CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Corporate organisations today are operating in increasingly hostile business environment characterised by increase in global competition, short product life cycles, technological change, and customers' demands for greater product diversity (Danneels, 2002). These are challenges for managers who need to consider more effective ways of achieving competitive advantage and improving performance, as their activities reflect on the nation's economic well-being. Okeke (2009) noted that the effect of global financial crisis on performance of firms in Nigeria has had effect on the Nigerian economy in the form of weak global demand as a result of rise in Naira exchange rate, falling crude oil production marked by upswing in crude oil prices and depleting external reserves. The capital market has also been affected as capitalisation declined steadily from 13.295 trillion Naira in 2007 to 8.4 tillion Naira by 2010. The trend of continuous heightened interest rates, and activities shifted to Bond segment of the capital market, where corporate organisations now seek to raise huge sums.

The performances of firms reflect in the sectional computations of Gross Domestic Product and in Nigerian economic well-being (Ayodele & Falokun, 2003; Ajakaiye & Fakiyesi, 2009). Firms therefore, need effective control strategy to manage threats and opportunities in the environment, and continuously add values to product and services rendered. They need to formulate clear business strategies, supported by appropriate and effective manufacturing processes, organisational design and control systems. These strategies, design and control systems are being facilitated by new developments and improvements in information technology (IT) in relation to accounting applications (e.g., Granlund, 2007; Surmen & Dastan, 2008). It has been argued that the efficiency of strategy is enhanced by advanced management accounting systems and advanced information technology. This argument is

premised on the fact that advanced information technology system provides proper information to enable management accounting systems to relate and support the formulation, implementation and control of strategy to attain enhanced performance (Baines & Langfield-Smith, 2003; Gerdin, 2005).

There has been an on-going debate on emerging turbulent time and its management using advances in IT and contemporary management accounting systems. Hence, firms have gone into massive investments in information technology as they appreciate its contribution. Researchers have argued that there is no evidence that computers have led to increase in output (examples, Brynjolfsson, 1993; Wilson, 1993 and Brynjolfsson, 2002). Loveman (1994) provided more specific evidence that the marginal product of IT could not be distinguished from Zero. Studies at both intermediate process level and organisational level have provided evidence that IT business value results into productivity enhancement, profitability improvement, improved work relations, competitive advantage and efficient use of resources (Melville, Kraemer & Gurbaxamni, 2004). There is no known in-depth analysis providing evidence from Nigeria on the effect of IT systems (control applications) used in cost control systems (subset of management accounting systems) on performance.

Researchers have offered several alternative perspectives in explaining their divergent viewpoints on the effect of IT systems on performance. The most influential of these perspectives are the Task-Technology fit theory (Goodhue & Thompson, 1995; 2005) and the Technology Acceptance theory (Davis, 1989; Dishaw & Strong, 1999). The Task-Technology fit theory argues that there is a need for correspondence between task requirements, individual abilities and functionality of technology while the Technology Acceptance theory suggests that the impact IT would have on an environment would depend upon perceived ease of use and usefulness of the technology. These perspectives are shown as ideal framework for

explaining IT cum management accounting strategy from developed countries, but are yet to be demonstrated in Nigeria, a developing country.

Globalisation of the world economy has challenged business organisations all over the world to pay greater attention to maintaining their competitive advantage and adapt their management accounting systems to the changing environment (Asel, 2009). Management accounting systems have therefore received much publicity (Ajibolade, 2008), with the performance effect of the systems being subject of debate.

For example, the traditional management accounting approach to cost control has been described as becoming irrelevant (e.g., Mia, 1993; 2006). The traditional volume based approach of allocation of production overhead costs to products and services is criticised as being over-simplified, and not reflecting the complexity of products as it produces wrong measures (e.g., Kennedy & Affleck-Graves, 2001). Traditional standard measures of machine efficiency and labour cost in terms of total efficiency could be misleading in an effort to control operating expenses and throughput (Ajibolade, 2008).

