) and Wang and Ahmed (2003) stated that informal structure refers to interpersonal, cross-functional and inter-organisational interaction that is not illustrated in the organisational chart. This informal structure is highly connected to people's perception and judgement that plays an important role in organisational structuring and effectiveness of structure. Therefore, the extent to which informal structure is developed reflects the richness of the soft component of organisational structure (see figure 4.3).

3. Competition

Khandwalla (1972, 1973) studied the relationship between formal accounting-based control systems and the type of competition in an industry. He concluded that increased competition leads to increased use of management control systems. He distinguished between three forms of competition - product, price and marketing- and found the more intense the level of competition, the greater was the reliance on formal control systems. He proposed that this relationship was strongest for product competition, moderate for marketing competition and weakest for price competition. He argued that intense product competition may require complex organisational forms, with departments for research and development, new product testing, and scanning for new markets; sophisticated control systems may play an integrative role. Khandwalla (1972) is notable in providing the first empirical evidence of the relationship between management control systems and the level of competition.

Simons (1990) argued that Khandwalla's study was like other prior studies, focusing on the relationship between formal control systems and competition, as an aspect of the external environments of the firm, and ignored the strategies of the firm. However, it did suggest that control system design was sensitive to the way that the firm competes. In the same vein, Langfield-Smith, (1997: p. 217) points out that Khandwalla (1972) limited his study to the formal financial measures such as standard costing, flexible budgeting, internal auditing, use of ROI and inventory control. However, he argues that these measures are not enough 'to act as an integrative device in an innovative and product-

focused organisation, with an emphasis on flexibility and quick responses, and after-the-event control'.

Porter (1980) has proposed two generic ways for a company to manage the competition it faces, in order to gain and retain a competitive advantage. Either, competition on price via low cost (cost leadership), or competition on one or more of other factors: quality, flexibility and innovation (product/service 'differentiation'). Porter (1980) sets out a 'competitive analysis framework' for analysing an industry's attractiveness to new investors; assessing the firm's position in the industry relative to its competitors; and creating a sustainable competitive advantage through the application of value-based planning. He suggested five elements that determine the attractiveness of an industry; namely, threat of new entrants; threat of substitute products/services; bargaining power of suppliers; bargaining power of customers; rivalry among existing competitors. These elements shape the degree of competition, volatility and uncertainty in the competitive environment, which in turn would affect the design and the use of any management control system.

In his attempt to explain the situation of a firm in competition, from a contingency perspective, Donaldson (2000) stated that, in the case of competition, when an organisation is in misfit state, its performance will be depressed if its competitors are in fit, because then they can take business away from the firm. Thus, low performance and the resulting adaptive organisational change into fit of a firm in misfit is more likely when its competitors are in fit. However, he added that if the competitors are also in misfit, then they are as disorganized as the firm. Therefore, the firm will not suffer loss of business to competitors and its performance will not be depressed. Thus, adaptive organisational change into fit is less likely when the misfit of a firm is offset by the misfit of its competitors. Then the depressing effect of the misfit of the firm on its performance is negatively correlated with the boosting effect of competitor misfit on the performance of the firm. Thus, he argues that the portfolio effect again comes into play, keeping organisational performance satisfactory and thus preventing needed organisational adaptive change of the firm. Donaldson (2000) concluded that intense competition could

come from several sources, especially, having more competitors, each of whom is well organized, that is, they are in fit.

In their thorough review for the differences between the industrial and post-industrial eras, Nahm and Vonderembse (2002: p. 2071) contend that in the industrial stage, 'firms compete in national markets, where their competitors often have the same labour costs and problems, a common supplier base and similar overhead costs. In many cases, firms hire key employees from the competition so their approach to management is similar to their competitors'. Vonderembse *et al.* (1997) and Nahm and Vonderembse (2002) argue that this significantly reduces the dimensions of competition. For this reasoning, during the 1960s and 1970s, Skinner (1985) stated that the American industrial leadership was shocked as foreign competitors with new ideas and new methods of manufacturing entered the American market place. Thus, Lawrence and Dyer (1983) point out that the post-industrial era, in which the manufacturing capabilities spread world-wide, was characterized with increasingly complex, changing, and uncertain markets. This resulted in an intensified global competition that changed the 'mind set' of how manufacturing should be done (Young, 1985a; Johansson *et al.*, 1993). In summary, performance measurement techniques are expected to become an even more effective strategic tool with the expansion of e-business and the Internet that facilitate adjustments to demand shifts (Piszczalski, 2000; Sowinski and Orton, 2001).

4. Technology

Woodward (1965) classifies technology into small batch, large batch, process technology and mass production categories. Woodward defines technology to include the physical flow of production. Perrow's (1967) definition of technology is based on the number of exceptions in the product or service generation process and the nature of the search process when exceptions are encountered. In addition, Thompson (1967) argues that one of the key components of firm technology is the interdependence among the firm's subunits. Pooled, sequential and reciprocal interdependencies are the typical categories in this interdependence framework (Fisher, 1994). Recently, Chenhall (2003) stated that technology has many meanings in organisation behavior. At a general level, technology

refers to how the organisation's work processes operate (the way tasks transform inputs into outputs) and includes hardware (such as machines and tools), materials, people, software and knowledge.

Otley (1980: p. 414) stated, 'the simplest and longest established contingent variable used in management accounting is perhaps that of production technology. The distinction between different types of production technique, as defined by Woodward (1965), is a factor that has long been recognised as influencing the design of internal accounting systems. Although, it should be noted that it emerged in Woodward's study as a means of explaining contradictory results in what was originally intended to be an empirical confirmation of classical organisation theory'. Thus, Otley (1980: p. 415) concluded that production technology has an important effect on the type of accounting information that can be provided and other work has distinguished other aspects of technology that have an effect on the information that should be provided for effective performance. For example, Piper (1978) demonstrates that the complexity of the task faced by an organisation is relevant to defining an appropriate financial control structure and Daft & Macintosh (1978) identify task variety and task knowledge as factors, which affect the design of an appropriate management information system.

Historically, as Skinner (1985) stated, technology was the main cause for the change from a craft-based society to an industrial society that enabled utilising the economies of scale and producing standardized products in large volume, which called mass production. Then, as the world moved from the industrial to post-industrial eras, there were major developments in technology in order to respond to the global changes. Because these inflexible production and management systems failed to perform effectively in the post-industrial era (Vonderembse *et al.*, 1997). Goldhar and Jelinek (1983), McNair and Norris (1988), MacDuffie *et al.* (1996) and Nahm and Vonderembse (2002) stated that the concept of economies of scope replaced the concept of economies of scale, which requires firms to build volume across a production facility by quickly and economically producing a variety of product at decreased volume per product. Goldhar and Jelinek (1983), Doll and Vonderembse (1987) and Jonsson (2000) concluded that all

these technological advances such as CAD, robots and flexible manufacturing systems (FMS) and ideas such as economies of scope offer opportunities to capture flexibility and efficiency at the same time. Thus, this lead to delivering products and services to customers who required satisfaction across multiple criteria, such as cost, quality, delivery, flexibility, time and service. Walton (1985) argues that the technological advances that are prevailing in the post-industrial era, affected management practices, which, in turn; continue to develop to absorb changes in technology.

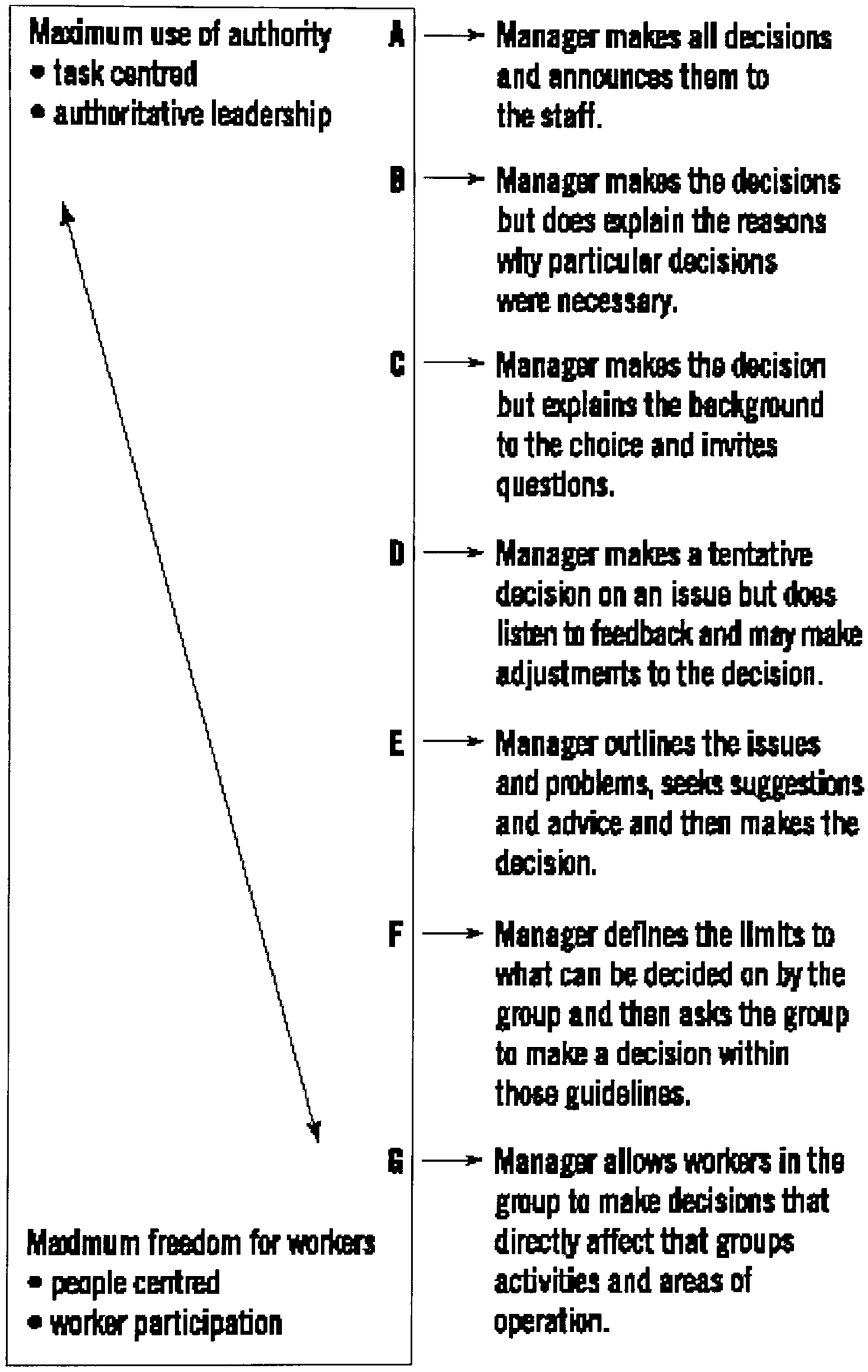
5. Management Style

Fowler and Fowler (1996) and Connolly (2006) stated that one of the most obvious manifestations of management practices is the style of management adopted in an organisation. Management style has been defined as 'the distinctive manner, pattern or approach of individuals or entities in doing something'. Purcell and Grey (1986) and Purcell (1987) stated that management style is 'the existence of a distinctive set of guiding principles, written or otherwise, which set parameters to, and signposts for, management action in the ways employees are treated and particular events handled' (Purcell, 1987: p. 267). Park (1996) Rees and Porter (2001) point out that management style can be categorised on the basis of four determinants: firstly, how managers make decisions; secondly, how managers handle information; thirdly, how managers build social relations with other individuals in the organisation; and finally, how managers exercise control and motivate others. Therefore, it is expected that the role of the manager will vary greatly with the size of the organisation, its goals and immediate needs.

Biddle (2005: p. 1) stated that 'the manager is the one who utilises the available resources of an organisation in an efficient way in the process of achieving the organisations' goals'. Leadership or management style should help the manager achieving that goal, thus, these styles may and probably will vary as conditions and circumstances change. There is a range of styles that leaders can adopt, a range of techniques that can be used and a range of skills and personal characteristics that can be valued and appreciated. The contingency management approach requires managers to possess a broad repertoire of management styles, to be used as the situation requires. Robbins and Mukerji (1994) and

Biddle (2005) devised an authoritative–participative continuum that indicates the range of management approaches when managers are exercising and delegating authority and encouraging worker participation. They stated that most managers do not rely on just one particular style of leadership; most would adopt a style that ranges from authoritative leadership style (autocratic style) to a participative style (democratic style) of leadership. Thus, this approach suggests that managers may have to adjust their styles from autocratic to democratic (and vice versa) as conditions change (see figure 4.4).

Figure (4.4) The authoritative-participative continuum



Source: Biddle (2005)

Dimitrova (2003) and Clear and Dickson (2005) define 'Management style' as the manner in which management exercises control over its workers. They contrasted two models, Fordist against Post-Fordist styles of management, which have different

implications for worker autonomy. They explained that a 'Fordist' style implies strictly prescribed tasks undertaken by employees and overseen by a hierarchy of managers and supervisors. In this style, decision making is centralized, therefore, the room for workers to exercise discretion is limited, and hence, worker autonomy may be low. On the contrary, a 'Post-Fordist' style implies flatter management hierarchies and more flexible and less bureaucratic forms of work organisation. In this style, decentralized decision making allows workers greater discretion over tasks, and hence, worker's autonomy may be higher than the other style. This Post-Fordist style is the equivalent to the participative style that gives staff the opportunity to have an effective say in administrative decision-making and guarantees that such decisions are not secret, closed to questioning or the outcome of one persons will or judgment.

In a different view to management style, McGuire (2005: p. 317) stated that '*Management style* is a term often used to describe the 'how' of management. However, she argues that it was believed that there were only two basic management styles; namely, autocratic and democratic. The autocratic style is used to instruct and command and managers who use this style impose their decisions on staff and expect or demand compliance, however, the democratic style allows decision to emerge from a consensus'. Thus, she identified four basic styles that she believes a manager should use, which are directing, supporting, coaching and delegating. In reality, she contends, many of the other management styles are components, of or overlap with, these four basic styles. She suggests that 'directing' style is good for new staff who need supervision to get started. 'Coaching' style is better for people who have some competence but lack commitment or need supervision because they lack experience. 'Supporting' style should be used for those who have competence but lack confidence or motivation. Finally, managers should use 'delegating' style for people who have both competence and commitment and who are able and willing to work on a task with minimum supervision (p. 319).

6. Reward Systems

Buchanan and Huczynski (1997) stated that 'a reward system aims to motivate people within an organisation. The term motivation can be defined as the social process through

which some members of the organisation try to influence other members, to work harder, work smarter, work more effectively'. They argue that organisations as social arrangements are dependent on being able to motivate people to join up in the first place, to stay with the organisation, and to perform at acceptable levels.

Kerr and Slocum (2005: p. 130) stated, 'The reward system defines the relationship between the organisation and the individual member by specifying the terms of exchange. It specifies the contributions expected from members and expresses values and norms to which those in the organisation must conform, as well as the response individuals can expect to receive as a result of their performance'. They stated that reward systems are concerned with two major issues: performance and rewards. Performance includes defining and evaluating performance and providing employees with feedback. Rewards include bonus, salary increases, promotions, stock awards, and perquisites'.

Katz and Kahn (1966) indicate that an organisation has the potential to remain viable only so long as its members choose to participate and engage in necessary role behaviours. They particularly mentioned three behavioural requirements that need to be fulfilled in order for an organisation to be effective. These behavioural requirements are; people must be attracted to join and further remain in the organisation, people must perform the tasks for which they are hired and must do so in a dependable manner, and people must go beyond this dependable role performance and engage in some form of creative, spontaneous and innovative behaviour in their work environment. In a similar manner, March and Simon (1958) emphasise the fact that for any organisation to be effective, they must come to 'grips' with the motivational questions of what stimulates human behaviour. As it is the only way, the organisation can affect the individual's decisions of joining and remaining within an organisation, and to put forth energy and effort at the rate and direction demanded by the organisation.

Merchant (1989) stated that it is of great significance whether the performance measures are appropriately designed and implemented to fulfil their potential contribution to managerial motivation and control to the utmost. Because in practice, not all systems of

performance measures and their related rewarding systems appear to be equally effective in their motivational function, probably for not taking into consideration the environmental conditions that the organisation has to operate. Fisher and Govindarajan (1993) stated that compensation scheme design is a form of management control that can be used to align the interests of corporate managers and operational managers. They point out that superiors must decide what approach to take in determining a specific bonus amount for subordinates. This bonus might be based on a strict formula-based plan tied to performance on quantifiable criteria. Alternatively, the incentive bonus amounts might be based solely on superiors' subjective judgment or discretion. However, what determines which type of bonus schemes to be followed, is the amount and type of uncertainty facing the business. They recommended that incentive bonus amounts should be based on a combination of formula-based and subjective (non-formula) approaches. By then, incentive compensation can be used as a powerful tool in the dynamic environment to insure that the manager is making the proper decisions.

In the same line, prior research indicates that goals' achievement under conditions of greater uncertainty requires a more subjective approach towards the determination of the incentive bonus (Hayes, 1977; Hirst, 1983: Govindarajan and Fisher, 1990). Fisher and Govindarajan (1993) stated that this could be due to the ability to predict the conditions surrounding the business is more accurately under stable environmental conditions than under dynamic and changing conditions. Thus, the greater the uncertainty, the more difficult it is to prepare satisfactory targets which could become the basis for financial incentives. Quantifiable performance measures alone would not be adequate to measure managerial efficiency and performance under uncertain conditions. This gives rise to flexible or subjective bonus schemes, which are designed to deal with uncertainty.

Johnson and Welsh (1999) stated that, traditionally, the company used to offer financial rewards, which was the common in all industries, such as gain sharing, employee recognition programs (such as nominating an employee of the month), and token gift giving (such as providing holiday gift certificates for all employees). However, Nelson (1994) stressed the importance of the nonfinancial rewards. He suggests that money is not

the best motivator or reward. He gave an example with some studies dating back to the 1940s that mentioned that employees have ranked other items as being important as salaries. For example, 'open communication' was ranked most highly in importance among workers, with salary being ranked 16th and 'being appreciated' for work well done and having an interesting work environment were also highly rated. However, he argues that non-financial rewards are not effective unless pay levels are considered to be satisfactory and appropriate.

7. Environmental Uncertainty

Govindarajan (1984) stated that environmental uncertainty means 'the unpredictability in the actions of the customers, suppliers, competitors and regulatory groups that comprise the external environment of the business unit' (p. 127). In addition, Fisher (1995a) defines environmental uncertainty as (1) lack of information regarding the environmental factors affecting a given decision-making situation, (2) not knowing how much the organisation will lose if a specific decision is incorrect, and (3) the difficulty in assigning probabilities with any degree of certainty as to how environmental factors are going to affect the success or failure of a decision. Milliken (1987) stated that environmental uncertainty is a central concept when explaining the relationship between organisations and their environments. Matthews and Scott (1995) pointed out that 'multiple definitions of environmental uncertainty have been offered in the literature, including lack of knowledge for decision-making (Duncan, 1972; Lawrence and Lorsch, 1967; Thompson, 1967); choice (Child, 1972); complexity (Galbraith, 1973); unpredictability (Cyert and March, 1963); and turbulence (Emery and Trist, 1965)'.

Hirst (1981) and Govindarajan (1984) argued that a contingency framework has been proposed that links environmental uncertainty and performance evaluation. The relationship emphasizes that the greater the environmental uncertainty, the greater would be the need for superiors to rely on subjective rather than objective approaches in evaluating the subordinate's performance and in deciding the subordinate's incentive bonus amount. Because a manager must be able to predict the conditions that will exist during the coming year, however, it is possible to predict these conditions more

accurately under stable environmental conditions than under dynamic and changing conditions.

Thompson (1967) and Govindarajan (1984) have explained that complete knowledge about cause-effect relationships exists under stable conditions and incomplete cause-effect knowledge exists under uncertain conditions. They point out that, in a situation with high environmental uncertainty, financial data –objective approach- alone would not adequately reflect managerial performance whereas such data would be adequate for a situation with low environmental uncertainty. Thus, they stated that the need arose for other nonfinancial measures-subjective approach-, as the financial performance measures alone are not adequate to measure managerial efficiency under uncertain environmental conditions. In addition, the emphasis of financial performance indicators is on outcome rather than on process. Therefore, a manager may have control over his actions but not over the states of nature, which combine with his actions to result in outcomes. Jauch and Kraft (1986) and Matthews and Scott (1995) stated that research on environmental uncertainty has shifted from `objective' to `subjective' environmental uncertainty because researchers agree that subjective environmental uncertainty mediates the relationship between the objective environment and a firm's strategic response. As Jauch and Kraft (1986: p. 784) pointed out that the objective environment, however, can be an important factor for organisational design or performance.

Duncan (1972) distinguishes an internal environment, which consists of physical and social factors within the boundary of the organisation from the organisation's external environment, which is the context in which enterprises operate. Waterhouse and Tiessen (1978) argue that external environmental factors such as economic or political changes might force management to redefine or modify the organisation's output, which would result in exceptional cases for converting raw material and thus, this might influence management practices and technological level in the firm. Waterhouse and Tiessen (1978) proposed that each factor in the internal and external environment has a simple-complex and a static-dynamic dimension. The static-dynamic dimension, defined as the extent to which factors are subject to change over time, is an important contributor to

uncertainty in decision making. Thus, it is suggested that factors in the organisation's environment might be mapped on a certainty continuum ranging from highly predictable to highly unpredictable. In the same vein, Jauch and Kraft (1986) summarized three different approaches to environmental uncertainty: a classical view, a transition view and a process view. The classical view describes external environment as a source of uncertainty, where the reality of the objective environment influences decisions, structure and performance. However, in the transition perspective, the source of uncertainty is both external and internal, because some might suggest that decision-makers have choices and can influence the environment. Concerning the process view, it tends to ignore objective properties of the environment. As the internal factors influence decision-maker's perceptions, it is argued that these perceptions mediate the link between uncertainty and system characteristics (see for example, Lawrence and Lorsch, 1967; Duncan, 1972; Downey and Slocum, 1975; Van de Ven *et al.*, 1976; Tung, 1979; Nahm and Vonderembse, 2002).

8. Organisational Size

Organisational size[15] has been a classic dimension in organisation research. Blau (1972: p. 3) defined size as 'the scope of an organisation and its responsibilities'. Different sizes mean different degrees of difficulty in forecasting, planning, coordinating and controlling the company's internal activities. Organisational size has been used in many types of research; for example, firm size has been investigated in terms of its relationship to profits (Stekler, 1963; 1964; Samuels and Smyth, 1968; Herendeen, 1975), organisational structure (Blau, 1970; Child, 1973; Amburgey and Dacin, 1994), job satisfaction and performance (Meltzer and Salter, 1962; Ingham, 1970), business planning (Gilmore, 1971; Wheelwright, 1971) and the use of business performance measures (Franco-Santos and Bourne, 2005).

The literature is divided into two groups, which in the first sees size as a structural characteristic of an organisation. This line follows Weber (1947) who argued that

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[15] However, size used to be a troublesome concept with scarce theoretical attention (see for a detailed review; Kimberley, 1976).

bureaucratic elements emerged in larger organisations. This means that larger sized organisations are characterised by a larger number of rules and procedures and more exhaustive forms of planning and control, which aim to keep to a minimum the uncertainty that is connected to an insufficient knowledge of all the ways of functioning of the company (Pugh et al., 1968; Blau and Schoenherr, 1971; Child and Mansfield, 1972; Mintzberg, 1989, p. 106; Moreno-Luzón and Peris, 1998). The other literature deals with the contingency perspective where size is seen as one of the elements of the organisations context that has been investigated as decisive for organisational structure (Iversen and Foss, 2000; Franco-Santos and Bourne, 2005). Research has shown that size is one of the main factors in predicting specialization (Pugh *et al.*, 1969a) and organisational control strategies (Child, 1973; Meyer 1972). Iversen and Foss (2000: p. 4) stated, 'As organisational size seem to affect specialization and control strategies, it is plausible that it may affect the need for a more comprehensive network strategy too. It is reasonable to assume that managers in larger organisations need a larger network range due to the complexity that follows organisational size. The larger the organisation is, the more diverse information from the environment is needed. This may require a broadly ranged network where the manager builds relations to a variety of actors'.

Kimberly (1976) and Hopkins (1988) stated that organisational size has been measured using numerous empirical measures; for example, firms capital, firms sales and number of employees amongst others. Hall (1977) stated that there is certainly no single ideal measure of a concept as broad as the organisational size. However, the two most common measures are employment (number of employees) and firm assets (capital). Some researchers have assumed that these two measures are interchangeable and provided some evidence to support this (For example, Agarawal, 1979; Bates, 1965; Pugh *et al.*, 1969a; Hall, 1977; Shalit and Sanker, 1977). In the contingency-based studies, there is evidence that the most common measure for organisational size is the number of employees, as Hopkins (1988) stated that the studies that address management practices or organisational behavior are interested in the effect of number of people on different factors such as human relationships and administrative control mechanisms.

4.8 Summary

Through a thorough review of contingency theory literature, it was revealed that the field of accounting was tentatively developing contingency ideas and realising the importance of dealing with the organisation as an open system that is interdependent with its environment (Otley, 1980; Miller, 1981; Scott, 1998; Clegg and Hardy, 1999). The main idea of contingency theory proposes that all organisational forms have latent strengths and weaknesses; however, a specific operating context will draw out specific strengths and weaknesses (Dent, 2001 in Sorge and Warner, 2001). In other words, as stated by Donaldson (1996), the organisational effectiveness is dependent on the correctness of 'fit' between the context in which the organisation works and the management form adopted. Ittner and Larcker (2001) stated that contingency theory contends that there is no universally applicable system of management control and the choice of an appropriate system depends on the circumstances surrounding an organisation and the factors that affect the use of these systems.

Rayburn and Rayburn (1991) and Selto et al. (1995) summarise the strengths of contingency theory by stating that no other theory directly concerns fit state; the intuition behind the theory continues to be appealing; and the identification of optimal forms of control under different operating conditions is unique. In addition, attempts were made to overcome some of the limitations of this theory. For example, variables suggested by the current study were well-defined; multiple regression analysis is utilised to take into consideration the interaction of multiple causes of different contingencies to determine the overall effects on the dependent variables; and this research follows the pluralistic approach that combines and utilises both quantitative and qualitative methods to overcome the positivist stance levelled at this theory.

Finally, the argument of contingency theory that there is a best fit for each organisation depending on the contingent factors would seem to have sufficient validity and applicability to form the basis of giving clear guidance to reach the suitable performance measurement system.

Chapter Five

Egypt: The Context of the Study

5.1 Introduction

The fifth chapter aims to highlight the characteristics of the Egyptian society, which affect all the organisations working in Egypt. It draws attention to the significance of the increasing private sector role in the Egyptian economy. It also describes the Egyptian stock exchange. The Egyptian economy, like that of many emerging markets, has been characterized by significant government involvement through state ownership of organisations and through extensive regulation of market conditions, including foreign trade and financial services.

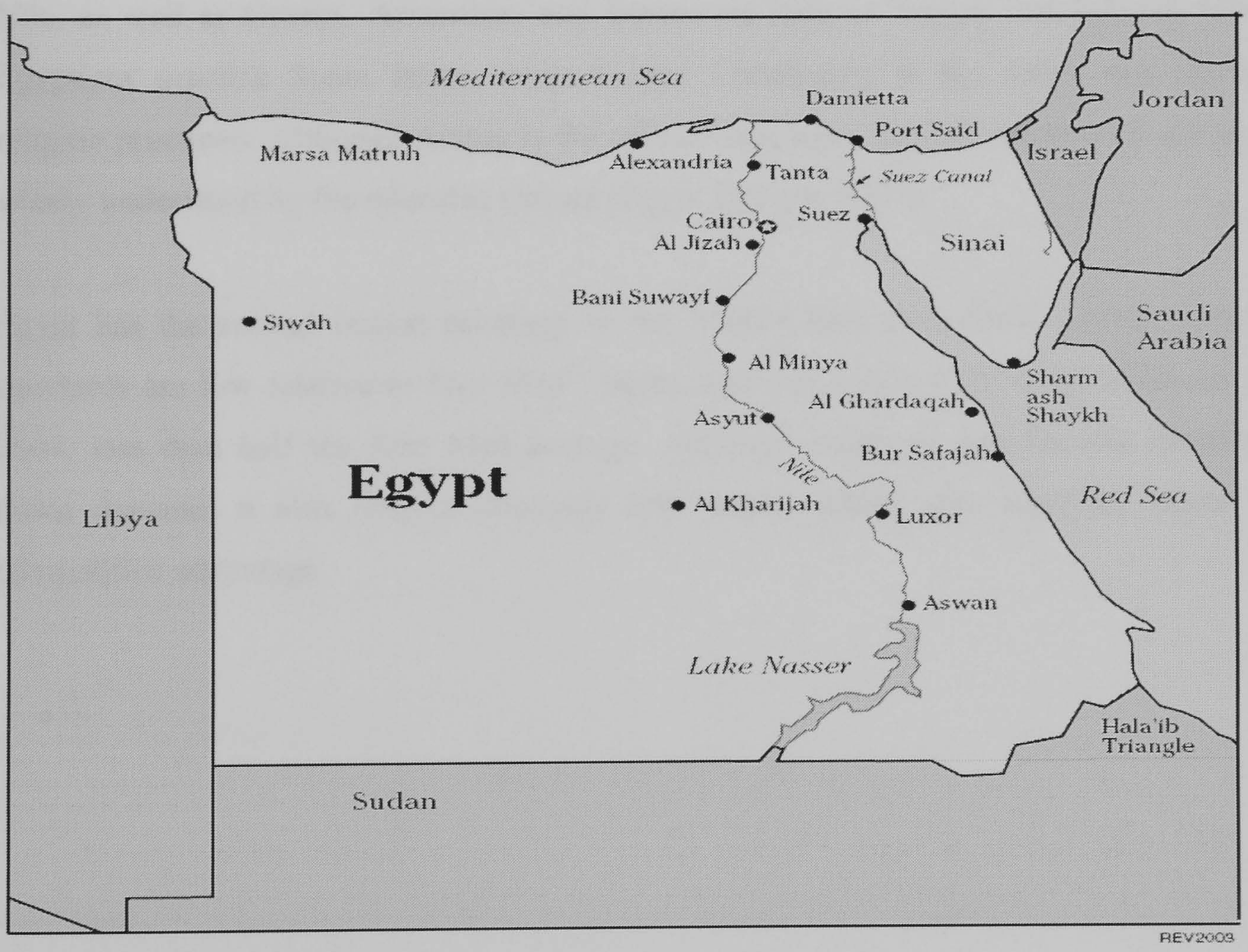
The chapter consists of eight sections of different literature about Egypt as follows:

- The first section gives some geographical and demographical information about Egypt that helps highlight Egypt's importance;
- The second section explores Egyptian culture as an important factor to be studied;
- The third section focuses on the political evolution to highlight how the political system developed in Egypt;
- The fourth section reviews the Egyptian political economy that stressed the governmental reforms' vital role in driving or restraining economic policies;
- The fifth section discusses the role of stock exchange market and privatisation;
- The sixth section focuses on accounting practices in Egypt and reviews the historical changes in accounting in order to know how these practices have been evolved in this society. In addition, it discusses the previous management control studies undertaken in Egypt;
- The seventh section examines some of the contingent variables that might affect the use of performance measurement techniques in Egypt; and
- Finally, the eighth section provides a summary that briefly explains why Egypt was chosen as the context of this study.

5.2 Geographical and Demographical Information

Egypt is located at the corner of north-east Africa; it has boundaries with three countries. Natural boundaries comprise significant lengths of coastline with the Mediterranean Sea, Gulf of Suez, Gulf of Aqaba, and Red Sea see figure (5.1). The geographical location is significant for trade, as Egypt has this access to both the Mediterranean and the Red Sea. Egypt's location has played, historically, a crucial role for stability and political alignment between the great powers, in addition to regional development. Also, its proximity for the Arabian Gulf countries with their very important oil resource, and its involvement in the Arab-Israeli peace process, in the 1970s, has enhanced its contribution to stability in the Middle East and North Africa in that period (Nyrop, 1982; Chase *et al.*, 1996).

Figure (5.1) Egypt Country Map



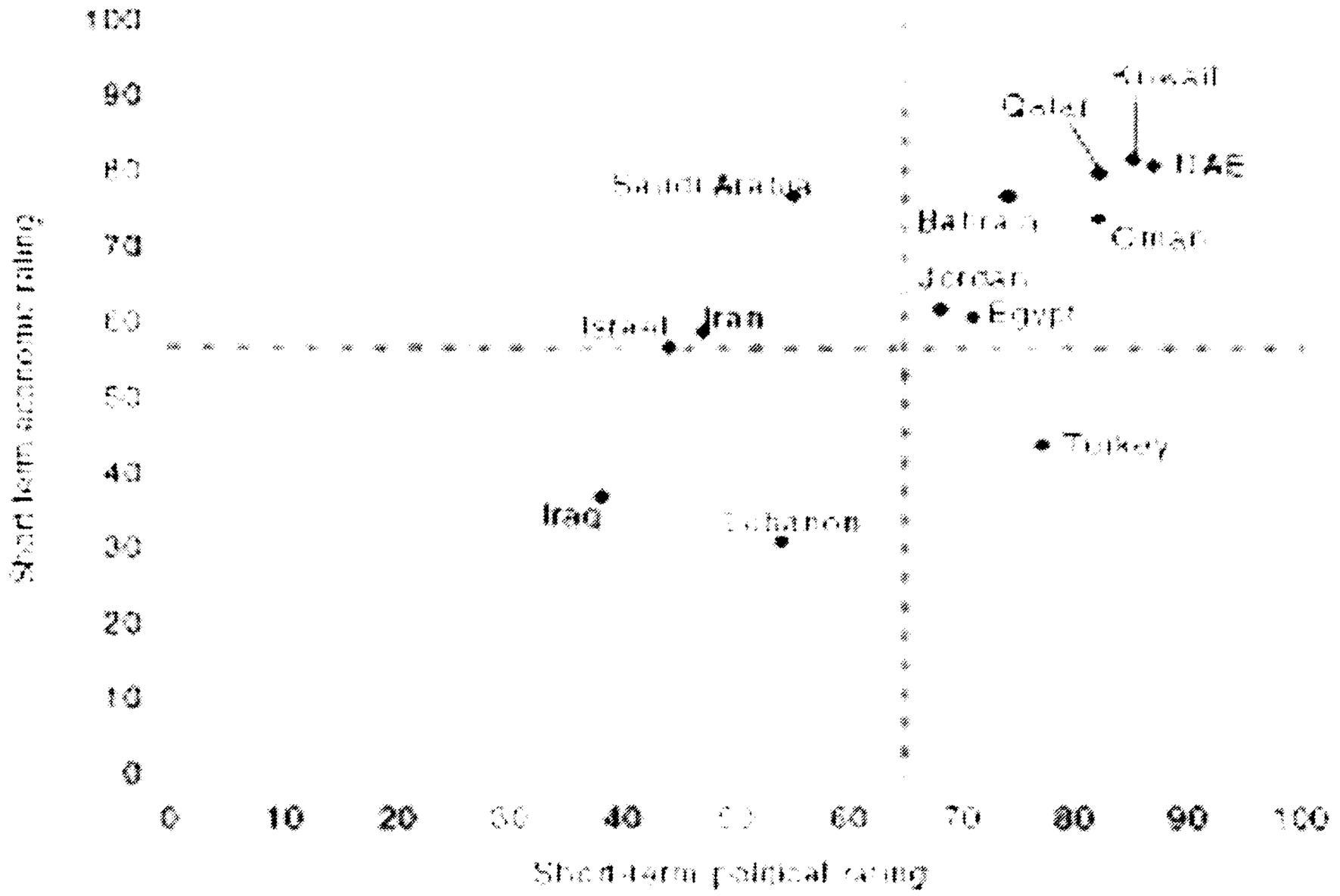
It became a republic in 1952 and the official name is the *Arab Republic of Egypt (ARE)*. Its capital is Cairo. The currency is the Egyptian pound (E£). Egypt's population exceeds 76 million (76,117,421 in 2004). It spreads over an area of 386,000 square miles (1,001,450 sq. km.). The Egyptian population is clustered on 4 percent of the total area, which is mainly in the delta and a narrow strip along the Nile valley and the northern coast (Hatem, 1994). These regions are among the world's most densely populated, containing an average of over 1,540 persons per square kilometre (3,820 per square mile). The Egyptians are a fairly homogeneous people of Hamitic origin originally from northern and north-eastern Africa and the Canary Islands, including the Berbers of North Africa; the Fulas, Tuaregs and Tibbus of the Sudan; the ancient Egyptians; as well as the major Ethiopian peoples. Mediterranean and Arab influences appear in the north, and there is some mixing in the south with the Nubians of northern Sudan. Ethnic minorities include a small number of Bedouin Arab nomads in the eastern and western deserts and in the Sinai, Berbers to the west, some 50,000-100,000 Nubians clustered along the upper Nile, as well as Greeks, Armenians and Europeans such as French and Italians. Most Egyptians practice Sunni Islam, while Coptic Christianity is the major non-Islamic religion practiced. Although Arabic is the official language, English and French are also widely understood by the educated classes (Egypt Review, 2003).

Egypt has the second largest economy in the Middle East after Saudi Arabia. Living standards are low relative to East Med[16] peers, with per capita GDP of US$1281.68 in 2004, less than half the East Med average. Although relatively low income dampens down demand, it also reflects relatively low wages, which give Egyptian labour a competitive advantage.

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16 Mediterranean Sea countries

Figure (5.2) Axes cross at emerging markets average



Source: Egypt Business Forecast Report (2004)

Per capita GDP is expected to continue falling, due to high population growth, unless GDP growth increases dramatically. Egypt's growth is below the average for the Middle East and North Africa (MENA) region as a whole, largely because the country is not a major oil producer. Egypt has a good economic-political rating among other emerging economies see figure (5.2). Moreover, Egypt is likely to benefit from strong growth in neighbouring states, particularly since intra-regional tourism has emerged as an important market (Egypt Business Forecast Report, 2004).

5.3 Culture Background

The word "*culture*" itself has several meanings. Watts (1994) pointed out that there are over 150 significant definitions in current use. Hofstede (1980; 1991) defines culture as the collective programming of the mind which distinguishes the members of one society from another, in which those members with or without having contact have something in common. Adler and Jelinek (1986, p. 74) prescribed culture as "a set of taken-for-granted

assumptions, expectations, or rules for being in the world. A paradigm, map, frame of reference, interpretive schema, or shared understanding". Erez and Earley (1993) summarized culture as the set of characteristics common to a particular group of people.

Culture has been shown to be a major factor affecting the structure of business and society (Adler, 1983a, 1983b, 1986; Hofstede and Bond, 1988; Jaeger, 1986) and, latterly, accounting (Bloom and Naciri, 1989; Gray, 1988; Perera, 1989). Hofstede (1991) and Kantor *et al.* (1995) argue that developing countries in general, and Arab countries in specific, have been shown a level of homogeneity in cultural, legal, and religious terms. Hofstede (1991) distinguishes between nations and societies. He suggests that the concept of a common culture is more applicable to societies than to nations. However, he recognizes that where there are strong forces for integration within a nation such as a dominant language, common history, dominant religion, common mass media, national education system, national political system, national armed forces and national representation in sports events, then nations can be regarded as the 'source of a considerable amount of common mental programming of their citizens'(p. 12). On the organisation level, many researchers state that organisation of the business enterprise, as well as practices common to its members, invariably occur within a cultural context (Laurent, 1983; Kogut, 1991; Gibson, 1994; Parnell and Crandall, 2003). Hofstede (1991) and Kantor *et al.* (1995) stated that a unique culture exists whenever a group of people share distinctive beliefs, norms and customs. In respect to the cultural aspects in Egypt, as an example of the Islamic developing countries, it has been portrayed as highly masculine and uncertainty avoidant with a large power distance and a low individualism or collectivist perspective on life[17]. Hence, Egypt was ruled for about 18 years with the

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[17] The four cultural constructs employed by Hofstede (1984) can be defined as follows:
Individualism: a preference for a loosely knit framework in society where individuals take care of themselves and their immediate family only. Its opposite, collectivism, is a preference for a tightly knit social framework.
Power distance: the extent to which society's members accept that power in institutions and organisations is distributed unequally. People in large-power-distance countries accept a hierarchical order in which everyone has a place needing no further justification.
Uncertainty avoidance: degree to which society's members feel uncomfortable with uncertainty and ambiguity. Strong uncertainty avoidance societies maintain rigid codes of belief and behavior and are intolerant of deviant ideas and behaviours.
Masculinity: preference for achievement, heroism, assertiveness and material success.

central planning and state-owned institutions. Gray (1988) argued that societal culture or values would impact upon both the institutions of society and the values or beliefs of accountants. In turn, both of these will affect the accounting system. Specifically, he argued that a country whose culture is characterized by high uncertainty avoidance, large power distance, and low individualism would be expected to have an accounting system that may be characterized as generally secretive, conservative, and based upon statutory control, with little professional judgment exercised by accountants.

Egypt has endured as a unified state for more than 5,000 years, and archeological evidence indicates that a developed Egyptian society has existed for much longer. Egyptians take pride in their Pharaonic heritage and in their descent from what they consider mankind's earliest civilization. The Arabic word for Egypt is 'Misr', which originally connoted "civilization" or "metropolis" (Egypt Review, 2003). Archeological findings show that primitive tribes lived along the Nile long before the dynastic history of the pharaohs began. By 6000 B.C., organized agriculture had appeared. In about 3100 B.C., Egypt was united under a ruler known as Mina, who inaugurated the 30 Pharaonic dynasties into which Egypt's ancient history is divided, the Old Kingdom (2700–2160 BC), the Middle Kingdom (2119–1794 BC) and the New Kingdom (1550–1070 BC). The pyramids at Giza (near Cairo), which were built in the fourth dynasty, testify to the power of the Pharaonic religion and state. The Great Pyramid, the tomb of Pharaoh Khufu, also known as Cheops, is the only surviving monument of the Seven Wonders of the Ancient World. Ancient Egypt reached the peak of its power, wealth, and territorial extent in the last period called the New Kingdom (Bureau of Near Eastern Affairs, 2004).

Ezzamel (1997) stated that ancient Egypt evolved a redistributive social, political and economic system, which remained prevalent for most of its long history. The social, political and economic domains were coordinated by a powerful bureaucracy in which accounting played a major role.

Management theory and practice in Egypt can be traced to Joseph's analysis of the King's dream in the Book of Genesis (Akande, 1991). The Holy Quran reveals that Prophet

Joseph (1610-1500 BC) conducted management control functions through a successful 15-year-plan, which is a budget, in ancient Egypt. The plan relied on four pillars: the first was predicting the future and producing a plan. The second was to identify clear aims and goals. The third was to ensure smooth implementation of the plan. The final stage was controlling all elements of plan implementation (the Holy Quran - Joseph, see verses 43-49).

Therefore, Egypt has a rich cultural and social tradition; in which Egyptians have developed their own unique culture, based on their long history and strategic location bordering Africa, Asia and Europe (Parnell and Hatem, 1999). In summary, ancient Egyptians have long been recognised by Egyptologists to have developed an obsession with bureaucratic detail. The Egyptian society had been described as a well developed bureaucratic system which reveals and shares a specific human trait, in which a deep satisfaction is achieved in devising routines for measuring, inspecting, checking, and thus as far as possible controlling functions (Ezzamel, 1997).

Humphreys (1996) acknowledges that religion is a major source of cultural perspective within any society that creates a similar culture. Abdel-Magid (1981) summarizes the major precepts of Islamic economics by stating that Islam is a religion that provides for an integrated way of life with prescribed codes for the social, economic, cultural, civil, and political fabric of society. He argues that the environment of accounting in Islamic countries would be characterized by political, social, and economic forces different from the forces found in the Western business environment. Specifically, Islam is the major religion in the Middle East, almost 94 percent of the Egyptian population (Safi, 2001). Sisk (1992) discusses the role of Islam in Egypt. He postulates that in the political culture of Egypt, state and religion cannot be separated either from a social and cultural point of view, or from a legal one, as Islam is the state religion. Abbasi *et al.* (1989) stated that the moral teachings of Islam provide comprehensive ethical guidelines for the effective conduct and control of business practices. Islam is a way of life and manages the universe's affairs on the basis of religion. Shahata (1999) explains that in order to please God and to be granted mercy in the Hereafter, the Islamic teachings are focused on a

balanced approach between material and spiritual values. 'Matter is the food of the body and ethics is the nutrition of the soul'. In Islam, everything that an individual undertakes, including management practices and all other functions performed in an organisation, is part of the worship of God (Saeed *et al.*, 2001).

In the Middle East, Islam is one source of the written laws and most of the legal environment surrounding business transactions. Najjar (1992) and Rice (1999) stated that Middle Eastern people are religious people closely attached to their religious beliefs and cultural identity. Saeed *et al.* (2001) emphasized that Islamic teachings are deeply rooted in the principles of equity and justice in business practices and offer a framework that creates values and elevates the standard of living of all parties involved in the exchange, while adhering to these principles and guidelines. This ethical framework is prevalent in various Muslim countries such as Egypt where beliefs, habits, ways of thinking and codes of ethics are consistent and shared among, almost, all members of the whole society.

In summary, the national culture of the Egyptian society, which stems from the common ancient history, *Islam* as the dominant religion, and a common language amongst many other similarities, is coherent. For this intra-country study and among the whole Egyptian companies' sample, culture effect is controlled and found to be consistent among all members of these companies. This is consistent with previous studies such as Hassabelnaby *et al.* (2003). They excluded tax laws, legal system and culture from their study since it was an intra-country study. They assumed that these excluded factors are country specific and remain relatively constant over time.

5.4 Political System Evolution

In the early nineteenth century, Egypt was ruled by Muhammad Ali (1805-48), an Albanian who seized power from the Ottomans. Ali, as pasha of Egypt, introduced modernization and industrialization policies that influenced the development of the country, attempting to build a diversified state-owned industrial structure. Ali also introduced cotton as a major export crop and it is still one of the primary sources of foreign exchange among the Egyptian agriculture products. Ali's policy was the major

reason for enlarging the public debts at that time. In 1887, this policy had led to the intervention of British and French creditors to establish the 'Caisse de la Dette' to control the fiscal receipts of the Egyptian government in order to repay the external debts (Ikram, 1980; Hatem, 1994).

In 1914, the British declared Egypt a protectorate until 1922 Egypt was recognized as a sovereign state but the British continued to maintain their military power in the country until the "Free Officers" seized power in 1952 and established a republic. In the period from 1952-1970, president Gamal Abdel Nasser was the ruler of Egypt. Egypt experienced a second surge in establishing a large industrial sector that was to be state-owned and operated (Ikram, 1980; Hatem, 1994).

Hassabelnaby *et al.* (2003) summarised the political development in Egypt by defining three distinctive stages of this evolution; the first stage of nationalization and dictatorship (1961–1973), then tendencies towards liberalization and democracy (1974–1985), and, finally, the stage of government's ambitious economic and political reforms (1986–1997). Nord (1974) and Benson (1977) argued that in the early stages, there was a tendency to undermine the negative aspects of the political environmental factors in favour of technical and administrative rationality; however, this did not turn up. Nevertheless, in developing countries, political objectives cannot be ignored as an influence on organisations. An example of the political objectives in that period is the deliberate use of public, state-owned, organisations to maintain a particular party system and to distribute patronage (Badran and Hinings, 1981).

The political system in Egypt, in the period after 1952, believed that the only way to achieve economic development and to increase the welfare of the society is through public and state-owned organisations. The political leaders by that time were faced with many social, economic and political problems. The previous government's policy was geared to the interests of a minority such as the big landowners, merchants, industrialists and the ruling family itself. Therefore, they started an economic development

programme, which would ensure both economic growth and distribution of income (Badran and Hinings, 1981).

Mabro and Radwan (1976) stated that a package of socialist laws was introduced in 1961. Over almost 20 years, public organisations became a permanent feature of the Egyptian economy. Unfortunately, as Badran and Hinings (1981) stated, the public sector suffered a number of major problems such as over-employment, because it was used to achieve the employment aims of the government which sometimes took precedence over notions of economic efficiency.

5.5 The Egyptian Political Economy

Belkaoui (1983, 1985) and Hassabelnaby *et al.* (2003) argue that the political environment could affect the development and use of accounting practices both directly and indirectly. The political atmosphere, in general, and political rights and civil liberties, in particular, have significant influence on the development and use of accounting practices. They explained that the political environment affects accounting in an indirect way through its effect on the national culture and the economy. The form of government, dictatorship or democracy, influences the national culture, which in turn influences the business environment in general and accounting environment in particular. In the same vein, Barro (1991) and Larson and Kenny (1995) believe that factors in the political environment, such as stable governments can significantly affect the economic environment, which in turn, may have an impact on the accounting environment. Hassabelnaby *et al.* (2003) stated that the evidence provided by the literature support the influence of the political system on the development of accounting practices and with increased democracy, it is found that both financial and management accounting exhibited a higher degree of professional influence, lower conservatism and lower secrecy. Therefore, the political freedom of a country affects, indirectly, the management accounting practices applied in different organisations working in this country.

Thus, it is of great benefit to give a feedback about how this political system has influenced the management practices in organisations. As shown earlier, in the period

between the mid-1950s and up to the mid-1970s, the public sector in Egypt had played the major role in all major sectors of the Egyptian economy such as banking, textile industry and insurance services amongst others. In the same time, government had placed ample restrictions on the private sector to the extent that opportunities for any private business were negligible especially in manufacturing (Hatem, 1994). During this stage of development, Ikram (1980) stated that reliance on central planning by the government had increased, as the only determinant of national economic policy. The government and the state-owned enterprises accounted for approximately 74 percent of gross investment; therefore, they became the biggest employers in the nation and acted as the main vehicle for growth.

In the 1970s, President Nasser's successor Anwar El-Sadat cut the military ties with the former U.S.S.R. and began to move the country from the centralized socialist economy towards market economy, which was known as the 'open door' policy (Economic Overview, 2003). Egypt introduced this in 1974 as a new economic measure. It aimed to liberalize the economic organisation of the country, reactivate the private sector –both Egyptian and foreign- by eliminating the obstacles facing this sector, and encourage growth through the incentive of competition; to encourage trade with the west, to promote western investment in Egypt, and to increase the productive activities such as the production of goods (Hatem, 1994; DTI – Egypt Desk, 1996).

In the 1980s, the Egyptian economy experienced sluggish growth, in which more sweeping economic reforms have come within the past two decades under President Hosni Mubarak. This problem was due to increasing unemployment (about 14 percent) and inflation, and foreign exchange shortages. In addition, Tessler *et al.* (1991) and Hatem (1994) stated that all these problems were compounded during the Gulf war due to the return of migrant labor and to a decrease in foreign earnings and revenues from tourism and the Suez Canal. Hatem (1994) points out that the changes in the economic and investment policies in Egypt, international joint venture firms, and multinational and private companies started to receive more attention. Therefore, the key elements of the reform program were: structural adjustment financing through the IMF-World Bank,

strong policy action to curb fiscal deficits and inflation, tax and policy changes, including large-scale privatisation of state industries, opening the economy to private (including foreign) investment, and pursuit of funding from a flexible range of sources to expedite needed development (EIU, 1995; Merrill Lynch, 1996; Economic Overview, 2003).

Egypt is currently one of many nations in the Third World implementing political and economic reform strategies (see for example; Hegazy, 1991). The Egyptian government is in the process of implementing a reform and structural adjustment program. The government tried to address the recurrent economic problems and imbalances that have beset the Egyptian economy over the last few decades, and then to reorient the economy towards an open market system and globalization. This included the promotion of the private sector and liberalizing the public sector so they can compete in the open market efficiently and effectively (Tessler *et al.*, 1991; Hatem, 1994). In order to be able to do so, the Egyptian government has passed a series of legislation that promotes and encourages potential investors to consider Egypt. It has also been active in formulating investment policies that significantly minimize bureaucratic procedures that may hinder future investors, allowing them flexibility and mobility to formulate their company policy with minimum governmental intervention (Sherif, 1990).

According to the HSBC report in 2003, these structural reforms and an IMF stabilisation programme, in the 1990s along with the collaboration with the World Bank, helped Egypt to improve its macroeconomic performance gradually over the period. The government was able to tame inflation, decrease budget deficits, and attract more foreign investment. Salaheldin and Francis (1998) stated that privatisation has been introduced, which was the core for its economic reform-transformation from public to private sector. They point out that this transformation increased the importance of the function of production management and it seems that the future holds enormous opportunities and challenges for production management

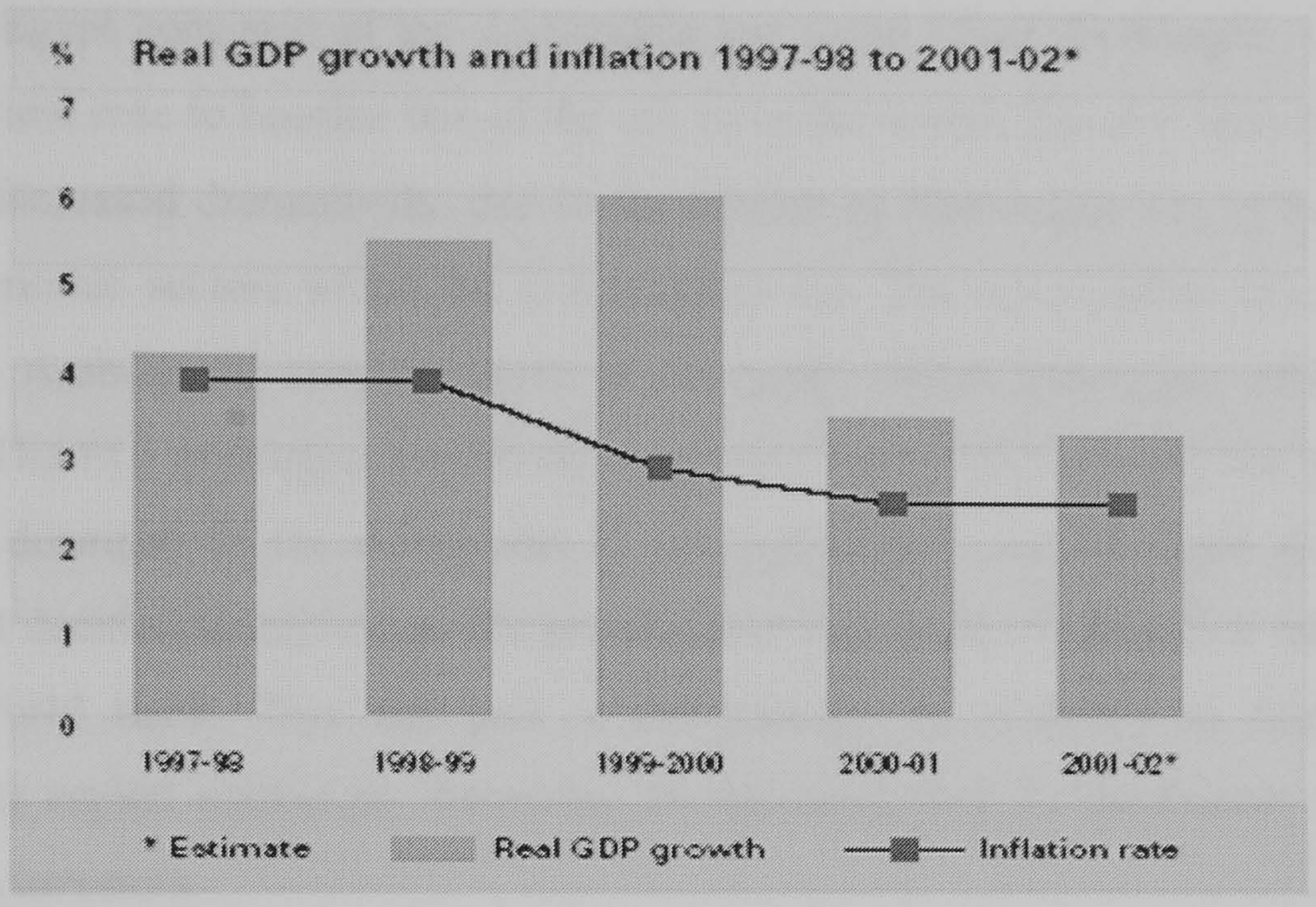
Furthermore, at the national level, Salaheldin and Francis (1998) stated that Egypt faces increasing regional and international competition, especially with the implementation of

the World Trade Organisation agreement (WTO). At the operational level, most of the manufacturing companies suffered from excessive inventory resulting from not making the right things at the right time. Manufacturing companies discovered that they should make their processes more efficient and effective. Therefore, many manufacturing companies in Egypt have revised, are revising or are considering the revision of their management control systems.

Recently, according to an HSBC report in 2003, especially, after 11 September attacks, the country slipped into an economic downturn when the pace of reform slowed down, and excessive spending on national infrastructure projects widened budget deficits. The global downturn also influenced the Egyptian economy through reducing foreign income from all sources including: oil, tourism, Suez Canal tolls, migrant remittances and external aid. Egypt applied a tight monetary stance to restore a macroeconomic balance.

In June 2002, tourism in particular recovered faster than expected and signs of improved monetary conditions were signaling a reversal of the economic downturn see figure (5.3) (HSBC, 2003). Real GDP growth slowed in 2000-01 to 3.4% from 5.9% in 1999-2000, and continued to fall in 2001-02, when real GDP growth was estimated at 3.2%. Per capita GDP rose to US$1,253 from US$1,170 in 2000-01 but remained well below the 1999-2000 level of US$1,432 (HSBC, 2003).

Figure (5.3) The real GDP growth and inflation from 1997/98 until 2001/02



Source: HSBC Business Profile Series – Egypt 2003

5.6 Stock Exchange Market and Privatisation

Many authors stated that, generally, the stock market promotes growth in any economy through business creation. Specifically, it is assumed that the innovations introduced by successful young firms generate technological spill-overs on future firms and, thus, feed the rate of technological progress. They contend that technological progress, in turn, raises the profitability of new businesses and the value of informed capital, so it encourages firms to go public early. Then, the rate of business creation rises, spill-overs boost technological progress, and a virtuous circle is completed. By the same logic, however, they argue that the economy may get trapped in a vicious low-growth, slow-recycling circle. In this case, encouraging young firms to go public can increase welfare (Caballero and Jaffe, 1993; Aghion and Tirole, 1994; Aghion and Howitt, 1998; Levine and Zervos, 1998; Greenwood and Jovanovic, 1999; Michelacci and Suarez, 2004).

The Egyptian stock market has a long history since 1882. This stock market was considered to be the fifth most active market in the world in the 1950s. Cotton had its

own exchange market, in this period, due to its importance and influence on the national economy (ACCE, 1995). According to HSBC report in 2003, formal stock market activity in Egypt consisted of the Alexandria and Cairo Stock Exchanges, which were established and rose to become one of the top 10 in the world. The activities of the Stock Exchange decreased dramatically, due to the process of nationalization, in the 1950s, in various economic sectors which led to a socialist era. The report points out that in this period, the Arab-Israeli conflicts were at the peak, which had major effects on the economy. The two exchanges continued to operate from 1960 to 1991 but trading was effectively dormant, to the extent that it was considered inactive, until the Egyptian government decided to implement the privatisation regime in collaboration with the IMF and the World Bank. This was part of the package to revitalize its economy, and specially, its capital market by improving its reputation and the confidence of national and foreign investors.

Abd-Elsalam and Weetman (2003) and HSBC (2003) stated that, in 1992, legislation was passed (Capital Market Law No. 95) to open the markets to foreign portfolio investment. In December 1993, the two exchanges were linked electronically to form the Cairo and Alexandria Stock Exchanges (CASE) and screen trading began. The Egyptian government began to believe that the first steps for real growth start with maintaining the stability and trust in the economy. In addition to raising new foreign capital, the government applied some policies to facilitate and encourage more Egyptian investors to look to domestic markets rather than continue to invest abroad. Hassabelnaby *et al.* (2003) argued that the development of stock markets significantly influences the accounting environment of any country, especially developing countries. The growing number of listed companies on the stock market creates demand for accounting and auditing services.

Hassabelnaby *et al.* (2003) stated that privatisation involves a shift to private ownership, whereby the role of government as the owner/manager of business enterprises is reduced by disposition to entrepreneurs and corporations. In other words, privatisation encompasses the transfer of property rights from the state to individuals and corporations,

or a reduction in state activities in an effort to remove barriers to entry for private ventures. They contend that improvements in the manufacturing methods took place as a result of the increasing role of the private sector in the Egyptian economy and were accompanied by performance measurement improvement in most organisations to cope with the global competition.

According to a group of reports, WEFA–October (1998), Egypt Country Monitor (2000) and DRI•WEFA (2001), Egyptian Privatisation Law 203, enacted in 1991, targeted 314 public-sector companies for privatisation. Recent government data indicates that around 40% of the total number of companies targeted for privatisation has at least been partially privatized during the years from 1996 until 2000. The government promised more and broader privatisation activity in years 2001/02, in energy and banking sub-sectors previously considered untouchable. The market, however, remains skeptical about the government's privatisation plans. However, privatisation of utilities will take longer, but Egypt will continue to seek some participation from private investors in sectors not subject to outright privatisation.

In the report of the Economic Overview in 2003, it was mentioned that the privatisation of state enterprises, a key component of IMF-administered structural adjustment program, was a policy goal during the previous decade. Actual sell-offs of parastatals[18] started slowly, prompting criticism from the IMF and others, but since 1996, Egypt's privatisation program has gained momentum, with a positive impact on both public finances and overall efficiency. Foreign equity participation in newly privatized companies and other joint stock ventures has brought fresh dynamism to Egypt's economy. Several hundred foreign-based firms now have branches in the country.

According to DRI•WEFA (2001), it was argued that since the government started privatisation, officials have faced numerous challenges in executing the privatisation program. Part of the problem is that the government has already sold most of the public-sector companies attractive to investors and is now left with loss-making companies

[18] Parastatals are units directly or indirectly controlled by state.

characterized by large work forces, large debts, huge unsold inventories, and obsolete technology. The government announced early in 2001 that it was taking some steps to privatize public-sector companies. First, the financial structures of loss-making companies will be reformed to get them out of debt prior to sale. Second, companies in troubled sectors, e.g., weaving and textiles, will be revamped to utilize foreign expertise where necessary. The management of the companies will be restructured to improve the performance of strategic sectors in which the state will retain a majority share. The greatest danger of a slow pace is that it allows vested interests more time to influence the direction of the process.

Privatisation studies in the Egyptian context turn out to be contradictory. Some studies, such as Abdel Fatah (1997), Sobh (1999), El-Hemidy (2001) and Ismail (2003) supported privatisation by stating that developing countries applied it in their economy in order to be released from public debt and to improve their economic and financial structure. They summarized privatisation's goals into four groups as follows: The first group is economic, which includes decreasing public expenses, increasing productivity for privatized organisations, increasing competitive advantages of organisations by improving a products' quality to satisfy customers, which at the end will increase overall revenues and possibly attracting foreign investments. The second group is administrative, which includes minimizing the governmental bureaucratic procedures, encouraging financial and administrative independence which will speed up work and improve the quality of provided services. The third is social, which includes improving the standards of living of medium and lower economic classes in the Egyptian society, in other words redistributing the GNP (Gross National product) across all classes in the society, increasing the role of private sector, which will increase the number of employment opportunities and increase overall growth. Finally, political goals exist mainly to reduce political corruption, in particular the use of politicians' positions to achieve personal gain.

A study[19] was undertaken in 2000, which concluded that privatisation has affected organisational performance positively and is reflected in improving profitability, controlling capital expenditures and decreasing the level of financial leverage.

On the contrary, Ismail (2003) undertook a study on a sample of 54 companies of the privatized companies listed in the stock market. The study indicated that no evidence is available to suggest performance improvement. The researcher referred to the economic circumstances, the state of recession in the whole world's economy in general, and in Egypt in particular. In addition to the Egyptian governmental myopia which led to ignoring other successful countries' experiments in this field such as those of certain developing countries like the Asian countries. He also stated that the main reason of failure was due to the unrealistic terms imposed by international financial institutions such as IMF and World Bank. Such terms have led to the existence of an ineffective stock market, ineffective reward systems in organisations and the continuity of the same bureaucratic culture in organisations both before and after privatisation.

Concerning the impact of privatisation on accounting practices, Hassabelnaby *et al.* (2003) pointed out that privatisation may impact the accounting practices in the developing countries environment. Government and state-control banks often provide capital to state corporation. For these corporations to be privatized, stockholders will mainly provide the capital. The accounting practices' requirements for the external environment are different from those required for government. Therefore, stockholders tend to require a more sophisticated level of control than that required by the government, stressing the need for effective performance measurement techniques that satisfy the shareholders.

In summary, Hassabelnaby *et al.* (2003) argued that when the economies of a country develop, through changes in the economic environment, the political environment, the capital market, and privatisation, this increases the need for the social function of

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[19] This study was conducted in collaboration between USAID and privatisation department in the public sector ministry on a sample of 28 companies of different privatized companies.

accounting to measure, control and communicate economic data. A number of researchers such as Frank (1979), Nair and Frank (1980), Cooke and Wallace (1990), Doupnik and Salter (1995) and Salter (1998) provide evidence on the importance of the economic environment for accounting practices' development, particularly in developing countries. The current study attempts to enrich our understanding of how management accounting systems are influenced in the Egyptian environment. In addition, it contributes and fills the gap in management accounting literature about such practices in the developing countries.

5.7 Accounting Practices in Egypt

5.7.1 The Development of Accounting Profession

In the last two decades, accounting history had become an important area of research. Carnegie and Napier (1996, p.7) state, 'Recent years have witnessed an explosion in the academic literature of accounting history, not only in the English language but throughout the world'.

Studies about the emergence of accounting systems and techniques in the context in which they operate are mostly drawn from American and European evidence (Johnson, 1981; Miller and O'Leary 1987; Bryer, 1993). Although there are different interpretations, little has been written on understanding accounting change in developing countries such as Egypt. Aba-Alkhail (2001, p.8) states, 'very little is known about the setting of standards and regulations in non-Western developing countries'. Some researchers on accounting systems in developing countries focus on the changes in the economic conditions to explain the changes in accounting systems.

Historically, Egyptians had made the choice to adopt the French Napoleonic Code, which can be traced back to the French occupation (1798-1805), as a basis of governance in preference to the system employed by their colonial supervisors, the British, but the actual accounting practices were mixed by both British and French rules (David and Brierly, 1985).

In the mid of the twentieth century, and specifically after the "Free Officers" revolution 1952, Abdel-Khalik (1966) stated that the majority of large and medium sized business firms were either half or wholly controlled through public ownership. Many governmental units have been responsible for controlling activities such as the Committee of National Planning, the National Committee of Statistics, the National Unit of Organizing and Controlling, banks and various ministries. A controller[20] was in each firm and their mission was to provide budgeting data to the upper governmental authorities[21]. After information has been provided to the upper levels, two steps in budget preparation remain, the first is to review the firms' initial estimates to coordinate and integrate the programs of different firms. The second is to consolidate the data of all firms, of the same functional body, into one budget to produce an initial estimate of the entire functional body. All these budgets were attached to the state appropriation budget for presentation to the Parliament for enactment into law. In a planned economy, it was apparent that the controller's responsibility for his firm's profits was limited since some of the profit factors were determined by centralized decisions. The central planners were providing the model of planning to control performance of the firm (Abdel-Khalik, 1966).

Briston and EL-Ashker (1984) trace the evolution of accounting in Egypt and describe in detail the philosophy and structure of its Uniform Accounting System, which was established in the late 1960s. However, they were more concerned about Western influence and describe in detail the content of the Uniform Accounting System. They share the idea that accounting system must change to respond to the changes in economic

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[20] The government's model charter of a corporation indicates the financial controller's responsibility for establishing sound internal control and auditing systems to insure proper use of firm's assets in achieving corporate objectives. Thus, the controller's main legal responsibility in protecting his firm's assets lies in establishing the procedural work and assigning responsibility for the performance of such procedures. Although the planning and budgeting function is regulated above the level of the firm by several central units, the controller of a firm is at liberty to use any approach he chooses in planning and budgeting for internal purposes. For example, he may prepare a flexible budget for internal purposes even though a fixed budget must be submitted to regulatory units above the firm.

[21] Using a model budget first provided in the Ministry of the Treasury's instructions, Budgets of Performance and Control, for 1965-66. These instructions state the minimum requirements of standard data and also contain the requirements of both governmental budget and business budget (see for more details, Budgets of Performance and Control for 1965-1966, Ministry of the Treasury, Cairo, December, 1964).

conditions. Mahmoud (1995) argues that the economic reform program implemented by the Egyptian government requires an improvement in accounting in order to play a role in advancing the rate of economic development. He stated that the organisation of the accounting profession in Egypt is weak as compared with that of developed countries; it needs some foundations such as independence, stability and organisation in order to achieve the objectives of the economic reform program.

Samuels and Oliga (1982) stated that the Uniform Accounting System was established, in Egypt, in 1966 and at the beginning of the 1990s, Egyptian Accounting Standards were implemented. Although there has been some research on accounting in Egypt, the focus has been on a single factor that is the change in economic conditions to explain the changes in accounting systems. The introduction of accounting standards is viewed in the context of the development of other types of events with emphasis on the national and local conditions under which it operates. They argue that the Egyptian state held all the power in society during the period of the introduction of the Uniform Accounting System, therefore, it represented a sovereign power and this is coupled with reason of state as a way of government. They contend that the state needed knowledge to govern after nationalization laws in which there was an expropriation of enterprises from their owners and this role was fulfilled by the Central Accounting Agency established in 1964 to control the accounts of public companies. Wahba (1994, p.104) states, the 'role of the Central Accounting Agency in the formation of a unified accounting is interesting as it gives an insight into the gradual nature of state control over the public sector'.

In the same vein, Moore (1975; 1980) points out that the Uniform Accounting System represented the interest of the state and accounting professional bodies had no role to play in its introduction. The need to create the Uniform Accounting System emanated from a central location that is the state. The Central Accounting Agency, which is a state agency, created the system and it was intended to provide all the accounting information necessary for planning and control at all levels of the economy. The professions in general were not participating in the formation or discussing state policies and their only function was to support the political regime and to create supporters for its policies.

Briston and El-Ashker (1984) and El-Nafarawy (1998) stated that the government of Egypt nationalized over 80 per cent of the country's investment during the 1960s. Most foreign companies and Egyptian private companies came under state control. The public sector began to play the major role in economic activities. The accounting profession was nationalized alongside the nationalization of business enterprises. The nationalized companies were classified into groups and government state agencies called Public Organisations were established to supervise each group based on the type of industry. The government employed many accountants who agreed to work as government employees but there was a lack of professional standards, requirements and conduct. Thus, a Uniform Accounting System was implemented in public sector companies, however, the Big Eight firms left Egypt in 1965 and the number of professional accounting firms was greatly reduced. Foreign accounting firms were prohibited from working in Egypt. Although this action helped the very limited number of Egyptian accounting firms, it had a negative impact on them in the long run as they were unable to exchange experiences and academic relations with foreign companies.

Briston and El-Ashkar (1984) stated that, during the 1970s, the situation changed dramatically. The introduction of liberalization policies encouraged the investment of foreign capital and many foreign companies were actively encouraged to invest in Egypt. The de-nationalization program provided a major stimulus for private sector accountants. Many of the foreign firms investing in Egypt insisted on local auditors in independent practice as opposed to subjecting themselves to government audit. Samuels and Oliga (1982, p. 84) point out that, consequently, many accounting firms were formed and grew rapidly. New pressure groups were founded. The 'professional accounting organisation grew in importance and stature'. Kayed (1990, p.321) stated that the profession was revived and by the end of 1980s they reached their "golden era". As a result, Renshall (1981) stated that many joint ventures were formed due to the Open Door Policy and accepted local auditors. The effect of this on the profession was energising.

However, Hammad (1991) and Tawfic (1991) argue that the Uniform Accounting System was coming under attack by the late 1980s and the beginning of the 1990s.

Although it was considered important for national purposes, it was hindering the development of the accounting profession. Accounting practices had been changed into something very routinized with no room for mental innovation or new initiatives. The development of accounting in different parts of the world was not taken into consideration because the Uniform Accounting System was dominant and there was a feeling that there was no need to change.

5.7.2 Previous Studies on Performance Measures

Most studies on performance measures were conducted either in developed countries (such as the USA, Europe) or in the newly industrialised countries (NICs). However, studies that addressed the developing countries practices were inadequate and insufficient. Thus, the current study attempts to fill the gap relating to the scarcity of the empirical studies concerning performance measurement techniques and the lack of related studies in less developed countries, such as Egypt. It is also to provide useful information which may permit managers and investors to get a better understanding on the factors that affect the implementation of performance measurement systems.

During the last decade of the twentieth century, several changes have taken place in the manufacturing business environment. Among these changes were the huge development in technology, communication, manufacturing tools and the intensive global and domestic competition. These evolving circumstances were accompanied by some severe changes in performance measurement techniques. These techniques represent a tool by which any company can improve and develop its performance. A number of studies stated that any organisation should not rely only on the financial measures but also on the nonfinancial measures. The combination of both measures takes into consideration the external and the internal factors, which affect any organisation's capability to achieve its strategic long-term objectives, as shown in Chapter Three.

For example, El-Dahrawy (1997) stated that financial statement's figures no longer reflect the economic state in the society accurately and precisely, especially with the existence of a large number of accounting techniques and environmental uncertainty. In

general, the theoretical framework of managerial accounting begins to consider some relatively new factors such as strategies, quality, manufacturing flexibility, high productivity and the use of non financial measures in performance measurement techniques. Therefore, in Egypt, there was an emerging and increasing need for new performance measures, which help overcoming these shortcomings and difficulties.

El-Sawafiry's (2003) study on service organisations in Egypt emphasized that there is a new tendency in Egypt to develop the area of performance measurement techniques. There were several reasons for the existence of such a tendency; Firstly, to maintain both vertical and horizontal communication in the organisation. Secondly, to rely on different and varied performance measurement techniques that would better explain and reflect the economy state. Thirdly, to guarantee disseminating the strategic vision to all individuals across all organisational levels through combining both traditional financial measures (lagging indicators) and contemporary non financial measures (leading indicators). El-Sawafiry believed that designing and using a combination of financial and non financial measures in performance measurement techniques will lead to well disseminating any organisation's strategic vision across its hierarchal levels. Finally, El-Sawafiry (2003) concluded that there are many factors that affect the design and the use of any performance measurement technique. For example, he stated that the number of measures included in the "Balanced Scorecard" should depend on the environment in which the organisation works. Therefore, the performance measures should not only be financial, customers, internal process and innovation measures but also could add other measures such as environmental measures. This depends on many factors such as the organisational activity, surrounding environment in which the organisation works, strategies, organisational structure and management style.

In the same vein, El-Kholy's (1997) study concluded that there is a trend in most of the service organisations in Egypt to use a combination of both financial and nonfinancial measures and that relying on the financial measures separately is no longer effective for any organisation. She found in her study on the banking sector in Egypt that many of the financial and non financial measures are applied in performance measurement with a

relatively high dependency on financial measures (such as profitability and productivity) and a relatively low dependency on nonfinancial measures (such as customer satisfaction, employees' motivation and technological acquisition). She recommended that organisations should focus on synthesis and decomposition of performance measures in order to reach the best combination of measures which fits the organisational activity and the surrounding environment.

In addition, Mostafa (1996) stated that the managerial accounting systems represent an effective approach to increase quality, which will improve overall organisational performance. Finally, Arabi (1997) stated that the importance of nonfinancial measures is very critical in measuring performance because they determine some aspects that financial measures cannot determine such as quality improvement and customer satisfaction of a company's products. Arabi (1997) in his study on one of the largest manufacturing companies in Egypt, namely, Alexandria National Iron and Steel Company, found that they use some non financial measures in their performance measurement techniques in order to assure overall quality which represents a long-term manufacturing strategy in the company.

El-Sayed (1999) in his study emphasized that severe changes in the business environment in general, and in the manufacturing technology in particular have taken place recently. For example, in the last decade of the last century, computers were widely and efficiently used by manufacturing organisations. This led to a revolution in the manufacturing methods which in turn caused the emergence of certain well-established techniques such as Total Quality Management (TQM) and Just in Time (JIT). Such changes encouraged the organisational development in general and developing performance measurement techniques in specific to cope with the increasing competition in the global market. On the other hand, El-Sayed (1999) stated that most of the Egyptian organisations are still using the traditional financial measures in performance measurement techniques, such as Return on Investment (ROI), Net Income (NI) and Return on Assets (ROA) amongst others. He proved in his study that there is still some delay in using other nonfinancial measures such as quality, customer satisfaction amongst other measures which affect

performance measurement negatively. Therefore, El-Sayed recommended that the Egyptian organisations should study other countries' experiments (whether developed or developing countries) in order to maintain and enhance their performance measurement techniques.

In summary, most of the results of multiple management accounting studies conducted in the Egyptian context agreed upon the importance of using non financial measures along with financial measures in performance measurement techniques. Financial measures fail to generate early warning signals about changes in the marketplace. Specifically, operations managers who are seeking improvements in manufacturing area, which is affected by non financial factors such as cycle time and defect rate. Therefore, it is argued that financial measures alone are not adequate as management decision-making tool (see for example; Baldwin and Clark, 1992). Also, it is proven that there is no ideal performance measurement system that suits all firms. Each company has to design its own performance measurement system that suits its situation and provides managers with the required information.

5.8 The Contingent Factors within the Egyptian Context

Enthoven (1978) points out that accountancy operates in a socio-economic context and the socio-economic activities and policies have a major bearing on accountancy. It is therefore not unreasonable to expect that accounting practices will generally reflect the environmental factors that influence business practice in any society. Kantor *et al.* (1995) argued that it is expected that accounting practices such as management control in Western countries could differ from those found in Arab countries. To some extent, due to these circumstances, it is advocated that Egypt could differ from Western countries such as France, the United Kingdom, or the United States in some aspects, but on the other hand, there would be some similarities. The difference between developing nations and developed nations is the relative emphasis on income measurement. In developed countries, where the majority of businesses are privately owned, income determination is of prime importance; in developing countries, although they have applied different privatisation programs, government ownership is still far more dominant.

Farashahi and Molz (2004) stated that the complexity of organisations' actions in developing countries and the emergent nature of their goals make the natural open system and contingency theory perspectives the most appropriate approach for analyzing them. Therefore, using an ecological level of analysis in a natural open system perspective to study organisations in developing countries, such as Egypt, would provide better understanding within a certain theoretical framework. In developing countries, the macro-environmental forces, especially at the national level, have the dominant role in shaping the nature of organisations, their activities and how accounting practices are shaped.

As a result, it is of crucial importance to identify some major contingent variables that might affect performance measurement (PM) systems in Egypt, as an example of the developing countries. Many studies have attempted to examine the relevance of contingency theory for management accounting, especially in developing countries (see for example; Badran and Hinings, 1981; Shenoy, 1981; Ayoubi, 1981; Conaty *et al.*, 1983). Previous literature highlights the major categories of these variables such as structure, management style, size, competition and technology amongst others (see for example; Pugh *et al.*, 1963; 1968; Child, 1972; Khandwalla, 1972; 1973; Sagafi-nejad, 1982). The following is a brief review of some of these contingent variables as they relate to Egypt.

1. Organisational Structure

Organisational structure is the recurring cycles of events which occur in organisations and which are predictable in a reliable way to minimize the number of exceptions in the behaviour of organisational members (Hall, 1977). In order to achieve its objectives, an organisation manifests itself in structural arrangements, which explicitly control individual behavior (Badran and Hinings, 1981). The function of structure concerned with holding an authoritative hierarchy of the whole entity of organisation together and give them a form rather than randomness, so it helps organisation to maintain consistency and stability and to relate parts together (Newman, 1973).

Organisational structure in Egypt was highlighted through three elements; namely, specialization, standardization, and formalization. Badran and Hinings (1981) stated that specialization refers to the available areas of staff functions. Standardization refers to the number of procedures and rules that an organisation has. Finally, formalization refers to the number of forms and documents that an organisation uses in applying its procedures, and in communication. They showed that most of the Egyptian firms scored high on written policies and job descriptions. They interpreted these results with the tendency in the society towards bureaucracy. The Egyptian enterprises were accountable to political, legislative, and executive organs. These enterprises were also subject to the imperatives of national planning prevailed for several decades. Accountability and planning necessitated receiving, handling, and sending large amounts of information and standardized procedures were introduced to facilitate this process.

Badran and Hinings (1981), in their study, concluded that there is an organisational control dimension of structuring activities, and that Egyptian organisations are more structured and more concentrated. Their results showed that there is convincingly support to the assertion that the level of structuring in public organisations will be relatively high in comparison with other organisations. Public enterprises used to play substantial role in driving the development of the Egyptian society, because they were/are part of governmental machinery and this increase the likelihood of exposure to rules and procedures. The requirements for information to and from public enterprise and government bodies necessitated the establishment of departments and rules to deal with those requirements. Badran and Hinings (1981), also, added that public enterprise in most countries is prone to bigness. The government steps in to reorganize industries in a way that is supposed to achieve economies of scale, the possibilities of planning and increased employment. The socialist aspect of the Egyptian economy added to structuring by increasing the number of activities that have to be regulated and standardized.

2. Management Style

Centralization refers to the locus of authority for making decisions. During the socialism era prevailing in Egypt after the 1952 revolution until mid 1970s, public-enterprise

organisations had become a permanent feature of the Egyptian economy (Mabro and Radwan, 1976). These circumstances gave rise to the autocratic stereotype of management because Egypt lacked market mechanisms and almost all decisions were approved at a very high level in the organisation. It is only decisions that can be clearly seen as having no policy connotations that were delegated or decentralized below departmental heads. However, Badran and Hinings (1981) argue that decentralization increases in Egyptian public enterprises as they increase in size. As organisations increased in size and increased the consequent decentralization, it was more difficult to continue the personalized 'boss' style management.

3. Organisational Size

Organisational size is one of the major variables that affect the use of performance measurement techniques. Historically, in Egypt, issued capital has been taken as a criterion for size. The company whose issued capital is below £.E. 10,000 is classified as a small business and may be privately owned (Abdel-Khalik, 1966). Small businesses are not considered in this study because the sample was restricted to only the medium and large sized manufacturing companies. Child (1972) suggests that an increase in size will lead to the adoption of a bureaucratic strategy of control, i.e. high emphasis on rules and procedures (standardization) and formal communication (formalization), and to less emphasis on centralization of authority. Also, size is strongly related to specialization. As size increases, so do the number of subunits within an organisation.

Many authors argued that size classification varies within regions and across countries relative to the size of the economy and its endowments. Organisational size, in management accounting studies, is usually determined by the number of employees and/or by the amount of their capital, as shown in Chapter Four. It is worth noting here that Egypt as one of the developing countries characterized by cheap workforce and hence, considered a labor-intensive country. Therefore, the number of employees is used as the determinant of organisational size. It is important to note that there are no strict or clear minimum or maximum intervals for organisational size for companies in the developing countries. It was agreed upon that, in the Middle East in general, and in Egypt

in particular, small enterprises are those that employ less than 50 workers, many of these enterprises would traditionally operate in the informal sector. Businesses that employ between 50 and 499 workers are referred to as medium enterprises. Finally, large state-owned or private enterprises employ a large number of workers over than 500 workers (see for example; Abdel-Khalik, 1966; Badran and Hinings, 1981; Radwan, 2001). The table below summarizes these figures. It is important to note that these figures are offered as rules of thumb rather than hard and fast categories.

Table (5.1) Organisational size categories (using number of employees)

	Small	Medium	Large
No. of employees	<50	50-499	500+

4. Technology

The technical system of an organisation interacts with the ongoing social and managerial system, which makes it one of the major influential factors on organisations (Hall, 1977). Mobarak (1992) highlighted the importance of advanced technology and its effect on managerial accounting application in general and performance measurement techniques in particular. He compared between the managerial accounting applications in three different countries, namely Egypt, Japan and the United States. He concluded that some dissimilarities among them were found because of different level of technology implemented in each country.

El-Sayed (1999) in his study on 64 companies of different industries stated that although the Egyptian organisations have started applying new advanced technology, this application is still very limited. He claimed that the business environment in Egypt did not learn from other countries' successful applications appropriately. His study concluded that although the relatively new manufacturing methods (such as TQM and JIT) aim at improving the competitive advantages of any organisation and encourage flexibility, a high percentage of the Egyptian organisations did not benefit from these methods. Sagafi-

nejad (1984) stated that the nature of recent industrial development in Egypt does not seem to have promoted broad capabilities comparable to other New Industrial Countries (NICs).

However, one positive aspect of the relatively early start in industrialization, in comparison with the other Arab countries, and the pool of skilled manpower of Egypt, is that Egypt has become a source for other developing countries not only in products but also in services and technology (Wells, 1977; Kumar and McLeod, 1981; Lall, 1981; 1982; O'Brien and Mankiewicz, 1981; Dahlman and Cortes, 1982; Dahlman and Westphal; 1982; Sagafi-nejad, 1982). Sagafi-nejad (1984) argued that the existence of the skilled manpower in a region rich in resources and poor in skills has led to relatively large exports of such skills, especially in the form of migration to other Middle Eastern countries. Interestingly, in the case of skilled manpower exports from Egypt, similar advantages (language, cultural ties) are known to have a dominant effect. This conclusion is reinforced by the fact that the majority of technology recipients were Arab countries. Sagafi-nejad's (1984) study showed that Iraq was the most frequent technology recipient from Egypt, followed by other Middle Eastern countries such as, Saudi Arabia, Kuwait, Sudan and other developing countries. The Egyptian government has promoted technology exports by means of political and financial support. However, this migration of the skilled workers and experts has a cost, there are stresses incurred in the Egyptian economy by the outflow of skilled manpower in activities already deprived of such manpower (Sagafi-nejad, 1984).

5.9 Summary

The research focuses on Egypt because of the rapid growth and its role as an emerging market with many foreign investment potentials. In addition to the business environment in Egypt which has experienced a dramatic reform over the past few decades. The Egyptian environment has been dynamic, evolving through different economic and political systems that, presumably, affected these accounting practices (Hassabelnaby *et al.*, 2003).

As shown earlier, one of the major relatively new reforms is privatisation. Massoud (1998) stated that in a developing market economy such as Egypt, the fundamental objective of privatisation is the successful transformation of a command economy into a market economy. Successful transformation necessitates a stable political system, a common fundamental acceptance of the economic policy, a proven and uncomplicated legal system, an efficient and flexible social welfare system, and a market-oriented accounting and reporting system.

As a result, this study is to begin the process of filling the gap in management accounting literature concerning the developing countries, namely Egypt. The empirical research reported in this study is conducted in Egyptian organisations; the accumulation of the data of this type should help in developing the performance measurement techniques of the Egyptian organisations.

In summary, Egypt was chosen, as the research field for this study, for several reasons. These reasons, which are agreed with El-Gendy's (2004) study[22], could be summarised in the following:

1. The lack of management Accounting studies in the developing countries in general and Egypt in particular.
2. The relative easiness in gaining access to required data, because it is my country, in which I am familiar with the environment, accounting practices, culture, economic and political backgrounds of organisations.
3. Privatisation, as mentioned earlier, is one of the major acts that motivate the economic transformation process in Egypt from public to private sector. Hence, increases the importance of the adopted accounting system that will assist any organisation to be competitive domestically and internationally.

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[22] This was a study, conducted by an Egyptian researcher in Sheffield Hallam University (UK), concerning the impact of environmental conditions on cost management information systems in Egyptian organisations.

Chapter Six

Research Methodology and Methods

6.1 Introduction

The sixth chapter describes the research design and how it links to the research problem and theoretical framework reviewed in previous chapters. This includes a review of different methodologies and justifications of the adopted methodology and methods. In addition, it explains how the research sample is identified from the population. Furthermore, it discusses the design of the research's data collection instruments and the suggested dependent and independent research variables.

The chapter consists of eight sections as follows:

- The first section discusses research methodology, which identifies the research philosophical approach through explaining the ontological, epistemological and paradigmatical stances adopted in the research;
- The second section discusses research methods and highlights the wisdom of using the triangulation in this research;
- The third section discusses the data collection methods (questionnaire and interviews) and focuses on the design of data collection instruments;
- The fourth section identifies the population of the research and sample size;
- The fifth section discusses validity and reliability issues;
- The sixth section justifies the choice of empirical data analysis techniques that best fit with the collected data, level of measurement and the purpose of the research;
- The seventh section addresses research dependent and independent variables suggested from the broad literature; and
- Finally, the eighth section summarises how the adopted methodology and method enabled the researcher to examine research debate within the contingency theory framework.

6.2 Research Methodology

In effect, this study seeks to investigate the intricate phenomenon of the use of performance measurement systems in different Egyptian manufacturing companies. Towards this end, a conscious choice has been made, right from inception, to place and investigate this particular management control issue of interest through the lens of a relevant theoretical context (that is, contingency theory) that helps in addressing the two research questions along with choosing the right methodology and methods. Burrel and Morgan (1979) claimed that methodology refers to the methods and steps used to conduct research. Any methodological position consists of three elements; namely, ontology, epistemology and research paradigm.

6.2.1 Research Ontology

Questions of social ontology are concerned with the nature of social entities, the essence of the phenomenon under investigation. The central point of orientation here is the question of whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors. In other words, the social world can be regarded as having an empirical, external concrete existence, independent of and prior to the cognition of any individual, which is called the *realism* view. On the contrary, the *nominalist* view assumes that the social world is external to the individual's cognition and is made up of nothing more than names, concepts and labels which are used to structure reality.

In other words, as Goles and Hirschheim (2000) stated, ontology refers to the nature of the world around us; in particular, that slice of reality which the scientist chooses to address. He also added that there are two extreme positions:

> "the first of which is *realism*. It postulates that the universe is comprised of objectively given, immutable objects and structures. These exist as empirical entities, on their own, independent of the observer's appreciation of them. The other position contrasts sharply with this ontology that of *relativism* or *instrumentalism*, which holds that reality is a subjective construction of the mind.

Socially transmitted concepts and names direct how reality is perceived and structured; reality therefore varies with different languages and cultures. What is subjectively experienced as an objective reality exists only in the observer's mind" (p. 252).

Exploring the use of performance measurement techniques reveals that this phenomenon is really very complicated. Some of the authors stated that it has an empirical, external existence prior to and independent of individuals, such as, Binnersley (1996) who stated that every company in the world measures performance either by the traditional tools such as budgets or by some modern tools such as the balanced scorecard. Some other authors argued that this phenomenon along with using the questionnaire survey as the main method of collecting the data reveal some doubt around this realism ontology. They stated that respondents to different questions in the survey questionnaire would vary dramatically according to their experiences, beliefs, positions amongst other variables; therefore, they are supporting the relativism ontology. Thus, it is considered that this research more likely moves towards relativism because of the methodology followed.

6.2.2 Research Epistemology

An epistemological issue concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline, or in other words, the nature of knowledge. Burrell and Morgan (1979) defined epistemology through two streams of knowledge; namely, *positivistic* and *anti-positivistic*. The positivistic approach seeks to "explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements". On the other hand, the anti-positivistic approach shows that "the social world is essentially relative and can only be understood from the point of view of individuals who are directly involved in the activities under study".

Goles and Hirschheim (2000: p. 253) stated, "Through the centuries, positivism has enjoyed great success. It has had an especially happy relationship with the physical sciences where a tremendous growth in knowledge has been experienced. Throughout history, individuals have sought to apply positivism to the human realm, bolstering or

modifying its conception as necessary". (The emergence of *post-positivism* as an evolutionary development of positivist thought is but one visible indicator) (see for example; Alexander, 1985; Popper, 1963; 1972).

However, critics have surfaced to question its validity on numerous occasions (Berger and Luckmann, 1967; Fay, 1975; Lincoln and Guba, 1985). From a historical perspective, one can distinctly see the uneasy tension that has existed in the application of positivism in the social sciences. This has given rise to what Tashakkori and Teddlie (1998) have termed 'the paradigm wars', which are battles fought by the adherents of positivism against the anti-positivists.

The main explanation of the epistemological and philosophical debate, between positivism (which is more inclined towards quantitative research) and other paradigms such as interpretivism (whose topics are better approached by qualitative methods), is the persistence of the domination of the positivist paradigm in many areas of social research. Positivism considers reality to be "objective", tangible and single. Interest is focused on what is general, average and representative so that statistical generalisation and prediction are possible. Positivists do not have a lot in common with interpretivists' claims for a multiple and socially constructed reality and their focus on what is specific and unique in order to understand and generate interpreted meaning. They further blame qualitative research for lacking rigor and validity. However, problems related to qualitative approaches do not only result from the endurance of the positivist paradigm. Interpretivist researchers, on their side, often fail to explain and justify how and why their qualitative approaches are sound. Goles and Hirschheim (2000) argued that the dominance of positivism as a single perspective does not benefit social sciences rather results in a narrow view that does not fully reflect the multifaceted varied nature of social, organisational, and phenomenological reality (see for example; Willmott, 1993; Blau, 1996). There have been an increasing number of scholars advocating the application of multiple methods, theories, and philosophical approaches to social research (see for example; Gioia and Pitre, 1990; Mingers and Brocklesby, 1997; Tashakkori and Teddlie, 1998). Proponents of this viewpoint argue that a single research perspective limits,

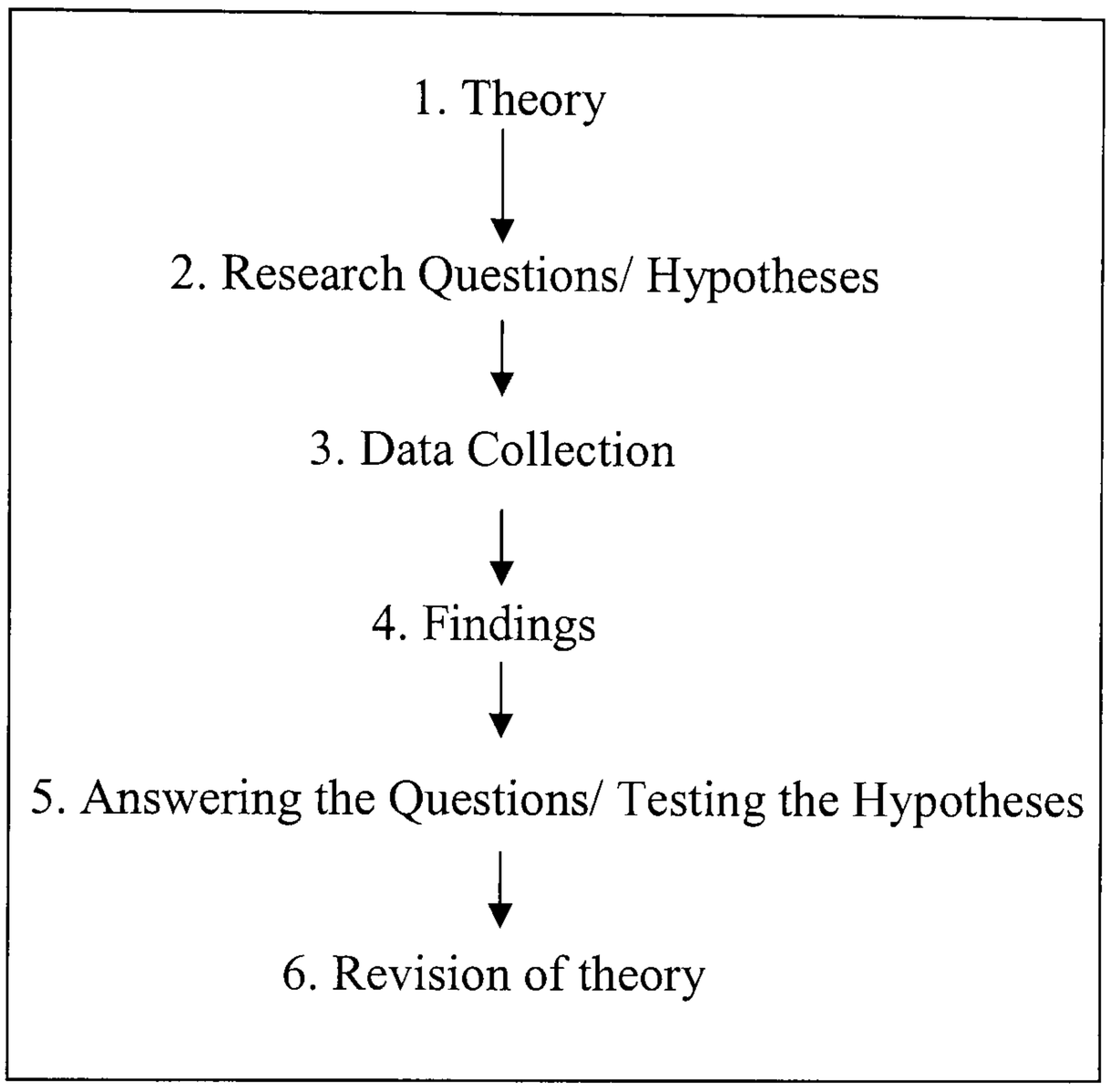
distorts, or even obscures our view of relationships between information systems, people, organisations, and society. Hopper and Powell (1985) point out that accounting research using *pluralism* can contribute much to re-assessing the role of accounting in organisational change and adaptation.

In addition, contingency theory lays claim to being strongly positivist in sociological terms as stated by Donaldson (1996). It therefore uses research, which is methodologically positivist (for example comparative empirical research) and sets out to construct scientific style theories closely informed by such research. What is more, it lays claim to producing law-like regularities applicable to all organisations for identified key variables. In addition, a number of cogent criticisms have been levelled at contingency theory and research. Attacks have been made on the strong positivist stance taken by much of contingency theory. These attacks range from a rejection of the validity of a positivist approach as mentioned by Silverman (1996) (in Donaldson, 1996), through to those who take issue with the strength of the positivist stance, often in relation to one particular aspect of positivism, such as, the strong determinist position which is often put forward in contingency theory. Therefore, this study utilises the pluralistic approach in order to benefit from the previously mentioned advantages and, on the same time, to overcome one of the limitations of contingency theory.

It is worth noting here that this pluralistic approach could also be justified through explaining the continuum of reasoning methods, namely, the deductive and the inductive approaches. Otely and Berry (1994) and Blaikie (1995) distinguished between deductive and inductive research. They stated that deductive work generates questions or hypotheses from theoretical assumptions and tests them against empirical observation. These questions or hypotheses are to be answered from the analyses of the appropriate data collected. In other words, Salmon (1989) and Wasim (2006) stated that deductive reasoning works from the "general" to the "specific", which sometimes called a "top-down" approach. The deductive reasoning works as follows: think of a theory about topic and then narrow it down to specific hypothesis(es) that could be tested. Then, narrow down further so observations could be collected for hypothesis(es), which will be used at

the end to accept or reject the hypothesis(es) and the reason we do that is to confirm or refute our original theory. Figure (6.1) describes the process of deduction.