Several studies however, showed that traditional cost accounting practice is still widely adopted in firms, due to the lack of knowledge of other alternatives or the high financial costs of changing the existing costing systems (e.g., Drury & Taylor 1994) and probably that, the traditional cost methods have higher benefits (e.g., Garg, Ghosh, Hudrick and Nowacki, 2003). Hyvonen, (2008:26), showed that the Institute of Management Accountants and Ernst and Young chartered accounting firm in the United States in 2003 were of the opinion that: "the traditional management accounting systems are still widely used and that adopting new cost management systems is not a priority in the current economic environment". In Europe, the Chartered Institute of Management Accounting encouraged the practice of contemporary

cost accounting system due to internationalisation of firms, increasing harmonisation of financial accounting practices and advances in information technology (Brierley, Cowton & Druru, 2001).

The contingency theory dominated attempts at resolving conflicting findings. The contingency theory suggests that different control systems may be appropriate depending on the business setting influenced by various contingent factors such as, technology, environment, structure, size and strategy (e.g., Chow, Heaver, & Henriksson, 1995; Chong & Chong, 1997; Chenhall, 2003; Hyvonen, 2008). The more uncertain the external environment, the more dependence on the management accounting systems; or the more hostile and turbulent the external environment is, the greater the reliance on formal control and an emphasis on traditional costing approach. Contingency studies further provided evidences on the usefulness of technology (stand-alone IT systems) in management accounting systems operation and effect on firm's performance. However, the effect of the integration of IT and management accounting systems on performance is yet to be fully explored.

In many developed countries including the United States of America (USA) and the United Kingdom (UK) for example, researchers have reported on the effectiveness of cost control systems (Drury & Taylor, 1994 and Reid & Smith 2001; Encyclopedia of Business, 2010). Findings have shown that IT brought about an automated revolution in management accounting and control reports with benefits, ranging from shortened production times, improved quality and reduced variability of output, decreased scrap and rework levels. IT has also been reported to bring about substantial reductions in number of labour hours workers are required to achieve in producing desired output level; resulting in productivity gains and cost reduction (Rayburn 1989; McNair, Moseni & Norris 1998). Chan, Huff, Barclay & Copeland (1997) and Chan, Sabherwal & Thatcher, (2006) studied American financial services and

manufacturing firms and found that strategic alignment of information systems and cost information system efficiency, has positive impacts on firms performance.

These changes in developed countries are filtering into developing countries being initiated by multinational investors (e.g., Prasad, 2008 & Roztocki, Pick & Navarrete, 2004). In Nigeria for example, the application of advanced technology in all areas of business operations is relatively a new concept as compared with developed countries. This study is an attempt to provide evidence on the effect of integrated CC-IT systems on performance from developing country.

1.2 STATEMENT OF THE PROBLEM

The contributions of firms in Nigeria have continued to be a cause for concern to researchers (e.g., Ajakaiye and Fakiyesi, 2009) because an increase in firm's level efficiency echoes on the performance of the economy. Researchers have blamed the alarming dwindling performance of firms in Nigeria on the challenging environment under which firms operate, aggravated by the global melt down (e.g., Ajakaiye & Fakiyesi, 2009; Okeke 2009). The mid-2008 global economic crisis among other factors, led to the Nigerian Stock Exchange (NSE) financial crisis as reflected in the all share indexes that depreciated by about 37 percent in the first quarter of 2009 (Okeke, 2009), and 38.3 percent at the close of 2009 (NSE, 2010/11).

Egbunike (2009) observed that in a challenging environment, since cost control is extremely difficult, the use of cost and management accounting techniques improves business cost-efficiency through reducing costs, or restricting the rate of cost increase. Researchers are of the view that cost and management accounting techniques utilised for control purposes, whether traditional or contemporary (e.g., Chenhall & Langfield-Smith 1998; Hyvönen 2005) would yield long run performance with the use of information technology (e.g., Granlund, 2007 and Alves, 2010).