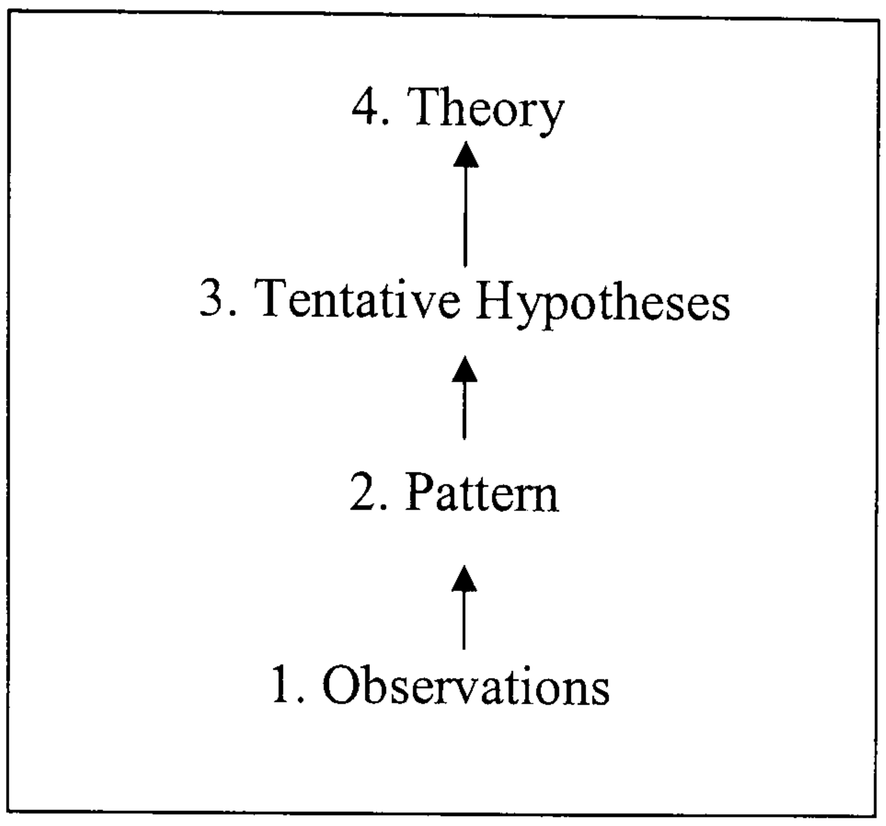
Figure (6.1) The steps of deductive research



Adapted from Bryman (2001)

On the contrary, Otely and Berry (1994) and Blaikie (1995) stated that inductive work consists of making generalisations from observations, which result in theoretical statements that attempt to explain the observed phenomena. Salmon (1989) and Wasim (2006) claimed that an Inductive reasoning works the other way around, it works from observation (or observations) works toward generalisations and theories, which also called a "bottom-up" approach. Inductive reason starts from specific observations, look for patterns (or no patterns), regularities (or irregularities), formulate hypothesis(es) that could be worked with and finally ended up developing general theories or drawing conclusion. Figure (6.2) describes the process of induction.

Figure (6.2) The steps of inductive research



Adapted from Bryman (2001)

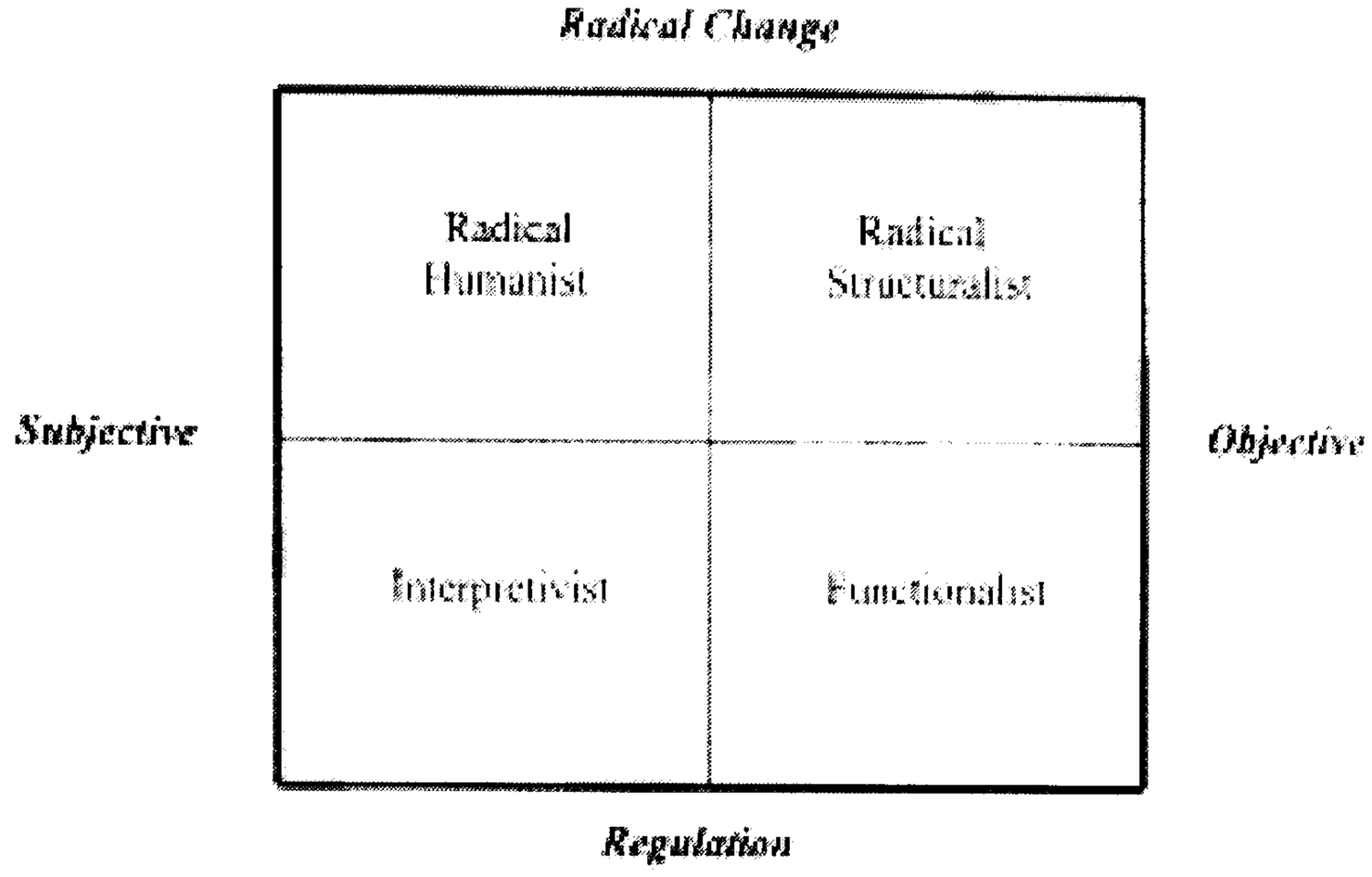
These two methods of reasoning are two opposite extremes laid on a continuum. Inductive reasoning is more open-ended and exploratory, especially at the beginning. Deductive reasoning is more narrow in nature and is concerned with testing or confirming hypothesis(es). Even though a particular study may look like it is purely deductive or purely inductive, however, most social research involves a combination of both inductive and deductive reasoning processes. As Machina (1985) and Bara and Bucciarelli (2000) argued that the standard ways of placing all arguments into two disjoint inductive and deductive classes fail to provide us with classes which ground a distinction between inductive and deductive logic because induction and deduction share a set of procedures. This point of view is consistent with the pluralistic approach that is utilised in this research. This enables us to start with a theory, which was implied from the literature that the research could be committed to a prior theory, which is the contingency theory, at the outset of the research. It is argued that a completely 'clean' state is difficult to achieve and that unfocused data collection may overwhelm the researcher with information (Eisenhardt, 1989). In addition, having this theory in mind enables us to benefit of both 'focusing' when collecting the quantitative and qualitative data combined in this research and, on the same time, 'exploring' whatever could come up of this study. This maintains the very nature of the study as an exploratory study.

In summary, the aims of this study are to grasp and understand what type of techniques prevail in the Egyptian manufacturing companies, in addition to identify some of the major factors that affect the use of these techniques. Towards this end, managers and executives inside these companies were requested to answer some questions, which in turn are analysed within a contingency theory framework. Contingency theory is adopted as a framework as this is an exploration of the context within which PM works and the features of the individuals and the environment which enhance the use of performance measures. Under the contingency framework, no universal control system exists, "it all depends", for all organisations in all situations; instead, control systems should be tailored in the light of the characteristics of the organisation and its environment (Otley, 1991; 1999; Otley *et al.* 1995). This implies that the knowledge that will be gained about the use of performance measurement techniques in this research will depend on which organisations will be examined, with what factors, such as technology, size, management style and structure, could mean to them. Therefore, the use of these measures as a social phenomenon will be "relative" and understanding it will depend on the insights of the participants in this study. Thus, this research will be based on a pluralistic approach because employing plural perspectives can help us to understand how people come to create different realities.

6.2.3 Research Paradigms

In 1979, Burrell and Morgan introduced their typology of paradigms for the analysis of social and organisational theory. They arrived at a matrix composed of four different research paradigms: functionalism, interpretivism, radical structuralism, and radical humanism (see figure 6.3). Each of the four paradigms has fundamentally different assumptions concerning the nature of social science and the nature of society.

Figure (6.3) Burrell and Morgan's four paradigms



Source: Burrell and Morgan (1979)

Silverman (1970), Burrell and Morgan (1979), Ali (2000) and Goles and Hirschheim (2000) agreed that the *functionalist paradigm* is concerned with providing explanations of the status quo, social order, social integration, consensus, need satisfaction, and rational choice. This paradigm depends on the idea of a real ontology where the social world is separated from the researcher. It seeks to explain how the individual elements of social systems interact together to form an integrated whole. The *interpretivist paradigm* seeks explanation within the realm of individual consciousness and subjectivity, and within the frame of reference of the perspective: 'social roles and institutions exist as an expression of the meanings which men attach to their world', so it can be said that this paradigm perceives the world as it is but explains it within the researcher's consciousness. The *radical structuralist* paradigm has a view of society and organisations, which emphasizes the need to overthrow or transcend the limitations placed on existing social and organisational arrangements. Simply, it assumes that contemporary society is characterized by conflicts and contradictions, which generate some radical change through political and economic crises and revolutions. The *radical humanist paradigm* seeks radical change, emancipation, and potentiality. It stresses the role that different social and organisational forces play in understanding change. It focuses on all forms of barriers to emancipation: in particular, ideology, power and social

constraints. Simply, this paradigm assumes that the consciousness of researcher is dominated by ideological superstructures with which researcher interacts, therefore, seeks ways to overcome them.

Hopper and Powell (1985) researched many accounting processes under these paradigms and stated that much of the conventional management accounting is based on the functionalist approach. For example, standard costing is inextricably linked with scientific management (Solomons, 1968). Principles of management stated by writers such as Fayol (1949) and Mooney (1974) provide rationales for budgetary control. Neo-classical economics provides a basis for marginal costing and financial management and reinforces notions of control based on assumptions of economic man, and organisations with unitary goals headed by a single decision-maker (Weston and Brigham, 1978). Horngren (1982) defines his general approach to management accounting as designing formal controls to provide goal congruence and incentives through the use of technical tools.

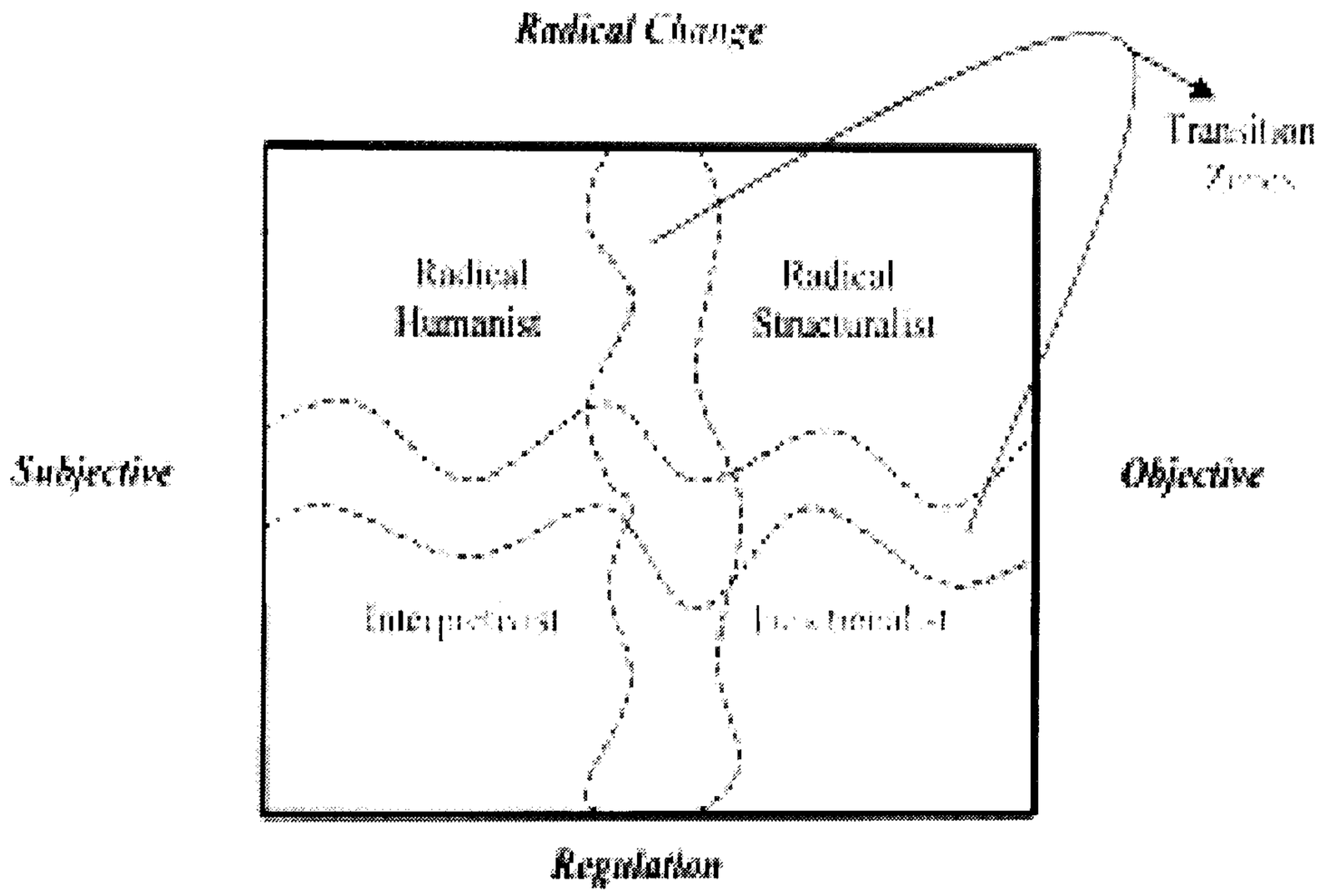
Nevertheless, Caplan (1971) criticized the relationship between management accounting and this traditional model of the firm. The relevance to practice of much of the functionalist academic research into the organisational and social aspects of accounting has recently been questioned by a number of authors (e.g Tricker, 1979; Bourne *et al.*, 1982; Tomkins and Groves, 1983). Therefore, some writers such as Fox (1966) have advocated *pluralism* as a more realistic approach to organisation control. In the same vein, Checkland (1981) found that traditional methodologies, which are based on those of the natural sciences, were inadequate for the complexity of problems of the social world. He introduced an alternative methodology that was seen to be based not on any external reality but on people's perceptions of reality, on their mental process rather than on the objects of those processes.

One of the most significant contribution of the Burrell and Morgan framework has been to legitimatize, or at least provide impetus to the legitimizing of, alternative approaches

to the study of organisations by bringing to light 'a growing dissatisfaction with the dominant, functionalist orthodoxy' (Willmott, 1993: p. 681).

Gioia and Pitre (1990) argue that the characterization of paradigms as separate and mutually exclusive domains may have been overstated. They added, "It is very difficult, if not impossible, to establish exactly where one paradigm leaves off and another begins" (p. 592). In place of hard and fast barriers between paradigms, they posit the existence of transition zones, or intermediate regions with blurred and shifting lines of demarcation (see figure 6.4). They argue that pluralism could 'bridge' between these zones.

Figure (6.4) Burrell and Morgan's four paradigms with transition zones



Source: Gioia and Pitre (1990)

A pluralistic approach to systems thinking is required because of the limitations inherent in traditional and contemporary approaches, indeed in all methodologies. Jackson (1999) argues that we need to employ a meta-methodology whereby the advantages of different methodologies can be employed to manage complex problems. This may involve employing different micro and macro methodologies or a combination of them. This is consistent with researcher's belief that the choice of methodologies should be guided by

the problem at hand and the resources that can be brought to bear on the problem rather than by a particular paradigm.

An implication of this approach is that no one paradigm will necessarily be dominant in the analysis in the sense that its assumptions will incorporate the other paradigms as a subset of its assumptions. In fact, competing paradigms and their methodologies may be employed side-by-side even though this may mean that the results may not be directly comparable and implications inconsistent. However, since no paradigm can claim to provide absolute truth, results from each methodology have to be interpreted within the constraints of its paradigm's assumptions on which they are based.

The use of a wide range of methods, models, tools and techniques may encourage their separation from their theoretical underpinning. Jackson (1999) suggests that although the flexibility of the use of these methods and techniques is encouraged, there should be a way to establish a connection between them and their paradigmatic assumptions in order to suggest improvements in methods and methodology. The suggestion here is to maintain theoretical consistency in the application of different methodologies employed to address a particular problem. Hopper and Powell (1985) argued that "Contingency theory, for management accounting research, has consciously adopted and encouraged this suggestion, probably to explain otherwise contradictory observations" (p. 439). They also added, "Reinforcement may have come from pragmatic researchers who had always expressed suspicion at universal prescriptions not tailored to the requirements of different firms" (p. 440).

6.3 Research Methods

Mingers and Brocklesby (1997) define the term 'method' as the most confusing term, because it is sometimes used to refer to the whole methodology followed by the research, and sometimes to mean a particular technique. In this research, it is used to mean a specific technique, which is a specific activity that has a clear and well-defined purpose within the context of a methodology. In simple words, how the data will be collected and analyzed in the research.

This research utilizes *triangulation*, which was first introduced by Campbell and Fiske (1959) as a synonym for convergent validation, in the presentation of a multimethod matrix. Webb *et al.* (1966) and Jick (1979) defined triangulation as mixing quantitative and qualitative methods, advocating that both should be viewed as complementary instead of rival methods. In simple words, triangulation means looking at the same phenomenon from more than one source of data. Information coming from different sources can be used to elaborate more the research problem, and it simply limits personal and methodological biases and enhances the generalizability of research's findings (Decrop, 1999).

Nevertheless, some authors have criticised the idea of triangulation that research results that are produced from different data instruments can be used mutually to validate research's assumptions (e.g. Fielding and Fielding, 1986; Flick, 1992; 1998). Fielding and Fielding (1986) tried to call attention to the fact that researchers may misinterpret commonalities and differences between data collected with incompatible methods by falsely assuming 'a common epistemic framework among data sources' (p. 31). According to those authors, research methods have different roots in epistemological and ontological commitments. Therefore, the decision to employ a specific research method (i.e., questionnaire or observation) is not simply about how to go about data collection but a commitment to an epistemological position that is inimical to a specific paradigm and consistent with another one (see for example; Bryman, 2001). However, triangulation advocates recognise quantitative and qualitative research as connected with distinctive epistemological and ontological assumptions but not fixed and ineluctable. Research methods are perceived as autonomous and that one method is viewed as capable of being pressed into the service of another method (see this debate in Bryman, 2001: p. 446).

As DeVaus (1991) argued that while surveys may often be criticised for inhibiting the process of problem formulation through their use of structured questionnaires and the collection of data at one point in time, thus limiting the extent that problems can be redefined and refocused, this is considered too narrow a view of survey research. On the other hand, he also advises that:

> "In the end, methodological pluralism is the desirable position. Surveys should only be used when they are the most appropriate method in a given context. A variety of data collection techniques ought to be employed and different units of analysis used. The method should suit the research problem rather than the problem being fitted to a set method" (DeVaus, 1991: p. 335).

In addition, Peters (2002) stated unlike case study methodology (where data from only one case is collected) or experimental methodology (where variation between cases is controlled by experimenter intervention), survey methodology seeks to uncover "naturally occurring variation between cases".

Therefore, and in accordance with the research paradigm applied for this research, this research utilizes both survey, specifically questionnaire, as the main method in data collection, in addition to conducting several semi-structured interviews to enrich the results and findings of this research.

6.4 Data Collection

The research has two main questions; firstly, what are the performance measures used by the Egyptian medium and large sized manufacturing companies? Secondly, what are the contingent factors that affect the use of performance measurement systems in these Egyptian manufacturing companies?

6.4.1 Survey Process

To examine the research argument, a nine-page survey instrument was used to collect specific information about two things; namely, the type of performance measures used by Egyptian manufacturing companies; and the contingent variables that might affect the use of these performance measures of the respondent firms. In designing the questionnaire, comments and feedback from my supervisor and colleagues[23] were elicited in an endeavour to ensure that questions were clear and precise. The main elements of the

[23] Colleagues include the PhD students at Durham Business School (UK) and my academic colleagues in the Arab Academy for Science, Technology and Maritime Transport (Egypt).

questionnaires were chosen as a product of the theoretical framework, which is based on contingency theory to describe different variables that affect the use of performance measurement systems in the Egyptian manufacturing companies. Otley (1980) and Humphrey and Scapens (1996) claimed that research in the context of contingency theory should involve a number of organisations, carefully selected so as to give a range of values on the chosen contingent variables. Therefore, using a questionnaire survey in this study was appropriate to achieve the research aims.

The questionnaire instrument in this research was developed in line with other questionnaires used in this field by different studies (e.g. Vangneur, 1996; Ali, 2000; Van der Stede, 2001; Kominis, 2002; El-Gendy, 2004), see Appendix (1). A special care that was specifically given in measuring some of the study's variables with instrument which has been previously developed and extensively tested in practice, therefore, enjoying the general acceptance of researchers in the field, provides some confidence about the study's construct validity. In effect, and specially in social science research, no one can ever claim to have developed and employed perfect measures that completely eliminate all possible random errors, noise and bias in the process of variable measurement. Likert scale is utilised in this research; therefore, it is worth paying some attention to the survey scale design and development.

6.4.1.1 Scale Design and Development

Dawis (1987) stated that the term 'scale' is limited to those instruments that are constructed by researchers in order to obtain quantitative data on variables for which appropriate standardized instruments are not available. As Moser and Kalton (1971: p. 350) state:

> *...to try to combine the answers a respondent gives to the various questions into a measurement of the extremity and intensity of his or her overall attitude requires a different analytical approach; and this is where scaling devices find their place.*

Dawis (1987) also argued that the classic method for developing individual differences variables' scales is the Likert method. He stated that of all the scale construction

methods, the most convenient for researchers is the Likert method because it can be employed with the use of ordinary SPSS programs. He specifies four procedures to obtain a reliable Likert scale: 1) A number of statements are written to represent the content domain. Five-point anchored rating scales are typically used as response choices for each statement. 2) The statements are administered to a large number of respondents (*N* should be greater than 30). Each respondent's statement rating choices are scored and the statement scores summed to constitute the respondent's total score. 3) Statements are selected according to their ability to measure what they suppose to measure, which is related to the scale reliability that refers to the accuracy or precision of a measuring scale or instrument that yields consistent results (Peterson, 1994). 4) The most highly reliable statements are then selected to constitute the scale, and the scale score is obtained by summing the statement scores for the selected statements.

In this research, respondents were asked, in different ways, if they apply different performance measures in their companies. Therefore, a 5-point Likert scale was used, where the statements were placed in an order, and next to the statements was a grid consisting of five columns: 'strongly agree', 'agree', 'neutral', 'disagree', 'strongly disagree'; each column had a particular value, i.e. 5, 4, 3, 2, 1 respectively. Respondents were asked to tick the appropriate box, to indicate how far they agree or disagree with each statement. Number (5) indicated that they strongly agree with what the statement says, number (1) indicated that they strongly disagree with what the statement says and numbers along the continuum indicate different levels of agreement or disagreement. The total score, which is calculated by adding up the scores for each statement, identifies the respondent's position of each type of performance measures and whether his or her company applies such type of performance measures or not.

Number (3) which is the middle point on the scale represents 'I do not know / neutral'. Karavas-Doukas (1996) highlighted that an attitude scale, such as the Likert scale, is a crude measuring device, consisting of a number of statements to which the respondent must express his or her degree of agreement or disagreement. Depending on the respondent's choice that represents his or her opinion about each statement, a particular

score is rendered. Although, one of the limitations of the Likert-type scales is the difficulty of establishing a neutral point on the scale, the neutral point could be, not necessarily, the mid-point between the extreme scores. This depends on the understanding of the topic and context studied (Oppenheim, 1966; 1992; Karavas-Doukas, 1996). Cox (1980) argued that an odd rather than an even number of response alternatives is preferable under circumstances in which the respondent can legitimately adopt a neutral position. Therefore, in this research, number (3) is dealt with as the mid and neutral point on the scale that distinguishes between the agreement and the disagreement attitude of the respondent.

The Likert scale has other limitations; Romano *et al.* (2000) argue that the pre-specified statements or questions in the Likert scale prevent respondents from expressing their attitudes toward what these statements or questions say in their own words. Crespi (1965), Fishbein and Ajzen (1975) and Doll and Torkzadeh (1991) argue that in developing a Likert scale, attitude is a function of a respondent's set of beliefs about a given object or item. A person's attitude score is obtained by summing across all his or her belief items. Therefore, the pre-specified Likert-scale questions or statements could direct respondents to a specific answer because his or her attitude could be influenced by the way the statement or the question shaped.

Moreover, Crespi (1965) points out that the use of scoring via Likert scales has some problems. One difficulty is that an individual may see little difference between the two choices of strongly agree and agree. Two people may have the same intensity of feeling toward an object or item but view the semantic description of their feelings differently. Finch and Luebbe (1997) assert that survey and other methods that use prompting questions may limit the responses from which a respondent can choose to express his / her opinion. Strong feelings in relation to a particular statement or question may not be stated due to constraints placed on the respondent by the instrument.

Cook and Campbell (1979), Fox *et al.* (1988), Oppenheim (1992) and Fowler (1993) argue that Likert scale could suffer from respondent bias that is respondents sometimes

desire to make good impressions about their companies. This might happen because of the question / statement content and presentation manner. Other potential sources of bias or error include instrumentation, low response rates, incomplete or unusable answers. Furthermore, advantages gained from reducing one form of bias are often at the expense of increasing another.

Nevertheless, Richins and Dawson (1992) stated that a Likert scale format is usually used for all items with response categories of strongly agree, agree, neutral, disagree and strongly disagree. Karavas-Doukas (1996) added that the Likert-type scale, as an attitude scale, is the most widely used method of scale construction because of its relative ease of construction, its use of fewer statistical assumptions, and the fact that no judges are required. Simply, it acts as a cost-effective and easy to administer instrument for gathering data on respondents' attitudes, beliefs and behaviors on particular issues.

Before starting the pilot study, the survey instrument was evaluated in a limited pretest by several business professors and managers from some firms for readability, completeness, and clarity. Appropriate changes were made as per their comments and suggestions. Researchers in Egypt, as in the Third World in general, have to develop the necessary sensitivity to avoid questions that offend or embarrass respondents to a questionnaire or interview. When such items are included, respondents will not respond or will give a misleading answer. The design of the questionnaire is complicated with translation problems, whether from and to different languages or between incongruous usages in the same language, see Appendix (2) for the Arabic version of this questionnaire. The researcher has to observe lexical equivalence (asking the same questions in different ways, using the same words) and conceptual equivalence (the transfer of concepts from one culture to another). The latter requires a high degree of understanding and knowledge of the local culture (Bulmer and Warwick, 1983; Hatem, 1994).

Dawis (1987) stated that after designing a scale, the need to develop it emerges. Scale development consists of collecting data with the use of preliminary form and analyzing the data in order to select statements for more final form. Clason and Dormody (1994)

added that Likert's original work assumed that this attitude scale would first be pilot tested for reliability assessment of the individual statements. This reliability assessment might use the correlation between the statement and the total scores to identify which statements have higher correlation and consequently higher Cronbach's alphas. In any event, the statements not correlated with the total would be discarded. Subsequent data would be summarized using the totals. Therefore, as Dawis (1987: p. 482) stated, "The pilot study can be used to check out such nuts-and-bolts points as how easily the scale instructions are followed, how well the scale format functions, how long the scale takes to complete, and especially, how appropriate the scale statements are for the target respondent population". Fishbein and Ajzen (1975), Doll and Torkzadeh (1991) and Richins and Dawson (1992) stated that pilot tests and the elimination of statements is a standard procedure in the development of Likert-type scales. Simply, different statements should indicate a favourable or unfavourable attitude toward the object in the statement. If the statement is ambiguous, redundant or leading, it should be eliminated.

6.4.1.2 Pilot Testing

The pilot testing of the questionnaire was undertaken in Egypt in summer 2005. Pilot testing is a way of simulating the live data collection phase. Therefore, it is a powerful way to eliminate surprises and make sure that everything is in order. In essence, pilot testing is to examine the questionnaire against clarity and length (Berenson and Levine, 1992). It was conducted on a small group of subjects that hold the same characteristics as the sample subjects of the main data collection phase. The pilot sample was 34 companies of medium and large sized Egyptian manufacturing companies. Pilot testing took approximately two to three weeks to be completed.

The main disadvantage of the questionnaire was its length. Berenson and Levine (1992) stated that an inverse relationship between the length of a questionnaire and the response rate to the survey. In other words, they stated that "the longer the questionnaire, the lower will be the rate of response; the shorter the questionnaire, the higher will be the rate of response" (p. 17). Unfortunately, the research questionnaire was inevitably long (9 pages); therefore and in order to overcome this defect, extra cost, time and effort were

exerted to reach the acceptable response rate (35%).

The final version of the questionnaire, which was developed and used in Egypt, consisted of 60 questions in 9 A4-pages with a covering letter describing what the researcher wants to do or to measure, see Appendix (1). It was divided into three main sections: an introductory section, which tries to gather some demographic information such as company's size. The second section attempts to identify the current performance measurement system used and adopted in the company. Lastly, the third section tries to capture the relationships between different contingent variables and the use of different performance measures. Over a period of nearly 6 months, both the content and wording of the questionnaire were revised in the light of the pilot study's feedback and intellectual development. There was a need to define and elaborate what is meant by a number of technical terms, in order to assure a complete understanding of the technical terms expressed in accounting language. Each statement was modelled so that it was as short, precise and as understandable as possible. Each section in the questionnaire carried instructions and at the end of the section, there was space for the respondent to write any comments. The statements on the survey instrument utilized the interval five-point Likert scale.

The survey was taken or sent to executives (CEO, CFO, or to the available head of department who the researcher could arrange a meeting with) representing around 400 Egyptian manufacturing firms from different industries, mainly located in Cairo and Alexandria as the biggest two cities in Egypt, in which most of the medium and large sized manufacturing companies are running their business. Most of these companies were identified from the General authority for investment and free zones database (2005), in addition, any missing information concerning any company was located by approaching commerce chambers in different regions and government organisations in the area. Anonymity was promised in return for completed surveys. Various measures to reduce non-response rates were also undertaken, in order to boost response rates, such as follow-up phone calls and several physical follow-up. These efforts culminated in an effective response rate of approximately 35%, that is, 140 useful and usable responses. Data from

the 140 survey responses were analyzed to determine whether the implementation of specific performance measures is linked to some specific contingent factors.

The possibility of a high non-response rate is a major problem with questionnaires (Sproull, 1988). However, it is worth noting that, McDaniel and Gates (1993) report that higher response rates are a means to reducing non-response bias. They also report, for social science studies, that "...of all the studies that have looked for differences between non-respondents and respondents of surveys, none has been reported that found meaningful, practical differences between respondents and the entire sample or between early respondents and respondents as a whole" (McDaniel and Gates, 1993: p. 233).

The usefulness of a questionnaire in unveiling the true meaning that a person gives to particular phenomena within his/her immediate social context has been extensively criticised in recent years. For example, Davies (1997) and Abernethy *et al.* (1999) argued that when questionnaires are used to capture complex constructs, they typically encounter serious interpretive difficulties, particularly because these questionnaires reflect answers people give that serve important functions for them. These answers reveal, first and foremost, something about the way those people think, and about their motives and intentions, rather than merely providing a blurred picture on the truth. Nevertheless, the analytic questionnaire survey was chosen as the most relevant and cost-effective research method and as the one that appeared to best fit the specific needs of this research. Towards this end, all that the present study can maintain is that all efforts have been made to utilize prior research practice and experience to measure this study's theoretical constructs.

6.4.2 Interview Process

In order to conduct a number of interviews, an interview guide was developed to guarantee a systematic and a consistent way in carrying out these interviews. The interview guide[24] contains some closed questions and open-ended questions that were

[24] To design this interview guide, the interview guide of a similar PhD study (El-Gendy, 2004) was used as guidance.

used as the basic guideline during the interviews to make sure that the required topics would be covered, see Appendix (3). The main aim of conducting interviews is gathering additional data that could be used as another source of the explanation of the results of quantitative data (from questionnaires). The interviews were semi-structured with a clear set of questions to be explored.

The questions were reviewed during the interview process to ensure that all the information was appropriately captured. The interview also allowed discussion of the strategy of the firm amongst other factors. Sekaran (2003) argued that an informed researcher who conducts interviews would be in a better position to clarify doubts and answer any inquiries the interviewees may have, thus, ensuring that the responses are properly understood and answered. Moreover, many ideas can also be brought to the surface during the interviews.

The researcher, by using triangulation, which is the use of quantitative and qualitative methods in collecting the required data, attempts to minimize data biases. However, it is still subject to the recall and respondent biases associated with survey and interview data.

6.5 Population and Sample Size

The General authority for investment and free zones database (2005) determines the number of medium and large sized companies of different manufacturing industries in Egypt. Then, the information of the selected companies was derived from the General Organisation for Industrialization (GOFI). According to recent information from GOFI, General Organisation for Industrialization, the registered industrial establishments are categorized as follows: 21541 micro units, 1264 small units, 774 medium units, and 1290 large size industries totaling 24869 firms. They are divided among industries such as spinning and weaving, food, chemicals, wooden, engineering, iron and steel, pharmaceutical and mining industries.

The sample size has been calculated as follows:

$$\textbf{Sample size (n)} = [\, z_{\alpha/2} * \sigma / E \,]^2$$

Where:

$(z_{\alpha/2})$ is known as the critical value, the positive (z) value that is at the vertical boundary for the area of $(\alpha/2)$ in the right tail of the standard normal distribution.

(σ) is the population standard deviation.

(E) is the margin of error, which is defined as the maximum difference between the observed sample mean $(\bar{\chi})$ and the true value of the population mean (μ).

For this research, a 95% confidence level corresponds to $\alpha = .05$. Each of the shaded tails in the normal distribution has an area of $\alpha/2 = 0.025$. The region to the left of $z_{\alpha/2}$ and to the right of $z = 0$ is $0.5 - 0.025$ or 0.475. From the table of the standard normal distribution (z), an area of 0.475 corresponds to a z value of 1.96. Therefore, the critical value is 1.96. Depending on the available data from a small sample and applying the previously mentioned equation, the sample size for this research is calculated for each dependent variable and the maximum will be chosen as follows:

Sample size $(n_1) = [z_{\alpha/2} * \sigma / E]^2 = [1.96 * .543/.1795]^2 = 35$

Sample size $(n_2) = [z_{\alpha/2} * \sigma / E]^2 = [1.96 * .817/.1815]^2 = 78$

Sample size $(n_3) = [z_{\alpha/2} * \sigma / E]^2 = [1.96 * .752/.1565]^2 = 89$

Sample size $(n_4) = [z_{\alpha/2} * \sigma / E]^2 = [1.96 * .613/.171]^2 = 49$

Sample size $(n_5) = [z_{\alpha/2} * \sigma / E]^2 = [1.96 * .707/.1825]^2 = 58$

Therefore, the minimum sample size that should be accepted is 89 companies. Moreover, Roscoe (1975) argued that sample sizes larger than 30 and less than 500 are appropriate for most research. The number of companies targeted in this research was, originally, 400 manufacturing companies, of which 200 medium sized companies and 200 large sized companies. The resulted response rate was 35%, which represented 140 manufacturing

companies, of which 73 medium sized manufacturing companies and 67 large sized manufacturing companies. In support of this, Tabachnick and Fidell (1996: p. 132) gave a formula for calculating sample size requirements, using the number of independent variables –which is 8 variables in this research, $N > 50 + 8m$ (where m = number of independent variables). If we plug in numbers in the formula, the result would be 114 companies, which means that the sample size in this research is well off.

The sample for this study contains medium and large sized Egyptian manufacturing companies. The sampling procedure excluded foreign firms; it focuses only on Egyptian manufacturing companies working in Egypt in order to reduce any multinational factor(s). This sampling procedure was intended to capture a variety of different sectors' firms where different management practices tools are more likely to have been adopted. The sample was selected through a random process; the complete random sample selection should make the tested sample representative of other Egyptian manufacturing firms. The number of employees was used as the determinant of organisational size to spilt the sample into two sub-samples; medium and large, as shown in chapter five. The data was gathered through questionnaires distributed to managers in each of these firms that expected to be knowledgeable about the policies and management practices of their firm. Therefore, the data collection method, so far, is consistent with the common methods in similar studies (see for example; Ali, 2000 and El-Gendy, 2004).

6.6 Reliability and Construct Validity Analysis

In the social sciences, an important issue is the psychometric properties of the measurement scales used. Measurement focuses on the relationship between empirically grounded indicators and the underlying unobservable construct. When the relationship is a strong one, analysis of empirical indicators can lead to useful inferences about the relationships among the underlying concepts (Pare and Elam, 1995). Measurement implies issues of both reliability and validity of the scales used. Where scales are highly reliable and valid, their ability to test the proposed model is stronger (Peters, 2002).

As Bollen (1984) highlights, only where items in a scale act as effects and not causes of the underlying concept, can the "internal consistency" perspective be used in assessing scale reliability. Traditionally, items are deemed to be internally consistent if they are each positively related to a unidimensional concept. However, where scale items act as causes of the underlying concept then items may be positively, negatively or zero correlated. Fundamentally, reliability concerns the extent to which a measuring procedure yields the same results on repeated trials.

One interpretation of the reliability criterion is the internal consistency of a test, that is, the items are homogeneous (Kerlinger, 1986). In this sense, reliability refers to the accuracy or precision of a measuring instrument or scale, that it is free of error and therefore will yield consistent results (Peterson, 1994).

Internal consistency of the scales may be assessed by calculation of the "Cronbach alpha". Which was developed by Cronbach in 1951 as a generalized measure of the internal consistency of a multi-item scale, it has become one of the foundations of measurement theory (Peterson, 1994). Nunnally (1978), Peterson (1994) and Peters (2002) argued that there are a number of considerations that previous research has highlighted in the use of reliability testing, which also determine the acceptable level of alpha coefficient. For example, the number of response categories (e.g. a 5-point Likert scale) and the number of items in the scale. They agreed that an alpha coefficient of an average between 0.50 - 0.70 is a moderate and acceptable level for social research. The alpha coefficients will be calculated in Chapter Seven (Data Analysis) after using factor analysis for both dependent and independent constructs that determines how many variables of each type are extracted, then alpha coefficients will be calculated for each construct measuring a specific variable.

The validity of a scale refers to the degree to which it measures what it is supposed to measure. Unfortunately, there is no one clear-cut indicator of a scale's validity. According to DeVaus (1991), Pallant (2001) and Peters (2002), scale validity could be described into three types: Firstly, content validity refers to the adequacy with which a

measure or scale has sampled from the intended universe or domain of content. In other words, how well the indicators measure the different aspects of the concept. Secondly, criterion validity concerns the relationship between scale scores and some specified, measurable criterion. Finally, construct validity involves testing a scale, not against a single criterion, but in terms of theoretically derived hypotheses concerning the nature of the underlying variable or construct.

Pallant (2001) stated that construct validity is explored by investigating its relationship with other constructs; both related (convergent validity) and unrelated (discriminant validity). Peters (2002: p. 71) argued, 'if constructs are valid in this sense, one could expect relatively high correlations between measures of the same construct using different methods, which is known as convergent validity, and low correlations between measures of constructs that are expected to differ, which is known as discriminant validity'.

Construct validity could be assessed through techniques such as factor analysis. Hair *et al.* (1995) stated that factor analysis attempts to identify underlying variables (factors) that explain the pattern of correlations within a set of variables. Factor analysis has multiple objectives that will be discussed later in this chapter. According to Brown (2000), regardless of how construct validity is defined, there is no single best way to study it and that construct validity could be demonstrated from a number of perspectives. He stated that construct validity could be demonstrated using content analysis, correlation coefficients and factor analysis.

According to Huck and Cormier (1996), convergent validity refers to whether the items comprising a scale behave as if they are measuring a common underlying construct. If so, items that measure the same construct should correlate highly with one another. On the other hand, discriminant validity is concerned with the ability of a measurement item to differentiate between concepts being measured. Therefore, as Peters (2002) explained that the test for discriminant validity is that an item should correlate more highly with

items intended to measure the same trait than with any other item used to measure a different trait.

This will be shown in the principal components factor analysis results in the next chapter (Chapter Seven), which should reflect that measures of constructs correlate more highly with their own items than with measures of other constructs being measured. It was found that the regression analysis is suitable for the defined constructs as shown in many previous studies in this field (see for example; Pennings, 1975; Bruns and Waterhouse, 1975; Selto *et al.*, 1995; Jarley and Fiorito, 1997; Fullerton and McWatters, 2002; Davila, 2005 amongst many others), which supports the construct validity of the survey instrument.

Moreover, Abernethy *et al.* (1999) stated that there are three types of validity; namely, construct, internal and external validity. They defined the construct validity as 'the extent to which the constructs of theoretical interest are successfully operationalised in the research'. They added, 'this definition incorporates both the extent to which the constructs are measured reliably and also whether the measures used capture the construct of interest' (p. 8). In terms of internal validity, they stated that it refers to the extent to which the research design permits us to reach causal conclusions about the effect of the independent variable on the dependent variable. Finally, they defined the external validity by saying 'it requires the researcher to establish whether the results can be generalised from the research sample and setting to the wider population, settings or times' (p. 8). This last definition of validity will be used here in this research and will be discussed in the following chapter (Chapter Seven).

6.7 Empirical Analysis

6.7.1 The Scale of Measurement

Berenson and Levine (1992) and Cohen and Holliday (1996) stated that any phenomenon to be researched should include variables that are measurable, which means they are capable of being placed at some point along a continuum against which numerals may be

assigned according to certain rules. Therefore, we can classify the level of measurement into four categories, which are nominal, ordinal, interval and ratio scales.

The nominal scale is the most elementary scale; it does no more than identify the categories into which cases may be classified. Those categories have to be mutually exclusive and no ordering is implied. On the other hand, ordinal scale incorporates the classifying and labelling function of the nominal type, but in addition, it brings to it a sense of order, means that one category is said to possess more of a particular characteristic being scaled than does another category. The ordering, in such type of scales, implies only which category is greater than another category but it does not assume that the intervals between the numbers are equal.

The interval scale is ranking the data in addition it allows us to state how far apart are different categories. In other words, the difference between measurements is a meaningful quantity. Nevertheless, it has no absolute zero point. On the other hand, ratio scale is the highest level of measurement, because differences being meaningful and equal at all points on a scale and there is a true zero point.

In this research, data collected is ordinal data that allows us to rank the data in some order, as Likert scale was employed in the questionnaire that is initially designed to capture respondents' opinions. However, we cannot claim that such type of scales permit us to quantify exactly the difference between ranks. According to Bryman and Cramer (2001), who stated that variables, which are derived from multiplex-item scales (such as Likert scales), are ordinal data not interval. They argue that treating these variables as ordinal variables will prevent researchers from using powerful statistical tools such as correlation and regression. They suggested that it is for the research's benefit to deal with these variables as interval ones. Therefore, these Likert scale data, which is often collected in surveys (see for example; El-Gendy, 2004), may be utilized for statistical analysis as if it were true interval scale data. In addition, Peters (2002) recommended such treatment for the ordinal data for the ease of data collection from respondents and ease of use by the researcher; therefore, we could assume equality of perceptual distance

on the part of respondents between ranks on the scale. Finally, Labovitz (1970) suggested that most ordinal variables could be treated as interval variables; however, the amount of error that can occur is minimal compared with the considerable advantages from using the powerful statistical techniques.

6.7.2 Parametric and Non-parametric Statistics

Field (2000), Bryman and Cramer (2001) and Pallant (2001) argued that parametric statistics are more powerful, but they are more stringent as well. Certain assumptions, for the data, should be fulfilled in order to use parametric statistics. These assumptions are as follows:

1. The scale of measurement attained on the collected data should be in the form of interval or ratio scaling, because, on the contrary, non-parametric techniques are ideal for use when the data measured is on nominal (categorical) and ordinal (ranked) scales.
2. The underlying distribution of scores in the population from which the sample has been randomly drawn is normal.
3. The variances of variables are equal or homogenous. As Berenson and Levine (1992) explained that for situations concerning central tendency for which two or more samples (or variables) have been drawn, "that they be drawn from normal populations having equal variances, so that any differences between the populations will be in central tendency".
4. Observations should be independent of each other.

If these assumptions are not fulfilled, non-parametric statistics could be used, also sometimes called distribution-free tests. For many of the commonly used parametric techniques there is a corresponding non-parametric alternative. On the other hand, these non-parametric techniques tend to be not as powerful as parametric techniques, because they may be less sensitive in detecting a relationship, or a difference among groups (Pallant, 2001).

For this research, it is argued that parametric techniques should be employed for the following reasons:

- Although the scale of measurement is ordinal, it was argued that the Likert scale could be treated as interval data without any serious damage. As Peters (2002) argues that the data, which is often collected in surveys employing the Likert scale, may be utilized for statistical analysis as if it was true interval scale data.
- By inspecting the histograms of the residuals[25] of the data, it was obvious that all points are lying in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality.
- Normal distributions and equality of variances of different variables are assumed in testing for the difference between the means of different variables. On the other hand, the consequences of departures from these assumptions on parametric tests (i.e. *t*-test) are very limited. Berenson and Levine (1992) stated that parametric tests are robust and "as long as the sample sizes are not extremely small, the assumption of normality can be violated without serious effect on the power of the test" (p. 415). However, for equality of variances, if it is unwilling to assume equal population variances or they are not equal[26], some modifications should be taken into consideration. Such as for the *t*-test, we should depend on separate variance estimates and the critical value of *t* is obtained by weighting the critical value of each variable by its variance of the mean. This point will be explained explicitly in the next chapter, which discusses the research analysis.
- All the observations carried out in this research were independent. As each manager, has been sent a questionnaire or interviewed, was only counted once and therefore the company he/she represents did not appear more than once (either in medium or in large sized company). In addition, due to sending the questionnaire to only one manager in the targeted company or interviewing only one manager in the targeted company, the researcher limited the data gathered from one subject to influence the data gathered from another subject (Pallant, 2001). Thus, it could be

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[25] There should be almost a roughly straight line, not a curve (the residuals should have a straight-line relationship with predicted DV values) in order to assume normality.
[26] When the equality of variances is violated, this will create what is called "Behrens-Fisher problem". For more information see Berenson and Levine (1992: p. 432).

claimed that each observation or subject has no influence on any other observations or subjects, which supports the independence claim in this research.

Pallant (2001) stated that "some statistics writers argue that most of the parametric approaches are fairly 'robust'; that is, they will tolerate minor violations of assumptions, particularly if you have a good sized sample" (see for example, Cone and Foster, 1993).

6.7.3 Statistical Analyses Methods

Peters (2002) stated that there are two basic types of statistics: inferential and descriptive statistics. Inferential statistics are those that allow us to decide whether the patterns seen in the sample data could apply to the population as a whole (i.e. tests of significance). On the other hand, descriptive statistics are those that summarise responses such as frequency distributions, averages, and standard deviations.

Therefore, different statistical methods will be used in this research: exploratory factor analysis, descriptive analysis and correlation and regression analysis. The first analytical method is the exploratory factor analysis that will determine the number of dependent and independent variables that construct the model. Then, the descriptive analysis will be conducted to describe the characteristics of certain groups of subjects (Connolly and Sluckin, 1971; Bowen and Starr, 1982; Norusis, 2000). Thus, descriptive analysis would be used to describe the current situation of the Egyptian firms and to provide some answers concerning types of performance measures applied by these firms. Finally, association analysis would be followed to assist in improving our understanding of the investigated phenomenon.

1. Exploratory Factor Analysis

Exploratory Factor analysis is a statistical technique that has a number of different uses. The primary purpose of factor analysis is data reduction and summarization. It is concerned with the reduction of a set of observable variables in terms of a small number of latent factors. It takes a large set of variables or scale items and looking for the commonalities among them so that the data could be reduced to smaller set of factors.

Thus, the smaller number of variables or scale items is more manageable because factor analysis is looking for the items that are closely related (have relatively moderate-to-high correlation). In addition, factor analysis has been used to assess the construct validity of a test or a scale (Pallant, 2001; Peters, 2002).

The researcher used factor analysis for analyzing relationships among a number of survey items or test scores. It is used to analyze interrelationships among a large number of variables and to explain these variables in terms of their common underlying factors. Therefore, by using factor analysis, a large number of statements can be refined and reduced to form smaller number of coherent subscales (Pallant, 2001; Darlington, 2002). Thus, composite factors obtained in the factor analysis would be included in correlation and regression analysis. Factor analysis attempts to simplify the correlation matrix by accounting for a large number of relationships with a smaller number of factors.

2. Descriptive Statistics

Descriptive statistics are used to organise, summarise, and describe measures of a sample. No predications or inferences are made regarding the population parameters. These statistics usually include the mean, median, mode, standard deviation, variance, range of scores, and skewness and kurtosis (Cohen and Holliday, 1996).

Mean (*M*) is a simple measure of central tendency that represents an average of a distribution of scores for any group of individuals, objects or events. It helps to compare two or more distributions; also, it is essential in describing data sets. It represents the value that every member of the distribution would have if the sum of the distribution was spread evenly among the members (Connolly and Sluckin, 1971; Berenson and Levine, 1992; Cohen and Holliday, 1996; Norusis, 2000).

Median is another useful measure of central tendency. The median is simply that point on a scale of measurement above which there are exactly half the scores and below which there are the other half of the scores. On the other hand, the mode is also another measure

of central tendency. The mode is the most frequently occurring score in a distribution (Berenson and Levine, 1992; Cohen and Holliday, 1996).

Standard deviation (SD) and variance are two commonly used measures of dispersion. They measure the variability around the mean. They give an indication of how dispersed is the probability distribution around its centre and of how spread out on the average are the values of the random variable about its expectation (Berenson and Levine, 1992).

Coefficient of variation (V) is another measure of variability. It expresses the standard deviation as a percentage of the mean values. It is used to describe the amount of variation in a sample and compare two or more data sets (Cohen and Holliday, 1996; Norusis, 2000).

Pallant (2001) defines the skewness as the value that provides an indication of the symmetry of the distribution. On the other hand, kurtosis provides information about the 'peakedness' of the distribution. If the distribution is perfectly normal, you would obtain a skewness and kurtosis value of zero, which is very uncommon in the social sciences.

3. Correlation and Regression Statistics

Correlation and regression analysis is an important tool for social sciences in the analysis of non-experimental data (Berry and Feldman, 1985). Therefore, correlation and regression specification, which puts very high structure on the whole model created and directly tests the impact of the variables of interest. However, the performance measurement literature offers enough guidance to relate certain aspects to a specific performance measurement model and thus the regression analysis is more informative than any other statistical tests.

Pearson-correlations (r) will be presented to show the direction and the strength of the associations between the dependent and independent variables examined. Pearson coefficient is designed for interval level variables. Pearson correlation coefficients (r) can only take values from -1 to +1. The sign out the front indicates whether there is a positive

correlation (the two variables move in the same direction) or negative correlation (the two variables move opposite to each other). The size of the absolute value (with ignoring the sign) indicates to the strength of the relationship. On the other hand, regression analysis will be conducted for the purpose of additional description of the relationships among variables rather than for the purpose of prediction. It is mainly used to explore the relationship between one dependent variable (factor) and a number of independent variables (factors). This analysis will be repeated as many dependent factors as we have in the two sub-samples, i.e. the medium and large sized manufacturing companies. Regression is based on correlation but allows a more sophisticated exploration of the interrelationships among a set of variables (Feiring, 1986; Schroeder *et al.*, 1986; Jaccard *et al.*, 1990; Pallant, 2001).

6.8 Research Variables

In this research, the dependent variables that represent performance measures are framed around five types, which represent the most common types of performance measures, namely the financial measures; the customer measures; the learning and innovation measures; the internal business process measures and the environmental measures. In order to facilitate unveiling the ambiguity around the first research question, which is concerned with identifying the performance measures employed in different Egyptian manufacturing companies, we will use the factor analysis to extract performance measures factors as they are perceived by respondents. In turn, each type of performance measures would have a dummy variable to represent the use of this measure in different firms that takes the value of one if the average is greater than 3 and zero if otherwise.

In simple words, firms would be classified as applying or not applying certain type of performance measures according to the average of the answers of the items constructing a performance measure. A firm would be coded as 0 if the average answers is less than or equal to 3, which is the turning point between the approval and disapproval of such type of measures, on a 5-item Likert-scale. On the other hand, the code will be 1 if the average

answer is greater than 3, which indicates that they use such type of measures[27]. This should identify the prevailing measures in the Egyptian organisations.

From the broad literature, there are eight independent variables investigated in this study[28] to identify their probable effect on the use of the performance measures in the Egyptian firms. Factor analysis would be utilised also to extract the relevant factors from these contingent variables according to respondents' beliefs and opinions. The following is a brief summary of each of these contingent variables as suggested from a wide array of literature.

The first variable is *strategy*; the managerial accounting literature generally takes strategy as given and examines the association between strategic choices and the organisation's accounting and control system design. Many studies typically measure strategy as a continuum between firms following a "defender", "harvest", or "cost leadership" strategy and firms following a "prospector", "build", or "innovation" strategy (Dent, 1990; Langfield-Smith, 1997). As defined in the strategy literature, a "defender", "harvest", or "cost leadership" strategy focuses on being the low cost producer of a narrow product range, while a "prospector", "build", or "innovation" strategy focuses on being first-to-market with a variety of innovative products or services (e.g., Miles and Snow, 1978; Porter, 1985). Therefore, business strategy has been identified as relevant to explain cross-sectional variation in the design of management control systems (Langfield-Smith, 1997; Kober *et al.*, 2000).

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[27] This way of variables measurement is consistent with studies in the field of Management Accounting in general and Control Systems in specific (see for example; Bryant *et al.*, 2004: p. 120).
[28] Which are derived from the broader literature on performance measurement systems that indicate that these variables are associated with variation in the design and use of these systems across companies (see chapters Two, Three and Four).

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The second variable is *structure*. There is evidence to suggest that the structure of the organisation affects the manner in which performance measurement technique is best used, therefore, it is identified as one of the important variables (Hopwood, 1972; Otley, 1978). Organisational structure can be defined broadly as the ways in which firms organize resources to achieve some end. Management accounting can then be viewed as the information support system that best facilitates communication, motivation and performance evaluation within a variety of organisational structures. Therefore, different performance measures should be adaptable to both centralized (to support coordination of decision-making activities) and decentralized organisational structures (to provide relevant information for decision making) (Atkinson *et al.*, 1997).

The third variable chosen is *competition* because it has been shown that there is an effect related to the type of competition faced by a firm on its use of management controls and concluded that the sophistication of accounting and control systems was influenced by the intensity of the competition it faced (Khandwalla, 1972). Simons (1990) stated, "It was concluded that increased competition leads to increased use of management control procedures. This relationship was strongest for product competition, moderate for marketing competition and weakest for price competition" (p. 130).

The fourth variable is *technology*, this pertains to the internal operations of the organisation; that is, the means that the organisation uses to convert inputs into outputs. Therefore, it was defined as the distinction between different types of production technique (e.g. unit production, small batch, large batch, mass production and process production). A key element is the use of knowledge in reducing the production or service costs. It is one of the factors which affect the design of an appropriate management information system. (Woodward, 1965; Pennings, 1975; Daft and Macintosh, 1978; Otley, 1980).

The fifth variable is *management style*; it is well known from the literature that the issue of authority and power distribution is crucial to an understanding of the control processes within an organisation. Whenever an individual is granted authority, the opportunity

arises for that individual to exercise discretion in developing and implementing policies or procedures (Downs, 1967; Waterhouse and Tiessen, 1978). Five modes of control over work: simple, technical, bureaucratic, occupational control, and worker self-control modes of control. Simple control refers to the personal exercise of power of the boss (owner, supervisor) over the worker. Technical control is embedded in the technology of work. Bureaucratic control is carried out through rules, policies, formal incentives and other impersonal devices. In occupational control, a profession defines appropriate /inappropriate work behaviour. Finally, worker self-control labels control contexts where the producers themselves have a high degree of discretion (Edwards, 1979; Simpson, 1985). The insight that management accounting seeks not only to affect behaviour but also consciousness to some extent transcends a narrow technocratic focus (Puxty, 1993). Langfield-Smith (1997) points out, most research on management control in management accounting research has failed to acknowledge the distinction between "the existence and the use of controls" (p. 226) as well as addressing forms of control that extend beyond the familiar terrain of output and formal behaviour. Therefore, it is suggested that managers may have to adjust their styles from autocratic to democratic (and vice versa) as conditions change.

The sixth variable is the *reward system* applied by each organisation. Reward systems should be aligned to motivate employee performance that is consistent with the firm's strategy, attract and retain people with the knowledge, skills and abilities required to realize the firm's strategic goals, and create a supportive culture and structure (Galbraith, 1973; Kilmann, 1989; Nadler and Tushman, 1988). Becker and Gerhart (1996) suggest that the human resource system can be a unique source of competitive advantage, especially when its components have a high degree of internal and external fit. Gomez-Mejia and Balkin (1992) conclude that modern organisations must align their reward system practices with their management control systems in order to achieve higher levels of performance at both the individual and organisational level.

The seventh variable is *environmental uncertainty*. The organisation may be unable to predict future events and may have to process a large amount of information, or it may be

unable to determine the results of an action. A large number of studies had been undertaken to distinguish between a tough operating environment (in which it was difficult for a unit manager to show accounting profits) and a liberal operating environment (in which it was relatively easy to maintain profitable operations). Environment is seen as having two important dimensions, the simple-complex and the static-dynamic, which may both be mapped into the single dimension of predictability. A number of authors have suggested that this variable is of great interest (Burns and Stalker, 1961; Pennings, 1975; Otley, 1978; Waterhouse & Tiessen, 1978).

Finally, many authors claim that *organisational size* has a strong impact on the factors that affect the use of performance measures. For example, large firms, due to their big size, have to consider more factors when using performance measures than smaller firms (Badran and Hinings, 1981; Fisher, 1998; Radwan, 2001).

6.9 Summary

This chapter attempted to address the methodology and methods that are adopted in this study. In the early sections of the chapter, the underlying philosophical and methodological roots of the study were thoroughly discussed. In addition, some certain statistical techniques have been raised to analyze the interval data collected.

A review of the principal theoretical and philosophical assumptions provided a very useful bridge between two major and related areas; namely, organisational theory and management accounting (Sathe, 1978; Burrell and Morgan, 1979). Largely due to its multidisciplinary character, the present research had the opportunity to build on a well-established body of empirical literature, and therefore made a conscious effort to employ previously developed and well-tested methodologies.

In the next chapter, the mechanism through which the data is being collected will be discussed, also, drawing attention to dependent and independent variables (factors), how they will be extracted from the factor analysis and then how they will be analyzed. Certain assumptions, which underlie regression analysis and limitations to its use, will be considered. The first assumption is concerning linearity. The Second is concerning the

interrelationships among independent variables and their probable effect. The third and fourth are concerning the issues of homoskedasticity[29] and multicollinearity[30] that are addressed in the next chapter (DeVaus, 1991; Hair *et al.*, 1995; Huck and Cormier, 1996).

[29] When the error variance in the dependent variable is constant for each value of the independent variable.
[30] When there are high correlations among the latent exogenous constructs (independent variables).

Chapter Seven

Data Analysis and Results

7.1 Introduction

The seventh chapter describes the statistical analysis procedures followed in this research, whether descriptive or inferential analyses. In addition, the results of the research from analyzing the data obtained from the questionnaire and interviews are shown. The chapter is organised as follows:

- Initially, sample characteristics are discussed and the scale design and development are presented in order to critically evaluate the survey instrument utilised in this research;
- The chapter goes on to describe in detail how exploratory factor analysis is used as a method of refining the questionnaire statements and constructs;
- In an attempt to provide an answer for the first research question, which is related to the nature of performance measures applied by the Egyptian manufacturing companies, the current use of performance measures is discussed followed by one sample T-test;
- The reliability and validity issues are discussed;
- Five methodological assumptions were checked; namely, normality, linearity, homoskedasticity, autocorrelation and multicollinearity;
- Correlation and regression analyses were discussed in order to unveil the very complicated nature of the relationships among factors;
- The interview procedures and analysis are presented and discussed; and
- Finally, a summary is provided.

7.2 Sample Characteristics and Data Analysis Methods

The main research questions are: I) What is the nature of performance measurement systems implemented in medium and large Egyptian manufacturing companies? II) What are the contingent factors that affect the use of these performance measurement systems in the Egyptian context?

A random sample of 200 medium and 200 large manufacturing companies was selected from the Egyptian chamber of commerce directory and the Egyptian Ministry of Investment directory. A survey questionnaire was constructed, piloted and sent to these companies (as described in section 6.4 in Chapter Six). The final questionnaire recorded a total response of 140 Egyptian manufacturing companies giving a very acceptable 35% response rate. The responses were from 73 medium sized manufacturing companies and 67 large sized manufacturing companies. Responses were coded and analysed through SPSS software. The main aim of the survey was to capture the views and beliefs of the participants concerning different performance measures applied in their companies, in addition their insights about the factors that might affect the use of these measures in their companies.

As shown in Chapter Six (section 6.4.1), the scale design and development was examined in depth. Then, the survey pilot testing was also discussed. After piloting the instrument, Churchill (1979) stressed the need to purify the measures before going beyond the pilot stage in research. He also added that refinements in the Likert scale method have been introduced via exploratory factor anaylsis. He contends that exploratory factor anaylsis should be conducted after the stage of purification otherwise it will lead to misleading results. Factor anaylsis is a data reduction technique in which a large set of variables is reduced to a smaller set without much loss of information. The technique can be used to select statements for Likert-type scales.

Methodologists have recommended that at least three to five measuring statements in a Likert scaled questionnaire representing each expected common factor that could be extracted to identify the dependent and independent factors in a specific study

(MacCallum *et al.*, 1999; Velicer and Fava, 1998). Thus, when designing studies for which exploratory factor analysis is likely to be used, one should consider the nature and number of common factors he or she expects might emerge. The total number of statements included should be at least 3 to 5 times the number of expected common factors, and the selected statements should include multiple attributes likely to be influenced by each of the common factors (Fabrigar *et al.*, 1999).

Therefore, three types of analyses are utilized in this study, namely; exploratory factor analysis that helps in refining the questionnaire and identifies a number of factors that represent the dependent and independent variables. Then, the descriptive analysis that describes the characteristics of certain groups of subjects (Norusis, 2000). Finally, association analysis that helps gaining more in-depth understanding of the relationships between the variables investigated (Peters, 2002). In addition, ten interviews were conducted, five of each size category, in order to assist in interpreting the results and to provide further insights to help understand any emerging phenomenon.

7.3 Exploratory Factor Analysis

Fabrigar *et al.* (1999) stated that researchers should always consider relevant theory and previous research when determining the appropriate number of factors to retain; to the extent, it is possible, they should try to anticipate the number and nature of the factors they expect to obtain and use this as a guide for selecting variables. Fabrigar *et al.* (1999) also stated, "Exploratory Factor Analysis (EFA) is used when a researcher wishes to identify a set of latent constructs underlying a battery of measured variables" (p. 275).

In addition, there is support for the use of factor analysis in accounting studies. See for example, Baber *et al.* (1996) and Gul *et al.* (2000). Bryman and Cramer (2001) stated "if there is no significant correlation between items that measure a variable, so they are unrelated and factor analysis is of no benefit in this case". Results of the reliability test showed that the questions or statements used to measure different variables, in the survey questionnaire, were inter-correlated. Therefore, factor analysis is appropriate to be utilized in this research.

ACITS (1995), Pallant (2001) and Peters (2002) highlighted that factor analysis could be applied for multiple aims such as exploring a content area, structure a domain, map unknown concepts, classify or reduce data, illuminate causal nexuses, screen or transform data, define relationships, test hypotheses, formulate theories, evaluate the construct validity, control variables, or make inferences. Although, all these purposes are overlapping, in this research factor analysis will be employed mainly to analyze relationships among survey statements that measure each variable. The underlying assumption of factor analysis is that there exist a number of unobserved factors that account for the correlations among different statements that measure a variable. In simple words, factor analysis specifies that variables are determined by common correlated factors and uncorrelated unique factors. Factor analysis determines these correlated factors and drops uncorrelated unique factors.

Factor analysis encompasses a variety of different but related techniques. The most well established techniques are the common factor analysis and principal components analysis. Although, they are functionally very similar, the main difference between the two techniques concerns interpreted variance. The former analyzes only the common variance[31] of the observed variables. On the other hand, the latter considers the total variance, both common and unique (ACITS, 1995).

In this research, Principal Components Analysis (PCA) is employed, although both techniques often produce similar results, PCA is psychometrically sound, simpler mathematically and it avoids some potential problems with 'factor indeterminancy' associated with factor analysis (Stevens, 1996: p. 363). Moreover, Tabachnick and Fidell (1996) stated that PCA is better in providing an empirical summary of the data set.

[31] It is assumed that the variance of a single variable can be divided into two portions: A common portion that is shared by other variables, included in the model, and a unique portion that is unique to a particular variable, uncorrelated with other variables and includes the error component.

As stated earlier, exploratory factor analysis would be used in the research to check the reliability of the data in addition to reducing the number of scale statements and to extract certain dependent and independent factors, which in turn will assist in evaluating the construct validity. Exploratory factor analysis will be applied in three steps following Pallant (2001): First, to assess the suitability of the data for factor analysis by using some specific statistical measures; namely, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Then, to extract factors that best represent the inter-relations among the set of scale statements. Finally, to rotate the extracted factors, which does not change the underlying solution, rather helps in interpreting the results.

7.3.1 Dependent Variables

Table (7.1) Barlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of the dependent variables

	Statements that measure the dependent variables
Barlett's test of sphericity	.000
Kaiser-Meyer-Olkin (KMO) measure	.694

In order to consider the suitability of the data, Barlett's test of sphericity should be significant ($p < 0.05$) to be appropriate. In addition, the KMO index ranges from 0 to 1, in which 0.6 is suggested as the minimum value for good factor analysis (Tabachnick and Fidell, 1996; Pallant, 2001).

Table (7.1) shows Barlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for all items that will shape the dependent variables. Obviously, the

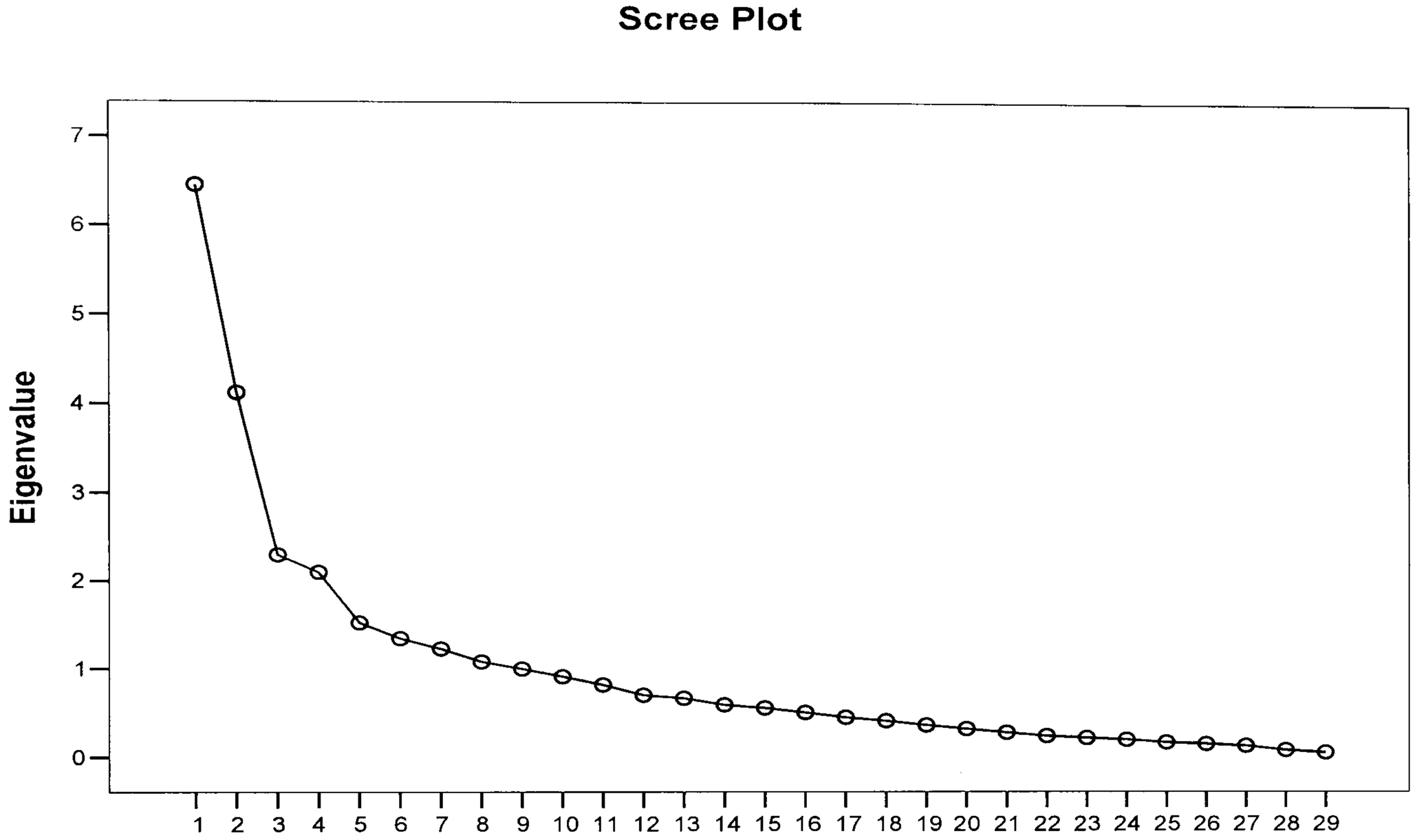
figures satisfy the required conditions, therefore, factor analysis is appropriate to this research.

Secondly, in order to determine how many factors are extracted, the SPSS outputs include the total variance explained table and scree plot, through which the extracted factors will be determined. Only factors that have an eigenvalue of 1 or more are considered to be retained. Sometimes when many factors are extracted, there will be a need to look to the scree plot. The scree plot determines the exact number of factors to be retained by looking to the change or the 'elbow' in the shape of the plot. Only factors above this point are retained. The following discussion will determine the extracted factors to be retained which will represent the dependent variables. In addition, after determining the number of extracted factors, they will be rotated in order to assist interpreting them. Rotation does not change the underlying solution; it simply helps provide further interpretation of the results.

Three criteria were used to determine the number of factors represented by the data: the magnitude of the eigenvalue, the scree test and the component matrix output (Pallant, 2001). Many researchers retain all factors with eigenvalues greater than 1. Alternatively, the scree test is used, because some researchers argue that the eigenvalue criterion is less precise (Tucker *et al.*, 1969) and may overestimate the number of factors (Zwick and Velicer, 1986).

Principal-component analysis initially identified nine factors with eigenvalues greater than 1 and accounted for almost 73% of the variance. However, the scree test indicated that five factors were adequate to account for the data; they explained almost 57% of the variance. The last four factors in the nine-factor solution each explained only a small percentage of the variance—Factor 6, 4.646%, Factor 7, 4.239%, Factor 8, 3.731% and Factor 9, 3.452%. The scree test identified the five-factor solution that explained almost 57% of the variance (see figure 7.1). This five-factor model was considered the best representation of the data in that each of the performance measures' statements was loaded saliently only on one factor.

Figure (7.1) The scree plot of the dependent measures



The component matrix indicated that most of the statements are loaded on the first five factors. The five factors were labeled financial measures (factor 2), customer measures (factor 5), Innovation and learning measures (factor 1), internal business measures (factor 4) and environmental measures (factor 3). Table (7.2) contains the results of the five-factor solution. The factor loadings were substantial, ranging from 0.423 to 0.837. This supports the conclusion from the scree plot to retain only these five factors. Numbers in the columns express the correlation between statements and factors. A number of statements have correlations with more than one factor; the rule that was followed is to include the statement with the factor that has the largest correlation. This is consistent with what have been done in other studies such as Ali (2000), El-Gendy (2004) and Mohamed (2004). Few statements have been excluded for not satisfying the reliability and validity criteria as explained in section (7.6).

Table (7.2) The five-factor rotated component matrix for performance measures

	Factor 1	***Factor 2***	***Factor 3***	***Factor 4***	***Factor 5***
	Innov. Measures	***Financial Measures***	***Env. Measures***	***Int. Measures***	***Cust. Measures***
-Financial figures importance		.685			
-Financial targets achievement		.695			
-Financial targets' effects		.629			
-Financial targets & promotion		.628			
-Financial figures & performance		.480			
-Financial ratios importance		.756			
-Financial figures & superiors		.423			
-Customers reactions					.514
-Customers complaints					.698
-Customers satisfaction & perform.					.837
-Meeting customers expectations					.540
-Gaining customers' loyalty					.504
-Acquiring the latest technology	.542				
-Monitoring competitors	.776				
-Creating new ideas	.542				
-Identifying new markets	.581				
-Updating databases	.759				
-Benchmarking competitors	.771				
-Continuous improvement	.797				
-Training for employees				.788	
-Products on-time delivery				-.554	
-Teamwork and coordination				.741	
-Products quality				.549	
-Public responsibility			.572		
-Greening			.708		
-Environment-friendly products			.597		
-Environmental commitments			.650		
-Environmental regulations			.638		
-Improving company's image			.607		

Eigenvalue	4.493	3.372	2.987	2.864	2.783
Percent of Variance	15.493	11.628	10.299	9.876	9.597
Percent of total Variance	15.493	27.121	37.420	47.296	56.893

Table (7.3) Summary of the factor analysis results for the dependent variables

	Original Statements	Factors Extracted
	29 statements	Financial Measures Customer Measures Learning and Innovation Measures Internal Business Measures Environmental Measures
Total	29 statements	5 factors

Table (7.3) summarizes factor analysis results for the dependent variables. In this research, factor analysis is used to reduce the large number of items that construct the dependent variables. Factor analysis can be used for this purpose with the knowledge that the meaningful variation in the original data has not been lost. The need to transform data is to meet the assumptions of other techniques such as regression analysis, which is utilized later in this chapter to have a better understanding of the factors that affect these performance measures. The results of the factor analysis showed that the dependent variables are divided into five factors; namely, financial (F2), customer (F5), innovation and learning (F1), internal business (F4) and environmental (F3) measures. In summary, the previous section, factor analysis helped in simplifying the very complicated and

correlated nature of statements that construct and shape the dependent variables in order to have a smaller number of unrelated factors that better fit in the association analysis.

7.3.2 Independent Variables

Barlett's and KMO index tests are carried out to check the suitability of the data, the Barlett's test of sphericity should be significant ($p<.05$) to be appropriate. In addition, the KMO index ranges from 0 to 1, in which 0.6 is suggested as the minimum value for a good factor analysis (Tabachnick and Fidell, 1996; Pallant, 2001).

Table (7.4) Barlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of the independent variables

	Statements that measure the independent variables
Barlett's test of sphericity	.000
Kaiser-Meyer-Olkin (KMO) measure	.626

Table (7.4) shows Barlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the statements included in this construct. Obviously, all figures satisfy the required conditions, therefore, factor analysis is appropriate to be used for extracting the independent variables.

To determine how many factors are extracted that represents the independent variables, the SPSS outputs include the total variance explained table and scree plot, through which the new extracted factors will be determined. Only factors that have an eigenvalue of 1 or more are considered to be retained. Sometimes when many factors are extracted, there will be a need to look to the scree plot. The scree plot determines the exact number of factors to be retained by looking to the change or the 'elbow' in the shape of the plot.

Only factors above this point are retained. In addition, after determining the number of extracted factors, they will be rotated in order to assist interpretation. Rotation does not change the underlying solution just helps in providing interpretation.

Figure (7.2) The scree plot of the independent variables

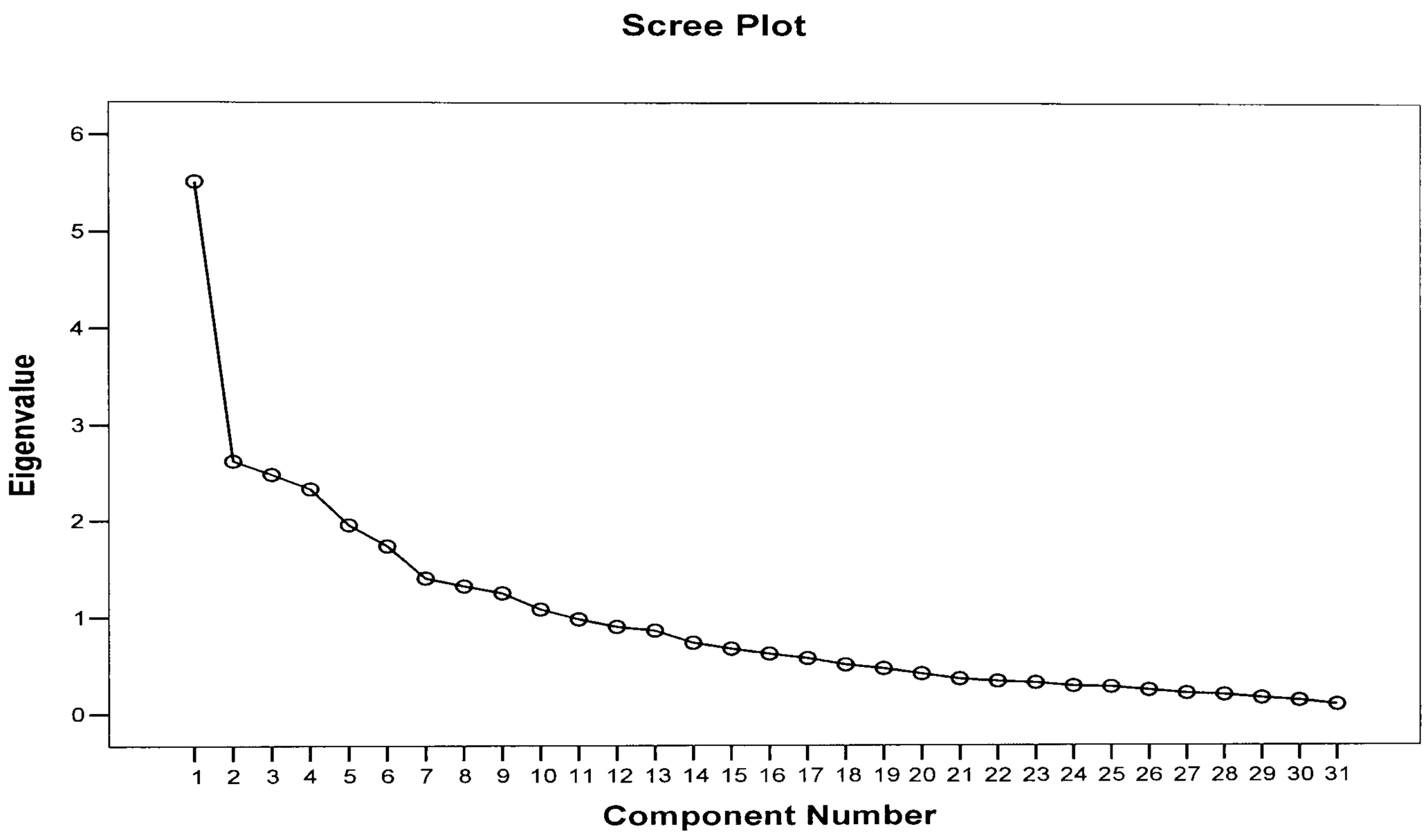


Table (7.5) The seven-factor rotated component matrix for contingent variables

	Factor 1	***Factor 2***	***Factor 3***	***Factor 4***	***Factor 5***	***Factor 6***	***Factor 7***
	Technology	***Strategy***	***Competition***	***Environmental Uncertainty***	***Structure***	***Management Style***	***Reward Systems***
-Strategies importance		.720					
-Long and short-term strategies		.656					
-Strategies & financial plan		.838					
-Strategies & non-financial measures		.778					
-Strategies' effects on innovation		.445					
-Structure & performance measures					.316		
-Structure's effect on financial measures					.733		
-Structure & non-financial measures					.727		
-Informal relationships between staff					.615		
-Competition importance			.617				
-Competition & financial measures			.484				
-Competition severity			.488				
-Competition & customers measures			.746				
-Competition & non-financial measures			.646				
-Competition & performance measures			.733				
-Technology importance	.802						
-Technology update	.566						
-Technology & performance measures	.789						

-Technology & non-financial measures	.779						
-Management style importance						.503	
-Mgt. style & performance measures						.468	
-Management styles' changes						.584	
-Management style & company's goals						.617	
-Management style & non-fin. measures						.646	
-Reward systems & performance							.661
-Reward systems & financial targets							.628
-Reward systems & non-fin. measures							.585
-Env. uncertainty & PM				.764			
-Env. uncertainty & financial targets				.859			
-Env. uncertainty & non-fin. measures				.736			
-Env. uncertainty & decision-making				.643			
Eigenvalue	3.336	2.870	2.794	2.673	2.331	2.067	1.961
Percent of Variance	10.762	9.259	9.014	8.621	7.519	6.668	6.326
Percent of total Variance	10.762	20.021	29.035	37.657	45.176	51.844	58.170

The loading of factor analysis shaped the seven original variables in a clear manner. These seven variables extracted are as follows: strategy (StratF2); structure (StrucF5); competition (CompF3); technology (TechF1); management style (MgtStF6); reward systems (RewSysF7) and environmental uncertainty (EnvUnF4). Principal-component analysis initially identified ten factors with eigenvalue greater than 1 and accounted for almost 70% of the variance. However, the scree test indicated that seven factors were adequate to account for the data (see figure 7.2), they explained almost 58% of the variance. The last three factors in the ten-factor solution each explained only a small percentage of the variance—Factor 8, 4.254%, Factor 9, 4.022%, and Factor 10, 3.479%. This seven-factor model was considered the best representation of the data in that different contingent items was loaded saliently only on one factor.

The component matrix indicated that most of the statements are loaded on the first seven factors. The seven factors were labeled Strategy (factor 2), Structure (factor 5), Competition (factor 3), Technology (factor 1), Management style (factor 6), Reward systems (factor 7) and Environmental uncertainty (factor 4). Table (7.5) contains the results of the seven-factor solution. The factor loadings were substantial, ranging from 0.316 to 0.859. This supports our conclusion from the scree plot to retain only these seven factors. Numbers in the columns express the correlation between statements and factors. A number of statements have correlation with more than one factor; the rule that was followed is to include the statement with the factor that has the largest correlation. This is also consistent with what have been done in other studies such as Ali (2000), El-Gendy (2004) and Mohamed (2004). Few statements have been excluded for not satisfying the reliability and validity criteria as explained in section (7.6).

Table (7.6) Summary of the factor analysis results for the independent variables

	Original Statements	Factors Extracted
	31 statements	Strategy Structure Competition Technology Management Style Reward Systems Environmental Uncertainty
Total	31 statements	7 factors

Table (7.6) summarizes the factor analysis results for the independent variables. In this research, factor analysis is used to reduce the large number of statements that construct the independent variables. Factor analysis can be used for this purpose with the knowledge that the meaningful variation in the original data has not been lost. The need to transform data is to meet the assumptions of other techniques such as correlation and regression analyses. The results showed that seven independent variables are extracted. This is in line with what was derived from the broader literature on performance measurement techniques that indicate that these variables are associated with variation in the use of these systems across manufacturing companies. Thus, factor analysis provided supporting evidence for this choice and that these variables are of paramount importance to performance measurement.

A crucial remark should be noted here that one of the independent variables, organisational size (sizectg) will not be extracted from the factor analysis. Organisational size was identified by asking the respondents to state the approximate number of employees in their companies. Organisational size is therefore dealt with as a categorical

variable which will be used as an intervening variable to divide the sample itself into medium and large sized companies.

In summary, the previous section sought to simplify the complicated and correlated nature of statements that make up the independent variables through the use of factor analysis. This was an attempt to construct a small number of unrelated factors that better underpin the association analysis.

7.4 The Current Use of Different Performance Measures

There were five extracted dependent factors from the exploratory factor analysis; namely, financial, customer, innovation and learning, internal business and environmental measures. In an attempt to answer the first research question, which is 'what is the nature of performance measurement systems implemented in medium and large Egyptian manufacturing companies?', the following descriptive analysis is undertaken to try to unveil the confusion around this point.

Table (7.7) summarizes the number of responses for each statement in the questionnaire, the total score and the average score for each statement. As mentioned earlier, the responses are 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree'. In addition, each column had a particular value, i.e. 1, 2, 3, 4, 5 respectively. The total score is calculated by adding up the scores for each statement, which identifies the respondent's position of each type of performance measures and whether his or her company utilizes such type of performance measures or not. The average score is calculated by dividing the total score of a statement by the number of respondents.

Table (7.7) Summary of the frequencies of the dependent variables

Statement Number	Number of Responses (R1)	Number of Responses (R2)	Number of Responses (R3)	Number of Responses (R4)	Number of Responses (R5)	Total Score	Average Score
1	9	13	24	25	69	552	3.94
2	10	9	13	35	73	572	4.09
3	14	19	23	27	57	514	3.67
4	16	14	29	27	54	509	3.64
5	16	6	25	44	49	524	3.74
6	7	7	38	47	41	528	3.77
7	19	11	22	43	45	504	3.60
8	4	6	19	28	83	600	4.29
9	0	9	27	34	70	585	4.18
10	2	12	24	35	67	573	4.09
11	25	18	34	34	29	444	3.17
12	3	7	15	45	70	592	4.23
13	10	6	22	30	72	568	4.06
14	8	8	36	28	60	544	3.89
15	25	22	44	27	22	419	2.99
16	44	26	29	25	16	363	2.59
17	14	14	34	35	43	499	3.56
18	12	18	21	50	39	506	3.61
19	10	19	31	34	46	507	3.62
20	19	25	20	31	45	478	3.41
21	16	19	34	34	37	477	3.41
22	15	21	36	32	36	473	3.38
23	12	19	27	44	38	497	3.55
24	11	21	30	29	49	504	3.60
25	5	12	33	19	71	559	3.99

Statement Number	Number of Responses (R1)	Number of Responses (R2)	Number of Responses (R3)	Number of Responses (R4)	Number of Responses (R5)	Total Score	Average Score
26	11	24	25	33	47	501	3.58
27	14	19	27	32	48	501	3.58
28	20	32	21	41	26	441	3.15
29	17	20	32	35	36	473	3.38

Maurer and Pierce (1998) stated that a response to a scale ranging from strongly agree to strongly disagree with a neutral response in the middle may be practically equivalent to providing a 'yes' (which in this research considered as 'measure used') or 'no' (which in this research considered as 'measure not used'). Therefore, a response on the agree side of the scale (agree and strongly agree) may be equivalent to a 'yes' response in the traditional measurement scales that depend on just yes/no option, whereas a response on the disagree side of the scale (disagree and strongly disagree) may be equivalent to a 'no' response in the traditional measurement scales. In addition, Likert scale provides the strength of the response, which is assessed as the distance away from the neutral response. In this research, this was utilised to determine the percent of the participated companies that agree or disagree with the importance of each set of measures, and whether they are using or not using them. As mentioned earlier, the 5-point Likert scale was used to capture respondents' opinions in respect to different performance measures applied by their companies. The following table (7.8) presents the frequencies analysis for the sample concerning the dependent factors. Respondents were more likely to agree that they apply different set of performance measures in their companies.

Table (7.8) Frequencies analysis

Use of measures	Use of Financial Measures (Percent %)	Use of Customer Measures (Percent %)	Use of Learning and Innovation Measures (Percent %)	Use of Internal Measures (Percent %)	Use of Environmental Measures (Percent %)		Use of Performance Measures (Percent %)
Not Used	17.1	14.3	28.6	32.9	34.3	Using single measure	5
Used	82.9	85.7	71.4	67.1	65.7	Using multiple measures	95
Total	100.0	100.0	100.0	100.0	100.0	Total	100.0

Respondents were asked about the importance of the financial figures, financial ratios and how superiors in these companies value the financial measures. Approximately 83% of respondents agreed with the importance of these measures and that their firms apply and utilize the financial measures in one way or another. As one interviewee stated "*...all what shareholders care about are the financial figures regardless of how can we achieve them*". Another one said, "*...among other performance measures, financial figures still have their own attractiveness*". However, the result that some manufacturing companies do not see the importance of the financial measures may appear somewhat surprising to the vast majority of Western researchers. However, it should be borne in mind that some of the managerial appointments are determined by family considerations and personal contacts, which is considered a sort of corruption that prevailed in the Egyptian society. Therefore, it is likely to find a manager with little or even no business or accounting background, thus, it is possible that some respondents are not familiar with these measures and hence cannot fully appreciate its importance. This will be discussed in detail in the following section.

Respondents were also asked about the importance of the customers' satisfaction, customers' complaints, how to achieve their needs and how the company can meet their expectations. Approximately 86% of respondents stated that because of severe competition, they have to focus on these measures in order not to lose their market share. As another interviewee stated "... *in our business, there are a lot of competitors which place an increasing responsibility on us to keep our customers satisfied*".

Concerning innovation and learning measures, respondents were asked about the level of innovation they apply such as introducing new products or discovering new markets, and how can they learn and benefit from their own experience and from others' experiences. Approximately 71% of respondents approved the importance of these measures to achieve sustainability. As an interviewee had put it "...*although creating new products cost a lot of money, it is worth the money invested in because, simply, it keeps you ahead of any competitor*".

Internal business measures such as those related to employees and their satisfaction. Respondents were asked about the importance of employees' satisfaction, products' quality levels and on-time delivery. Approximately 67% of respondents reported that they use all or some of these measures. As one interviewee stated "...*if our employee is not satisfied, we can not ask him/her why our customers aren't?*"

Surprisingly, the environmental measures reported a very good ratio 65%. Respondents were asked about how they follow the environmental regulations and their point of view about environment and safety. Although, these measures are relatively new in the world, in general and in Egypt in particular, there are a large number of firms that use these measures. Whether this application is because these firms are trying to obtain a good image to attract more customers or just to obey regulations in the country. As one interviewee said, "...*we have to follow the new environmental laws in order to obtain the ISO certificate which indeed will make our image better in the eyes of our customer*".

Finally, in line with others' studies (For example, Said *et al.*, 2003), the adoption of at least two types of these five types of performance measures was measured in another new dummy variable called "Use of Performance Measures". Results show that the vast majority of respondent companies in Egypt (95% of the companies participating in the study) apply more than one type of measures; therefore, it is not assumed that they depend on the financial measures as the traditional type of measures. This might be because they realise the importance of applying multiple measures for maintaining the company's performance.

7.5 T-Test of the Use of Performance Measures

The One-Sample T-Test procedure tests whether the mean of a single variable differs from a specified constant. As shown earlier, the value of '3' is chosen as the break point in the scale between the disagreement of applying the measure (answers 1 and 2) and the agreement of applying the measure (answers 4 and 5).

Table (7.9) shows the result of t-test that has been undertaken to compare the mean value of each type of performance measures with 3, which is the neutral point in the scale between the agreement in using different performance measures and the disagreement in using the measures. As shown in table (7.9), the null hypothesis H_0: $\mu = 3$ and the H_1: $\mu \neq 3$. The significance we are looking for is only for $\mu > 3$, which indicates the importance of the use of these measures (answers 4 and 5); therefore, the significance one-tailed is calculated. Obviously, all types of measures are significant ($p < .001$).

Table (7.9) Descriptive Statistics for Performance Measures Constructs and Comparison of their Means

	One-Sample t –Test / Value = 3						
	Mean	Std. Deviation	Std. Error Mean	Mean Difference	T-value	Sig. (2-tailed)	Sig. (One-tailed)
Average FinMs	3.78	.813	.069	.779	11.325	.000	.000
Average CusMs	3.99	.768	.065	.991	15.267	.000	.000
Average InnvMs	3.48	.917	.078	.476	6.135	.000	.000
Average IntMs	3.44	.993	.084	.438	5.214	.000	.000
Average EnvMs	3.55	.895	.076	.546	7.226	.000	.000

Results indicate that financial measures are important in 82.9% of the participated manufacturing companies in the sample. T-test results supported the view that these measures are significant. Behn (2003) stated that for a business, the traditional financial performance measures have been the famous bottom line—although any business has not just one bottom line but many of them, a variety of financial ratios (return on equity and return on sales) that collectively suggest how well the firm is doing—or, at least, how well it has done. Goldratt and Fox (1993) believe that financial performance is the most

important dimension of performance to be measured, although they suggest the use of measures of performance other than traditional financial-oriented management accounting techniques.

Eccles and Pyburn (1992) developed a comprehensive performance measurement system that incorporates both financial and nonfinancial measures. They stated:

> "*Of course, we would not deny the central role that financial measures play in assessing the overall performance of a business. They are legitimate and important indicators of how well management is utilizing the assets under its control to increase shareholder value. But, as every manager knows, there are important limitations in relying exclusively on financial measures of performance*" (p. 41).

Nevertheless, a few companies (17.1%, which was 24 companies out of the 140 companies of the sample) admitted not utilising the financial measures, which has an explanation related to the corruption prevailing in Egyptian society. Gloster-Coates and Quest (2005) stated that administrative *corruption* generally refers to extortion of firms by bureaucrats who can make it difficult for a company to operate in a particular country. This is often seen in third-world countries where development languishes. Hayajenh *et al.* (1994) highlighted that the prevailing cultural attitude in the developing countries, such as Egypt, inspired students to pursue degrees in traditional types of education instead of the technical skills needed in industry. Such education has created an imbalance in the labour market and, therefore, nepotism plays a great role in finding jobs. Bardhan (1997) highlighted that inefficiency may result if the official is influenced by considerations such as favoritism for a particular client or nepotism.

Smadi (1987) stated that Arab nations have faced many problems since their independence in the mid-1950s and 1960s. Arab governments have assigned educated chiefs and their sons to key positions to buy their loyalty. The chiefs, in turn, have used their influence to help relatives and friends to find jobs in the public sector or in military

organisations. Later, this culture prevailed in the whole society, whether public, governmental or private companies.

Hayajenh *et al.* (1994) stated that the majority of respondents, in their study, agree that organisations, which prohibit nepotism, are more effective than those which allow it. Based on the empirical evidence provided by their study, they concluded that nepotism violates the basic rule of equal employment opportunity, which recognizes "the right person for the right job". Therefore, it was not surprising to find poorly qualified people running companies. The main reason why they ruin their business is that they are not aware of how to use the managerial tools to achieve high performance and to fulfil company's objectives. Overall, such organisations would not be able to achieve organisational goals, objectives and effectiveness. This would generate low morale, frustration and stress, regarding employees. This might be an explanation to why there is a certain percent (17.1%) of the respondents who do not see the importance of the financial measures. This issue is fascinating but the full investigation is beyond the scope of this study and will be left for future research.

Results also show that customer measures are applied in 85.7% of the participated manufacturing companies. T-test shows that these measures are significant. These results are in line with other previous studies conducted in this field. Srinivasan's study (1997) demonstrates that customer measures are significantly associated with future financial performance. These measures have a positive impact on revenues and profit, which are more likely to show long-term rather than immediate improvement. Therefore, these measures were widely used in the companies of his sample. Brignall and Ballantine (1996) stated that management has to manage the interactions between the desires of various stakeholders such as customers, suppliers, employees and shareholders in order to achieve better performance.

Anderson *et al.* (1994, 1997), in their study on 77 Swedish firms representing different industries, found that after controlling for past returns and a time trend, contemporaneous accounting performance is positively associated with customer satisfaction. Perera *et al.*

(1997) found that the use of nonfinancial measures is associated with enhanced performance for firms pursuing customer satisfaction through their manufacturing strategy. Ittner and Larcker (1998a) examined the relation between customer satisfaction and firm performance using customer-level, business unit, and firm-level data. They found some evidence that firm-level customer satisfaction measures are associated with the firms' current market value. Behin and Riley (1999) found that customer measures are contemporaneously associated with financial performance in the U.S. airline industry. Foster and Gupta's (1997) study provides evidence on the link between customer satisfaction and future profitability. Similarly, Banker *et al.* (2000) provide evidence on the impact of nonfinancial measures, such as customer measures, on future accounting-based performance. The results of their field-based study indicate that current customer satisfaction is significantly and positively related to future financial performance. In contrast, Ittner and Larcker's (1998b) survey suggests that many firms do not experience a significant association between customer satisfaction and contemporaneous accounting and market returns. In summary, the results of the majority of these studies find a positive relation between future firm performance and current use of customer measures.

Results also showed that innovation and learning measures were applied in 71.4% of the participating companies. T-test results show that these measures are significant. These results are consistent with other studies. Rouse *et al.*'s (2002) case study of an airlines company found that the fact that there is a mixture of changes through high efficiency, doing things better, and better technology makes it difficult to identify when performance improvement reflects a change in performance efficiency and when it reflects learning. Their results suggested that the airline company had instigated deliberate processes directed towards continuous improvement and management believed that these efforts had been successful. The results also suggest that overall gains have been achieved in efficiency and learning culminating in across the board improvement. They concluded that learning is a major contributor to improvement and has lifted the level of performance on average by 8%. In addition, the results in Hirschey *et al.* (2001) suggest that nonfinancial information on the quality of patents has consistently positive effects on stock prices.

Results highlighted that internal business measures were applied in 67.1% of the participated companies. T-test proved that these measures are significant. This is consistent with other studies. Heskett *et al.* (1994) consider that employee satisfaction is a prerequisite for customer satisfaction and consequent profit. In addition, Brignall and Ballantine (1996) agreed that one key element in making any control system work is employee satisfaction, which will be intimately linked to the organisation's reward system.