Meanwhile, there has been inconclusive evidence on the relationship between applications of information technology and organisational performance; where some researchers proposed that performance can be ascertained by examining IT investment, others proposed the examination of IT usage efficiency while for yet others, none of these propositions could yield performance. (e.g. Mahmood & Mann, 2000; Devaraj & Kohli, 2003). Some other researches were unable to identify the impact of information technology on the organisational performance (Devaraj and Kohli, 2003), a different school of thought concluded that benefits from information technology are less than the estimated marginal cost (Morrison and Berdnt, 2001) and for other works, there is no basis to refute the hypothesis that information technology is inconsequential to performance (Loveman, 2000 and Dedrick, 2003). The reasons for inability to properly explain the relationship between technology and performance could be due to complexity of isolating the effects of any individual technology or insufficient detail analysis (e.g. Kelly, 1994; 2004) or difference in levels of usage across industries, firms and processes (e.g. Devaraj *et al.,* 2003).

In their contribution to the debate on IT usage impacts, Goodhue and Thompson (1995), propounded the Task-Technology Fit (TTF) theory, which explained that the fit between task and technology would have to be established before IT utilisation can lead to individual performance impacts. In order to achieve task-technology fit the technology and targeted application would have to be compatible (Goodhue *et al.,* 1995; 2005). This proposition implies that technology infrastructure and the corporate business goal would have to be in alignment before benefits from information technology can be ascertained. Dishaw *et al.,* (1999), based on the technology-acceptance model (TAM) developed by Davis, (1989) argued that IT would result into individual and firm performance when users perceive system usefulness and ease of use of such system. Stoel & Muhanna, (2009) affirmed that the relationship between IT and firm performance seems to be more complex than previously theorized.

Advances in information technology have changed the manner in which data and information are being collected, measured, analysed and disseminated within and between organisations, in order to respond appropriately to the new market structure, transaction dynamics, operating risks, threat and opportunities. For example, Teng and Calhoun, (1996); Isa and Foong (2005) and Alves, (2010) asserted that, to cope with the turbulence and uncertainty in the market place, corporate organisations need advanced cost and management accounting systems enabled by information technology. Egbunike (2009) observed that challenging environment brings about cost control difficulty and suggested the use of cost and management accounting techniques in improving business cost-efficiency.

According to the contingency theory, cost and management accounting systems when utilised for control purposes, should lead to enhanced organisational performance. However with increasing competitive and turbulent business environment, this fit could be distorted. Ajibolade, Arowomole and Ojikutu, (2010) provided findings in support of the proposition that more sophisticated management accounting systems design will enhance performance if tailored to the level of environmental uncertainty facing manufacturing companies.

Management accounting systems information is now recognised as one of the most powerful tools that can substantially influence the growth of firms. Since over a decade, researchers and educators of management accounting have raised serious questions about the capability of management accounting to develop strategies that could be adopted by managers for planning, controlling, and decision making. However, with the advent of information technology in the developed countries, applications were developed that brought about contemporary cost control and performance evaluation techniques.

Garg *et al*. (2003) observed that these contemporary methods are more widely adopted than was found in prior surveys, but the benefits obtained from traditional management accounting methods are higher than those of contemporary systems. Others are of the view that cost and

management accounting techniques for control measures, whether traditional or contemporary would yield long run performance with information technology (e.g. Chenhall *et al.,* 1998; Palmer & Markus, 2000; Davis, Dibrell & Janz, 2002; Hyvönen 2005; Granlund, 2007; Alves, 2010). Indigenous studies reporting on management accounting systems in Nigeria are limited (Ajibolade, 2008).

Hyvonen (2008) suggested that, in order to achieve competitiveness there should be an optimal fit between the cost control strategy and information technology used by the firm. The criticism of the traditional costing system as lacking timely and detailed information on process efficiencies (Johnson & Kaplan, 1987), has brought to the fore the need for cost control-information technology system fit (CC-IT systems). This fit (CC-IT systems) is necessary as certain intricacies can be smoothened out. For example, the challenge of replacing direct labour costs with machine-related costs, which are not readily captured and controlled by conventional cost /management accounting systems; delineation of controllable versus uncontrollable costs; and measurement of semi-variable cost.