Neely *et al.* (1994b) found that delivery performance is more commonly measured than lead time performance, which will positively contribute to the overall performance. A case study conducted by Monkhouse (1995) also found quality levels to be the most frequently measured performance indicator. Hvolby and Thorstenson (2001), in their study on a sample of Danish SMEs, found that the most frequently measured performance indicators were 'quality levels' and 'on-time delivery'. On the other hand, the potential and readiness for using 'lead time' and 'capacity utilization' as performance indicators also seemed to be fairly strong.

Chenhall (1997) concludes that firms using quality control measures as one of their nonfinancial manufacturing performance measures achieve higher performance than those firms that do not use these measures. Simons (1987) finds that return on investment is higher when accounting control systems include strategic nonfinancial measures. Abernethy and Lillis (1995) indicate that greater reliance on nonfinancial manufacturing measures, such as quality control, has a more positive effect on performance. Taken together, the results of theses studies are consistent with the results of the current study concerning the application of the internal business measures.

Surprisingly, results showed that environmental measures were applied in 65.7% of the participating companies. T-test shows that these measures are significant. This might be because of some new environmental regulations that are implemented by the Egyptian government (see for example; Mohamed, 2004), which is consistent with what Ashford and Meima (1993) and Fiksel (1994) stated about the increasing pressure from the

government, trade organisations, proactive companies and other stakeholders for information on organisations' environmental performance.

These results are also consistent with other studies such as Epstein (1996), Welford (1996) and Young and Welford (1998). Epstein (1996: p. xxix) stated, "5 or 10 years ago, most corporations did not seriously consider their environmental liabilities in either internal decision making or external reporting. The rapid increase in environmental costs now has caused companies to begin to integrate these considerations into management decisions at all levels ... measuring and reporting corporate environmental performance is still in its infancy but significant developments are occurring. Companies are beginning to recognise that they need to be proactive rather than reactive and that planning orientation rather than a compliance orientation pays off in both reduced environmental impacts and increased long-term corporate profitability". Roberts (1994) added that environmental measures have been one of the routes followed by many organisations in the United States and Europe to improve their impact on the environment. Finally, according to Epstein (1996), environmental measures should be developed and used by the business community if companies seek sustainability.

7.6 Reliability and Validity Issues

In the present research, the *reliability* of performance measures was estimated using Cronbach Alpha coefficient (Cronbach, 1951) for internal consistency of the scale. The following tables (7.10) and (7.11) represent Cronbach Alpha coefficient for both the dependent and independent variables, respectively. As mentioned earlier in chapter six, Nunnally (1978), Peterson (1994) and Peters (2002) argued that there are a number of considerations that previous research has highlighted in the use of reliability testing, which also determine the acceptable level of alpha coefficient. For example, the number of response categories (e.g. a 5-point Likert scale) and the number if items in the scale. They agreed that an alpha coefficient of an average between 0.50 - 0.70 is a moderate and acceptable level for social research. Certainly, the higher the coefficient, the better the reliability of the scale.

Table (7.10) Cronbach Alpha coefficients for the dependent variables constructs

Serial No.	Dependent Variables Constructs	Cronbach Alpha Coefficient
1	7 multi-item construct for measuring the use of the financial measures	.771
2	5 multi-item construct for measuring the use of the customer measures	.776
3	7 multi-item construct for measuring the use of the learning and innovation measures	.846
4	4 multi-item construct for measuring the use of the internal business measures	.562
5	6 multi-item construct for measuring the use of the environmental measures	.763

The reliability coefficients (Alpha) for the dependent variables constructs in this research are ranging from 0.562 to 0.846, which are within the acceptable level of reliability coefficients in social researches.

In addition, the reliability coefficient (Alpha) for the independent variables constructs, as shown in the following table (7.11), are ranging from 0.525 to 0.787, which are also within the acceptable levels. Therefore, both reliability coefficients for the dependent and independent variables are considered safely above the limit of acceptability for social research.

Table (7.11) Cronbach Alpha coefficients for the independent variables constructs

Serial No.	Independent Variables Constructs	Cronbach Alpha Coefficient
1	5 multi-item construct for measuring strategy	.662
2	4 multi-item construct for measuring structure	.611
3	6 multi-item construct for measuring competition	.762
4	4 multi-item construct for measuring technology	.787
5	5 multi-item construct for measuring management style	.651
6	3 multi-item construct for measuring reward systems	.525
7	4 multi-item construct for measuring environmental uncertainty	.781

Concerning the *construct validity* of a particular measure, it was assessed by factor analysis (using Varimax rotation) (Brown, 2000). The factor analysis yielded five factors for performance measures with an Eigen-value greater than one, together explaining 57% of the observed variability. On the other hand, factor analysis yielded seven factors for the variables that affect the use of performance measures with an Eigen-value greater than one, together explaining 58% of the observed variability. Results from a principal components factor analysis reflect that measures of constructs correlate more highly with

their own statements than with measures of other constructs being measured (see chapter six, p. 182-185). Following Hair *et al.* (1995) only those statements have a factor loading larger than 0.5 should be retained. As stated by Peters (2002), "Statements that do not respect the reliability and validity criteria may be removed from the instrument" (p. 72). As a result, this implies that research constructs are valid.

Therefore, the original questionnaire was clarified, simplified and restructured as illustrated in Chapter Six. To use the questionnaire data efficiently, there was a need to aggregate these statements to represent limited number of factors that represent the research variables. Factor analysis and Reliability tests were used to achieve this aim, in addition, to test the reliability and construct validity for the data. Statements, which did not fulfil the conditions of those two tests, were cancelled. Fortunately, the cancelled statements were few, which is in line with other studies in this field (e.g. Ray, 1982; El-Gendy, 2004). This statistical work was carried out in line with the recommendations of key statistical writers (For example, Field, 2000; Sekaran, 2000; Bryman and Cramer, 2001; Peters, 2001). Table (7.12) shows the phases of the scale refinement, originally the scale started with 82 statements that was designed to capture the attitudes and beliefs of the participants. After the pilot testing phase, 13 statements were deleted for clarification, redundancy and simplification reasons. Then, after conducting the exploratory factor analysis and reliability tests, 9 statements were also cancelled.

Table (7.12) Phases of scale refinement

	Original No. of Statements	The No. after the Pilot study	The No. after Factor Analysis and Reliability tests
No. of Statements in the Questionnaire	**82** Statements	**69** Statements	**60** Statements

In addition, concerning the external validity, Abernethy *et al.* (1999) stated that the use of multiple methods and/or multiple sources of data in survey-based studies could not only

improve the study's overall generalisability, but also enhance the interpretation of the results coming from the survey method itself. Therefore, semi-structured interviews were also utilized in this research to provide another method of further interpretations of the questionnaire results. Overall, although it is quite unlikely that the philosophical stances adopted and the research methods employed in this study will be universally accepted by the whole academic community in the field of management accounting and control, the method and methodology chosen in this research are seen as highly justified.

7.7 Checking the Methodological Assumptions

A number of assumptions should be checked before performing any analysis on the data. The sample was divided into two sub-samples (i.e. medium and large sized manufacturing companies). Different statistical tests are conducted for each sub-sample five times in order to determine the relationships between each type of performance measures and the independent variables.

The first assumption is the normality of the error. Normality means that the residuals[32], as a measure of the error, should be normally distributed with a mean of zero and constant variance. This has been checked by inspecting the histograms of the residuals of each sub-sample. There should be almost a straight line (roughly), not a curve (the residuals should have a straight-line relationship with predicted DV values). By inspecting the residuals scatterplot and the Normal Probability Plot of the regression standardized residuals for the two sub-samples, the medium and large sized manufacturing companies, it was obvious that all points are lying in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. This result can be reinforced by using the K-S test, the "Asyms. Sig. (2-tailed)" values for the two sub-samples of medium and large sized manufacturing companies are greater than 0.05, which means that the residuals are normal.

[32] Residuals are the differences between the obtained and the predicted dependent variable (DV) scores.

The second assumption is linearity. It means that the relationship between the dependent and independent variables should be linear. This can be verified by looking at a scatterplot of the residuals against predicted values. The Scatterplot of the standardized residuals should show a roughly rectangular distribution, with most of the scores concentrated in the centre (along the 0 point). This is the case with this data and there is no clear or systematic pattern to the residuals and the linear relation is significant.

The third assumption is homoskedasticity, which means that the variability in errors (the residuals) for variable X should be similar at all values of variable Y. This has been checked by looking at the scatter plot of the residuals, which should show a fairly even cigar shape along its length. Which is also the case for the data; therefore, it is assumed that the variance of the error term is constant and that there is no violation of this assumption in our model.

The fourth assumption is the need to avoid autocorrelation, which means that the residuals should be independent. One way to test the autocorrelation of the residuals is a Durbin-Watson test. This statistic range is from 1-4 and if there is no autocorrelation among our variables this figure should be around 2, this is the case in the two sub-samples, the medium and large sized companies as shown in table (7.13). For further investigation of the autocorrelation, the autocorrelations function, in the SPSS package, was run.

Table (7.13) Medium & Large Sized Companies Summary of Durbin-Watson Values

	Financial Measures	Customer Measures	Internal Business Measures	Innovation and Learning Measures	Environmental Measures
Medium Sized Companies	1.754	1.787	2.356	2.238	1.376
Large Sized Companies	2.160	2.118	2.023	1.883	1.620

In addition, the "Runs" test was performed, which reinforces the result of having no significant autocorrelation in the data. All the "Sig. (2-tailed)" values for the whole model are greater than 0.05; therefore, the assumption of the independence of the residuals is not rejected. In summary, there is no evidence that proves the existence of autocorrelation and the assumption of the independence of the residuals is maintained.

The fifth assumption is multicollinearity. Tests of multicollinearity are performed to assure independence of the variables. The correlation matrices of the independent variables were examined for evidence of collinearity problems. Although there are several significant relationships among the Pearson correlation coefficients, none of them is sufficiently high enough to suggest serious multicollinearity. In addition, SPSS performs 'collinearity diagnostics' on the variables, the value labelled "Tolerance" helps us to judge if we suffer multicollinearity or not. Tolerance is calculated by the formula 1-R^2 for each variable. If this value is very low (near 0), then this indicates that the multiple correlation with other variables is high, suggesting the possibility of multicollinearity.

Table (7.14) Collinearity Statistics for the Two Sub-Samples

Independent Variables	Medium Sized Manufacturing Companies		Large Sized Manufacturing Companies	
	Tolerance	VIF	Tolerance	VIF
Strategy	.399	2.508	.373	2.683
Structure	.470	2.128	.630	1.588
Competition	.504	1.985	.439	2.279
Technology	.482	2.073	.572	1.749
Mgt Style	.557	1.797	.352	2.840
Reward Systems	.418	2.390	.444	2.252
Env. Uncertainty	.431	2.319	.475	2.105

Neither the tolerance (TOL) for each variable nor the variance inflation factor (VIF) shows signs of material multicollinearity, as shown in table (7.14). This refers to the relationship among the independent variables. Multicollinearity exists when the independent variables are highly correlated (r = 0.9 and above) (Pallant, 2001). Tabachnick and Fidell (1996: p. 86) suggest that the bivariate correlation among the independent variables should not exceed 0.7.

Moreover, the VIF (Variance Inflation Factor) column was checked to make sure that all values are below 10, which suggests no multicollinearity as shown in table (7.14). This can also be reinforced by the levels of correlation coefficients between the independent variables which are acceptable. All the VIF values in table (7.14) are less than 10. For such type of social studies, it is not unusual to have some insignificant multicollinearity among the research variables. Therefore, it is assumed that there is no severe multicollinearity among the independent variables for all performance measures in both medium and large sized manufacturing companies' sub-samples. These results were also in line with other studies such as Belsley (1991) and Hassabelnaby *et al.* (2003).

7.8 Association and Variation Statistics

To better understand the relationship between a firm's performance measures and the contingent variables selected initially in this study, regression analysis is used. In this section, the contingent variables of this research will be examined in an attempt to explain the relationships between these variables and different performance measures. This section is divided into two main subsections, each for one of the sub-samples. In the first section (7.8.1), medium sized manufacturing companies sample is analyzed. The second section (7.8.2), large sized manufacturing companies sample is also analyzed. Each subsection will discuss the relationships between the five types of performance measures and different contingent variables. The statistical analyses that have been undertaken to trace the association among variables are correlation and regression. Each performance measure will be discussed separately, and then a summary of all the individual results will be followed.

The statistical correlation as a measure of association has been used in this research to test association between independent and dependent factors. Correlation techniques are widely used as measurements of the direction and strength of association between pairs of variables. The correlation technique, which was been used to test this association in this research, is the Pearson test. The Pearson correlation coefficient is a measure of the degree of closeness of the linear relationship between two variables (Snedecor and Cochran, 1971; Weisberg, 1985; Rice, 1995). This test is the parametric test that measure three pieces of information: (1) The direction of the relationship between pairs of variables or factors (positive which means that the two variables are moving in the same direction or negative which means that the two variables are moving in the opposite direction). (2) The strength of the relationship between the variables (the absolute number of the correlation). (3) Finally, the statistical significance of each correlation, which makes it possible to examine whether the correlation should be accepted or not in the light of certain limits and the need for a confidence interval.

Regression analysis determines how variation in one variable relates to variation in another variable and what is the shape of the relation between the two variables (Snedecor and Cochran, 1971; Bowen and Starr, 1982; Jaccard *et al.*, 1990; Rice, 1995). In other words, regression parameters can also show the contribution of each individual variable in the set of independent variables on the change in the dependent variable. The result from the regression is a determination coefficient that describes the percentage of variability in the dependent variable due to one unit change in the independent variable. The regression models, in this research, are used to explain and describe the behaviours of dependent variables rather than to predict, since the main aim of this research is to discover and explain the relationships between the dependent and independent variables rather than to predict these relationships.

The outputs of the regression model include the following terms:

- Multiple R measures the influence of the set of independent variables on the dependent variable.

- The R square, also called the coefficient of determination, shows the % change in the dependent variable due to a change in the independent set of variables.
- *B* is the unstandardized regression coefficient, which predicts the amount and direction of change in the dependent variable due to a unit change in the independent variable. *B*s are the unstandardized coefficients of the estimated regression model.
- Beta is a way to classify the independent variables according to the influence of each one of them on the dependent variable. Beta is the standardized coefficient because, mostly, the independent variables are measured in different units. Therefore, the standardized coefficients or betas are an attempt to make the regression coefficients more comparable.
- Significance of T provides the significance of each independent variable individually (less than .05 and vice versa).
- Significance of F points at the model's fit, or in different way, the significance of the whole model. If F less than .05, so the regression is significant at 95% confidence level and vice versa.

Linear Regression estimates the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variable. As shown earlier, the assumption that for each value of the independent variable, the distribution of the dependent variable must be normal was maintained. The relationship between the dependent variable and each independent variable was found to be linear, and residuals are independent. The multiple linear regression model contains multiple independent variables (X_1, X_2, X_3, ... X_n), a constant, the slope of the regression line and the dependent variable. The regression model equation is expressed as:

$$Y = a + B_1X_1 + B_2X_2 + B_3X_3 + \ldots + B_nX_n$$

Where:

(*Y*) is the dependent variable.

(a) is the intercept (on the y axis), it is the constant number in the equation. By default, the regression model includes this constant term, which is found in the output results of the SPSS.

(B_i) is the slope of the regression line.

(X_i) is the independent variable

The regression models are all statistically significant to $p<0.001$, with explained variances ranging from a high ratio of 72.8% for the customer measures to a relatively low ratio of 48.2% for the environmental measures both in medium manufacturing companies.

As mentioned earlier, the association analysis, which is conducted in the following section, is divided into two subsections; namely, medium and large sized manufacturing companies. Previous studies related to developing countries recognised the importance of company size to the use of management accounting techniques, such as performance measures, as small firms are likely to employ less and not organised management accounting techniques than larger companies (Savage, 1966; Chiu, 1973; El-Ebaishi, 2003). Therefore, the responses obtained from the medium sized manufacturing companies are analyzed separately from the responses obtained from the large sized manufacturing companies to enable any differences due to organisational size to be identified.

7.8.1 Medium Sized Manufacturing Companies

1. The use of financial measures

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the financial measures, and other independent variables. A correlation coefficient is used to describe the strength of the relationship between two variables. It is a number between –1 and +1 (inclusive) that measures how closely a set of data points tends to cluster about the regression line. If the correlation coefficient is close to +1, then the variables have a strong positive

relationship. If it is close to –1, then there exists a strong negative relationship. If it is near 0, then little or no relationship exists (Mendenhall and Sincich, 1992).

Table (7.15) presents the results of the Pearson correlation between financial measures in relation to strategy, structure, competition, technology, management style, reward systems and environmental uncertainty. The results show that there are strong positive correlation coefficients between the dependent variable (i.e. financial measures) and all the independent variables. The lowest correlation coefficient was between financial measures and technology, which was 0.479. All the rest of the coefficients were above 0.600, which reflects a strong positive relationship between the dependent and independent variables. The correlation test can be a useful tool, but it produces no insight on the explanatory power of variables. Therefore, after conducting the correlation test, which describes the relationship between dependent and independent variables, the multiple regression tests will be conducted in order to describe the significance level of these relationships.

Table (7.15) Financial Measures Correlations with the Contingent Variables in Medium Companies

		Financial Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Financial Measures	1	.676	.700	.607	.479	.628	.687	.647
	Strategy	.676	1	.497	.532	.609	.576	.643	.591
	Structure	.700	.497	1	.573	.428	.433	.572	.597
	Competition	.607	.532	.573	1	.571	.478	.542	.513
	Technology	.479	.609	.428	.571	1	.436	.457	.611
	Mgt Style	.628	.576	.433	.478	.436	1	.593	.458
	Reward Systems	.687	.643	.572	.542	.457	.593	1	.386
	Env. Uncertainty	.647	.591	.597	.513	.611	.458	.386	1

Table's (7.15) results offer evidence that there was a strong positive relationship between financial measures and other independent variables, namely; strategy, structure, competition, technology, management style, reward systems, and environmental uncertainty. The results were quite similar to the results obtained by previous studies employing comparable measures (e.g. McMillan *et al.*, 1973; Bruns and Waterhouse, 1975) with the exception of the low significance of the correlation between financial measures and both competition and technology. Strategy, structure, management style, reward systems and environmental uncertainty emerged as strongly related to the financial measures.

The findings from correlation tests revealed some relationships between dependent and independent variables. However, multiple regression tests provide an estimation of the relationships between the variables to fit an explanatory model.

The following table (7.16) summarizes the regression results. It shows that the whole model is significant (sig. = .000, $p < .001$). In respect to independent variables and their individual influence on the dependent variable, there are five out of the seven independent variables found to be significant to the dependent variable. It is shown from the results that strategy, structure, management style, reward systems and environmental uncertainty are significant to the financial measures. On the other hand, competition and technology are insignificant in explaining the variance in the dependent variable, namely financial measures. From table (7.14), the regression model equation could be expressed as:

Y = .520 + .206 Strategy + .192 Structure + .084 Competition - .116 Technology + .149 Management Style + .219 Reward Systems + .217 Environmental Uncertainty

Table (7.16) A summary of regression analysis results for financial measures

Variables	**B**	**Beta**	**t**	**Sig. of t**	**Classification**
(Constant)	.520				
Strategy	.206	.180	1.754	.084	Significant influence
Structure	.192	.249	2.637	.010	Significant influence
Competition	.084	.109	1.190	.239	Non significant influence
Technology	-.116	-.132	-1.416	.162	Non significant influence
Mgt Style	.149	.170	1.957	.055	Significant influence
Reward Systems	.219	.233	2.323	.023	Significant influence
Env. Uncertainty	.217	.249	2.524	.014	Significant influence
Multiple R	.853				
R Square	.727				
Adjusted R Square	.698				
Significance of F	.000 (very significant)				

In summary, the correlation and regression results could be summarised in the following: The financial measures and strategy were strongly positively correlated ($r = .676$, $p < 0.1$), also, with structure, they were strongly positively correlated ($r = .700$, $p < 0.05$). In addition to the strong positive correlation with management style ($r = .628$, $p < 0.1$), also reward systems ($r = .687$, $p < 0.05$) and with the environmental uncertainty ($r = .647$, $p < 0.05$). There was a positive correlation ($r = .607$; $r = .479$, respectively) between financial measures and technology and competition, respectively, both of them were statistically insignificant. This might be consistent with the idea that organisations that apply

financial measures are highly structured, which makes them associated with routine and standardized activities.

These results support the view of Vancil (1973), which concluded that the choice of a design for assigning financial responsibility should be a function of the organisational structure, which is defined in terms of the delegation of authority and the specialization of effort, and organisational strategy. In addition, the results were consistent with Prahalad & Bettis's (1986: p. 492) results that the performance appraisal and incentive system of a firm, that is responsible of many rewards and/or punishments, could provide a link in which the reinforcement regime that can change cognition as well as behavior could be used effectively.

2. The use of customer measures

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the customer measures, and other independent variables. Table (7.17) presents the results of Pearson correlation between customer measures in relation to strategy, structure, competition, technology, management style, reward systems and environmental uncertainty. The results show that there are strong positive correlation coefficients between the dependent variable and all the independent variables. The lowest correlation coefficient was between customer measures and competition, which was 0.544. All the rest of the coefficients were reasonably high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.17) Customer Measures Correlations with the Contingent Variables in Medium Companies

		Customer Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Customer Measures	1	.723	.669	.544	.599	.575	.673	.691
	Strategy	.723	1	.497	.532	.609	.576	.643	.591
	Structure	.669	.497	1	.573	.428	.433	.572	.597
	Competition	.544	.532	.573	1	.571	.478	.542	.513
	Technology	.599	.609	.428	.571	1	.436	.457	.611
	Mgt Style	.575	.576	.433	.478	.436	1	.593	.458
	Reward Systems	.673	.643	.572	.542	.457	.593	1	.386
	Env. Uncertainty	.691	.591	.597	.513	.611	.458	.386	1

After conducting the correlation test, which describes the relationship between dependent and independent variables, the multiple regression tests will be conducted in order to describe the significance level of these relationships.

Table (7.18) A summary of regression analysis results for customer measures

Variables	**B**	**Beta**	**t**	**Sig. of t**	**Classification**
(Constant)	-.369				
Strategy	.312	.237	2.314	.024	Significant influence
Structure	.192	.216	2.289	.025	Significant influence
Competition	-.055	-.061	-.672	.504	Non significant influence
Technology	.090	.088	.950	.346	Non significant influence
Mgt Style	.065	.065	.746	.458	Non significant influence
Reward Systems	.266	.245	2.453	.017	Significant influence
Env. Uncertainty	.276	.275	2.794	.007	Significant influence
Multiple R	.853				
R Square	.728				
Adjusted R Square	.699				
Significance of F	.000 (very significant)				

The customer measures variable is significant (sig. = .000, $p < .001$). Four of the independent variables are significant except competition, technology and management style that proved to be insignificant as shown in table (7.18). The regression model equation could be expressed as:

Y = -.369 + .312 Strategy + .192 Structure - .055 Competition + .090 Technology + .065 Management Style + .266 Reward Systems + .276 Environmental Uncertainty

In summary, strategy is positively correlated to customer measures and statistically significant ($r = .723$, $p < 0.05$). In addition, structure is positively correlated and statistically significant ($r = .669$, $p < 0.05$). Reward systems and environmental uncertainty are positively correlated and statistically significant ($r = .673$, $p < 0.05$) and ($r = .691$, $p < 0.05$), respectively. Contrary to expectations, competition, technology and management style are found to be statistically insignificant, although they have good positive correlation with customer measures.

These findings imply that as medium sized organisations become more strategic-oriented, more structured, more relying on the reward systems to motivate their employees and working in a vulnerable environment, the need to have more than one type of performance measures, such as customer measures, emerges. The managers in the medium size sample felt they had to have more performance measures such as customer measures in their performance measurement system in order to capture more aspects of the business, thus, reducing the environmental uncertainty.

3. The use of innovation and learning measures

Kaplan and Norton (1992) argue that to create more value for customers, and improve operating efficiencies continually is through the ability to launch new products. This would enable a company penetrate new markets and increase profits, which will increase shareholder value.

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the innovation and learning measures, and other independent variables. Table (7.19) presents results of the Pearson correlation between innovation and learning measures in relation to strategy, structure, competition, technology, management style, reward systems and environmental uncertainty. The results show that there are strong positive correlation coefficients between the dependent

variable and all the independent variables. The lowest correlation coefficient was between innovation and learning measures and management style, which was 0.529. All the rest of the coefficients were reasonably high, which reflects a strong positive relationship between the dependent and independent variables. The highest correlation was with structure (r = 0.714), this is in line with the idea that structure is strongly related to such measures.

Table (7.20) shows the summary of the regression coefficients between the innovation and learning measures and the independent variables. Regression results show that four independent variables are statistically significant with the innovation and learning measures; namely, strategy, structure, competition and environmental uncertainty. However, the other three independent variables proved to be insignificant with the innovation and learning measures. The regression model equation could be expressed as:

Y = -.294 + .265 Strategy + .241 Structure + .140 Competition + .021 Technology + .007 Management Style + .154 Reward Systems + .198 Environmental Uncertainty

In summary, strategy is positively correlated with the innovation and learning measures and statistically significant ($r = .684$, $p < 0.05$). In addition, structure is also positively correlated and statistically significant ($r = .714$, $p < 0.05$). As well as competition, which has a positive correlation and statistically significant ($r = .651$, $p < 0.1$). Finally, the environmental uncertainty which proved to have a positive correlation and was statistically significant ($r = .668$, $p < 0.05$).

On the other hand, although technology, management style and reward systems have positive correlation ($r = .571$, $.529$, $.639$ respectively), they are not statistically significant. This might be because developing countries such as Egypt are labour intensive, which delays the implementation of recent technology, especially in medium sized manufacturing companies because acquiring this technology is expensive and needs access to financial sources that are not available for such companies.

Table (7.19) Innovation and Learning Measures Correlations with the Contingent Variables in Medium Companies

		Innov. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Innov. Measures	1	.684	.714	.651	.571	.529	.639	.668
	Strategy	.684	1	.497	.532	.609	.576	.643	.591
	Structure	.714	.497	1	.573	.428	.433	.572	.597
	Competition	.651	.532	.573	1	.571	.478	.542	.513
	Technology	.571	.609	.428	.571	1	.436	.457	.611
	Mgt Style	.529	.576	.433	.478	.436	1	.593	.458
	Reward Systems	.639	.643	.572	.542	.457	.593	1	.386
	Env. Uncertainty	.668	.591	.597	.513	.611	.458	.386	1

Table (7.20) A summary of regression analysis results for innovation and learning measures

Variables	B	Beta	t	Sig. of t	Classification
(Constant)	-.294				
Strategy	.265	.214	2.029	.047	Significant influence
Structure	.241	.288	2.972	.004	Significant influence
Competition	.140	.167	1.780	.080	Significant influence
Technology	.021	.022	.234	.816	Non significant influence
Mgt Style	.007	.007	.077	.939	Non significant influence
Reward Systems	.154	.151	1.468	.147	Non significant influence
Env. Uncertainty	.198	.209	2.067	.043	Significant influence
Multiple R	.844				
R Square	.713				
Adjusted R Square	.682				
Significance of F	.000 (very significant)				

Moreover, these findings are in line with Burns and Stalker (1961) on structure. They categorised structure into two types of structure, namely; mechanistic and organic structures. The former is the traditional type that incorporates and supports the very traditional financial measures, but the latter moves the organisation across the line of employing flexible types of measures such as the innovation and learning measures. This also might be consistent with what Pugh *et al.* (1969a) stated. In their study on a sample of manufacturing and service companies, they found that as integrated technology and level of sophistication of operations increase, the organisation moves towards the

impersonal control and decentralisation structure, which supports the organic type of structure, therefore, it is concluded that there is an important association between these measures and structure.

4. The use of internal business measures

Internal measures are concerned with measures that affect cycle time, quality, employee skills and satisfaction, and productivity. Companies should also attempt to identify and measure their company's core competencies; therefore, companies should decide what processes and competencies they must excel at and specify measures for each. These measures ensure that employees at lower levels in the organisation have clear targets for actions, decisions, and improvement activities that will contribute to the company's overall mission.

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the internal business measures, and the independent variables. Table (7.21) presents the internal business measures and their correlation coefficients with the contingent independent variables. The results of the Pearson correlation between internal business measures in relation to strategy, structure, competition, technology, management style, reward systems and environmental uncertainty reflect strong positive correlations between the dependent and independent variables. The lowest correlation coefficient was between internal business measures and technology, which was 0.484. In general, all correlation coefficients were reasonably high.

Table (7.21) Internal Business Measures Correlations with the Contingent Variables in Medium Companies

		Int. Bus. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Int. Bus. Measures	1	.608	.621	.520	.484	.590	.605	.561
	Strategy	.608	1	.497	.532	.609	.576	.643	.591
	Structure	.621	.497	1	.573	.428	.433	.572	.597
	Competition	.520	.532	.573	1	.571	.478	.542	.513
	Technology	.484	.609	.428	.571	1	.436	.457	.611
	Mgt Style	.590	.576	.433	.478	.436	1	.593	.458
	Reward Systems	.605	.643	.572	.542	.457	.593	1	.386
	Env. Uncertainty	.561	.591	.597	.513	.611	.458	.386	1

Table (7.22) A summary of regression analysis results for internal business measures

Variables	**B**	**Beta**	**t**	**Sig. of t**	**Classification**
(Constant)	.278				
Strategy	.172	.148	1.152	.253	Non significant influence
Structure	.206	.263	2.223	.030	Significant influence
Competition	.016	.020	.176	.861	Non significant influence
Technology	.019	.021	.183	.856	Non significant influence
Mgt Style	.193	.218	2.005	.049	Significant influence
Reward Systems	.152	.159	1.266	.210	Non significant influence
Env. Uncertainty	.117	.132	1.072	.288	Non significant influence
Multiple R	.757				
R Square	.573				
Adjusted R Square	.527				
Significance of F	.000 (very significant)				

Table (7.22) shows the results that just two of the independent variables are statistically significant, namely structure and management style. They have positive correlations, as shown earlier, and are statistically significant ($r = .621$, $p < 0.05$) and ($r = .590$, $p < 0.05$) respectively. Other independent factors, although positively correlated, proved to be statistically insignificant. The regression model equation could be expressed as:

Y = .278 + .172 Strategy + .206 Structure + .016 Competition + .019 Technology + .193 Management Style + .152 Reward Systems + .117 Environmental Uncertainty

The evidence suggests that the medium sized manufacturing companies in Egypt still do not realise the importance of these measures. A growing stream of literature provides evidence that even when managers collect and track different nonfinancial measures, they still place primary reliance on traditional generic (often financial) measures, which might be an explanation why these nonfinancial measures are not yet realised (e.g., McNair *et al.*, 1990; Stivers *et al.*, 1998; Lipe and Salterio, 2000).

Obviously, these firms could not relate such measures to the main strategy of the firm; this might be because there are some managers in these medium sized companies with little or no business background, thus, it is possible that some managers are not familiar with these measures and hence cannot fully appreciate its importance (see for example, El-Ebaishi, 2003). In addition, the insignificance of competition means that Egyptian firms might still be influenced by the historic dominance of the public sector. These results are consistent with previous studies such as Road (1997) who stated that during 1960–90, state-owned enterprises (SOEs) handled most of Egypt's economic activity under the direction of various ministries. Poor management and weak capitalization of SOEs inevitably had a negative effect on their efficiency and financial viability. (See also for example; Hatem, 1994 and Omran, 2004).

5. The use of environmental measures

The importance of environmental performance measures is highlighted by the development of ISO 14031 Environmental Performance Evaluation standard guidelines. Measures summarise information on a company's environmental performance which are then evaluated for decision-makers and other stakeholders. Ashford and Meima (1993) explain that the environmental performance of the firm is the extent and effectiveness of actions that the firm takes to mitigate its environmental consequences. For manufacturing firms, these measures could be the carbon dioxide emissions (kg), which could be compared to an internationally accepted standard figure. The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the environmental measures, and the independent variables.

Table (7.23) Environmental Measures Correlations with the Contingent Variables in Medium Companies

		Env. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Env. Measures	1	.632	.507	.523	.495	.464	.549	.490
	Strategy	.632	1	.497	.532	.609	.576	.643	.591
	Structure	.507	.497	1	.573	.428	.433	.572	.597
	Competition	.523	.532	.573	1	.571	.478	.542	.513
	Technology	.495	.609	.428	.571	1	.436	.457	.611
	Mgt Style	.464	.576	.433	.478	.436	1	.593	.458
	Reward Systems	.549	.643	.572	.542	.457	.593	1	.386
	Env. Uncertainty	.490	.591	.597	.513	.611	.458	.386	1

Table (7.23) presents correlation coefficients for environmental measures with the contingent independent variables, namely; strategy, structure, competition, technology, management style, reward systems and environmental uncertainty. The results show that there are strong positive correlation coefficients between the dependent variable and all the independent variables. The lowest correlation coefficient was between environmental measures and management style, which was 0.464. All the rest of the correlation coefficients were reasonably high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.24) A summary of regression analysis results for environmental measures

Variables	**B**	**Beta**	**T**	**Sig. of t**	**Classification**
(Constant)	.848				
Strategy	.358	.336	2.374	.021	Significant influence
Structure	.089	.124	.955	.343	Non significant influence
Competition	.094	.130	1.030	.307	Non significant influence
Technology	.050	.061	.472	.639	Non significant influence
Mgt Style	.025	.031	.259	.797	Non significant influence
Reward Systems	.110	.125	.908	.367	Non significant influence
Env. Uncertainty	.042	.051	.377	.707	Non significant influence
Multiple R	.694				
R Square	.482				
Adjusted R Square	.426				
Significance of F	.000 (very significant)				

As shown in table (7.24) there is just one significant and effective variable, which is strategy. Strategy is positively correlated and statistically significant with these measures ($r = .632$, $p < .05$). All other independent variables have moderate positive correlation but they are all statistically insignificant. This might be because Egypt, as one of the developing countries, does not have the culture of preserving the environment; therefore, environmental measures are not well communicated in the Egyptian society (see for example; Mohamed, 2004). The regression model equation could be expressed as:

Y = .848 + .358 Strategy + .089 Structure + .094 Competition + .050 Technology + .025 Management Style + .110 Reward Systems + .042 Environmental Uncertainty

These results are in line with the results of another PhD study conducted in this field. Mohamed (2004) found that awareness of these issues is limited and should be raised. A high percentage (80%) of large firms reported that environmental issues have a small (actual) impact on the companies' statements, and a moderate percentage (60%) of small firms indicated that these issues have small or no actual impact on the companies' statements. She added that environmental experience of practitioners in both big and small firms is limited. For example, only 10% of practitioners, in her sample's companies, attended a course concerning environmental accounting or took training related to the environmental implications on the profession. She stated, "it can be argued that a number of companies aware that a good reputation arising from environmental protection can help them to achieve many benefits, avoid environmental risks and, also, guarantee their sustainability" (p. 164).

The only explanation that strategy is the only factor that proved to be effective and significant is that these measures should be imposed by high management as a strategic goal. Mohamed (2004) observed that respondents reported that the main potential advantage of environmental issues is the desire of a company to differentiate the organisation from its competitors, to improve the corporate image, and to publicise the commitment of environmental regulation. Respondents indicated that the most important motivation of the company to disclose its environmental performance is to get an

advantage over other companies, i.e. a company seeks to create a positive image by announcing its commitment to protect the environment.

Some interview examples proved this such as that with the manager of the leather company. He said in the interview, "*...any environmental issues related to our work should come from top management directly in order to force employees to obey and follow these rules, which at the very end will benefit our company by making its image more attractive in the eyes of our customers and the government*".

7.8.2 Large Sized Manufacturing Companies

1. The use of financial measures

Table (7.25) represents the correlation coefficients between financial measures and other independent variables, namely; strategy, structure, competition, technology, management style, reward systems, and environmental uncertainty. Strategy, structure, management style, reward systems and environmental uncertainty emerged as the same strongly related variables of financial measures as the case of the medium sized manufacturing companies.

Table (7.25) presents financial measures correlation coefficients with the contingent independent variables of the large sized manufacturing companies. The results of the Pearson correlation between financial measures in relation to strategy, structure, competition, technology, management style, reward systems and environmental uncertainty reflect a strong positive relationship between these variables. The results show that there are strong positive coefficients between the dependent variable and all the independent variables. The lowest correlation coefficient was between financial measures and technology, which was 0.504.

Table (7.25) Financial Measures Correlations with the Contingent Variables in Large Companies

		Financial Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Financial Measures	1	.735	.580	.538	.504	.691	.642	.628
	Strategy	.735	1	.549	.614	.561	.647	.694	.537
	Structure	.580	.549	1	.524	.416	.475	.463	.431
	Competition	.538	.614	.524	1	.532	.672	.530	.599
	Technology	.504	.561	.416	.532	1	.572	.528	.488
	Mgt Style	.691	.647	.475	.672	.572	1	.601	.673
	Reward Systems	.642	.694	.463	.530	.528	.601	1	.374
	Env. Uncertainty	.628	.537	.431	.599	.488	.673	.374	1

Table (7.26) A summary of regression analysis results for financial measures

Variables	**B**	**Beta**	**T**	**Sig. of t**	**Classification**
(Constant)	-.051				
Strategy	.346	.325	2.744	.008	Significant influence
Structure	.197	.186	2.040	.046	Significant influence
Competition	-.130	-.148	-1.355	.181	Non significant influence
Technology	-.032	-.032	-.333	.740	Non significant influence
Mgt Style	.210	.216	1.772	.082	Significant influence
Reward Systems	.191	.200	1.837	.071	Significant influence
Env. Uncertainty	.258	.257	2.451	.017	Significant influence
Multiple R	.831				
R Square	.691				
Adjusted R Square	.654				
Significance of F	.000 (very significant)				

Table (7.26) summarizes the regression results. It shows that the whole model is significant (sig. = .000, $p < .001$). In respect to independent variables and their individual influence on the financial measures, the results were consistent with the ones of medium sized manufacturing companies. The same five independent variables that proved to be significant in the medium sized sample were also proved to be significant in this large sized sample. It is shown from the results that strategy, structure, management style, reward systems and environmental uncertainty are significant to the use of financial measures. On the other hand, competition and technology are insignificant in explaining the variance in the dependent variable. The regression model equation could be expressed as:

Y = -.051 + .346 Strategy + .197 Structure - .130 Competition - .032 Technology + .210 Management Style + .191 Reward Systems + .258 Environmental Uncertainty

In summary, the financial measures and strategy were strongly positively correlated ($r = .735$, $p < 0.05$), also, with structure, they were strongly positively correlated ($r = .580$, $p < 0.05$). In addition to the strong positive correlation with management style ($r = .691$, $p < 0.1$), also reward systems ($r = .642$, $p < 0.1$) and with the environmental uncertainty ($r = .628$, $p < 0.05$). Although, there was a good positive correlation with technology and competition ($r = .538$; $r = .504$, respectively), both of them were statistically insignificant.

This might be consistent with the idea that organisations that apply financial measures are highly structured, which makes them associated with routine and standardized activities. These results support the idea that the financial measures (traditional measures) are well known and one of the reliable measures in different manufacturing whether they are medium or large sized companies.

2. The use of customer measures

Table (7.27) summarises the Pearson correlation coefficients between customer measures and the contingent independent variables, namely; strategy, structure, competition, technology, management style, reward systems and environmental uncertainty, of the large sized manufacturing companies. The results show that there are strong positive correlation coefficients between the dependent variable and all the independent variables. The highest correlation coefficient of 0.702 was between customer measures and strategy. The lowest correlation coefficient was between customer measures and competition, which was 0.430. All the rest of the coefficients were high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.27) Customer Measures Correlations with the Contingent Variables in Large Companies

		Customer Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Customer Measures	1	.702	.546	.430	.577	.606	.642	.538
	Strategy	.702	1	.549	.614	.561	.647	.694	.537
	Structure	.546	.549	1	.524	.416	.475	.463	.431
	Competition	.430	.614	.524	1	.532	.672	.530	.599
	Technology	.577	.561	.416	.532	1	.572	.528	.488
	Mgt Style	.606	.647	.475	.672	.572	1	.601	.673
	Reward Systems	.642	.694	.463	.530	.528	.601	1	.374
	Env. Uncertainty	.538	.537	.431	.599	.488	.673	.374	1

However, correlation analysis provides no real insight into the explanatory power of the variables. It cannot describe the relationship between one dependent and more than one independent variables. Therefore, regression analysis was also conducted in order to describe these relationships and explain the value of dependent variable with other values of the independent variables (Bryman and Cramer, 2001). Then, results from both correlation and regression analyses could be integrated.

Table (7.28) A summary of regression analysis results for customer measures

Variables	**B**	**Beta**	**T**	**Sig. of t**	**Classification**
(Constant)	-.272				
Strategy	.369	.325	2.556	.013	Significant influence
Structure	.217	.192	1.966	.054	Significant influence
Competition	-.273	-.293	-2.501	.015	Significant influence
Technology	.193	.177	1.728	.089	Significant influence
Mgt Style	.127	.122	.935	.354	Non significant influence
Reward Systems	.246	.241	2.073	.043	Significant influence
Env. Uncertainty	.211	.197	1.752	.085	Significant influence
Multiple R	.803				
R Square	.645				
Adjusted R Square	.602				
Significance of F	.000 (very significant)				

Table (7.28) shows that the model is significant (sig. = .000, $p < .001$). All the independent variables are significant except management style which proved to be insignificant. The regression model equation could be expressed as:

Y = -.272 + .369 Strategy + .217 Structure - .273 Competition + .193 Technology + .127 Management Style + .246 Reward Systems + .211 Environmental Uncertainty

In summary, strategy is positively correlated with customer measures and statistically significant ($r = .702$, $p < 0.05$). In addition, structure is positively correlated and statistically significant ($r = .546$, $p < 0.1$). Although, competition has the lowest positive correlation coefficient, it was also statistically significant ($r = .430$, $p < 0.05$). Technology is also positively correlated and statistically significant ($r = .577$, $p < 0.1$). Reward systems and environmental uncertainty are also positively correlated and statistically significant ($r = .673$, $p < 0.05$) and ($r = .691$, $p < 0.05$), respectively. The only independent factor that was proved to be statistically insignificant is management style, although it has a good positive correlation with the customer measures ($r = .606$).

These findings might indicate that as companies grow in size, they value customer measures more. Therefore, performance measures in the large sized companies are affected by more independent variables. This is simply because these large sized companies are affected by local and global competition that forces them to focus on their customers and their needs. The results failed to prove a significant relationship with the management style variable.

3. The use of innovation and learning measures

Large sized manufacturing companies are more affected by intense local and global competition which requires them to make continual improvements to their existing products and processes and have the ability to introduce entirely new products with expanded capabilities. A company's ability to innovate, improve, and learn ties directly to the company's value. That is, only through the ability to launch new products, create more value for customers, and improve operating efficiencies continually can a company

penetrate new markets and increase profits, which will increase shareholder value (Kaplan and Norton, 1992). The size here places more responsibility on these companies to do so.

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the innovation and learning measures, and other independent variables. Table (7.29) presents the correlation coefficients between innovation and learning measures and the contingent independent variables of the large sized manufacturing companies. The correlation results show that there are strong positive correlation coefficients between the dependent variable and all the independent variables. The highest correlation coefficient of 0.687 was between innovation and learning measures and strategy. The lowest correlation coefficient was between innovation and learning measures and structure, which was 0.430. All the rest of the correlation coefficients were high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.29) Innovation and Learning Measures Correlations with the Contingent Variables in Large Companies

		Innov. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Innov. Measures	1	.687	.430	.656	.619	.668	.501	.641
	Strategy	.687	1	.549	.614	.561	.647	.694	.537
	Structure	.430	.549	1	.524	.416	.475	.463	.431
	Competition	.656	.614	.524	1	.532	.672	.530	.599
	Technology	.619	.561	.416	.532	1	.572	.528	.488
	Mgt Style	.668	.647	.475	.672	.572	1	.601	.673
	Reward Systems	.501	.694	.463	.530	.528	.601	1	.374
	Env. Uncertainty	.641	.537	.431	.599	.488	.673	.374	1

Table (7.30) A summary of regression analysis results for innovation and learning measures

Variables	B	Beta	T	Sig. of t	Classification
(Constant)	.758				
Strategy	.337	.340	2.689	.009	Significant influence
Structure	-.063	-.063	-.652	.517	Non significant influence
Competition	.160	.197	1.689	.096	Significant influence
Technology	.207	.218	2.134	.037	Significant influence
Mgt Style	.121	.134	1.031	.307	Non significant influence
Reward Systems	-.073	-.082	-.704	.484	Non significant influence
Env. Uncertainty	.189	.203	1.809	.075	Significant influence
Multiple R	.805				
R Square	.649				
Adjusted R Square	.607				
Significance of F	.000 (very significant)				

Table (7.30) shows the regression results that reveal that there are four independent variables statistically significant with the innovation and learning measures. These variables are strategy, competition, technology and environmental uncertainty. The rest of the independent variables failed to prove any significance level with these measures.

The regression model equation could be expressed as:

Y = .758 + .337 Strategy - .063 Structure + .160 Competition + .207 Technology + .121 Management Style - .073 Reward Systems + .189 Environmental Uncertainty

In summary, strategy is positively correlated and statistically significant with the use of the innovation and learning measures ($r = .687$, $p < 0.05$). In addition, competition has a positive correlation and is statistically significant ($r = .656$, $p < 0.1$). Technology proved to have a statistical significance and positive correlation ($r = .619$, $p < 0.05$), this might be because the large sized companies can afford to acquire more technology than their medium counterparts do, which is consistent with what El-Ebaishi (2003) had found in his study. Finally, environmental uncertainty proved to have a positive correlation and statistical significance ($r = .641$, $p < 0.1$). Although structure, management style and reward systems have positive coefficients ($r = .430$, $.668$, $.501$ respectively), it was proved that they are not statistically significant.

4. The use of internal business measures

The evidence suggests that the large sized companies realise the importance of these measures on a strategic level. Therefore, they pay more attention to identifying and measuring company's core competencies, in turn, these companies ensure, for example, that employees at lower levels in the organisation are motivated, and have clear targets for actions, decisions, and improvement activities that will contribute to the company's overall mission.

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the internal business measures, and other independent variables. Table (7.31) presents the correlation coefficients between internal business measures and the contingent independent variables of the large sized manufacturing companies. The correlation results show that there are strong positive correlation coefficients between the dependent variable and all the independent variables. The highest correlation coefficient of 0.736 was between internal business measures and strategy. The lowest correlation coefficient was between internal business measures and reward systems, which was 0.516. All the rest of the coefficients were also high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.31) Internal Business Measures Correlations with the Contingent Variables in Large Companies

		Int. Bus. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Int. Bus. Measures	1	.736	.576	.636	.552	.709	.516	.627
	Strategy	.736	1	.549	.614	.561	.647	.694	.537
	Structure	.576	.549	1	.524	.416	.475	.463	.431
	Competition	.636	.614	.524	1	.532	.672	.530	.599
	Technology	.552	.561	.416	.532	1	.572	.528	.488
	Mgt Style	.709	.647	.475	.672	.572	1	.601	.673
	Reward Systems	.516	.694	.463	.530	.528	.601	1	.374
	Env. Uncertainty	.627	.537	.431	.599	.488	.673	.374	1

Table (7.32) presents the regression results that identify three statistically significant independent variables; namely, strategy, structure and management style. The rest of the independent variables failed to prove any level of significance with the internal business measures. The regression model equation could be expressed as:

Y = .193 + .396 Strategy + .152 Structure + .059 Competition + .061 Technology + .239 Management Style - .111 Reward Systems + .113 Environmental Uncertainty

Table (7.32) A summary of regression analysis results for internal business measures

Variables	**B**	**Beta**	**T**	**Sig. of t**	**Classification**
(Constant)	.193				
Strategy	.396	.413	3.445	.001	Significant influence
Structure	.152	.159	1.726	.090	Significant influence
Competition	.059	.075	.679	.500	Non significant influence
Technology	.061	.066	.681	.498	Non significant influence
Mgt Style	.239	.272	2.210	.031	Significant influence
Reward Systems	-.111	-.129	-1.177	.244	Non significant influence
Env. Uncertainty	.113	.124	1.172	.246	Non significant influence
Multiple R	.827				
R Square	.684				
Adjusted R Square	.647				
Significance of F	.000 (very significant)				

In summary, strategy, structure and management style have positive correlation and statistically significant ($r = .736$, $p < 0.05$), ($r = .576$, $p < 0.1$) and ($r = .709$, $p < 0.05$) respectively. Other independent factors, although having high positive correlation, proved to be statistically insignificant.

These relationships might imply that large sized manufacturing companies in Egypt begin to pay attention to these issues at a strategic level. This is in line with the contention of Bryant *et al.* (2004) that performance measures that are supported by the firm's competitive strategy assist the manager to gauge the results of actions taken and provide information about the cause or the driver of the outcome. Thus, internal business measures help in guiding the firm in accordance with its overall strategy and mission. However, these large sized companies still do not recognise the link between some other contingent variables such as competition, technology, reward systems and environmental uncertainty and these measures.

5. The use of environmental measures

As mentioned earlier, the importance of environmental performance measures is highlighted by the development of ISO 14031 Environmental Performance Evaluation standard guidelines. Measures summarise information on a company's environmental performance which are then evaluated for decision-makers and other stakeholders. Ashford and Meima (1993) explain that the environmental performance of the firm is the extent and effectiveness of actions that the firm takes to mitigate its environmental consequences.

The Pearson correlation focused on the relationship presented in the first column of each of the matrices (the dependent variable), which is the environmental measures, and other independent variables. Table (7.33) presents the correlation coefficients between environmental measures and the contingent independent variables of the large sized manufacturing companies.