An empirical evidence is therefore needed to support the proposition that enhanced performance would require a fit between cost control (CC) system (subset of management accounting system), and information technology (IT) system. Rom and Rohde, (2007:41) stated that "research on management accounting and integrated information systems has evolved across a number of different lines of research. Some place heavier emphasis on the management side, while others emphasise the information systems side".

In summary, to the best of my knowledge, this study would provide explanations to the following research problems:

i. Lack of conclusive evidence on the effect of IT on firms' performance in Nigeria.

ii. Lack of definite evidence on the effect of cost control systems on firm performance.

iii. Lack of research that focuses on the effect of the integration of cost control and IT systems on performance of Nigerian firms.

iv. Lack of integrative framework examining the possibility of extending the task technology/ technology acceptance models to CCS.

1.3 AIM AND OBJECTIVES

This study aims at ascertaining the effect of the integration of cost control and information technology systems on performance and determining whether certain organisational factors influence the efficiency of the integrated systems in affecting performance. In order to achieve this aim, the specific objectives pursued are to:

i. evaluate the extent of development of cost accounting system in Nigerian firms

ii. measure the effects of cost control system employed by the firms on their performance.

iii. ascertain the extent of acceptance and utilisation of IT applications in cost control systems in the firms

iv. assess the extent to which the use of different IT control applications affects performance.

v. evaluate the effect of cost control structure and lines of authority on the efficiency of cost control system and information technology control applications.

vi. ascertain the extent of association between cost control system and available information technology control applications.

vii. assess whether a relationship exists between performance and observed fit between cost control system and information technology control applications.

1.4 RESEARCH QUESTIONS

Seven research questions were formulated to guide the search for answers to the main research problem as follows:

i. How developed are the cost accounting systems in Nigerian firms?

ii. What effect does cost control system utilised by the firms have on performance?

iii. To what extent is IT control applications accepted and employed in cost control systems?

iv. To what extent do different IT control applications affect performance of the firms?

v. To what extent do organisational structures (lines of authority and cost control structure) influence the efficiency of cost control system and information technology system?

vi. What is the extent of correlation between cost control system and available information technology control applications?

vii. To what extent does a relationship exists between performance and observed fit between cost control system and information technology control applications?

1.5 RESEARCH HYPOTHESES

Six null hypotheses as stated below were adopted to help answer the research questions.

Hypothesis 1

H_0: Cost control systems have no significant effect on performance of firms in Nigeria.

Hypothesis 2

H_0: There is no significant difference in the effect of the various IT control applications on performance.

Hypothesis 3

H_0: Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of cost control system.

Hypothesis 4

H_0: Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of information technology system.

Hypothesis 5

H_0: There is no significant association between cost control system and information technology control applications adopted by firms.

Hypothesis 6

H_0: There is no significant relationship between performance and observed fit between cost control system and information technology control applications.

The analysis of the link between the hypotheses, objectives and research questions are presented on Table 1.1. The Table shows a disaggregation of the research problem into objectives, research questions and relevant hypotheses.

TABLE 1.1: TABULAR STRUCTURE OF THE RESEARCH PROBLEM

S/N	RESEARCH OBJECTIVES	RESEARCH QUESTIONS	HYPOTHESES	STATISTICAL TOOLS
i	Evaluate the extent of development of cost accounting system in Nigerian firms	How extensive is the cost accounting systems in Nigerian firms?	NIL	Descriptive statistics
ii	Measure the effects of cost control system employed by firms in Nigeria on performance.	What effect does cost control system utilised by firms in Nigeria have on performance?	**Hypothesis 1** H_0: The cost control system has no impact on performance of firms in Nigeria.	Descriptive Multiple Regression analysis and Anova
iii	Ascertain the extent of acceptance and utilisation of IT applications in cost control systems in Nigerian firms	To what extent is IT control applications accepted and employed in cost control system?	NIL	Descriptive statistics
iv	Ascertain the extent to which the use of different IT control applications affects performance.	To what extent do different IT control applications affect performance of the firms?	**Hypothesis 2** H_0: The effect of IT control applications has no significant difference on performance of the firms.	Descriptive Correlation coefficient Multiple regression
v	Evaluate the effect of cost control structure and lines of authority on the efficiency of cost control system and information technology control application.	What is the extent of influence, organisational structures (lines of authority and cost control structure) would have on efficiency of cost control system and information	**Hypothesis 3** H_0: Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of cost control system.	Correlation Coefficient analysis Regression analysis