Table (7.33) Environmental Measures Correlations with the Contingent Variables in Large Companies

		Env. Measures	Strategy	Structure	Competition	Technology	Mgt Style	Reward Systems	Env. Uncertainty
Pearson Correlation	Env. Measures	1	.667	.446	.668	.523	.645	.537	.660
	Strategy	.667	1	.549	.614	.561	.647	.694	.537
	Structure	.446	.549	1	.524	.416	.475	.463	.431
	Competition	.668	.614	.524	1	.532	.672	.530	.599
	Technology	.523	.561	.416	.532	1	.572	.528	.488
	Mgt Style	.645	.647	.475	.672	.572	1	.601	.673
	Reward Systems	.537	.694	.463	.530	.528	.601	1	.374
	Env. Uncertainty	.660	.537	.431	.599	.488	.673	.374	1

The correlation results show that there are strong positive correlation coefficients between the dependent variable and all independent variables. The highest correlation coefficient of 0.668 was between environmental measures and competition. The lowest correlation coefficient was between environmental measures and structure, which was 0.446. All the rest of the correlation coefficients were high, which reflects a strong positive relationship between the dependent and independent variables.

Table (7.34) A summary of regression analysis results for environmental measures

Variables	**B**	**Beta**	**t**	**Sig. of t**	**Classification**
(Constant)	.578				
Strategy	.255	.264	2.009	.049	Significant influence
Structure	-.033	-.034	-.335	.739	Non significant influence
Competition	.194	.245	2.021	.048	Significant influence
Technology	.038	.041	.387	.700	Non significant influence
Mgt Style	.050	.057	.422	.674	Non significant influence
Reward Systems	.061	.071	.589	.558	Non significant influence
Env. Uncertainty	.275	.302	2.590	.012	Significant influence
Multiple R	.787				
R Square	.620				
Adjusted R Square	.575				
Significance of F	.000 (very significant)				

As shown in table (7.34), there are three significant and effective variables, which are strategy, competition and environmental uncertainty. The rest of the independent

variables failed to prove any significance with the environmental measures. The regression model equation could be expressed as:

Y = .578 + .255 Strategy - .033 Structure + .194 Competition + .038 Technology + .050 Management Style + .061 Reward Systems + .275 Environmental Uncertainty

In summary, strategy is positively correlated and statistically significant with these measures ($r = .667$, $p < .05$). Competition is also positively correlated and statistically significant with these measures ($r = .668$, $p < .05$). Finally, environmental uncertainty is positively correlated and statistically significant with these measures ($r = .660$, $p < .05$). Although, all other independent variables have high positive correlation, they are all statistically insignificant. Therefore, it is concluded that, in large sized manufacturing companies, these measures are more appreciated than in medium sized manufacturing companies. This might be because they realise their social responsibility towards the society they work in, in addition to local and global competition factors which place a pressure on top management to comply with international regulations, which is consistent with what was found by Mohamed (2004). Moreover, the very vulnerable environment these companies work in puts additional pressure on these companies so they become very cautious in dealing with these environmental issues. Although, the lack of communicating the importance of these measures is obvious and represented in the insignificance of many other variables, at least the results of these companies are more indicative than the medium sized ones. This might be a good explanation that strategy, competition and environmental uncertainty are the independent variables that proved to be effective and significant with the environmental measures.

7.9 Interview Procedures

Post-survey interviews were also conducted to provide further insight into the findings of the field survey. The 140 firms involved in the questionnaire survey provided the basis for data analysis. In addition, sixteen firms were initially contacted for interviewing purpose, of which ten firms agreed to participate in this study. Five firms were large and the other five were medium sized manufacturing companies as shown in table (7.35).

Face-to-face interviews are considered one of the most appropriate methods to gather further data about social phenomenon for two reasons. First, previous studies have highlighted difficulties in focusing managers' attention on questionnaire constructs (e.g. Dew and Gee, 1973). Second, the interviews provided the opportunity to gather more detailed qualitative data that not only supports the statistical analysis but also illustrates how managers see the importance of different performance measures in practice, in addition to the factors that affect the use of these performance measures. The interviews were semi-structured and managers were asked open questions about the use of different performance measures and the contingent factors that affect these performance measures. The open questions enhanced construct validity by ensuring that a manager was focused on the construct associated with each performance measures. Face-to-face interviews enabled the questions to be repeated until such a focus was achieved. This focus validated the manager's responses, where the answers were inconsistent; this inconsistency could be resolved at the time of the interview. The rapport developed during the face-to-face interviews enabled these inconsistencies to be clarified and managers often provided clearer answers to validate their responses. Examining the construct from a number of perspectives in this manner is a strength of the method because it enhances convergent validity (Burgess, 1982: p. 164).

Each interview lasted approximately an hour and half, on average; with the shortest being 50 min and the longest, 120 min. The interviews were semi-structured and used an open-ended guide that focused on critical and specific points. This interview guide was divided into three sections, as shown in Appendix (3). The first section asked about general information of the company and the interviewee. The second section discussed personal opinions and beliefs of the interviewee about the importance of different performance measures. The last section explored the point of views of the interviewees about different factors that might affect the use of the performance measures in their companies. Most of the interviewees refused to have their interviews tape-recorded, this might be because of the secretive culture that prevails in Egyptian society; therefore, notes were taken during the interview and were written up as soon afterwards as possible.

The first five companies are large manufacturing companies. Firm 1 is Abu Qir Fertilizers and Chemical Industries Corporation which works in the Fertilizers & chemicals Industry. This company is considered a large company with approximately 3000 employees. Firm 2 is the Egyptian Salt and Soda Company which works in Food industry and detergent products with approximately 2400 employees. Firm 3 is Kaha Company for Preserved Foods which works in the food manufacturing business. This large company has multiple factories dispersed in different Egyptian governorates with approximately 1700 employees and workers. Firm 4 is the National Paper Company which is a newly privatised company and has approximately 1000 employees and workers. Finally, firm 5 is Alexandria National Iron & Steel Company and has approximately 3200 employees and workers.

The medium sized manufacturing companies are as follows: Firm 6 is MINAPHARM Pharmaceuticals & Chemical Industries, which works in a high-technology Pharmaceutical Industry to produce different medical products. This company has approximately 200 employees more qualified and highly skilled. Firm 7 is called Egyptian for Leather Manufacturing and has approximately 450 employees and workers. Firm 8 is El-Negma & El-Helal Company that works in the plastic products industry with approximately 120 employees and workers. Firm 9 is Egylin Company that works in the Textile Industry. The company produces a variety of products that include woollen, cotton, linen and silk products with approximately 270 employees and workers. Finally, firm 10 is El-Shamedan Company which is a biscuits and chocolates products company. The company is located mainly in Borg Elarab in Alexandria city and has approximately 350 employees and workers.

Table (7.35) A summary of participated companies in the interviews

Co. No.	The Company	Number of Employees	Industry Sector	The Interviewee
1	Abu Qir Fertilizers and Chemical Industries Corporation	Approximately 3000 employees	Fertilizers & chemicals Industry	General Manager of Budgets
2	Egyptian Salt and Soda Company	Approximately 2400 employees	Food industry	Chief Financial Officer
3	Kaha Company for Preserved Foods	Approximately 1700 employees	Preserved foods' Industry	CEO
4	National Paper Company	Approximately 1000 employees and workers	Paper Industry	Chief Financial Officer
5	Alexandria National Iron & Steel Company	Approximately 3200 employees	Iron & Steel Industry	General Manager for Budgets and Finance
6	MINAPHARM Pharmaceuticals & Chemical Industries	Approximately 200 employees	Pharmaceutical Industry	Financial & Liaison Manager
7	Egyptian for Leather Manufacturing	Approximately 450 employees	Leather Industry	Financial Manager
8	El-Negma & El-Helal Company	Approximately 120 employees	Plastic Industry	Vice President
9	Egylin Company	Approximately 270 employees	Textile Industry	General Manager
10	El-Shamedan Company	Approximately 350 employees	Food Industry	General Manager

Content themes and observations by the researcher are provided in the following summary. Analyses of the interview data are discussed, where appropriate, with direct quotes by the managers, with as little editorial interpretation as possible.

7.10 Interview Analysis

7.10.1 Performance Measures Themes

All the participated companies in the study agree on the importance of *financial measures* in order to measure different financial aspects such as profitability, liquidity and debt percentages, which would enable any company to monitor if anything goes wrong. For example, they use financial ratios such as profit margin, asset turnover and leverage, which are considered the core of the financial perspective. Other important measures may be concerned with cash flow or working capital management. However, most of the large sized companies used to compare their business results with their own previous results and with the results of their main competitors.

For example, when the general manager of budgets of firm 1, the fertilizers & chemicals manufacturer, was asked whether there were regular checks to follow up the current financial performance and compare it with the previous performance, his reply was:

Yes ...we pay more attention to the financial measures; to the extent, it is in our policy to do regular checks with previous records in order to make sure that performance is maintained. Thus, if there is any negative deviation, we have to inspect it and know what the cause of this deviation was to avoid it in the future.

When the financial manager in firm 6, the pharmaceutical firm, was queried regarding the financial measures applied in his company, his response was:

...Financial measures are of paramount importance to any business because one can understand what numbers mean, and in turn determine how bad or good are we?

Thus, the above comments seem to suggest that the financial measures for both large and medium sized manufacturing companies are of crucial importance to manage and monitor the bottom line of the business.

Regarding the *customer measures*, some companies manufacture standardized products such as firm 1, the fertilizers company, which limit to some extent the importance of such measures for these companies. However, for other companies, such as firm 3, the preserved foods manufacturer, there is a wide range of products that they produce, therefore, they have to utilise customer measures to monitor their customers' needs. In other words, the customer perspective identifies outcome measures that will facilitate the achievement of the organisation's financial objectives (Kaplan and Norton, 1996). As the CEO of firm 3, Kaha Company for Preserved Foods, had put it:

...Although, it is not everyday that we need to provide new products but we already have a large number of customers who expect us to supply products with extra value ... It's a challenge ... every now and then, we do market research, to try our best to meet what customers need... you know, it's not always easy but it's interesting ... well ... at the end of the day - customer relations are very important to sustain any competitive advantage.

In Firm 9 (a medium textile manufacturer), the general manager was interviewed, he believed that product differentiation is a key point in achieving the company's objective of controlling a large market share of textile market at regional level. In addition, he stressed on market research as seen as particularly important for the company and the identification of new and changing customers' trends. As the general manager put it:

...Monitoring our competitors tells us about the products which we need to add to our variety. Moreover, we collect more information through market researches that determine customers' needs and new trends ... We then provide our customers with the products that, hopefully, will enjoy! Hence, simply, increases customers loyalty leads to sales growth.

Thus, the above comments seem to suggest that customer measures for most of large and medium sized manufacturing companies are of crucial importance, especially, when there is a product differentiation that helps to provide customers with the products that make them satisfied. As Kaplan and Norton (1996b: p.68) suggest that customer satisfaction could be a driver of another generic outcome measure of the customer perspective, which is market share that means sales growth.

The *innovation and learning measures* focus on business process re-engineering or re-designing which might lead to more efficient performance. It is essential that each member in the company becomes active in *learning* through personal experience, workshops, training, literature and any other method for information sharing. The aim of the learning firm is to profit from the pooled knowledge of its employees, the organisational knowledge that is developed and from the learning and innovation that results. While employees and workers may, almost unconsciously, learn, it crucial that the firm creates some mechanisms whereby new knowledge and ideas are communicated and harnessed by the firm. Furthermore, selected members of the company could be charged with the task of scanning and evaluating emerging technologies.

The general manager for budgets and finance in Firm 5, Alexandria National Iron & Steel Company, stated that they always apply recent technology that enhances performance, and that the company knows how to effectively adapt to the changing conditions. He also expressed proudly how actively the company pursued the learning process through training programs for employees and workers in different levels. He stressed that staff needed to be trained with new technologies, and that the company works closely to its stakeholders. His own words were:

...The company believes that the main development in performance should come from the employees and workers. They are the main source of any changes; therefore, the company dedicates a lot of money for training purposes to keep our manpower well trained and high skilled, which in turn, will push the performance.

In firm 8, the plastic products manufacturer, the vice president was interviewed. He was heavily concerned about these measures, particularly from a competitive point of view. As he said:

...Product differentiation and coming up with new ideas are simply supporting the strong image of the company based on the quality and the creativity of our products. In addition, he mentioned that *the company also needs creative advertisements to enhance company's image. Hence, he is strongly encouraging the marketing department staff to come up with new and interesting ideas for sales promotion.*

Thus, the above comments seem to suggest that the innovation and learning measures for most large and medium sized manufacturing companies are of growing importance. Firms will achieve greater innovation and more effective learning through more investing in people. To sustain and develop competitive positions, most firms turn to their human resources for creativity and innovation. Creativity and innovation rests on the acquisition, dissemination and reaction to new knowledge. The success of this process depends on the employees' ability to share their diverse ideas and insights. On the other hand, dissatisfied employees tend to be less committed and more likely to engage in withdrawal activity. For any company, to attract, retain, and motivate employees, the firm must focuses on motivating them. Once employees experience improved quality of work life, their contribution to decision-making and problem solving increase. This would encourage them to access, share and utilise their latent information and knowledge that can promote creative and innovative behaviour, enhancing decision-making, creativity and innovation. These improvements flow through to bottom line benefits for the organisation. Thus, this environment would encourage creating new ideas, which could lead to improving products or production methods.

The *internal business process measures* include elements that enable the firm to identify the key business issues, in which they must excel such as quality assurance, order-to-delivery cycle time and response time for dealing with customer complaints. Time is a key influence on many of these internal processes. The internal business process draws heavily from the concept of the value chain. Kaplan and Norton (1996a; 1996b) include all the processes relating to the realisation of products and services to satisfy customers' needs.

The following two quotes are from managers of large and medium sized companies, each quote addresses the benefits manager experienced from applying such type of measures. Firm 2, the food and detergent company, the financial officer said:

...These issues are very important for any business; therefore, we different departments that deal with most of these key internal processes. For example, we have a specific department for output quality inspection and another one for customers' complaints.

While it is not easy to figure out how these issues affect the budget figures, but what for certain is that without monitoring such key issues, it would be much harder to improve the financial figures, if not impossible.

Firm 10, the biscuits and chocolates company, the general manager said:

...Because we are working in food industry, therefore, we are obliged to maintain and update the warehousing database so we can monitor our inventory. The database is then periodically interrogated by quality improvement teams to get hold of what might be causing any problems, and investigate these problems that might been occurred recently and the circumstances in which they arose. Moreover, delivery has a major role in our industry because we have to deliver the orders in the right time to the right place; otherwise, we could suffer great losses.

Thus, the above comments seem to suggest that the internal business process measures for most of large and medium sized manufacturing companies are vital. Hence, managers define these measures as they show whether the company has achieved operational excellence through improving supply chain management, resource management, asset utilization, and other internal processes.

Finally, *environmental measures* indicators summarise information on a company's environmental performance which are then evaluated for decision-makers and other stakeholders. The most well-known measure of environmental commitment is the ISO 14001 certificate. The compliance indicators relate to the organisation's compliance to environmental legislation as well as its environmental liabilities. The commitment indicators deal with the organisation's commitment to reducing its environmental impact through financial and personnel resources and projects. The indicators for stakeholders deal with the organisation's interaction with its stakeholders through complaints as well as proactive projects.

All managers interviewed indicated that all of their companies should comply with these measures whether because they have to obey the regulations or because they seek to have

a better image for their business in the eyes of their customers and the rest of stakeholders. Consequently, the general manager of budgets for firm 1, the fertilizers and chemical firm, he stated,

... We have huge refinery units that purify the air and take off all the harmful waste; it is our responsibility not to harm the environment and to make the society better off. In addition, we have a regular check done by the government to ensure that everything is in order.

In firm 5, Alexandria National Iron and Steel Company, the general manager for budgets assure that the management has recently created an environmental department to direct and manage all the activities related to environment, health and safety issues at the plant. The company provides employees with appropriate personal protective equipment. His words were,

...Our environmental principal issues involve compliance of existing operations, air emissions, recycling of primary waste materials, liquid effluents, noise and company load on infrastructure, environmental management and employee health and safety. The company's existing operations are in compliance with Egyptian and World Bank guidelines. Also, the effluent discharges meet local regulations and World Bank guidelines.

In firm 8, the plastic products firm, the vice president assure that they have a department that is responsible for environmental activities, he said,

...First of all, we have an environment department that is responsible for all the environmental activities, thus, we have obtained the ISO 14001 certificate. We also have refinery and recycling unit for all plastic waste, it is being recycled. We are trying to keep our waste and pollution at the minimal levels that do not harm the society.

The following is the matrix framework, as shown in Table (7.36), which was used to compare the data across different firms. The matrix format draws attention to presence or absence of consistency and consensus across different respondents (Miles and Huberman,

1984) and as such is a useful tool for comparing data across a set of respondents (Martin and Meyerson, 1988).

Table (7.36) Interviews Data Matrix

	Firm 1	Firm 2	Firm 3	Firm 4	Firm 5
Demographic Details:					
• Years with the firm	28 years	26 years	31 years	30 years	21 years
• Years in current position	8 years	2 years	16 years	4 years	9 years
• Numbers of employees	About 3000	About 2400	About 1700	About 1000	About 3200
• Industry sector	Chemicals	Food	Food	Paper	Iron & Steel
Importance of Performance Measures:					
• Financial measures	Very important	Very important	Very important	Very important	Very important
• Customer measures	Not that important	Very important	Very important	Not that important	Important
• Innovation & learning measures	Important	Important	Important	Very important	Very important
• Internal business measures	Very important	Very important	Very Important	Important	Very important
• Environmental measures	Very important	Important	Important	Important	Very important

Table (7.36) Interviews Data Matrix (continued)

	Firm 6	Firm 7	Firm 8	Firm 9	Firm 10
Demographic Details:					
• Years with the firm	7 years	15 years	10 years	20 years	16 years
• Years in current position	7 years	8 years	10 years	11 years	9 years
• Numbers of employees	About 200	About 450	About 120	About 270	About 350
• Industry sector	Pharmaceutical	Leather	Plastic	Textile	Food
Importance of Performance Measures:					
• Financial measures	Very important	Very important	Very important	Very important	Very important
• Customer measures	Important	Very important	Very important	Very important	Very important
• Innovation & learning measures	Very important	Important	Important	Very important	Important
• Internal business measures	Very important	Very important	Important	Important	Very important
• Environmental measures	Very important	Important	Very important	Important	Important

7.10.2 Independent Factors Themes

All the companies participating in the study agree on the importance of *strategy* as one of the factors that affect the use of performance measures in any company. Managers from large or medium sized companies recognise the value of strategy as the statement, at a reasonably high level of detail, of what the company wants, plans, and expects to accomplish, which is less evident from the questionnaire analysis. In other words, they believe that strategy is a plan of action intended to accomplish a specific goal. As the general manager for budgets in Firm 1, Abu Qir Fertilizers and Chemical Industries Corporation, stated;

...A good strategy is supported by reality. A good way to make your strategy conveys reality is to exert the relevant efforts, conduct appropriate experiments, and recognize major constraints and barriers, and then all of this should be translated into a plan of actions.

Also, the Chief Financial Officer of firm 4, National Paper Company, said that '*...a company that has no strategy is like walking in a dark street without any lights on*'

El-Shamedan Company's general manager contends that '*strategy is very essential to any business no matter its size because recently have people begun to realize that effective strategy is a competitive business advantage. Companies are now seeing that if they have an effective strategy, they perform better. If they integrate long-term and short-term objectives, if they consider incentives, controls and feedback, they perform better. And if one company has that and the other doesn't, the competitive advantage is clear*'.

Concerning *structure*, structure includes things like degree and type of horizontal differentiation, vertical differentiation, mechanisms of coordination and control, formalization, and centralization of power. Hence, all the ten companies agreed upon the importance of structure for any business to be successful. They highlighted that having an effective and clear structure ensures that every member of staff will recognise his / her authorities and responsibilities. In addition, this structure will help in making the information flows in both ways, top-down and bottom-up, which is related to feedback

and feedforward loops of information. They stated that when starting a business, or when changing from one organisational structure to another, it is appropriate to consider advantages and disadvantages of each structure in meeting the business goals. The best structure for one type of business may not be best for another. The best structure for a new business may not be suitable as the business expands.

As the general manager for budgets and finance in firm 5, Alexandria National Iron & Steel Company, had put it:

'*…The structure is really a very important factor; the thing is that any company should choose the type of structure that fits well with its functions, processes and size*'. He also added that, '*if the organisational size increases, the structuring of organisations activities should increase too but the concentration of power might decrease through out the organisation*'.

The financial manager of firm 7, Egyptian for Leather Manufacturing, stated that,

…Certainly, structure affects performance measures in any company because, simply, it identified the authorities and responsibilities in the company. In addition, the size of the company determines which form of structure to be followed. For our company, which is of moderate size, it persisted with a very simple organisational structure linked to its group of owners. Few hierarchies keep the work flows effectively; thus, lead to effective decision making process.

Comments made on *competition* issues were varied. The vast majority of the participating companies highlighted that competition is really a very important factor in the use of different performance measures, especially with international competition. Few companies (e.g. Abu Qir Fertilizers and Chemical Industries Corporation) made the comments that they do not face very severe competition in their industry whether because they are just few companies that dominate the market or because that their products are distinguished enough not to be competed.

The CEO of firm 3, Kaha Company for Preserved Foods, he contends,

… We are doing many customers surveys to know what customers expect from us. In addition, we have to keep an eye on our competitors in order to be distinguished because we are facing a severe competition in our industry.

The general manager of firm 9, Egylin Company, put it this way,

… There are too many textile companies working in the Egyptian market; therefore, we have to provide as much variety as we can with high quality and reasonable prices. What any customer wants is to buy what s/he needs with an affordable prices and that is what we up to.

On the other hand, the general manager of budgets of firm 1, Abu Qir Fertilizers and Chemical Industries Corporation, said,

… Because our products are very standardised that means that they have specific features, which do not give us a room to add or change in them therefore we do not consider ourselves customer-oriented company. Hence, the only way to face competition and trying to increase our market share is to be cost-oriented in order to reduce the costs, then in turn the prices. We already have a big share of the Egyptian market, in addition to exporting certain quotas to some other countries….we cannot consider competition is a big deal for us.

Also, the financial and liaison manager of firm 6, MINAPHARM Pharmaceuticals & Chemical Industries, says,

… We have bought licenses from some international pharmaceutical companies, such as GlaxoSmithKline Company (gsk), to manufacture specific medicines here in Egypt; therefore, we are the only agents for these medicines. Thus, we do not face any competition concerning these medications. However, we are trying our best to keep the rest of the regular types of medicines competitive.

Technology was another issue that participants have not agreed upon. Participating companies differ in their points of view, some of them especially the large sized ones

believe that by acquiring the recent technology will give a competitive advantage which will increase their market share and, in turn, increase their profitability. Other companies, especially the medium sized ones have not seen the importance of acquiring expensive recent technologies. They argue that Egypt has an advantage in the relatively cheap labor force that they have to benefit from; in addition, they stated that they cannot afford this very expensive technology.

As the general manager for budgets and finance of firm 5, Alexandria National Iron & Steel Company, had put it,

… We have a budget each year to upgrade our machinery, which enables us to acquire the recent technology in the industry. Simply, it helps us to increase the quality of our products and to keep us very competitive in the international markets.

On the other hand, the financial manager of firm 7, Egyptian for Leather Manufacturing, stated that,

… We cannot afford to upgrade our machinery regularly; we have no enough financial resources to do so. In addition, in our industry, we do not need to obtain the latest technology, what we have is enough to achieve our mission and objectives.

Moreover, the vice president of firm 8, El-Negma & El-Helal Company, said,

… I agree that technology is an important factor that affects performance measures in any company; however, we have to bear in mind the cost-benefit analysis of any decision. In other words, before investing money in acquiring recent technology, we have to be sure that it worth that money and that the return from this investment is worthwhile. We know that our company is not that big; therefore, we manage our available resources in the best way that fits our objectives and goals.

All the participating managers agree on the importance of *management style* regardless of the size of the company. They stated that there might be some forms of management style that fit the large sized companies and others that fit the medium sized ones. Thus, it was concluded from the views of the respondents that the amount of authority and power

distributed by individuals within organisations does vary considerably according to the size of company. Also, interviewees stated that managers have to perform many roles in a firm and how they handle various situations will depend on their style of management. Because, management style is an overall method of leadership used by a manager. As implied by their views that management forms lie along a continuum from the democratic to autocratic forms. This continuum is related to the structure of the company and, therefore, ranging from the centralized to decentralized forms. It was concluded from the interviewees' comments that as size of the company increases, number of hierarchical levels increases, which in turn pushes the management style towards the democratic form that permits subordinates to take part in decision making and also gives them a considerable degree of autonomy in completing routine work activities, and vice versa.

The CFO of firm 2, Egyptian Salt and Soda Company, stated,

... Our company is a large company, thus, the chairman cannot control and manage all the routine work as well as all details. Therefore, he delegates to his subordinates the authority to make certain decisions. When the boss finds that we can manage this type of work properly, he became more encouraged to do this empowerment and listen to our advices. That is why we have a good two-way communication system. However, major decisions such as investment decisions need to be taken after participation and discussion. Usually, these decisions are discussed in the Board of Directors (BOD) meetings, which can offer useful suggestions and ideas.

The general manager of firm 10, El-Shamedan Company, put it this way,

... This company has started as a family business, then, we expand it to include few more investors. Therefore, we do not have too many hierarchical levels; hence, the general manager should make most of the important decisions and closely supervise and control workers and employees. There could be some consultation with head-departments over issues and to listen to their feedback or opinions. However, the general manager will make the actual decisions, which is in the best interests of the work and the workers.

All the participating companies value *reward systems*, although in different ways. Reward systems are mechanisms that can bring good congruence. However, reward systems are much more than just bonus plans and stock options, they can also include awards and other recognition, promotions, reassignment, non-monetary bonuses (e.g., vacations), or even a simple thank-you.

It was concluded from what the interviewees stated that the size of the business also makes a difference in reward strategies because large companies have more resources to provide a variety of rewards than medium companies. Larger organisations typically put compensation at the top of reward list. The rest of the list also includes some type of longer-term rewards for key individuals in the firm such as some form of equity ownership and empowerment as a very powerful motivational tool. These companies have to match or exceed the benefit levels of their competitors, otherwise, they will have difficulty attracting and retaining top workers.

The consensus of the views of respondents from medium sized companies, although appreciating the effects of reward systems, they cannot compete with the large sized firms in the amount of incentives because of limited financial resources, which is consistent with previous studies (see for example; El-Ebaishi, 2003; Kerr and Slocum, 2005). Therefore, they rely on some non-monetary incentives such as rewarding through empowerment or human relations. Some managers stated that as employees develop and grow, they can be given more responsibility and perhaps more basic compensation and the empowerment itself will be considered as a reward for good performance. The employee will develop self confidence and self esteem. It drives the employee to even further improve performance. On the contrary, some other managers stated that we live in a money-motivated world. Therefore, these non-monetary types of incentives cannot compensate for a lack of monetary reward. If the reward is right, good human relations and empowerment will give that extra zest to employees, motivating them to give of their best efforts. However, insufficient monetary reward cannot be compensated by good non-monetary rewards.

The general manager of budgets of firm 1, Abu Qir Fertilizers and Chemical Industries Corporation, stated,

... Pay is an important feature of human resources; after all, it is the main reason why people work. Reward system, to work efficiently, has to be clear, straightforward and also has unambiguous links between the activities employee should perform and the reward. The reward or compensation, our employees receive for their contribution to the company, includes monetary and non-monetary components. We have different reward packages, which might include basic pay, insurances, health care, social clubs free membership, share options, training grants, paid holidays and pension arrangements.

Financial & Liaison Manager of firm 6, MINAPHARM Pharmaceuticals & Chemical Industries, put it as following,

... In our company, to have an effective performance measurement system, it is tied to compensation or some sort of reward. Mainly, financial rewards take the form of pay or bonus, which is usually an amount up to 5% of the employee's current base salary. Pay is an important form of recognition and a motivator. On the other hand, we are providing nonfinancial rewards along with these financial rewards such as prepaid vacations, free meals and free transportation. To ensure the reward system is effective and motivates the desired behaviors, it is essential to consider carefully the rewards to ensure that they are linked to or based on performance.

All managers agreed upon the importance of *environmental uncertainty* as one of the factors that affect the use of all managerial tools, especially performance measures. Organisations must cope with and manage uncertainty to be effective. Uncertainty means that decision makers do not have sufficient information about environmental factors, and they have a difficult time predicting external changes. Uncertainty increases the risk of failure for organisational responses and makes it difficult to compute costs and probabilities associated with decision alternatives. This environmental uncertainty includes a large number of external elements that make up the organisation's domain, and in turn, creating a complex environment. For example, increased global competition, rapid technological breakthroughs, changing exchange rates, and the unpredicted

governmental and environmental regulations. However, it was concluded from the interviewees that, although all companies in all industries are facing a greater level of complexity and change, but not all industries are exposed to environmental uncertainty by the same degree.

As the chief financial manager of firm 4, National Paper Company, had put it,

... Indeed, environmental uncertainty is an important factor, which should be taken into consideration while designing performance measures. However, in our industry that depends on producing papers, which is a standardised product, we cannot say that environment is very unstable. Although, we might be exposed to some changes in governmental and environmental regulations, I cannot consider it a turbulent environment. When a large number of elements impinge upon the company and they shift frequently or react strongly to organisational initiatives and several sectors change simultaneously then we can call the environment is turbulent.

On the other hand, the CEO of firm 3, Kaha Company for Preserved Foods, stated,

... As is well known, in recent years the environment faced by food manufacturers has been characterized by intense competition, changing governmental regulations, and uncertainties regarding raw material prices and collections from credit customers. I believe that our company because it operates in that uncertain environment, it becomes more market oriented since we can clearly see a direct effect of the market orientation on our performance.

Lastly, the general manager of firm 9, Egylin Company, said,

... Companies are in continuous interaction with their environment; therefore, an environment is considered the primary source of opportunities and threats to any company. However, managers need detailed information about that environment for making sound decisions, but that information is never complete that is why there is always uncertainty. In our company, we have planners who scan environmental elements and analyze potential moves and countermoves by other competitors. Therefore, it helps

us to provide new products in the right time. All what we are trying to do is to minimize the negative effects of the environmental uncertainty as you cannot avoid it completely.

Finally, it was shown from the previous results, the variation in managers' answers and comments due to the organisational size. Organisational size is salient and known to affect other organisational conditions (Baron and Bielby, 1984) and outcomes (Baron *et al.*, 1986). For example, as shown earlier, large organisations maintain high wages to avoid costly turnovers. By contrast, the behavior of medium organisations is difficult to observe. As a result, workers at these medium organisations always look for outside opportunities, even if they are identical to large organisations in other characteristics, which is consistent with the established finding that large organisations pay higher wages for otherwise identical jobs (Brown and Medoff, 1989; Kalleberg and Van Buren, 1996; Troske, 1999). Therefore, it is concluded that organisational size is an important intervening variable that affects the use of performance measures through affecting the rest of the contingent variables.

7.11 Summary

This chapter described and justified the main steps of data analysis. The SPSS package was used to describe and analyse the data to unveil the complicated nature of the relationships between the dependent and independent factors. All the research data was classified as interval data (see section 6.7.1 in Chapter Six) because all these variables were measured using a 5-point Likert scale, except the organisational size variable, which is a categorical intervening variable that divided companies into medium and large size according to their number of employees. Two main sources of data were used; namely survey questionnaires and interviews. The former was analysed earlier in this chapter. The latter, which is interviews, is used and analysed where needed in order to provide further method of interpretation of the results.

This chapter utilized the exploratory factor analysis technique that enhanced reliability, in addition to aggregating the huge number of statements used in the survey into few meaningful factors. Results from the exploratory factor analysis revealed that there are

five dependent factors; namely financial, customer, innovation and learning, internal business and environmental measures. Respondents believed that these measures are the best representation of performance measures. On the other hand, seven factors were extracted, as independent factors, namely; strategy, structure, competition, technology, management style, reward systems and environmental uncertainty. In addition to organisational size which is considered as the intervening variable in this study. Respondents believed that these factors accounted for most of the variation in dependent factors. These contingent factors were examined to identify their effect on the use of the performance measures in either the large or the medium sized companies. Researching these factors; namely, strategy, structure, competition, technology, management style, reward systems, environmental uncertainty and the organisational size, was in line with many prior studies that examined different contingent factors include environmental uncertainty, technology, structure, reward systems and strategy (e.g. Hirst, 1983; Govindarajan, 1984; Imoisili, 1985; Harrison, 1992; Mia and Chenhall, 1994; Subramaniam and Mia, 2003).

Correlation and regression analyses were also utilized in this study. Respondents were classified according to organisational size, namely; medium and large sized manufacturing companies. All correlations were positive between dependent and independent factors and at acceptable levels in the two size categories. These results indicate that these independent variables are critical and of great importance when designing and using different performance measures. Regression analysis highlighted the significant factors that affect the design and use of performance measures in the Egyptian manufacturing companies. In the medium sized manufacturing companies, all the independent factors were significant with different set of performance measures except technology, which failed to prove any significance with any performance measures set. On the other hand, in large sized manufacturing companies, all the independent factors were significant to different performance measures, including technology. As mentioned earlier, this might be because of the financial ability of these companies to afford the acquisition of technology which is consistent with some previous studies (see for example; El-Ebaishi, 2003).

Interviews revealed important insights that helped to provide further interpretations to survey results. Most managers, in either the large or the medium sized companies, seemed very supportive to different performance measures, although the degree of this support might vary between different performance measures. They were more enthusiastic about having nonfinancial measures along with the traditional financial measures. They contend that in reality all these measures should be used even that their importance might vary from industry to another. They also stressed that there is no business nowadays can survive with only the financial measures. Hence, customer relations and market share changes are seemed very vital to any business. In addition to motivating the staff towards creating new ideas, products and markets. Moreover, issues such as quality control, delivery time, cycle time, preserving the environment and security and safety have become of paramount importance to any business. Such observations support the findings of the questionnaire survey which suggest that, most of the Egyptian manufacturing companies apply hybrid performance measurement systems.

In addition, results from the interviews provide more support to the results from the survey. All the participating managers, whether from large and medium sized companies, agreed that strategy, structure, management style, reward systems and environmental uncertainty are of crucial importance to the use of different performance measures. However, they highlighted that these factors should fit the organisational size of the company; therefore, each company should adopt the form of strategy, structure, management style and reward systems that fits with its environmental and organisational circumstances.

Competition and technology were the most two debatable issues, although the participating managers agreed on their importance. For competition, most of the managers of large and medium sized companies stated that in some extraordinary conditions, such as standardised products or governmental protection, this factor has no great importance. For technology, the two teams of large and medium sized companies spilt because of their organisational size. Large sized companies found it very justified investing in acquiring recent technology that helps them to improve their products,

quality and price-wise, which in turn will make them more competitive in the local and international markets. On the other hand, medium sized companies stressed that their investments in latest technology is linked to the limited financial resources. Firms with limited financial resources cannot expand their business to include high-tech equipment and the technical assistance necessary to teach staff how to use it. Simply, when calculating the cost of these equipments, it also should include start-up expenses and the price of regular maintenance, service agreements and the cost of staff training needed to integrate the requested equipment into its current configuration. Consequently, if all these investments are not justified in terms of financial resources availability, payback period and other criteria, it is not worth investing in such advanced technology.

Finally, the results were in line with what Wang and Ahmed (2003) contend that as the organisational size increased, the side effects grew and it became difficult to exert controls and influence for effective organisational functions. This might be because of the magnitude of factors that affect management control systems in these companies. Therefore, the need rises to consider more factors that affect performance measures when designing and using these management control systems. This might provide an explanation for the differences in results between the medium and large sized manufacturing companies in Egypt.

Chapter Eight

Discussion of the Results and Conclusion

8.1 Introduction

The eighth chapter aims to discuss the analyses of the hundred and forty survey questionnaires and commentaries from the data obtained from the ten semi-structured interviews of the medium and large sized manufacturing companies in Egypt. This chapter discusses the results and links current findings with previous management accounting studies.

The chapter consists of six sections, after this introductory section, as follows:

- The first section gives a coherent picture about the representation of the sample used in this research;
- The second section reviews the findings of this research in respect to the contingency perspective as the theoretical framework used and compares them with the relevant contingency-based literature;
- The third section compares the current findings with the previous studies' findings to identify the similarities and dissimilarities between them;
- The fourth section critically reviews the research findings in order to determine the strengths and weaknesses of the current research, in addition to highlighting the research limitations;
- The fifth section recommends some themes for future research; and
- Finally, the sixth section presents the conclusion of this research.

8.2 Representation of the Sample

Medium and large sized manufacturing companies are most likely to have well developed and extensively used management accounting systems (Merchant, 1984; Emsley, 2001). Consequently, medium and large sized manufacturing companies were randomly sampled from a governmental directory, the General authority for investment and free zones database (2005) and included, *inter alia*, pharmaceutical, chemical, weaving, food and electronics companies. The population for this study was initially defined as medium and large sized manufacturing companies in Egypt. However, the details of the manufacturing companies randomly selected in this study were derived from the General Organisation for Industrialization (GOFI). They are divided among industries such as spinning and weaving, food, chemicals, wooden, engineering, iron and steel, pharmaceutical and mining industries.

By restricting the sample to this population, it is possible to partially control confounding data due to the industry sector (i.e. manufacturing and non-manufacturing). This approach is consistent with other studies in this area of research (e.g. Govindarajan, 1984).

Previous studies related to developing countries recognised the importance of company size to the use of management accounting techniques, as small firms are likely to employ less management accounting techniques than medium and large firms (Savage, 1966; Chiu, 1973; El-Ebaishi, 2003). Overall, a total of 400 questionnaires were forwarded to CEO, CFO, financial managers, or the available head department of medium and large sized manufacturing companies. A covering letter outlining the importance of the study and a copy of the questionnaire was forwarded to the 400 companies, of which 200 were medium sized and 200 were large sized companies. A total of 140 usable responses were received from the initial mailing and the follow-up process, a usable response rate of 35%. Out of the 140 usable responses, 73 were from medium sized companies and 67 from large sized companies. The respondent companies were from a range of industries, which enhances the representation of the sample. Non-response bias is always an issue with survey-type research. However, the reasonable response rate in this research (35

percent) reduces the problem of non-response bias. However, a random selection was taken from the non-respondent companies to investigate the reason of not response, all the answers were concentrated onto two reasons either not having time to answer this long questionnaire (9 pages) or confidentiality reasons. Also, these non-respondent companies were checked against having similar or specific characteristics but no evidence was found of any similarities or specific features. It is possible that there is a difference between non-response and response but there was no evidence from this examination that they were distinct.

In addition, an Independent-Samples t-test was also performed for the Likert-scale items for the first ten questionnaires and the last 10 questionnaires. The test showed no significant difference in the responses of the early and late respondents. All numbers of the Sig (2 tail) column showed values above the required cut off point (.05); therefore, it is concluded that there is not a statistically significant difference in the means of the first and the last ten respondents of the questionnaire (see for example; Pallant, 2001). This suggests that the main reason for no response was either the length of the questionnaire or confidentiality.

Moreover, analysis was undertaken of the designation of the individuals named as having completed the questionnaires and this reveals that about 10 percent of respondents were CEOs, about 62 percent either CFOs or financial managers and 28 percent other experienced head of departments. The seniority of the respondents gives strong support for the belief that responses provide an authoritative source of information on the issues raised in this study. Respondents were also asked in the questionnaire and interviews to state their period of employment in the company in general and in their current position in particular. Responses revealed that over 71 percent had been employed in their companies for around sixteen years. In addition, the average length of employment in their current positions was around seven years.

8.3 Contingency Approach Comparison with Previous Studies

In this section, an attempt is made to discuss the motive behind the use of contingency approach in this study. In addition, a comparison is made with other key studies in this field. For example, Chandler and Daems (1979), Kaplan (1983), Johnson and Kaplan (1987), Hopwood (1987) and Loft (1991) agree that accounting as an information system played an integral role in the development of organisations as the uncertainties they faced became ever greater. These studies concluded that a relationship between accounting and wider organisational concerns exists. In doing so, these studies move towards an idea of how accounting might function as a tool for management control, especially, in the face of the increasingly uncertain and varied operations faced by manufacturing organisations. Their reasoning was stemmed from the idea that control takes place in an environment in which physical processes remain visible alongside their accounting representations. Such an environment was the core of many contingency studies. The informal and non-routine aspects of accounting were the main motive to consider contingency approach as one of the most plausible approaches to study this phenomenon. Chapman (1997) argued that an omission of such wider contexts in the examination of accounting control systems by some contingency studies might provide an explanation of the discrepancies between their expectations regarding the functioning of accounting and their findings.

It was agreed among these studies, as well in the current one, that it is too hard for a single contingency study to consider a large number of contingent factors, which is consistent with Weick's (1979) ideas concerning the necessarily limited nature of any individual piece of research. However, it might be expected that any attempt at a comprehensive picture of a contingent view of accounting must derive from a synthesis of the results of previous research. Therefore, as Chapman (1997) stated, the implications of the range and depth of characterisations of a particular accounting study will be highly dependent on the exact nature of the question(s) being asked and the methods being used to determine an answer.

The fundamental reason for choosing contingency theory, as the theoretical framework for this research, was that the use of management accounting practices in general, and the

use of different performance measures in particular, is linked to some certain factors that might include strategy, structure, competition, technology, management style, reward systems and the surrounding uncertainties in the environment. As Mintzberg (1987), Bhimani (1993) and Daniels *et al.* (1996) stated that contingency theory provides the facility to identify internal and external forces in the field of performance measurement on the application of financial and non financial measures that could shape different resulting forms, from which the organisation will be pulled. In other words, they concluded that the profile of any performance measurement system will be contingent on some internal and external forces.

The approach followed in this research is also consistent with what was followed in many studies in the same field such as Otley (1980), Selto *et al.* (1995), Ali (2000), Chenhall (2003) and El-Gendy (2004). The problem of matching the characteristics of performance measurement systems with the environment and different contingent factors (e.g. firm's strategy) is explored in a wide stream of contingency research. Contingency research investigates, as the case of the current research, how the use of performance measurement systems is tailored to different contingent factors such as the needs of the strategy being pursued. The problem of fitting the performance measurement systems with company's strategy has been explored by, among others, Haka (1987) and Govindarajan and Shank (1992). These contingency theories attempt to provide answers to how performance measurement systems designs vary among firms following different strategies. The findings of the current research were in line with others results, which provide evidence that applying performance measurement system is not depending on a specific factor such as corporate strategies alone but on cumulative multiple factors.

However, what is worth noting here that each study adopts a slightly different approach, point of view and factors to elaborating the aspects of accounting control systems which might be affected. As Fisher (1998: p. 49) who stated that "A contingent variable is relevant to the degree that businesses that differ on that variable also exhibit major differences in how control attributes or actions are associated with performance". He used Hofer (1975) as an example for the impossible mission for any study to identify all the

contingent variables. He points out that Hofer (1975), in strategy settings, identified 54 possible contingency factors, with each factor assumed to have only two possible values, which resulted in around 18 quadrillion possible settings. Therefore, it was concluded that some contingency variables have priority or dominate other contingency variables because most contingency studies have included and selected their variables on an ad hoc basis and thus there might exist many potential variables inside and outside the firm.

Bruns and Waterhouse (1975), Gordon and Miller (1976) and Waterhouse and Tiessen (1978) sought to address the contingent nature of accounting in a broader context. These studies concerned themselves with more detailed conceptions of how accounting systems might be affected by a variety of contingent variables. The management control system most of these studies addressed was budgeting system as a well-established traditional financial system used widely in the past. As Kaplan (1983) who discussed how the use of financial measures such as return on investment by managers in DuPont was always affected by considerations of wider economic factors such as the business cycle.

This stream of studies attempted to address the appropriateness of different contingent factors on the accounting performance measures. However, each study had different point of view and focused on its research question(s). For example, Bruns and Waterhouse (1975) were the most structured in their elaboration of aspects of budgetary control. Their results were the formulation of two distinct strategies, which they term: administrative and interpersonal strategies. In turn, Merchant (1981; 1984) studied these strategies and, in their results, they linked organisational size and structure with these strategies. Waterhouse and Tiessen (1978) discussed the potential impacts of environment and technology on the structure, and hence centralized or decentralized nature of authority in organisations. Their conclusion, at the end, was about the impact on management accounting systems. Gordon and Miller (1976) take a different angle on the facets of the accounting information system, which they address. They formulate a framework in which uncertainty derives from the environment. They propose that accounting systems should incorporate more nonfinancial information, more forecasts, and more frequent reporting. The suggestion of the inclusion of a sort of non financial measures or

information, was quite new in that period. They concluded that, most research up until that point had adopted a rather narrow and inflexible view of accounting information. Their solution appears to be the introduction of the issue of non financial information into accounting systems. However, the non financial measures began to sound in the last twenty years; specifically, at the beginning of year 1990.

The subsequent studies that addressed contingency theory varied. They researched different aspects of the organisational contexts such as Drazin and Van de Ven (1985) who suggest that an organisation's structure is contingent upon contextual factors such as environment, strategy and size. They conclude that these variables interact with context and affect performance. They stated that the proper way of analysing fit between these variables is thus the *Contingency* approach. Another study, Miller and Friesen (1982) revealed that controlling for the strategy of the firm is critical to understanding the relationship with control. They stressed that contingency approach is the most reliable approach to study these organisational attributes.

Also, Covaleski and Dirsmith (1996) stated that contingency theory emphasizes how contingent factors such as technology and the task environment affected the design and use of control systems in organisations. For example, the tightness of the control systems determined by contingent factors such as the structure of the organisations, level of technology and the stability of environments.

In summary, the results of these studies which might at first sight appear to have strong generalisable implications for a contingent theory of accounting. However, as the contradictions between their findings illustrate, their results may be more locally constrained. Nevertheless, this would not lessen the suitability of contingency approach for the nature of this research. Therefore, it is concluded that the assumptions and procedures of this research are consistent with other studies conducted in this field; and in turn, provide supporting evidence that using the contingency approach, as the theoretical framework in the area of performance measurement systems, is more likely to convey a relatively true picture.

8.4 Previous Studies Results

In this section, an attempt is made to compare the results of this research with other studies' results to determine the agreement and disagreement areas between them. The main two questions this research tried to answer were: 1) What are the current performance measures applied in medium and large sized manufacturing companies in Egypt? 2) What are the factors that affect the use of these performance measures in the medium and large sized manufacturing companies in Egypt?

Concerning the first question, it was found that medium and large sized manufacturing companies in Egypt apply hybrid types of performance measures as reported in the questionnaire analysis (shown in chapter seven, p. 215-226) and as also reported from the comments of the interviews (shown in chapter seven, p. 275-281). Although, not all managers have agreed on the same degree of importance of each performance measures, their overall answers showed that all these performance measures are of paramount importance for any medium and large sized manufacturing company. Which is in line with what was noted by Perera *et al.* (1997, p. 569), "changes in manufacturing strategies to emphasise quality, flexibility, dependability and low cost should be accompanied by changes in formal performance measurement systems to place greater emphasis on nonfinancial (operations-based) measures". Nevertheless, some exceptions have been noticed through some managers' responses such as the case of the company, which manufactures standardized products, which have fixed features, i.e. fertilizers, the manager stated that the nature of their products hinders the full utilising of customer measures, which in turn forced them to be more cost-oriented than customer-oriented company.

A wide array of previous studies agreed on the same results. For example, Daniels and Burns (1997) stated that the use of exclusively financial performance measures is now widely recognized as conflicting with the most fundamental aims of modern business. Therefore, they highlighted that the focus on the needs of the market and the customer is one of the drivers for successful manufacturing. In addition, Brown and Laverick (1994) and Butler *et al.* (1997) stressed the inadequacy of the traditional financial measures due

to the contemporary business environment. They stated that a wider range of measures related to quality, market share, customer and employee satisfaction could be employed to yield greater insights into the factors which drive financial performance.

The results of varied importance of different performance measures were also in line with Butler *et al.* (1997) study that concluded that performance measures applied by different companies vary. Different market situations, product strategies and competitive environments require different combination of performance measures. Any company customizes performance measures to fit its mission, strategy, technology and culture amongst other factors. For the case of the company they studied, it was clear that the executives of the company appreciated the impedance of financial criteria set as a constraint on the development of their performance measures combination. They believed it did suit their needs and felt comfortable with it this way. In simple words, performance measures have to be tailored to the needs of each company.

The results from the survey and interviews indicated that any manufacturing company must utilise a combination of financial and non financial measures. However, respondents did not agree on the importance level of each performance measure, they stated that their importance might vary according to the circumstances of the company. These results were in line with Rouse *et al.* (2002), which their study was on an American aircraft company. The management of the company desired to improve the performance measurement system. The researchers stated that the new implemented performance measurement system should recognize not only a need for financial indicators but also nonfinancial measures to accommodate the diverse management tasks of different stakeholders. They highlighted that every company has its own unique internal and external environments; therefore, performance measures should be chosen that in aggregate are capable of presenting a comprehensive, integrated and activity-related view of a complex business situation. In addition, they contend that performance measures should be related or linked to many factors such as strategy and structure, if the company aims to achieve sustainability. After a critical observation, they concluded that although a hybrid performance measurement system had been developed beforehand in the

company; however, it did not enable managers to drill down to underlying drivers or to comprehend the interrelationships among strategic goals, measures and drivers. Therefore, the study of the factors and restrictions surrounding the company leads to a better use and increases the relevance and fit between performance measures, which in turn will lead to a better performance.

In summary, the results of this research were, to a certain extent, surprising. Although it was intuitively expected that the level of application of performance measures in the Egyptian society should be lower than developed countries, the evidence suggests that performance measurement systems in Egypt were in line with most of the evidence from developed countries. The research found evidence of the hybrid nature of the implementation of performance measurement systems in Egypt. This raises an accounting reflection for developing countries that has not been addressed in previous studies, i.e. the relevance of Anglo-American management accounting systems and practices built into management control packages for developing countries.

A particularly surprising result to the researcher relates to environmental measures since Egypt, as one of the developing countries, does not have a long history of paying great attention to preserving the environment. This is comparable to Mexico during the last forty years, as a result of the industrial revolution; Mexico City has air pollution which is among the worst in the world, and other cities also suffering from excessive pollution. Until recently, however, environmental regulation has received scant attention. Mexican environmental policy continues to evolve rapidly, reflecting raising consciousness of pollution problems and Mexico's higher international profile (Hettige et al., 1996 and Dasgupta et al., 1997). As in the case of Mexico, Egyptian environmental performance was evidenced to be maturing, although this might be surprising, the rapid growth of "green" pressure in North America and Western Europe may pressure developing-country exporters toward greater environmental effort. In addition, the new ISO 14001 is already having a significant impact on the environmental stance of firms in both industrial and developing countries. ISO 14001 is receiving significant attention in developing countries, and for example in Asia, both Indonesia and Philippines intend to

incorporate ISO 14001 elements into their new programs for public disclosure of firms' environmental performance (Dasgupta et al., 1997).

The use of both quantitative and qualitative data, which is in line with several previous studies, is a strength for the current study as the post-survey interviews provide rich insights into the factors that affect the use of performance measures. For example, Ali (2000) and El-Gendy (2004) utilised both survey and interviews methods, they stated that using both methods in collecting research data is complementary and reveal valuable insights. Consequently, the research identifies certain variables to be of crucial importance when using these performance measures as shown in table (8.1). Most of the results concerning these factors were in line with previous studies, as Simons (1987) who stated that researchers have become interested in understanding the relationship between control system design and organisational variables such as size, technology and environment. Moreover, the results also suggest that while the organisational size increases the variables these companies taking into consideration increases too.

Table (8.1) A summary of the significant independent variables in both medium and large sized manufacturing companies

Variables	The Use of Financial Measures		The Use of Customer Measures		The Use of Innovation and Learning Measures		The Use of Internal Business Measures		The Use of Environmental Measures	
Company Size	**M**	**L**	**M**	**L**	**M**	**L**	**M**	**L**	**M**	**L**
Strategy	S	S	S	S	S	S	NS	S	S	S
Structure	S	S	S	S	S	NS	S	S	NS	NS
Competition	NS	NS	NS	S	S	S	NS	NS	NS	S
Technology	NS	NS	NS	S	NS	S	NS	NS	NS	NS
Mgt Style	S	S	NS	NS	NS	NS	S	S	NS	NS
Reward Systems	S	S	S	S	NS	NS	NS	NS	NS	NS
Environmental Uncertainty	S	S	S	S	S	S	NS	NS	NS	S

M: Medium sized company

L: Large sized company

S: Significant factor

NS: Not significant factor

Research results suggest that applying more than one type of performance measures depend on multiple factors such as *corporate strategies*. This result (shown in the summary in table (8.1) and the comments of the interviews in chapter seven, p. 284) is in line with Daniels and Burns (1997) study, which stated that performance measurement system certainly married up to strategy formulation, which has a key part to play in the advancement of manufacturing companies. In addition, various scholars suggest that there is a need for a tighter link between the firms' performance measurement systems and their strategies to accomplish more effective control (e.g. Pinches, 1982; Merchant, 1985b; Haka, 1987). The primary way of ensuring that this link is achieved is to design the appropriate management control system that takes into consideration an adequate strategic guidance. Therefore, firms should improve their understanding of how these systems are actually used in order to determine the influence of firm's strategy (Slagmulder, 1997).

Langfield-Smith (1997) expresses surprise that it was so long before strategy was addressed as a variable by the contingency literature. Chandler (1962) and Mintzberg (1973) stated that strategy was a relatively simple and accurate description of a phenomenon in an organisation. They developed contingent arguments concerning strategy, in which they concluded that it is something highly contextual and grounded in any organisation.

Many studies classified strategy into certain typology; for example, Miles and Snow (1978) carried out an in depth investigation for describing the strategic behaviors. Their typology, four stereotypes of strategic behaviour, resulted from careful observation of patterned variation within this domain, which could be used to describe general differences in strategy between organisations. Their work provides a set of general characterizations which can be broadly applied to a wide variety of settings. However, as Chapman (1997) argue that this generality of their typology was bought at the price of specific accuracy and the implications of this lack of local accuracy are highly significant to the efforts of contingency theorists.

In addition, Hambrick (1981) operationalizes strategy by classifying firms as either defenders or prospectors, on the grounds that these represent extremes of the Miles and Snow (1978) typology that they map onto the input, throughput, output model of organisations. Moreover, Govindarajan and Gupta (1985) introduced a further typology. They viewed strategy as representing a spectrum from build to harvest, where build represents the intention to increase market share, and harvest the intention to maximize cash flow or short-term profit. They used strategy as a contingent variable to try to explain differences in the measures used in deciding the bonus levels of managers of strategic business units. Another classification was followed by Covin (1991) who strategically differentiates his firms as either entrepreneurial or conservative. The methodology of his study was also questionnaire based, and used factor analysis in his study. The attempt to differentiate accounting use between entrepreneurial and conservative firms was also problematic, with the results indicating that entrepreneurial firms were just as likely to be concerned with financial fine tuning as their conservative counterparts.

It was concluded from the pilot study that managers recognize the importance of strategy in its general term; however, they could not differentiate among different classifications such as Miles and Snow's (1978) typology. Therefore, it was decided to use the term "strategy" in its general term for two reasons; the first was derived from the nature of the research, which is to explore if the "strategy" one of the factors that might affect the use of performance measures. The second reason was the researcher's desire to reduce the biasness of the research by not leading the respondents for some certain answers.

Strategy has been used in this study as an overall expression, which covers a variety of approaches. This is in line with several previous studies. For example, Schendel and Hofer (1979) stated that firm's strategy is concerned with determining what business(es) the organisation chooses to compete in and the most effective way of allocating scarce resources among business units. Mintzberg (1978), Andrews (1980) and Mintzberg and Waters (1985) stated that firm's strategies could refer to how the firm competes in its markets; in other words, how the firm could follow some patterns of action to

differentiate itself from its competitors to gain competitive advantage. Hence, the results were also in line with Chenhall and Langfield-Smith (1998) study, which addressed that strategies and management accounting practices would combine in mutually supportive ways to enhance organisational performance. And Simons (1987) who argued that different strategies require different control systems, if the organisation is to perform well, which means that strategy is an effective factor that affects performance measures. As Simons (1990, p. 136) stated, "Although firms competing in the same industry face the same set of potential uncertainties (changes in government regulation, intensity of competition, advance of new technologies, nature of customers and suppliers, product life cycles and diversity in product lines), the strategy of the firm strongly influences which uncertainties are critical to the achievement of chosen objectives".

However, research results of strategy were not consistent with other studies. For example, Ittner and Larcker's (1998b) conclusion that recent initiatives to link long-term strategies to short-term actions have yet to prove successful. Epstein and Birchard (2000a; 2000b) explain that managers always have had trouble making the system for corporate strategy, business- unit strategy, budgeting, performance evaluation, and compensation work as one. Kalagnanam and Lindsay (1998, p. 28) note that there is little current evidence of the successful use of 'strategically-driven performance measurements'.

In reviewing the relationships between different performance measures and *structure*, in medium sized manufacturing companies, structure was found to be significant with four of the five types of performance measures. In large sized manufacturing companies, it was significant with three of these five performance measures types. These results (shown in the summary in table (8.1) and the comments of the interviews in chapter seven, p. 284-285) were in line with what was found in the literature about the significance of structure. For example, Thompson (1967) highlighted the importance of the structure for any company by stating that, "structure refers to internal patterns of organisation relationships" (p. 51); therefore, it was not a surprise to find this factor of crucial significance to the medium and large sized manufacturing companies in Egypt.

Wang and Ahmed (2003) concluded that the current dynamic environment inevitably raises the importance of organisational structure. This importance is to develop new types of organisational forms that facilitate knowledge management, in particular knowledge flow. They also stressed on the idea that the traditional understanding of organisational structure fails to capture the essence of organisational development in the face of new challenges and demands. However, to develop and map different forms of structure, which are capable of meeting the demands of knowledge-based environments and incorporate the using of different performance measures such as customer, innovation and learning, internal business and environmental measures, depends on the contingent variables that surround the company. These contingent variables play an important role in defining and understanding the intrinsic nature of structural activities within the organisation. Piercy and Cravens (1994) stated that the current vulnerable global circumstances (i.e. intense competition, instable political systems, rapid technology amongst others) led to development of decentralization as a part of the solution for effective control. This could recommend that the hierarchical structure is giving way to flatter and more flexible structures in the post-modern world of business, which they claimed, it might be a calling for the rise of organic structure.

Concerning their conclusion about structure of large sized companies, Pugh *et al.* (1969b) stated that the organisations that are highly structured and have a low concentration of authority are found to be large, mainly independent, and to have their workflow relatively highly integrated. This particular structural combination is that developed by large-scale manufacturing, or big business.

From the pilot study, data analysed from the questionnaires and the insights and comments obtained from interviews, it was concluded that all managers value the importance of the structure in determining performance measures; however, each firm, whether of medium or large sized, has to determine the suitable form of structure that best fit with its internal and external environment.

It was also found that *competition* is significant with at least one type of performance measures; namely, customer measures in medium sized manufacturing companies, see the summary in table (8.1). On the other hand, the significance with other types of performance measures was increased in large sized manufacturing companies, which proved to be significant with three types; namely customer, innovation and leaning and environmental measures. This could suggest that, when the organisational size increases, the importance of this factor increases too.

However, to some extent, results from interviews, see the comments of the interviews in chapter seven, p. 285-286, raised another important point related to the competition factor in Egypt. Whilst the vast majority of the interviewees had agreed on the importance of competition, some interviewees highlighted that competition for them is based on cost orientation not customer orientation, they refer this to either the standardised nature of their products or the slow progress of the privatisation program in Egypt. This was supported by many studies, which have tested the real benefits from privatisation programs in Egypt, and it was proved that the benefits obtained from such programs are well-known but slow (see for example; WEFA–October, 1998; Egypt Country Monitor, 2000, DRI•WEFA, 2001). Also, Jenny (2003) stated that competition policy officials in developed countries usually do not have the possibility to intervene directly in the executive process. This did not create a particular problem as long as antitrust or competition law enforcement played a relatively minor role in economic policy and as long as the legal environment of business was fairly stable. However, many developing countries, such as Egypt, switched from a command public economy to market economy and decided to adopt some form of antitrust law. The period of 1980s and 1990s was a period during which many developing countries were urged by donors or international institutions (i.e. IMF and World Bank) to adopt market-friendly policies including competition policy and laws. Jenny (2003) highlighted that this transition raised important issues related to the proper design of a competition authority and the role such an authority should play in the regulatory reform program and/or in the privatisation process. He argued that this raised a complex question about the ways and means through which a local business community and/or politicians could be convinced with the benefits

of adopting such laws on the expense of their own personal benefits because of the corruption prevailed in such countries. In many developing countries, antitrust officials led a fierce battle to retain full jurisdiction over the regulation of the competitive relationships in markets newly opened to competition but full success is yet to be proven.

Martin and Parker (1997), Villalonga (2000), Megginson and Netter (2001), Prizzia (2001) and Shirley and Walsh (2001) suggested that the full utilisation of any privatisation program would not achieved unless there are an introduction of effective competition, effective state regulation and supportive organisational and political changes. Wallsten (2001), in his study on developing economies between 1984 and 1997, stated that privatisation alone was not beneficial and was negatively correlated with performance outcome. However, he found that competition is significantly associated with increases welfare and decreases the prices. Therefore, he concluded that performance gains occurred due to competition and when privatisation was coupled with effective and independent regulation, competition is the most effective agent of change, and privatising a monopoly without concurrent regulatory reforms may not necessarily improve the outcome.

Lalor and Garcia (1996), Birdsall and Nellis (2002), Omran (2004) and Parker and Kirkpatrick (2005) stated that the consequences of privatisation within developing countries remain controversial. In their review of the multiple goals for privatisation policy, they found very limited and sometimes contradictory evidence concerning the overall impact of privatisation in developing countries. They refer this to the commonly found features in developing countries; namely, regionalised and sometimes ethnically distinct labour markets with appointments through connections, imperfectly competitive and incomplete markets, under-developed capital markets, management weaknesses and patronage in appointments, poorly protected private property rights, under-developed business codes of behaviour, relatively low standards of probity in public administration including cronyism and corruption. Further investigations need to be undertaken concerning this point, which is beyond this research's interests.

The results of competition in this study were also consistent with the results of the pioneered studies of Khandwalla (1972, 1973) who focused on the relationship between formal accounting-based control systems and the type of competition in an industry. He concluded that increased competition leads to increased use of management control procedures. He also found in his study that increased competitive pressure resulted in increasing sophistication and, in turn, the use of accounting systems. In other words, he found that competition increases the use of sophisticated control systems because the control system design was sensitive to the way that the firm competes. Also, Miller & Friesen (1982), Govindarajan and Gupta (1985) and Simons (1987, 1990) attempted to identify the relationship between the way a firm competes and the way that it uses its management control systems. They indicated that there are systematic differences in management control systems among firms that compete in different ways, which highlights the importance of competition to any firm to the extent it has to strategically be taken into consideration.

Technology was introduced as a major explanatory variable of the effectiveness of a management accounting system (see for example; Daft and Macintosh, 1978; Otley, 1980). Technology in this research was concerned with the know-how methods in production, which in other words refers to the knowledge of how to transform the inputs to produce the required outputs, and technology, in this sense, could be a source of competitive advantages to the firm. This conceptualisation of technology, which is employed in this research, was at an aggregate level of a firm, which is consistent with Bell and Pavitt (1997). Also, Fry (1982: p. 533) stated, 'at a global level, technology has been defined as the organisational process of transforming inputs into outputs'. He also added, 'this definition assumes that organisations are open systems and that processes are carried on at all organisational levels'.

This conceptualisation was not consistent with the more disaggregate level followed by Basant and Chandra (2002), in which they define technology as a continuum of three entities; namely, products, processes and practices. They stated that products refer to the knowledge of how products are expected to function, their design, and the interface with

other products. However, processes encompass knowledge on the laws of transformation, and how products could be manufactured or modified. Finally, they defined practices as the link or the bridge between products and processes. This conceptualisation of technology was not followed, as it was revealed from the pilot study and the interviews conducted with a number of managers that their firms have not recognised the importance of the linkages among these three aspects of technology (products, processes and practices) in order to reap full benefit of the acquired technology. This consensus is in line with what Basant and Chandra (2002: p. 417) found in their study on a number of manufacturing companies in India.

In large sized manufacturing companies, this factor was found to be significant with two types of performance measures; namely, customer and innovation and learning measures. However, technology was found to be an insignificant variable with all types of performance measures in medium sized manufacturing companies. This might be because this recent technology that is a cost medium sized companies cannot afford.

These results concerning technology (see in table (8.1) and the comments of the interviews in chapter seven, p. 286-287) were in line with other studies conducted in the field of management accounting techniques utilising a contingency approach. Contingency theory literature suggests that the size of organisations is related to the use of management control systems. It has been shown that management control systems tend to be more specialized and sophisticated in larger firms (Bruns and Waterhouse, 1975; Merchant, 1981; Ezzamel, 1990; Libby and Waterhouse, 1996; Hoque and James, 2000).

Managers in large sized manufacturing companies believe that advanced technology is something critical for sustainability, especially after severe competition that is currently prevailing in the world. As Perrow (1967) and Child (1972) stated that technological sophistication might be positively associated with structuring of activities. As organisations become more closely tied to technology and means for standardized mass production, they formalize role definitions and decentralize decision-making authority, which is more applicable in the large sized firms. In addition, Bruns and Waterhouse

(1975), Merchant (1981), Ezzamel (1990), Libby and Waterhouse (1996), and Hoque and James (2000) point out that larger firms are associated with more decentralized organisational structures and more specialized functions and processes and, therefore, co-ordination and communication problems increase with size. Therefore, as a broader set of information and measurement issues arises in larger firms, more advanced and more sophisticated management accounting systems, in specific management control systems are required. Thus, this was consistent with what was revealed from the interviews that most of the medium sized Egyptian manufacturing companies lack recent technological applications, which in turn lead to more centralization and power concentration in the hands of a few managers.

Child (1976) argued that large organisations acquire more technologies and to be more specialized than small ones. Large organisations appear to have more rules, more documentation, more extended hierarchies, and greater decentralization of decision-making authority. In the same vein, Banker *et al.* (2006) and Melville *et al.* (2004) argued that the last decade has witnessed a rapid growth in plant-level information technology (IT) investments because of the major role IT plays in enabling the development of manufacturing capabilities. Hendricks and Singhal (1997) highlighted that large plants are more likely to have the scale required to justify adoption of advanced manufacturing practices that is more demanding on the financial resources. In the same vein, Scherer (1970) and Hopkins (1988) stated that large firms are likely to have a greater level of financial resources available to them; therefore, they will have a broader range of choices as to technology. Thus, due to this lack of financial resources, smaller firms might be confined to labor intensive procedures, whereas, large would be able to choose either labor or capital intensive procedures. The results on the impact of technology were in line with previous studies conducted in this area that provided some evidence to indicate that organisational size is an important factor in making a firm innovate and adopt new IT (Yao *et al.*, 2003; Khazanchi, 2005).

Manufacturing firms in developing countries could acquire the necessary technology either by imitating technology in the developed countries or by developing their own

genuine technology through, for example, R&D research (see for example; Basant and Chandra, 2002). It was revealed from the pilot study and the interviews that Egyptian manufacturing firms are still, to a large extent, followers. This might be because technology is relatively easy to import on a continuous basis than to innovate or develop bespoke systems. It is worth noting here that importation comes with a higher degree of control from the technology supplier in developed countries due to the fear of creating competitors (Basant and Chandra, 2002).

In summary, it is concluded that most of the Egyptian firms piloted and interviewed were following a strategy of quick assimilation and improvement, which is likely to be more rewarding than a strategy of technology generation. Whilst importing technology from abroad is expensive, it is still cheaper than developing a firm-specific technology, which require large R&D budgets.

The results of the significance of technology with customer and innovation and learning measures in large sized companies were consistent with other studies. For example, Mulani and Lee (2001) stated that Dell Computer Corporation utilises technology to satisfy customers. The company uses a high level of technology that includes using the internet to view Dell's requirements, monitor changes in forecasts, order different components of computers, assemble computers of specific configuration to different customers, and confirm their ability to meet delivery requirements. The company also utilises JIT technology that reduces lead-time of ordering, assembling, and shipping computers to customers. This shows that the alignment between information technology and manufacturing practices enhances the abilities of companies to meet and satisfy their customers.

Moreover, Banker *et al.* (2006) in their study on a large cross-section of U.S. plants, classified technology applied in these plants into three classes: resource planning systems (RPS), operations management systems (OMS), and electronic data interchange (EDI). They stressed the importance of these technologies to create competitive advantage by leveraging IT and complementary organisational resources to develop unique, change-

oriented capabilities that enable firms to meet customer needs and respond to competitors. They found out that the impact of information systems on plant performance is mediated through affecting two areas; first, the advanced manufacturing capabilities such as just-in-time (JIT) and, second, performance measures such as customer satisfaction and supplier relationships. They concluded that these technologies have a positive impact on improvements in plant quality, time to market, and efficiency.

Furthermore, Gerwin (1993), Srinivasan *et al.* (1994), Bates and Flynn (1995), Gupta and Somers (1996), Hendricks and Singhal (1997), and Sakakibara *et al.* (1997), amongst others, state that large firms that develop advanced production technologies are better aligned to performance measures such as customer satisfaction and short manufacturing lead times. Benefits due to advanced technology implementation range from reduced work-in-progress and finished goods, and lower space requirements, to better quality and higher productivity. Hence, by helping to integrate business information technology across the firm, it is possible to improve plant managers' abilities to track work progress, spot and correct deviations, and consistently execute on business initiatives, which in turn leads to better plant performance.

Management style is found to be significant with the use of financial and internal business measures in both medium and large sized manufacturing companies, which indicates that results (shown in the summary in table (8.1) and the comments of the interviews in chapter seven, p. 287-288) are consistent across different manufacturing companies, whether medium or large companies. This result is consistent with Davidmann's (1995) explanation about style of management. Davidmann (1995) points out that the style of management could be described on a scale from fully authoritarian to fully participative. It applies to community organisations, commercial enterprises, political parties, whole countries. Most governments, companies and organisations fall somewhere along this scale with a style of management that combines aspects of both types. The position of any organisation on this scale depends on the balance of authority between, for example, ruler and ruled or between management and worker. In other words, it depends on the degree of participation in decision making which is practised.

For example, in authoritarian organisations, orders are passed down from above and the manager's role is to pass orders down the 'chain of command'. Managers in lower levels are not expected to make decisions and so carry little responsibility. They order and may compel the worker to carry out the tasks demanded from them to produce.

Egypt as a developing country with a socialism history and the power concentrated in the hands of a few people. As Mobarak (2001: p. 1) had put it, "The Egyptian economy had, for a long time, especially after 1952 revolution, relied heavily on public sector enterprises. For about forty years, public enterprises were the keystone in running the Egyptian economy". Belkaoui (1983, 1985) and Hassabelnaby *et al.* (2003) argued that the political atmosphere in any country affects the management style in different organisations in this country, which in turn has significant influence on different accounting practices. They explained this by stating that the political environment affects accounting in an indirect way through its effect on the national culture and the economy. The form of government, dictatorship or democracy, influences the national culture, which in turn influences the business and accounting environment.

Moreover, Hofstede (1991) and Erez and Earley (1993) focused on the values and beliefs of managers that are associated with national culture. They highlighted that managers from different cultures have different values that correspondingly affect their managerial styles. As Kozan (1993) who highlighted that, the national culture influences management styles and techniques. Specifically, Hofstede (1980) stated that the Egyptian culture, as an Arab nation, is exemplified by a high power distance that is characterized by the acceptance of superior's opinions, simply because they emanate from the superior. Hence, organisations centralize power more and subordinates are expected to be told what to do, because superior and subordinates consider each other as unequal. Parnell and Hatem (1999) concluded that 'orders' form of management is a critical phenomenon associated to Egyptian organisational practices, which is preserved more by autocratic decision making than by establishing and following rules and regulations. Because in Egypt, employees are frequently afraid to disagree with their superiors who are often seen as autocratic or paternalistic. In other words, managers are more likely to employ

participative decision making when they believe that it improves the quality of the decision and does not adversely influence their power relative to others within the organisation (Parnell and Bell, 1994). Although the views of Egyptian managers concerning participation's effect on decision quality are unclear, they tend to believe that such behaviour weakens their power position in the organisation (Parnell and Hatem, 1999). This might be the reason for the Egyptian bureaucracy, which deals with how power is distributed in the organisation or the business enterprise. It has been said that there are no easy solutions to the Egyptian bureaucracy (Stoval, 1990; Hatem, 1994).

Reward systems is a well-established factor found to be significant with the use of financial and customer measures in medium and large sized manufacturing companies. This result (shown in the summary in table (8.1) and the comments of the interviews in chapter seven, p. 289-290) is consistent with multiple previous studies conducted in this field. For example, Vancil (1979, p. 292) has shown that an organisation's reward systems is usually tied to its control systems. Managers often receive at least some of their remuneration as a function of control system measures (e.g. budget targets, profit centre results). Carey (1992) and Bowen and Lawler (1995) stated that reward systems encourage employees to work toward planned strategic outcomes. These systems should be linked to performance measures in order to achieve their main role of motivating employees that leads to performance improvement. In other words, reward systems require performance measurement systems to evaluate performance and determine bonuses. Reward systems can motivate employees to pursue strategic priorities by setting performance measures targeted on priorities and sharing rewards between employees and the organisation, based on achieving these performance targets (Carey, 1992; Welbourne *et al.*, 1995).

Usually, managers use performance measurement systems to control employees' behavior, thus, reward systems are often utilized to motivate their behavior to achieve organisation's goals (Cummings and Schwab, 1973; London and Oldham, 1976; Merchant, 1989; Kerr and Slocum, 2005). This might be because reward systems (incentives /punishments) always represent a traditional motive for employees to perform

their work, because they are always tied to the financial performance measures more than the non financial measures. This is simply because when an individual's rewards are tied to financial performance along certain criteria; his/her behavior would be guided by the desire and motivation to optimize performance with respect to those criteria. Spitzer (1964) reported a significant positive correlation between employees' actual contribution to achieve the financial targets as long as it would be helpful in attaining more pay. Similarly, Schuster *et al.* (1971) found that the more an employee believed that financial performance influenced pay, the harder he worked to improve this performance. Moreover, Porter and Lawler (1968), in their study on managers in both private industry and government, also found a definite tendency for managers who believe that their financial performance on the job would have a significant impact on their pay to be assessed by their superiors as more effective than managers who believed that financial performance had relatively insignificant impact on their pay.

The results of the importance of reward systems are also in line with the results of Chenhall and Langfield-Smith's (2003) case study. Their case study was on a parent company that formed CIGGC to manufacture and supply it with aluminum cylinders. The CIGGC division operated as a highly autonomous unit with commercial and accountability links between the division and its parent. In the past, CIGGC operated at break-even and had little competitive awareness. In addition, existing manufacturing processes were inefficient, productivity and labor relations were well below leading international companies. CIGGC had experienced considerable downtime due to employee strikes and absenteeism, and employee turnover was high. The company appointed a consultant to remedy this problem. The consultant explained that the main problem is their reward systems that frustrate the employees because as he demonstrated, other organisations distributed productivity gains equally between employees and the company. Therefore, the company decided that employees and the company would equally share the financial rewards (bonuses) derived from productivity improvements. After restructuring reward systems, there were no strikes, little absenteeism, and staff turnover continued to fall, which in turn improved the financial measures such as

productivity that continued to improve. They concluded that reward systems are linked to formal performance measures that represented a mechanistic form of control.

A significant relationship between the degree of use of financial and non financial measures and compensation rewards exists, supporting earlier research by Abernethy and Lillis (1995) and Perera *et al.* (1997). This result lends additional support to Dean and Snell (1996) argument that reward incentives are given to encourage and enhance company's performance. In addition, Ittner and Larcker (1998b) note that performance measurement systems have a key role in developing different methods for compensating individuals. Graen (1976), Lawler (1976) and Lawler and Rhode (1976) highlighted that performance measures and incentive systems may assist together in achieving firm's objectives by providing clear signals about the intended strategic direction and supplying the necessary motivation by rewarding behavior that is goal directed.

Reward systems' results are also consistent with the results of many key studies. Berg (1965) stated that managers were rewarded solely on the basis of their divisional financial results because the logic for an incentive system is based on the divisional "bottom-line". Also, Lorsch and Allen (1973) reported that, in most cases, bonus decisions for the division managers are made almost exclusively on the basis of the divisions' profit performance. However, they argued that some companies do not link their division managers' incentive compensation solely to divisional profits thereby relying also on top management's discretion. Which is consistent with Keely (1977) and Govindarajan and Gupta (1985) who stated that the more uncertain the environment, the less reliable predictions about future performance are likely to be, thus, requiring a greater reliance on subjective bonus determination approaches such as the customer measures (i.e. customer satisfaction).

Reward systems in the Egyptian society seem to be linked heavily on the financial measures (the bottom-line figures), however, recently and because of many contingencies they start to link them to other non financial measures such as customer satisfaction. This was supported by Salter (1973) who has also argued, in his empirical findings, that there

is no single "best" incentive compensation system for all companies and that such systems should "fit" the other requirements of the firm.

Environmental uncertainty is found to be significant with the use of financial, customer and innovation and learning measures in medium sized manufacturing companies. On the other hand, this significance has increased in large sized manufacturing companies to be also significant with the environmental measures (shown in the summary in table (8.1) and the comments of the interviews in chapter seven, p. 290-292). Obviously, the high vulnerable environment, which is prevailing currently in the whole world, is affecting all companies in the Egyptian market. This might place a high pressure on most of the manufacturing companies to take this factor into their consideration. Which is consistent with what Porter (1985) stated that traditional types of measures, which are based only on financial measures, were not sufficient to cope with dynamic environments. These dynamic environments force organisations to obtaining and sustaining competitive advantage through the development of a distinctive set of organisational capabilities, which are reflected by the non financial measures. Moreover, Stalk *et al.* (1992), Day (1994) and Wang and Ahmed (2003) found that the essence of strategy does not lie in the organisation's particular products and markets, but the dynamics of its behavior and processes. In addition, the organisation's ability to renew and achieve new and innovative forms of competitive advantage becomes most important. This ability is referred to as a firm's dynamic capability, which plays a crucial role in reducing the risk of environmental uncertainty.

Teece *et al.* (1997) and Metcalfe and James (2000) concluded that in the current dynamic world, it is imperative that organisations constantly renew and create new layers of certain capabilities. These capabilities relate to the integration, joint operation of routines and creating knowledge, learning to learn and managing strategic change. Leonard-Barton (1992) and Wang and Ahmed (2003) also highlighted that competitive capabilities are needed to achieve new and innovative forms of competitive advantage given path dependencies and market positions, in addition to the ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments.

Hambrick (1981) bases his study on the identification of what he called "critical contingencies" faced by organisations. He precisely named environment and strategy as the most effective contingencies for any organisation. Simply, he stated that these two factors should influence the distribution of power within organisations, which affects coping with dominant requirements for the organisation. He operationalizes environment as a contingency factor that impacts on either input, throughput, or output processes. For example, he argues that if there is a scarcity of raw materials or personnel then this represents pressure on the input process. If there is pressure for reduced cost or faster production then this will affect the throughput process, whilst new product developments from competitors and changing market preferences represent output process pressure.

Chapman (1997) stated that as uncertainty increases, more complex forms of communication becoming necessary. This complexity arises out of the fact that more discussion is required in order to determine what appropriate action at any given point is.

Finally, the number of employees was used to define and measure *organisational size*, the intervening variable in this study, which is in line with other studies such as (Chenhall, 2003; Speckbacher *et al.*, 2003; El-Gendy, 2004). The variation in the results between medium and large sized manufacturing companies in Egypt places evidence that organisational size influences the number of contingent factors that affect the use of performance measures in medium and large sized manufacturing companies in Egypt.

The variation in the results between the medium and large sized companies could recommend that, as companies grow further in size, in particular, as they internationalize and face domestic and global competition, the contingent factors they have to take into their consideration while using a mix of performance measures rise. This in turn should be supported by adopting an effective strategy that realises and reflects company's objectives. Moreover, there would be different type of demand placed upon structure in terms of control over larger geographical dispersed organisations. In such a very turbulent environment, the organic metaphor results in the development of variations of more sophisticated, decentralized, divisional structure, such as the matrix structure (Miller,

1986; Martinsons and Martinsons, 1994). Previous studies related to developing countries recognised the importance of company size to the use of management accounting techniques. These studies concluded that as size grows, the employment of management accounting techniques such as performance measures increases (see for example; Savage, 1966; Chiu, 1973; El-Ebaishi *et al.*, 2003). Based on this reasoning, it seems plausible that larger organisations are more likely to take into their consideration more variables than smaller ones when using different performance measures.

8.5 Research Critical Review and Limitations

Three main dimensions of the research are reviewed; namely, the location in which the field study had carried out, the research design and methodology choices and the theoretical framework. This is carried out because specific research limitations should be highlighted that might reduce the generalisability and applicability of the findings.

An important aspect in this study is selecting Egypt to explore the relationships between some contingent factors and performance measures. There are several reasons for choosing Egypt as the selected country for study, which is consistent with other previous studies (see for example, Hassabelnaby *et al.*, 2003; El-Gendy, 2004). Firstly, the development of industry in Egypt has passed through many different phases beginning from the sixties till the year 2000, depending on the political atmosphere in the different decades and the transformation from the social economy to the free market economy (Mobarak, 2001). According to the appraisal report done by the African Development Bank in 2005, it states that during most of the 1990s, Egypt made considerable progress in macroeconomic stabilization and structural reforms. These were on the background of a comprehensive economic reform program that the country has pursued since 1990, supported by the IMF, WB and ADB (International Monetary Funds, World Bank and African Development Bank, respectively). New legislation and amendments to existing laws have been passed to enhance the conditions for private investment and to accelerate the pace of structural reform. The main goal of the reforms is to reduce the role of government in economic production, improve governance, remove administrative barriers to market forces, and promote the role of the private sector as the catalyst for sustained

economic growth. Egypt had started to transfer its public enterprises to private ones at the beginning of the Egyptian comprehensive Economic Reform Program, although the results of the progress and outcome of privatisation program in Egypt were varied (see for example, Younis, 1996; Omran, 2002; 2004), no doubt it contributed to the growth of the Egyptian economy. Statistics identified that at the beginning of the 80s, about 80% of the industrial production was public, recently about 85% of the industrial production is in private hands (Mobarak, 2001; African Development Bank, 2005).

Secondly, the main reason for choosing the private manufacturing sector is, according to Mobarak (2001), the manufacturing sector is the keystone for economic and social development and therefore, the Egyptian government looks at manufacturing as the key-player in increasing the growth rate and improving the performance of quality and productivity of the industrial sector. According to the report of the African Development Bank (2005), the manufacturing sector in Egypt alone contributed 19.3% of GDP during 2003/2004, making it the largest contributor to national value added. The overall industrial sector, including manufacturing, contributed more than one third (34%) of GDP, with 62% of the contribution being generated by the private sector. It was also added in the African Development Bank appraisal report that the manufacturing sub-sector is among the fastest growing sectors in Egypt, its average annual growth rate has been subdued in recent years. From an average rate of 6.8% achieved during 1996 – 2001, the sub-sector grew by only 3.7% during 2003/2004, which makes it an attractive sector to be studied and explored. In addition, the share of manufacturing in gross investment was about 11.2% during 2003/2004, while manufactured exports have seen a rebound over recent years, with the value of such exports reaching US$ 4.0 billion during 2003/2004, from the average of US$ 2 – 2.3 billion achieved during much of the 1990s. It was identified that the major manufacturing exports are metal industries, foodstuffs, chemicals, textiles, and engineering products, which were all covered in this study.

Therefore, the results of this research should not be generalised to other sectors, because it relates to the fact that the sample was limited to only medium and large sized manufacturing companies. Consequently, the results may not be generalisable to other

sectors, which are different from the industrial products, and consumer products sectors. For example, the results may be irrelevant to service companies such as companies working in the banking and finance sector, the trust fund sector or health sector. In addition, the present study limited the analysis to private manufacturing companies only; therefore, public-sector companies were not surveyed. Moreover, another restriction of the current study is the organisational size, which was determined by only the medium and large sized companies; therefore, results of this research might not be applicable to those of small size.

Thirdly, the rapid improvements in the environmental policy of Egypt that seeks to achieve environmental protection through the establishment of proper institutional, economic, and legislative frameworks at the national, regional, and local levels. Egypt has established a Ministry of State for Environmental Affairs (MSEA) with its executive arm the Egyptian Environmental Affairs Agency (EEAA) that are responsible for carrying out the environmental policy of the Egyptian government. The main focus of these units is to prevent all sources of pollution and to protect Egypt's natural resources. As mentioned earlier, there were some reforms and laws to legislate this area such as the Law 4 of 1994, which after its enactment; it became necessary to make balance between development and the environment through sustainable development (Mobarak, 2001).

It is worth noting here that the expected reasons of the secretive culture of Egyptian society were supported by many previous studies. Hopwood (1972) argued that sometimes managers' attempts to assist their employees by identifying areas for improvement were perceived as threats by employees and might resulted in defensiveness. Hofstede (1980), Child (1981) and Harrison (1993) have stated that there are societies, which are characterized by the acceptance of inequality and its institutionalization in hierarchies that locate people according to the power they have that, in turn, reflects and reinforces inequality. Hofstede (1980) classified these societies as high in power distance. This culture blocks the subordinate from representation in the evaluation process and thereby frustrates the realisation of equality in the subordinate's relations with his/her superior. Because, simply, an involvement of subordinates in

discussions of problems could be regarded as a sign of poor leadership, and hence generate anxiety by employees. Especially, Egypt is a country where submission to authority figures is ingrained in the culture, which leads to this secretive culture in the Egyptian society.

Some methodological issues, the research design, the sampling and the methods of analyses need to be reviewed critically. This research is deductive research, which represents the commonest view of the nature of the relationship between theory and social research. This deductive research depends on exploring or interpreting a phenomenon building on a relatively well-established theoretical framework, which is the contingency theory in this research.

The research has two main questions; firstly, what are the performance measures used by the Egyptian medium and large sized manufacturing organisations? Secondly, what are the contingent factors that might affect the use of performance measurement systems in these companies? As Abernethy *et al.* (1999) stated that the first step in any research is to determine the research question(s). They added that the question(s) should be of contemporary concern to other accounting researchers and practitioners as well.

The second step in research, according to Abernethy *et al.* (1999), is to determine research methods. They stated, 'methods are meant to be means to ends and not ends in themselves. Hence, logically, one should determine appropriate means once ends are clearly specified' (p. 4). They explained that research should be seen as moving rationally in this linear two-stage process; namely, question/end, then choose the method/means. Also, it is very important for any research to choose the methods that fit the research question(s).

The data collection methods in this research were survey and semi-structured interviews that represent the most common forms of empirical research in managerial accounting, which is consistent with Shields (1997) and Abernethy *et al.* (1999). Both methods were utilised in this research, the mailed survey provides a cost-effective method of collecting

a large quantity of data that avoids interviewer bias (Roberts, 1999). However, it has its own weaknesses such as the lack of the ability to clarify to respondents the interpretive difficulties with the design of the survey (e.g. sophisticated terms). Whilst this was checked in the pilot study of the questionnaire, it was hard to control for some other factors such as the low level of education of some managers (as reported by several studies conducted in developing countries, see for example, El-Ebaishi *et al.*, 2003 and El-Gendy, 2004). In addition, as in all survey research, the survey questionnaire relies on capturing respondents' opinions about the importance of different performance measures; therefore, a necessary assumption in data collection is that the respondents had sufficient knowledge to answer the statements and that they answered them conscientiously and truthfully. In an attempt to reduce the significance of this limitation, semi-structured interviews were conducted to provide further evidence that could be linked to the data collected from the survey instrument.

The additional field research through semi-structured interviews provided a rich data that helped in minimising the introduction of biases so some confidence in the findings of this study could be placed. This field research enabled the researcher to have a close contact with respondents to clarify any interpretive difficulties (Merchant and Manzoni, 1989 and Lillis, 1999); however, this could lead to some interview bias (Abernethy *et al.*, 1999). Consistent with Lillis (1999), the semi-structured interviews were used to collect richer qualitative data that would complement with the qualitative data collected by the survey. Also, Sekaran (2003) argued that an informed researcher who conducts interviews would be in a better position to clarify doubts and answer any inquiries the interviewees may have, thus, ensuring that the responses are properly understood and answered. Moreover, many ideas can also be brought to the surface during the interviews.

In summary, utilising both methods helped the researcher to minimize the bias of using one method solely, unlike what was done by Roberts (1999) and Lillis (1999) who used only one method in collecting their data set either qualitative or quantitative methods, respectively. Thus, in line with Abernethy *et al.* (1999), triangulation of research methods has much to offer. They stated '...use of multiple methods may provide a means of not

a large quantity of data that avoids interviewer bias (Roberts, 1999). However, it has its own weaknesses such as the lack of the ability to clarify to respondents the interpretive difficulties with the design of the survey (e.g. sophisticated terms). Whilst this was checked in the pilot study of the questionnaire, it was hard to control for some other factors such as the low level of education of some managers (as reported by several studies conducted in developing countries, see for example, El-Ebaishi *et al.*, 2003 and El-Gendy, 2004). In addition, as in all survey research, the survey questionnaire relies on capturing respondents' opinions about the importance of different performance measures; therefore, a necessary assumption in data collection is that the respondents had sufficient knowledge to answer the statements and that they answered them conscientiously and truthfully. In an attempt to reduce the significance of this limitation, semi-structured interviews were conducted to provide further evidence that could be linked to the data collected from the survey instrument.

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only achieving the objectives of generalisability and limiting interview bias but also of enhancing the meaningfulness of the measures to those completing the survey, which is at the heart of issues relating to construct validity' (p. 7). Moreover, Webb *et al.* (1966) and Jick (1979) defined triangulation as mixing quantitative and qualitative methods, advocating that both should be viewed as complementary instead of rival methods. In simple words, triangulation means looking at the same phenomenon from more than one source of data. Information coming from different sources can be used to elaborate more the research problem, and it simply limits personal and methodological biases and enhances the generalisability of research's findings (Decrop, 1999).

Usual limitations of cross-sectional survey research, namely data collected at a single point in time, should be taken into consideration. A longitudinal study may aid in understanding how performance measures use develop within organisations and how some variables might affect the use of these measures. In addition, as the case in the current study, previous empirical studies conducted in developing countries have revealed that research access is problematic (see for example; El-Gendy, 2004). Companies have restricted access to their information, particularly policies and procedures, which they perceive, may be useful to their competitors. This might be because of the significant period of changes, which the Egyptian companies faced in this period as reported by El-Gendy (2004), or it might be because of the secretive nature of the culture prevailing in the Egyptian society as shown earlier. Therefore, the researcher had to use some connections in order to facilitate arranging meetings in the targeted companies. In a number of companies, access has been provided on the condition that the company's anonymity will be maintained in all research references. Whilst the researcher decided to use multiple methods in data collection, as shown above, to lessen the effect of this limitation, the potential posed by this limited access to companies' databases needs to be considered.

In this research, data collected is ordinal data that allows us to rank the data in some order, as Likert scale was employed in the questionnaire that is initially designed to capture respondents' opinions. It is not claimed that such type of scales permit us to

quantify exactly the difference between ranks. Nevertheless, according to Bryman and Cramer (2001), who stated that variables, which are derived from multiplex-item scales (such as Likert scales), are ordinal data not interval. They also argued that treating these variables as ordinal variables will prevent researchers from using powerful statistical tools such as correlation and regression. They suggested that it is for the research's benefit to deal with these variables as interval ones. Therefore, the Likert scale data, which is often collected in surveys (see for example; Ali, 2000; El-Gendy, 2004), may be utilised for statistical analysis as if it were true interval scale data. In addition, Peters (2002) recommended such treatment for the ordinal data for the ease of data collection from respondents and the ease of use by the researcher; therefore, it was assumed that there is equality of perceptual distance on the part of respondents between ranks on the scale. In addition, Labovitz (1970) suggested that most ordinal variables could be treated as interval variables. However, the amount of error that can occur is minimal compared with the considerable advantages from using the powerful statistical techniques. Field (2000), Bryman and Cramer (2001) and Pallant (2001) argued that parametric statistics are more powerful than non-parametric statistics. Pallant (2001) stated that "some statistics writers argue that most of the parametric approaches are fairly 'robust'; that is, they will tolerate minor violations of assumptions, particularly if you have a good sized sample" (see for example, Cone and Foster, 1993).

Measurement implies issues of both reliability and validity of the scales used. Where scales are highly reliable and valid, their ability to test the proposed model is stronger (Peters, 2002). Reliability concerns the extent to which a measuring procedure yields the same results on repeated trials, which means that the items of the scale are homogeneous (Kerlinger, 1986). Reliability, or the internal consistency, of the scales may be assessed by calculation of the "Cronbach alpha". As mentioned in chapter seven, Nunnally (1978), Peterson (1994) and Peters (2002) argued that there is a number of considerations that previous research has highlighted in the use of reliability testing, which also determines the acceptable level of alpha coefficient. For example, the number of response categories (e.g. a 5-point Likert scale) and the number of items in the scale. They agreed that an alpha coefficient of an average between .50 - .70 is a moderate acceptable level for social

research. Most of Cronbach alpha coefficients for the dependent and independent variables were above 0.6, which considers an acceptable reliability level for social research. These results are consistent with El-Gendy (2004, p. 240) who has reported, in a similar study, that most of the Cronbach's alpha values in her research were above 0.6, which considers the limit of acceptability. Certainly, the higher the coefficient, the better the reliability of the scale.

The validity of a scale refers to the degree to which it measures what it is supposed to measure. Originally, the multi-item questionnaire used in this research was developed from prior literature of contingency theory and performance measurement systems (see chapters two, three and four). In addition, this questionnaire is in line with other questionnaires used in this field by different studies (e.g. Vangneur, 1996; Ali, 2000; Kominis, 2002; El-Gendy, 2004). Therefore, it is claimed that a special care was specifically given in measuring the study's variables with this instrument, which has been previously developed and extensively tested in practice. Hence, enjoying the general acceptance of researchers in this field provides some confidence about the study's construct validity. In addition, this questionnaire was piloted among a small group of subjects that hold the same characteristics as the sample subjects of the main data collection phase. Pilot study is a powerful way to eliminate surprises and make sure that everything is in order. In essence, pilot testing is to examine the questionnaire against clarity and length (Berenson and Levine, 1992). In effect, and specially in social science research, no one can ever claim to have developed and employed perfect measures that completely eliminate all possible random errors, noise and bias in the process of variable measurement.

Moreover, factor analysis was used to test construct and internal validity as suggested by many authors (see for example, Pallant, 2001; Peters, 2002; Sekaran, 2003). They claimed that factor analysis could be used to confirm whether the constructs of a scale are measuring what they suppose to measure or not. In this research, factor analysis has taken a large set of scale items, checked them for commonalities and, in turn, reduced the data to smaller set of factors. Thus, the smaller number of scale constructs is more manageable

because factor analysis is looking for the items that are closely related. Also, Hair *et al.* (1995) stated that factor analysis attempts to identify underlying variables (factors) that explain the pattern of correlations within a set of variables. This enhances construct validity, in terms of convergent and discriminant validity as Pallant (2001) stated that construct validity is explored by investigating its relationship with other constructs; both related (convergent validity) and unrelated (discriminant validity).

Twenty-nine items were used to measure and to explore the dependent variables, which represent different performance measures. The results of the factor analysis showed that the dependent variables are divided into only five factors; namely, financial, customer, innovation and learning, internal business and environmental measures. In addition, thirty-one items were used to measure and explore the independent contingent variables. The results of the factor analysis showed that seven independent variables are in effect. These seven factors are strategy, structure, competition, technology, management style, reward systems and environmental uncertainty, which was in line with what was derived from the broader literature on performance measurement systems that indicated that these variables are associated with variation in the use of these systems in manufacturing companies.

In terms of internal validity, Abernethy *et al.* (1999) stated that internal validity reflects the percent of variation in the dependent variables that is explained by the variation in the independent variables, which, in this study, was generated by the factor and regression analyses. The results of both analyses in this research supported the internal validity and confirm its safely limit. It is worth noting here, as mentioned elsewhere in this research, no single piece of work can take all possible variables in account for many reasons (for example, cost and time constraints) (Weick, 1979). It is worth noting here also that for each method, there are strengths and weaknesses and, by necessity, any researcher should make trade-offs when designing a study (Abernethy *et al.*, 1999). One of the trade–offs done here in this research, was the number of independent variables, the researcher was aware that there were other variables found in other studies, for example; culture, demographic characteristics of managers, interdependencies between different units in

the organisation, different dimensions of organisational structure (i.e. formalization, integration, centralization) and job related tension, were also likely to influence the study. However, for the limited nature of the research and other constraints such as time and cost, an attempt was made to control for the possible impact of these variables. This was done through, for example, restricting the sample to only Egyptian manufacturing companies with the exclusion of any multinational or foreign manufacturing companies that might be working in Egypt, in order to control for the culture variable. In addition, the randomisation of the sample might give a certain level of confidence about the findings of this research. Therefore, further investigation is needed to determine the importance and effect of other variables on the use of performance measures.

According to Abernethy *et al.* (1999), many contingency studies using survey data attempt to support theoretical models, which hypothesise that certain contextual variables determine or affect particular aspect(s) of control systems. They argued that, in this case, high levels of internal validity apply whenever claims are made about causality. Nevertheless, in this research, the research questions simply investigating whether the independent variables affect the dependent ones, with no intentions to include or investigate any causal linkage. The main motive, beyond undertaking this research, is the desire to enrich and extend the understanding of empirical links between the aforementioned dependent and independent variables from a contingent perspective. In addition, data collected from interviews provide supportive evidence concerning the importance of the chosen variables, which enhances the internal validity of this research.

Finally, in terms of external validity, it is claimed that one of the advances of doing survey-based research is the high external validity (Roberts, 1999; Abernethy *et al.*, 1999). As discussed earlier in this chapter, the sample of this research was randomly selected from medium and large sized manufacturing companies in Egypt. Whilst Abernethy *et al.* (1999) argued that the ability to make broad generalisations from a single study is limited. However, if the results were consistent with other prior studies that examine similar questions and/or of the same nature; consequently, a certain degree of confidence can be placed on generalising these findings to the rest of the population,

from which this sample was drawn, which is consistent with many previous studies (see for example, Roberts, 1999). However, generalising to different populations or different settings is more problematic (Abernethy *et al.*, 1999), as shown earlier in this section (see p. 326).

In summary, it is very important for any researcher to do his/her best to have reliable and valid measures in order to minimize the bias and random errors. Simply, as Abernethy *et al.* (1999) stated that noisy measures of variables reduce the chances of finding relations that do exist between the dependent and independent variables (Type I error) and, on the same time, increase the chances of finding spurious relations between these variables (Type II error).

The statistical methods utilised in this research are exploratory factor analysis, descriptive analysis and correlation and regression analysis. The first analytical method is the exploratory factor analysis determined the number of dependent and independent variables that construct the model (as shown earlier). Then, descriptive analysis that helped to describe the current implementation of different performance measures in the medium and large sized manufacturing companies in Egypt, which is line with Connolly and Sluckin (1971), Bowen and Starr (1982) and Norusis (2000). Finally, association analysis; namely, correlation and multiple regression, which assisted in exploring the relationships among the dependent and independent variables to enrich our understanding of the investigated phenomenon and that helped us to answer the second research question concerning the factors that might affect the use of performance measures in the medium and large sized manufacturing companies in Egypt. Simply, multiple regression analysis was utilised in this study to help us in determining the variables overall effects on the use of different performance measures rather than adding their effects together, which was an attempt to control for some limitations of contingency theory, which is consistent with El-Gendy (2004).

This methodology has been used in contingency-based studies in the field of management control systems literature and is very often documented by key authors (see for example,

Khandwalla, 1972; Otley, 1980; 1991; Abernethy and Lillis, 1995; Berry *et al.*, 1995; Selto *et al.*, 1995; Chapman, 1997; Kaplan, 1998; Donaldson, 2001). Chapman (1997) stated, 'Contingency studies have come to be seen as large scale, cross sectional, postal questionnaire based research, which examine the interaction of a limited number of variables. The implications of this approach to the kinds of question that may be asked are substantial' (p. 189). Under the contingency framework, no universal control system exists for all organisations in all situations; instead, control systems should be tailored in the light of the characteristics of the organisation and its environment (Otley, 1991; 1999). However, the use of contingency theory as the theoretical framework in this research has some limitations. This framework has been criticised because of ill-defined conceptualisation of the set of variables chosen in any contingency-based study. In other words, it lacks the precision in defining different contingent variables. Another pitfall of the contingency approach is the idea of organisational 'fit'. As Donaldson (2001) argued that, this view might be unrealistic. He claimed that management might know the direction in which fit lay and head in that direction. Therefore, he stated that organisational adaptation is to move into quasi-fit rather than into full-fit. In an attempt to clarify this point, Gresov (1989), Fisher and Govindarajan (1993) and Fisher (1998) explained that designing the control system to simultaneously address several contingencies involves trade-offs that preclude a "fit" to all contingencies. Simply because there is a conflict between different contingent variables that causes some misfit; therefore, the resolution of this conflict is ambiguous and not straightforward.

These limitations would not lessen the importance and suitability of contingency approach as a well-established approach in studying management control systems. The theoretical framework is in line with previous studies conducted in the field of management control systems (see for example; Otley, 1980; Mintzberg, 1987; Bhimani, 1993; Selto *et al.*, 1995; Daniels *et al.*, 1996; Ali, 2000; Chenhall, 2003 and El-Gendy, 2004). All these studies claimed that contingency theory is the suitable framework to management accounting studies such as the studies that aim to interpret the phenomenon of the effect of different contingent factors on the use of performance measurement systems. It is worth noting here that the main aim of this study is to explore the factors

that might affect the use of performance measurement systems in medium and large sized manufacturing companies in Egypt and not to provide these companies with a prescription or a ready-made solution to maintain their performance.

In summary, it was important to link the theoretical framework, the research design, the data collection methods, the sample and the statistical analyses conducted in this research with previous management control systems literature to locate the significance of the current research in covering the gap in literature in developing countries. The research was an attempt to unveil the very complicated nature of the phenomenon of performance measurement systems in an emerging economy that is going through dramatic economy, social and political changes. Despite the noted limitations, this research contributes to our understanding of the links among strategy, structure, competition, technology, management style, reward systems, environmental uncertainty and organisational size and management accounting practices and techniques. The results indicate that the Egyptian manufacturing firms should employ a performance measurement system that includes both financial and nonfinancial performance measurement. Meanwhile, they must focus on some contingent variables while they use their own performance measures. The results of the study also provide clear evidence in support of prior research relating to management accounting systems (MAS) use in functionally differentiated organisations. The present study illustrates that MAS use needs to consider some specific variables. The study contributes a further nomographic validation of the influence of organisational size on the variables taken into consideration when using performance measurement systems.

8.6 Future Research

The directions for future research are motivated from the limitations of this study. These directions concern how other variables may be relevant to the model. Additional research is needed to figure out whether there are some additional intervening and/or moderating variables that might affect the relationship between the contingent variables and the use of performance measures. For example, in this study, the relationships between the previously mentioned contingent factors and performance measures were investigated with the exclusion of the culture variable. This factor was excluded from the study of the

contingent factors since it is an intra-country study and it was assumed that this excluded factor is a country specific and remains relatively constant over time, which is consistent with other previous studies such as Hassabelnaby *et al.* (2003). However, it might be fruitful to take this factor into consideration in future researches as the culture of the same society might change over a long period of time.

Future research on the performance measures in the service sector and public sector companies in the developing countries would be useful as the use of these measures is not limited to the private manufacturing sector only. In addition, a longitudinal research is also needed in order to determine whether the time has an influence over the magnitude of contingent variables that affect the use of performance measures. Moreover, to enrich such kind of longitudinal studies in a developing country such as Egypt, it is suggested to study the privatised companies before and after privatisation, as the results of privatisation programs are still mixed.

Whilst the results could be cautiously generalised to developing and emerging countries, they might not be applicable to developed nations. In fact, this is an open question for future research that might include a comparative study between developed and developing countries or a replication of this study in one of the developed countries to figure out the differences between both studies.

Further research is also recommended to target more than one respondent in the same company, such as the financial and the marketing or production managers, in order to trace differences in perceptions for different members of staff of the same company, in addition, do these differences affect the use of performance measures.

Further research is needed to determine the extent to which firms change or modify their performance measurement system subsequent to non financial measures adoption and what role management accountants play in the change or the adaptation process. For change or adaptation to occur in performance measurement systems, managers must

believe that the new systems contribute to sustained profitability; therefore, it is the work of future researchers to attempt to investigate this phenomenon.

8.7 Conclusion

The main motive for this research was the gap in management control systems literature in developing countries. Management control systems and the contingency approach literature were mainly based in developed countries and carried out by western researchers. Kiggundu *et al.* (1983) stressed the importance of conducting research in developing countries, highlighting over 70 percent of the world's population live in developing countries that face challenging problems. Developing countries are involved in development programs, such as the privatisation programme in Egypt, which is a motive *per se* to investigate the effect these programs have on management practices. Younis (1996) stated that privatisation of manufacturing and service companies has been one of the more obvious features of Middle Eastern economies in recent years, which needs a large foreign and domestic investment. Investors need information about management practices and performance of these privatized companies before investing their money. Younis also added that very few developing countries have conducted their own empirical studies on the performance of their own privatized and/or public companies. Therefore, Kiggundu *et al.* (1983) stated that what is going on in these countries is of great significance to the rest of the world, as the world becomes more interdependent and the business becomes more international. In the same vein, Shoib and Jones (2003) point out that further research is needed in the developing countries due to today's increasingly complex and interconnected world. They added that it would seem important to recognize diversity and promote learning both in and between developed and developing contexts. Gaburro and O'Boyle (2003) stated that recently it has witnessed the flourishing of economic globalization, which means the practice of economic agents working in different countries and serving the world market without any prevailing national barriers. In order for these agents to invest in other countries, especially the emerging ones, they need enough information about the opportunities for growth and profit. Thus, it was suggested that studies in this part of the world need to be conducted and further research needs to be undertaken in these emerging and developing nations.

The importance of performance measurement system rests as a strategic tool that enables firms to achieve important objectives (e.g. the need to sustain an organisation's capability to create value within an increasingly competitive marketplace). Thus, the contribution of this research to management control systems literature is twofold; first, it provides evidence about the current application of performance measures in the medium and large sized manufacturing companies in Egypt. Second, it determines the factors that might affect the use of these performance measures.

The results of this study demonstrate that most of the Egyptian firms are employing some levels of nonfinancial measures practices along with the financial measures. Although, it is not possible to discern from this study whether these nonfinancial performance measures were a part of an established performance measurement system used in the Egyptian manufacturing firms, at least the results demonstrate the importance of these measures for the manufacturing firms, which assist in the adaptability of the firm to different internal and external factors. Egyptian firms utilise a complementary mix of different financial and non financial control systems. However, it is suggested that these firms need to incorporate bottom-up measures, frequent reports of quality results, staff satisfaction reports amongst others in order to make the right decisions. In addition, Egyptian firms must adapt their control system by empowering workers and linking compensation rewards to quality results. Subject to the limitations of the study, this study found evidence to support the contingent nature of performance measurement literature. As such, it contributes to that literature and provides an indication of how the literature might develop.

All the contingent variables selected in this study; namely, strategy, structure, competition, technology, management style, reward systems and environmental uncertainty proved to be significant with the use of performance measurement systems in large sized manufacturing companies. All, except technology, proved significant for medium sized manufacturing companies, this might be because these companies cannot afford expensive recent technology that large sized companies can buy. Organisational size, as the intervening variable in this study, has major influence on the results between

medium and large sized companies for technology; therefore, size does matter in this context.

In addition, this research, as a contingency-based piece of work, adds valid empirical evidence of the use of the contingency approach as a theoretical framework in performance measurement systems studies. A thorough review of management control systems and contingency theory literature was undertaken. Fisher (1998) stated, 'contingency theory argues that the design and use of control systems is contingent upon the context of the organisational setting in which these systems operate' (p. 49). He also added that if a company is to reach a better match between its control system and the contingent factors, better organisational performance would be achieved. 'A contingent variable is relevant to the degree that businesses that differ on that variable also exhibit major differences in how control attributes or actions are associated with performance' (Fisher, 1998; p. 49). He also stressed the existence of many contingent variables to the extent it is very difficult for a single study to take them all into account; however, he stated that some contingency variables will dominate other contingency variables. In the same vein, Donaldson (2000) stated, 'contingency theory of organisations holds that the organisational characteristics need to fit the level of the contingency variables of the organisation for that organisation to have high performance'. He gave an example of organisational structure that affects management systems in any organisation; therefore, the company has to choose the appropriate structure (i.e. functional, divisional or matrix structure) that fits with other contingent variables. This was also in line with some seminal work done in this area by scholars such as Burns and Stalker (1961), Chandler (1962), Thompson (1967), Woodward (1965) and Donaldson (1995).

This research constitutes one of the first studies to provide empirical evidence on the effect of this number of contingent variables on different performance measures all together in one piece of work on developing countries, in particular Egypt. After a thorough review of the broad performance measurement systems literature, it was revealed that some variables are of paramount importance to any management control systems research. The specific contingent factors selected in this study were strategy,

structure, competition, technology, management style, reward systems, environmental uncertainty and organisational size. The identification of these contextual variables potentially implicated in the design of management control systems, which was addressed in many contingency-based studies. Burns and Stalker (1961), Perrow (1970), Thompson (1967), Lawrence and Lorsch (1967), and Galbraith (1973) focused on the impact of environment and technology on organisational structure. Early accounting researchers (see for example, Waterhouse and Tiessen, 1978 and Otley, 1980) drew on this work to investigate the importance of environment, technology, structure and size to the design of management control systems. As Chenhall (2003) stated, 'in considering management control systems (MCS) research since 1980, it is apparent that key variables, such as environment, technology, structure, management style and size, have been confirmed as descriptors of fundamental, generic elements of context'. He also added that recent research (e.g. Langfield-Smith, 1997) has considered the relevance of additional contextual variables to the design and use of management control systems, such as the role of strategy that was addressed in the most important new stream of literature.

This research utilises the triangulation concept and provides further evidence that using both quantitative and qualitative methods in a single piece of research is complementary rather than rivalry, which is consistent with Webb *et al.* (1966) and Jick (1979). The survey was distributed to 400 managers of medium and large sized manufacturing companies in Egypt achieving a 35% acceptable response rate. This was followed by 10 semi-structured interviews, which provided further evidence that reinforce the confidence in the results of this research. Triangulation can be seen to reduce personal and methodological biases, which is in line with Decrop (1999), who stated that the use of multiple methods might provide a means of not only achieving the objectives of generalisability and limiting interview bias but also of enhancing the meaningfulness of the measures to those completing the survey. Decrop (1999, p. 159) also stated that 'since each quantitative or qualitative method has its own limits and biases, and single methodologies result in personal biases, using multiple methods paves the way for more credible and dependable information'. Abernethy *et al.* (1999) point out that triangulation of research methods has much to offer as it helps in minimizing the bias of using one

method solely. Peters (2002) stated that the use of complementary forms of methodological approaches, such as surveys and semi-structured interviews, could offset the limitations and the biasness of using a single method. Henderson (1991, p. 11) stated, 'method triangulation entails the use of multiple methods to study a single problem. The researcher can also guard against the accusation that a study's findings are simply the artifact of a single method, a single data source, or a single investigator's bias'. Bryman (1984) stated that all research methods have costs and benefits; therefore, a researcher generally finds it best to use some combination or mixture of methods. For example, semi-structured interviews provide a closer involvement of researchers that yield richer and more complete data. However, this closer involvement of the researchers might cause a level of personal bias concerning the interpretation of interviewees' opinions and inferences. He points out that triangulation implies that a better overall view of reality is achieved when a social survey is linked to qualitative methods such as semi-structured interviews. Triangulation enables the researcher to check the possible drawbacks of a particular method in order to discern whether any inherent bias is present.

It was concluded from the data obtained from questionnaires and interviews that Egypt has achieved a big progress regarding the introduction of the environmental laws and legislations that have supported the application of the environmental measures in most of the Egyptian manufacturing companies. The results were in line with Mohamed's study (2004) concerning environmental measures in Egypt. Mohamed (2004: p. 184) stated, "A number of companies made changes in their operations to protect the environment and comply with environmental laws in Egypt. They cannot ignore the impact of environmental issues on their business". Therefore, it was consistent with this study to find that these measures although they are relatively recent in the Egyptian society proved to be, for a certain extent, followed by the manufacturing companies.

This study is the first to address the *status quo* of the use of performance measures in medium and large sized manufacturing companies in Egypt and, in addition, it is the first to explore the contingent factors that might have an influence on the use of these

performance measures; as such, the study contributes on two levels, namely, in application and in academic literature.

In application, this study enables Egyptian manufacturing companies to develop and evaluate their performance measurement systems by identifying the factors they have to take into their consideration when designing and using their performance measurement systems. In addition, this study enriches our understanding of current management accounting application in Egypt, which in turn, would be of interest to Egyptian and foreign, whether current and/or potential, investors who consider starting/managing their businesses in the Egyptian context. Thus, this study can be of significance to managers of manufacturing companies and Egyptian and foreign investors.

This study contributes to the literature of performance measurement systems in that it helps researchers identify whether differences in management accounting practices between industrialized and developing countries have been decreasing over the past few years. Management accounting practices in the industrialized countries were found to be very similar to those in the manufacturing companies in Egypt. There used to be a claim that 'current management accounting practices are strongly framed and driven by factors at macro level, at which various and considerable global pressures of convergence are currently at work' (Granlund and Lukka, 1998: p. 170). There is also a considerable body of literature that stresses the particularities of management accounting practices within each country and the difficulties facing Anglo-American accounting practices in developing countries (e.g. Mensah, 1981; Ndubizu, 1984; Hove, 1989; Wallace, 1993; Larson, 1993; Larson & Kenny, 1995; Longden et al., 2001). For example, Wallace (1997: p. 393) states that 'much of the literature on accounting is not designed to deal with African problems and some of it is totally irrelevant to African conditions and problems'. Thus, this research contributes to this controversial issue of the conflict between the globalisation and localisation of management accounting practices. In this research, performance measurement systems with built-in management accounting practices indicate a move towards globalisation.

The conflict, caused by the implementation of different performance measurement systems in developing countries, between the globalisation and localisation of management accounting practices is worthy of further investigation. However, this conflict is not a unique phenomenon to developing countries. It has been observed in developed countries as well. For example, Scapens et al. (1998) observed that a British subsidiary of a US multinational, which was implementing a specific management system world-wide, found considerable difficulty in adapting that system to its operating needs. The system was configured for the US operations and this led to inflexibility for the British subsidiary. Future research could attempt to explore the relevance of best management accounting practices to other developing countries or even developed countries. In this regard, comparative case studies from different countries would be of great benefit.

This study has questioned the relevance of Anglo-American management accounting techniques in developing countries context. It has contributed to the existing body of knowledge in this area (e.g. Mensah, 1981; Ndubizu, 1984; Larson, 1993; Larson & Kenny, 1995; Longden et al., 2001). However, this study added a new dimension to performance measurement systems literature, it extends the balanced scorecard model that includes four performance measures by adding the environmental measures. In addition, this study is the first to take all these key contingent factors, namely, strategies; structure, competition, technology, management style, reward systems, environmental uncertainty and organisational size to identify their effect on the extended model of the balanced scorecard that includes five performance measures (financial, customer, internal business, innovation and learning and environmental measures).

In general, the results of this research lead to several recommendations. The research findings encourage Egyptian manufacturing firms to follow an adaptive performance measurement system, which assumes that firms should adapt continuously in reaction to changes in different environmental conditions (e.g. change in strategy). This could prevent these systems from becoming obsolete and dysfunctional as external or internal conditions change. This recommendation is in line with Slagmulder (1997: p. 106) who

stated, 'the design of management control systems must be sufficiently flexible so that new control mechanisms (either formal or informal) can be developed to adequately handle decisions when situations are encountered that cannot be dealt with by the existing formal management control systems'. Moreover, Miles and Snow (1978) state that 'organisations must constantly modify and refine their mechanism by which they achieve their purposes—rearranging their structure of roles and relationships and their decision making and control processes' (p. 3). And for these firms to do so, they can benefit from similar practices developed by Anglo-American firms.

This study suggests a number of factors that manufacturing firms have to take into consideration to improve the use of their performance measures. Special attention should been given to the technology factor. Technology flows from foreign firms have increased in recent years, as most of the companies in the sample had acquired technology from abroad. The lack of financial resources in medium manufacturing companies weakens their ability to acquire latest technology and is an important factor that reduced the number of patents and innovations. In addition, interviewees believe that the acquisition of foreign technology is the key element to become competitive. Therefore, the Egyptian manufacturing companies and the Egyptian government need to support R&D budgets and encourage patents and innovations. It is recommended that the Egyptian government create schemes to facilitate funding upgrades of technology in the medium manufacturing companies. In doing so, these incentives will facilitate Egyptian companies to develop new technologies and exploit the complementarities between indigenous R&D and foreign technology, which will reflect positively on the national economy.

The final recommendation was emerged from the interviews. Participants claimed that to help the manufacturing companies working in the Egyptian environment to utilise management control systems, some governmental actions are required. They gave examples such as enhancing the consistency and improving transparency in the application of reforms and regulations, strengthening and enforcement of the laws in order to control the corruption in the country and maintaining certain policies to encourage and attract local and foreign investment.

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Appendices

Appendix (1) The English version of the questionnaire

Durham
BUSINESS SCH...

Name of recipient:
Position of recipient:
Name of the company:
Address:

Alexandria, Egypt
August 2005

Dear Sir,

Subject: A Research Project on Performance Measurement

I am sending you this letter in order to explore the opportunity of your company taking part in a research project on performance measurement techniques. This is the focus of my doctoral research and I am now seeking a corporate partner to conduct fieldwork.

The primary aim of the above mentioned research project is to identify the effect of some variables on the relevance and the usage of performance measurement techniques in your respectable company. This study has implications for the design of performance measurement and incentive systems, in particular, how to use your performance measurement technique more effectively and efficiently?

Your cooperation would enable this question to be addressed and data to be collected. The benefits to your company are:

1) An independent evaluation of how current performance measurement and incentive systems influence organisational performance.
2) Potential insights to improve the design of current techniques.

Total confidentiality can be guaranteed for your company and the participating managers. To give a clear indication of the project, a draft of the questionnaire that is intended to be utilised in the study is enclosed. A meeting to discuss the questionnaire's format and content, as well as the most appropriate means to administer it would be very much appreciated.

I thank you in advance for your time and interest.

Yours sincerely,

Amr Abdel-Aziz

Section 1: Introduction

A study on Performance Measurement Techniques

Initially, we would like to thank you for your support and participation in this study. As part of a PhD programme at Durham University, England.

The questionnaire that follows includes a number of questions that basically attempt to capture your personal perceptions about the performance measurement technique implemented in your respectable company. And the variables that you think they affect the relevance and usage of this technique. Although we know that you may find some of the questions repetitive, please make an effort to answer all of them.

In the following questionnaire, we are particularly interested in your own personal beliefs, opinions, and experiences. At this point it is important to stress once more that all the information you provide in the next sections is strictly confidential and will be used **only** for the purposes of this study. The company will not have access to individual questionnaires, and you will not be identified in any way.

You will find useful instructions of how to answer the questions at the beginning of each section. If, however, you have any queries about the questionnaire, you can always contact me.

Before you start completing the questionnaire, please spend some time to provide us with some personal details. You are to fill in the cells provided below with the information required.

Personal Details

Company's Name :

Position in the Company :

Number of Years in the position :

Qualifications :

Number of employees (approx.) : employees

Issued capital (in E£) :

Section 2: Performance Measures

In this section of the questionnaire, you will be required to express your personal beliefs about the company's formal Performance Measurement Technique that is used to measure, evaluate, and reward your performance.

Below there are a number of questions concerning this technique. You are to read carefully each of these questions and answer them by **circling** on the corresponding scale number that represents your opinion.

Please do not omit any of the questions.

	(1) Strongly Disagree	**(2) Disagree**	**(3) I do not know**	**(4) Agree**	**(5) Strongly Agree**
1. Corporate superiors are convinced that financial figures reflect performance better than any other basis.	1	2	3	4	5
2. In the eyes of my corporate superiors, achieving financial targets is an accurate reflection of whether we are succeeding in our business or not.	1	2	3	4	5
3. Not achieving my financial targets has a negative impact on how my performance is rated by my corporate superiors.	1	2	3	4	5
4. My promotion prospects depend heavily on my ability to achieve the operations' targets with the targeted costs.	1	2	3	4	5
5. In the eyes of my superiors, not achieving the planned financial targets reflects poor performance.	1	2	3	4	5
6. Financial ratios (such as profitability ratios) are the main performance measures in our company.	1	2	3	4	5
7. From the comments made by my corporate superiors, I know that they focus on the financial statements in every detail more than anything else.	1	2	3	4	5

	(1) Never	(2) Rarely	(3) Sometimes	(4) Usually	(5) Almost Always
8. Corporate policy takes into consideration customer reactions towards our products and/or services.	1	2	3	4	5
9. In the eyes of my corporate superiors, achieving outstanding performance is accompanied by no customer's complaints.	1	2	3	4	5
10. Satisfying customers' needs has a positive impact on how performance is rated by my corporate superiors.	1	2	3	4	5
11. My promotion prospects depend on my ability to meet customer expectations.	1	2	3	4	5
12. My corporate superiors are very keen about gaining customers' loyalty.	1	2	3	4	5
13. The corporate policy takes into consideration the latest technology in our industry.	1	2	3	4	5
14. In the eyes of my corporate superiors, we must make efforts to monitor our competitors to be ahead of them.	1	2	3	4	5
15. My promotion prospects depend partially on my ability to create new ideas.	1	2	3	4	5
16. In the eyes of my superiors, failure in identifying new markets reflects poor performance.	1	2	3	4	5
17. We update our customers' needs database, so we would be able to meet any changes in a proper time.	1	2	3	4	5
18. Our company collects information about competitors' movements in order to compare them with ours.	1	2	3	4	5

	(1) Never	(2) Rarely	(3) Sometimes	(4) Usually	(5) Almost Always
19. Corporate policy encourages continuous improvements in our products.	1	2	3	4	5
20. There are regular training courses for all employees in order to maintain and develop their capabilities.	1	2	3	4	5
21. The company's policy supports the on-time delivery for our products.	1	2	3	4	5
22. The company encourages teamwork as the best way to coordinate between staff.	1	2	3	4	5
23. My corporate superiors are very keen about our products' quality level rather than the sales figure	1	2	3	4	5
24. In the eyes of my corporate superiors, achieving outstanding performance is associated with company's public responsibility towards the society.	1	2	3	4	5
25. "Greening" is a new concept that is considered a waste of money and time.	1	2	3	4	5
26. Producing environment-friendly products has no impact on how corporate performance is being measured.	1	2	3	4	5
27. In the eyes of my superiors, failure to meet environmental commitments is not a big deal, as long as our financial performance improves.	1	2	3	4	5
28. My company follows the environmental regulations because it believes they are important for both the society and the company as well.	1	2	3	4	5

	(1) Never	(2) Rarely	(3) Sometimes	(4) Usually	(5) Almost Always
29. My company seeks to gain knowledge concerning recent environmental issues to improve its image.	1	2	3	4	5

Please express your opinion about any additional measures might be missing in this section……..……
……..……
……

Section 3: Variables affecting performance measures' design and use

In this section of the questionnaire you will be required to express your personal beliefs about some variables that may affect the usage of Performance Measurement Techniques (different performance measures) used by your company.

Below there are a number of questions concerning these variables. You are to read carefully each of these questions and answer them by **circling** on the corresponding scale number that represents your opinion.

Please do not omit any of the questions.

	(1) Strongly Disagree	**(2) Disagree**	**(3) I do not know**	**(4) Agree**	**(5) Strongly Agree**
30. Company's strategies is a critical factor that affects the use of performance measures.	1	2	3	4	5
31. Short and long-term strategies influence the use of performance measures.	1	2	3	4	5
32. Strategies have a great effect on the future financial plan of the company.	1	2	3	4	5
33. Strategies have a great effect on the nonfinancial measures because they draw the orientation of the company towards some major stakeholders such as customers.	1	2	3	4	5
34. Strategies do not have that great effect on encouraging employees' creativity and innovation.	1	2	3	4	5
35. Centralisation and decentralisation are different types of structure, but they have nothing to do with performance measures.	1	2	3	4	5
36. Structure does not affect the financial measures use to any major degree.	1	2	3	4	5
37. I do not think that structure affects nonfinancial measures.	1	2	3	4	5
38. I believe that informal relationships among employees do not affect performance measures.	1	2	3	4	5

	(1) Strongly Disagree	(2) Disagree	(3) I do not know	(4) Agree	(5) Strongly Agree
39. Competition that the company faces is a critical factor that affects the use of performance measures.	1	2	3	4	5
40. Competition has impact on prices; therefore, it affects the financial measures more than the nonfinancial ones.	1	2	3	4	5
41. Increasing the severity of the competition affects the whole market so we need to do nothing.	1	2	3	4	5
42. Severe competition does require changes in the products, because it affects customer measures.	1	2	3	4	5
43. I do not think that competition affects the nonfinancial measures.	1	2	3	4	5
44. I believe that competition has very limited impact on performance measures.	1	2	3	4	5
45. Technology prevailed in an industry is a critical factor that affects the use of performance measures in different companies.	1	2	3	4	5
46. We update our factory(ies)' technology regularly, although it requires a lot of money.	1	2	3	4	5
47. We believe that technology acquired is a critical factor that affects the use of the performance measures.	1	2	3	4	5
48. Certainly, technology has significant effect on nonfinancial measures, especially issues like customers and environment.	1	2	3	4	5
49. Management style, that superiors have, is a critical factor that affects the use of performance measures in our company.	1	2	3	4	5
50. Different management styles have different effects on the use of performance measures.	1	2	3	4	5

	(1) Strongly Disagree	(2) Disagree	(3) I do not know	(4) Agree	(5) Strongly Agree
51. Changing managers' styles from autocratic to democratic (and vice versa), as circumstances change, has nothing to do with the use of performance measures.	1	2	3	4	5
52. Superiors can utilise management style to influence employees to achieve their goals.	1	2	3	4	5
53. I do not think that management style affects the nonfinancial measures at all.	1	2	3	4	5
54. Oftenly, I feel that awards are actually depending on my evaluated and measured performance.	1	2	3	4	5
55. I believe that reward system is tied up to the financial targets I achieve.	1	2	3	4	5
56. Reward systems have some effect on nonfinancial measures, for example, I receive bonuses, if my superior becomes aware that customers are satisfied.	1	2	3	4	5
57. Environmental uncertainty that we face, is a critical factor that affects the use of performance measures.	1	2	3	4	5
58. Environmental uncertainty has a vital role in not achieving the financial measures' targets.	1	2	3	4	5
59. I do not think environmental uncertainty has anything to do with nonfinancial measures.	1	2	3	4	5
60. Environmental uncertainty has a direct effect on decision-making process thus it affects the targets to become achievable or not.	1	2	3	4	5

Please express your opinion about any additional items might be missing in this section.....
.....

Thank you very much for completing this questionnaire ☺

Appendix (2) The Arabic version of the questionnaire



Durham
BUSINESS SCHOOL

الموضوع : بحث علمي حول نظم تقييم الاداء

تم ارسال هذا الخطاب لمعرفة مدى امكانية مشاركة شركتكم الموقرة فى هذا البحث العلمي حول نظم و طرق تقييم الاداء. و هذه النقطة هى محور التركيز فى رسالة الدكتوراة الخاصة بى و لهذا فانى اتطلع لمشاركة شركتكم لتطبيق هذا البحث.

الهدف الأساسي لهذا البحث المذكور أعلاه هو تعريف و تحديد أثر بعض العوامل و المتغيرات على مدى ملائمة وسائل و نظم تقييم الأداء و قابليتها للأستخدام و التطبيق في شركتكم الموقرة.

هذه الدراسة لها أبعاد مؤثرة على تصميم نظم تقييم الاداء و الحوافز، و بشكل خاص كيفية استخدام وسائل و نظم تقييم الاداء بشكل أكثر كفاءة و فاعلية .

تعاونكم معنا سيساعدنا على الاجابة على هذا السؤال من خلال تسهيل جمع البيانات، مع العلم بأن الفوائد التى ستعم على شركتكم تتلخص في عمل تقييم محايد لتحديد كيفية تأثير نظم تقييم الاداء و الحوافز على آدائكم التنظيمي، بالأضافة الى تقديم بعض الأقتراحات لتطوير تصميم هذه الوسائل و النظم الحالية.

نود أن نؤكد على أننا نضمن السرية التامة لشركتكم و لكل من سيشارك فى هذه الدراسة، ولاعطاء فكرة واضحة عن هذا البحث تم ارفاق نسخة من هذا الأستقصاء الذى سيستخدم فى البحث، مع تقديرنا التام لامكانية عمل اجتماع لبحث شكل و محتويات الأستقصاء أو أى وسيلة أخرى ترغبون فى عملها لتناوله.

نشكركم لاهتمامكم و نقدر لكم الوقت الذى منحتمونا اياه.

عمرو عبد العزيز

باحث دكتوراة

جامعة درهام - المملكة المتحدة

الجزء الأول : المقدمة

دراسة حول أنظمة تقييم الاداء

بادئ ذي بدء نود أن نشكركم لدعمكم و مشاركتكم فى هذه الدراسة و التي تعتبر جزء من برنامج الدكتوراة بجامعة درهام بالمملكة المتحدة. هذا الأستقصاء يحتوي على عدد من الأسئلة و التى تحاول تحديد مدى الاستيعاب و الفهم لنظام تقييم الاداء و المطبق بشركتكم الموقرة. و كذا العوامل التى ترون و تعتقدون أنها تؤثر على مدى ملائمة و قابلية الأستخدام لهذا النظام، و بالرغم من أننا نعرف أنكم قد تجدون بعض الأسئلة مكررة و لكن الرجاء بذل الجهد اللازم للاجابة على جميع الأسئلة فى هذا الأستقصاء ، فنحن مهتمون بشكل خاص بمعتقداتكم الشخصية و آرائكم و خبراتكم.

وهنا نود أن نؤكد مرة أخرى على أن كل المعلومات التى تقدمونها هى سرية للغاية و سوف تستخدم فقط لأغراض البحث فى هذه الدراسة، و الشركة لن يكون لها أى صلاحية للحصول على المعلومات المذكورة فى الأستقصاءات الفردية، و بالتالى فلن يتم تعريفكم بأى صورة.

ستجدون فى بداية كل جزء بعض التعليمات المفيدة عن كيفية الاجابة على الأسئلة المذكورة فى هذا الجزء ، و كذلك اذا كان لديكم أى استفسارات أخرى عن أمور غير واضحة فى هذا الأستقصاء يمكنكم دائماً الأتصال بى.

برجاء امدادنا ببعض البيانات الشخصية قبل البدء فى الاجابة عن الأسئلة بتدوين البيانات المطلوبة فى الخانات المقدمة أدناه.

البيانات الشخصية:

اسم الشركة: _____

المركز الوظيفي: _____

عدد السنين فى هذا المركز: _____

المؤهلات: _____

عدد العاملين بالشركة (تقريباً): _____

رأس مال الشركة المصدر: _____ جنيه مصرى

الجزء الثاني :

نظم تقييم الأداء

المطلوب منكم فى هذا الجزء من الأستقصاء التعبير عن آرائكم الشخصية عن نظام تقييم الاداء المطبق رسمياً فى شركتكم و المستخدم لقياس و تقييم و تحفيز آدائكم و كذا بقية الموظفين.
هناك العديد من الأسئلة حول بعض أوجه نظام تقييم الأداء ، أقرأ هذه الأسئلة بعناية و أجب بوضع دائرة حول الرقم الذى يعبر عن رأيكم ، اذا أخترت رقم (1) للدلالة على "أبداً" فانها تعنى أنك ترفض الفكرة التى تقررها العبارة المعنية ، و على النقيض فان أختيار رقم (5) للدلالة على "فى غالبية الأحيان" فانها تعنى أنك تقر و توافق على ما تقرره العبارة المعنية . بقية الأرقام بين (1) و (5) تعطى مستويات مختلفة من الموافقة أو عدم الموافقة لما تقرره العبارة المعنية.

برجاء عدم حذف أى سؤال من الأسئلة التالية و الاجابة عنها كلها.

	(1) أبـداً	(2) نادراً	(3) أحيانـــاً	(4) عادةً	(5) فى غالبية الأحيان
1) الرؤساء فى العمل مقتنعين تماماً بأن أسس تقييم الأداء المعتمدة على الأرقام المالية تعكس الأداء بشكل أفضل من أى أساس آخر.	1	2	3	4	5
2) تحقيق الأهداف المالية فى أعتقاد رؤسائي هو خير ما يدل على أننا ننجح فى عملنا أم لا.	1	2	3	4	5
3) عدم تحقيق الأهداف المالية له أثر سلبى على كيفية تقييم أدائى عن طريق رؤسائي.	1	2	3	4	5
4) شروط الترقية تعتمد بشكل كبير على قدرتى في التحكم بمستويات التكاليف وأيضاً تحقيق أهداف العمليات .	1	2	3	4	5
5) رؤسائى يعتقدون أن عدم تحقيق الأهداف المالية المخططة يعكس أداء ضعيف.	1	2	3	4	5
6) المعدلات و النسب المالية فى شركتى تعتبر المعايير الأساسية للأداء و هي ما يهتم به رؤسائي.	1	2	3	4	5
7) من تعليقات رؤسائى أعرف أنهم يركزون على القوائم المالية بكل تفاصيلها أكثر من أى شيئ آخر.	1	2	3	4	5
8) سياسة الشركة تأخذ فى اعتبارها ردود أفعال العملاء نحو منتجاتنا وخدماتنا.	1	2	3	4	5
9) تحقيق اداء متميز من وجهة نظر رؤسائي مرتبط بعدم وجود شكاوي من العملاء.	1	2	3	4	5
10) اشباع رغبات أو حاجات العملاء له أثر ايجابى على كيفية تقييم رؤسائى للأداء.	1	2	3	4	5

	(1) أبـداً	(2) نادراً	(3) أحيانـــاً	(4) عادةً	(5) فى غالبية الأحيان
11) شروط ترقيتي تعتمد بشكل كبير على مدى قدرتي على ارضاء توقعات العملاء.	1	2	3	4	5
12) رؤسائي بالعمل مهتمون جداً بمدى ولاء العملاء.	1	2	3	4	5
13) تأخذ سياسة الشركة في الحسبان آخر التطورات التكنولوجية في مجال صناعتنا.	1	2	3	4	5
14) رؤسائى بالعمل يؤمنون بأنه يجب علينا بذل جهد لمراقبة منافسينا من أجل التفوق عليهم.	1	2	3	4	5
15) شروط ترقيتى تعتمد جزئياً على قدرتى في ابتكار أفكار ابداعية جديدة.	1	2	3	4	5
16) الفشل فى اكتشاف أسواق جديدة من وجهة نظر رؤسائى يعكس أداء سيئ.	1	2	3	4	5
17) نحن نحدث قاعدة البيانات الخاصة بحاجات العملاء الحالية و ذلك لكى يتسنى لنا أن نواجه التغيرات فيها بسرعة كبيرة و فى وقت مناسب.	1	2	3	4	5
18) شركتنا تجمع معلومات عن توجهات المنافسين و ذلك من أجل مقارنتها بخططنا و توجهاتنا.	1	2	3	4	5
19) سياسة الشركة تشجع التطوير المستمر في منتجاتنا.	1	2	3	4	5
20) هناك برامج تدريب منتظمة لكل الموظفين من أجل تحسين وتطوير امكانياتهم و قدراتهم.	1	2	3	4	5
21) سياسة الشركة تدعم التوصيل الفورى لمنتجاتنا.	1	2	3	4	5
22) الشركة تشجع العمل الجماعى كأحسن وسيلة للتنسيق بين الموظفين.	1	2	3	4	5
23) رؤسائي بالعمل حريصين على مستوى جودة منتجاتنا أكثر من رقم المبيعات.	1	2	3	4	5
24) من وجهة نظر رؤسائي تحقيق أداء متميز مرتبط بالمسئولية العامة للشركة نحو المجتمع.	1	2	3	4	5
25) " التخضر" هو فكر جديد غير عملي و يعتبر أضاعة للجهد و الوقت.	1	2	3	4	5
26) انتاج منتجات صديقة للبيئة لا علاقة له بتحسين الأداء في الشركة.	1	2	3	4	5

	(1) أبـداً	(2) نادراً	(3) أحيانـــاً	(4) عادةً	(5) فى غالبية الأحيان
27) من وجهة نظر رؤسائي عدم الوفاء بالألتزامات البيئية بشكل كامل موضوع ثانوي طالما الأداء المالي يتحسن.	1	2	3	4	5
28) تلتزم شركتي بالقوانين البيئية لايمانها بأهميتها للمجتمع و للشركة على حد سواء.	1	2	3	4	5
29) شركتي تهتم بمعرفة أحدث القضايا البيئية لأنها اتجاه جديد يساعد على اظهارنا بشكل أفضل لعملائنا و المحيطين بنا.	1	2	3	4	5

هذا الجزء حاول أن يحدد الأبعاد الرئيسية لنظام قياس الأداء في شركتكم الموقرة ، ومن الممكن أن نكون قد نسينا بعض الأبعاد الأخرى المهمة. برجاء التعبير عن رأيكم بخصوص أى أبعاد اضافية ترون أننا لم نذكرها في هذا الجزء:

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الجزء الثالث:

المتغيرات و العوامل التي تؤثر على استخدام نظم قياس الأداء

في هذا الجزء من الأستقصاء أنت مطالب بالتعبير عن معتقداتك و آرائك الشخصية في بعض المتغيرات و العوامل التي يمكن أن تؤثر على استخدام نظم قياس الأداء المستخدمة في شركتكم.
أدناه عدد من الاسئلة المعنية بهذه المتغيرات، برجاء اقرأ هذه الأسئلة بعناية و أجب عنها بوضع دائرة حول الرقم الذي يعبرعن رأيك. أذا اخترت رقم (1) فهذا معناه أنك لا توافق بشدة على ما تقرره العبارة ، و على النقيض أذا اخترت رقم (5) فهذا معناه أنك توافق بشدة على ما تقرره العبارة . الأرقام بين (1) و (5) تعكس مستويات مختلفة من الموافقة أو عدم الموافقة.

برجاء الأجابة عن جميع الأسئلة وعدم حذف أى سؤال منها.

	(1) لا أوافق بشدة	(2) لا أوافق	(3) لا أعرف	(4) أوافق	(5) أوافق بشدة
30) تعتبر استراتيجيات الشركة عامل هام يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
31) وجود استراتيجيات عامة للشركة سواء طويلة أو قصيرة المدى يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
32) الأستراتيجيات لها أثر كبير على الخطة المالية المستقبلية للشركة.	1	2	3	4	5
33) الأستراتجيات لها أثر كبير على معايير الأداء غير المالية وذلك لأنها ترسم توجه الشركة نحو أطراف هامة مثل العملاء.	1	2	3	4	5
34) الأستراتيجيات لا أثر هام لها على مدى تشجيع الأبتكار و الأبداع لدى الموظفين.	1	2	3	4	5
35) المركزية و اللامركزية هي أنواع مختلفة من الهيكل التنظيمي و لكن لا علاقة لهم بنظم قياس الأداء.	1	2	3	4	5
36) الهيكل التنظيمي لا يؤثر على استخدام معايير قياس الأداء المالية بأي شكل.	1	2	3	4	5
37) لا أعتقد أن الهيكل التنظيمي يؤثرعلى معايير قياس الأداء غير المالية.	1	2	3	4	5
38) أعتقد أن العلاقات غير الرسمية بين الموظفين لا تؤثر على معايير قياس الأداء.	1	2	3	4	5
39) تعتبر المنافسة التي تواجهها شركتنا عامل هام يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
40) المنافسة تؤثر على مستويات الأسعار و بالتالي فانها تؤثر على نظم قياس الأداء المالية أكثر من غير المالية.	1	2	3	4	5

	(1) لا أوافق بشدة	(2) لا أوافق	(3) لا أعرف	(4) أوافق	(5) أوافق بشدة
41) أزدياد حدة المنافسة يؤثر علي السوق بأكمله و بالتالي فاننا غير مطالبين بعمل شيئ.	1	2	3	4	5
42) المنافسة الحادة تتطلب تغيرات في منتجاتنا لأنها تؤثر على معايير الأداء الخاصة بالعملاء.	1	2	3	4	5
43) لا أعتقد أن المنافسة تؤثر على معايير الأداء غير المالية.	1	2	3	4	5
44) أعتقد أن المنافسة تؤثر بشكل محدود على معايير الأداء.	1	2	3	4	5
45) يعتبر مستوى التكنولوجيا السائد في الصناعة عامل هام يؤثرعلى استخدام نظم قياس الأداء.	1	2	3	4	5
46) نحن نحدث مستوى التكنولوجيا في مصانعنا بشكل منتظم بالرغم من تكاليفها الباهظه .	1	2	3	4	5
47) مستوى التكنولوجيا الذى حصلت عليه شركتنا عامل هام يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
48) بالتأكيد أن مستوى التكنولوجيا له أثر هام و فعال على معايير الأداء غير المالية و بخاصة الموضوعات الخاصة بالعملاء و البيئة.	1	2	3	4	5
49) يعتبر شكل الأدارة المتبع بشركتنا عامل هام يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
50) الأشكال الأدارية المختلفة تؤثر بشكل ما على استخدام معايير قياس الأداء المختلفة.	1	2	3	4	5
51) تغيير الشكل الأداري من الأنفرادية بالسلطة الى الديمقراطية و العكس ، و ذلك بحسب تغير الظروف لا يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
52) يستطيع الرؤساء في العمل الاستفادة من الشكل الأداري في التأثير على مرؤوسيهم لتحقيق الأهداف المرجوه.	1	2	3	4	5
53) لا أعتقد أن الشكل الأداري المتبع بالشركة يؤثر على معايير الأداء غير المالية لأى درجة.	1	2	3	4	5
54) دائماً ما أشعر أن الحوافز و العلاوات المالية ترتبط بالأداء الذى تم قياسه و تقييمه.	1	2	3	4	5
55) أعتقد أن نظم الحوافز مرتبطة بالأهداف الماليه التي أحققها.	1	2	3	4	5

	(1) لا أوافق بشدة	(2) لا أوافق	(3) لا أعرف	(4) أوافق	(5) أوافق بشدة
56) بالتأكيد أن نظم الحوافز لها أثر ما علي معايير الأداء غير المالية ، علي سبيل المثال يقرر رئيسى في العمل منحي حوافز اذا علم بزيادة درجة رضا العملاء .	1	2	3	4	5
57) يعتبر عدم ثبات البيئة المحيطة بالشركة - و بالتالى عدم القدرة على التوقع بشكل مؤكد - عامل هام يؤثر على استخدام نظم قياس الأداء.	1	2	3	4	5
58) عدم ثبات البيئة المحيطة يلعب دور فعال في عدم تحقيق أهداف الموازنه و الذي بالتالي يؤثر على استخدام نظم قياس الاداء المالية.	1	2	3	4	5
59) لا أعتقد أن عدم ثبات البيئة المحيطة يؤثر على معايير الأداء غير المالية.	1	2	3	4	5
60) عدم ثبات البيئة المحيطة له تأثير مباشر علي عملية اتخاذ القرارات و بالتالي يؤثر علي مدى امكانية تحقيق أهداف الشركة.	1	2	3	4	5

هذا الجزء حاول أن يحدد المتغيرات و العوامل الأساسية التي تؤثر على استخدام نظم قياس الاداء المتبع في شركتكم الموقرة ، ومن الممكن أن نكون قد نسينا بعض المتغيرات الأخرى المهمة. برجاء التعبير عن رأيكم في المتغيرات و العوامل الأضافية التي ترون أننا لم نذكرها في هذا الجزء:

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شكراً جزيلاً لكم

Appendix (3) The interview guide



Durham

UNIVERSITY

The Interview Guide

Introduction

This is an investigation for a PhD research which I am currently preparing at Durham University, UK. The research is about factors that affect the use of performance measurement techniques in medium and large sized manufacturing companies in Egypt. The study should try to explore the current application of these techniques and whether these companies apply single traditional approach, which is the financial measures, they apply multiple performance measures, or even considering applying hybrid performance measures (financial and non-financial measures) in the future to enhance their capabilities.

Semi-structured interviews were conducted during an on site-visit with relevant personnel at various levels of management (financial directors or controllers, accounting staff, head department, or CEO, if available). In the beginning of the interview, I discussed points arose from the results of analyzing survey questionnaire data. This interview's guide was used as a basic guideline during the interview to make sure that all relevant topics are covered and to help the researcher conduct the interviews in a systematic and comprehensive fashion. Interviewing is supported by tape-recording, where possible, in

order to capture much more than my memory. Unfortunately, the researcher could not benefit from this tool, as most of the interviewees refused to have the interview recorded, this might be due to the secretive culture that is prevailing in the Egyptian society as shown earlier (see chapter five and eight).

I emphasised to the interviewees that the data collected via this interview is used for academic purposes only and would not be released, under any circumstances, for any other use or for any other parties. Therefore, confidentiality is guaranteed and secured.

At the end of each interview, I appreciated that there are many demands on interviewee's time, but stressed that the more complete responses I get, the better I will be able to draw a picture of these schemes. Finally, I asked the interviewee, if s/he has any queries; not to hesitate to contact me. In addition, I thanked him/her in advance for his/her concern.

Section 1: General Background

Personal Information

1. Name of interviewee (optional)
2. Job title
3. Job description
4. Years in the company
5. Years in this position (if different)
6. Education level

Company's Information

1. Company's activity
2. Number of employees (approximately)
3. Company's issued capital

Section 2: Dependent Factors Exploration

1. What do financial measures represent to you? Do you apply any?

   If yes, give examples.

   If no, why?

2. What do customer measures represent to you? Do you apply any?

   If yes, give examples.

   If no, why?

3. What do innovation and learning measures represent to you? Do you apply any?

   If yes, give examples.

   If no, why?

4. What do internal business measures represent to you? Do you apply any?

   If yes, give examples.

   If no, why?

5. What do environmental measures represent to you? Do you apply any?

   If yes, give examples.

   If no, why?

Section 3: Independent Factors Exploration

Results from the survey questionnaire showed that there are some factors that are of great importance to performance measurement and others of low or no importance.

1. In your opinion, how can you describe *strategy* in your company? What do you think about its relation with the previously mentioned performance measures that applied in your company?
2. In your opinion, how can you describe *structure* in your company in terms of centralization and decentralization of authorities? What do you think about its relation with the previously mentioned performance measures that applied in your company?
3. In your opinion, how can you describe *competition* your company faces, whether local or global ones? Do you think it affects the previously mentioned performance measures that applied in your company and in what context?
4. In your opinion, how can you describe *technology* acquired and implemented by your company? Do you consider your company labor intensive or machine intensive? What do you think about its relation with the previously mentioned performance measures that applied in your company?
5. In your opinion, how can you describe *management style* in your respectable company (in terms of democratic or dictatorship style)? What do you think about its relation with the previously mentioned performance measures that applied in your company?

6. In your opinion, how can you describe *reward systems* in your company? What types of positive or negative rewards you use to motivate your employees? What do you think about its relation with the previously mentioned performance measures that applied in your company?
7. In your opinion, how can you describe *environmental uncertainty* affecting you company? Do you think it affects any of the previously mentioned performance measures that applied in your company?
8. Finally, do you think if your company grows up and have more employees, any of your answers would differ? (This question was directed to the medium sized companies personnel)
9. Finally, do you think if your company has fewer employees than the case now, any of your answers would differ? (This question was directed to the large sized companies personnel)

In the end of the interview, I asked the interviewee if he or she thinks anything was forgotten or missed. Then, I thanked the interviewee very much for the help provided and time dedicated. In addition, I asked the interviewee to permit me the chance to come back again if I need more information or discovered something missing.