		technology system?	**Hypothesis 4** H_0: Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of information technology system.	
vi	Ascertain the level of association between cost control system and available information technology control applications.	What is the extent of correlation between cost control system and available information technology control applications?	**Hypothesis 5** H_0: There is no significant association between cost control system and available information technology control applications.	Correlation coefficient
vii	Measure whether a relationship exists between performance and the level of association observed between cost control system and information technology control applications.	To what extent does a relationship exists between performance and the level of association observed between cost control system and information technology control applications?	**Hypothesis 6** H_0: There is no significant relationship between performance and the level of association observed between cost control system and information technology control applications.	Regression analysis

1.6 SIGNIFICANCE OF THE STUDY

The complexity and growth in intercontinental business activities coupled with the development of more sophisticated control/accounting application software; brought to the fore the need to study the effect of information technology and cost control systems on corporate performance. Globally, many studies have examined the concepts of management control systems and management accounting systems in organisations (Mia, 2006; Granlund & Taipaleenmaki, 2005; Hyvonen, 2003; Macintosh, 1995). Probably very few studies have been documented on the effect of information technology (Surmen & Dastan, 2008; Prasad, 2008) and cost control system (Lin &Yu, 2002; Rotch, 1995) on corporate performance (Kraev, 2003) in Nigeria. This study is an attempt to add to literature in these areas. Literature has not been documented on survey of listed firms in Nigeria that integrate CCS to IT.

The outcome of this study would reveal the effect of applying information technology control related applications in cost management. In that case, firms whether manufacturing or service organisation would appreciate the role of management accounting cost control system in an ever dynamic economic environment undergoing challenges posed by deregulations, globalisation of operations and technological innovations (Soludo, 2005).

Several studies have investigated the relationship between management accounting strategies, manufacturing technology, company strategies and performance in developed countries (Kelly, 1994; Hyvonen, 2005; 2008 & Prasad, 2008). Not much is however known about contemporary cost accounting system and effect of IT in many developing countries (Hyvonen, 2008).

Information generated in this study will add to the understanding of ways in utilising cost control system on IT platform in managing firms during turbulent economic times. It will

also provide information on the need to take into consideration organisational factors when managing competitive environment with integrated CC-IT systems.

Finally, by examining the effect of both systems (information technology and cost control), the study provides an attempt to utilise knowledge of task-technology fit, acceptance theory and contingency theory in explaining possibility of integrating cost control and information technology systems in achieving performance in listed firms in Nigeria.

1.7 SCOPE AND LIMITATIONS OF THE STUDY

The study is focused on two aspects of cost control system comprising of cost control techniques and performance measurement techniques. The information technology system examined is the control applications. Performance comprised of financial accounting measures of performance, based on the financial statements of listed companies (NSE) existing between 2006-2010 period(detail of which is provided in Appendix 2) and non-financial performance comprises of, customer value in terms of (lead time delivery and defect level) and market share determined by reference to respondents' analysis. The study is limited to a cross-sectional survey and like many other cross-sectional studies, has its limitations. The model used in the study presents the author's perception of the major influences on CC-IT systems integration. It however does not embrace all possible variables relating to the CC-IT systems integration and performance of the organisations studied; and not all contingent variables were considered. The non-financial performance may be attributable to more variables than those considered. This study also considered only quoted firms on the Nigerian stock exchange.

1.8 THEORETICAL/ CONCEPTUAL FRAMEWORK

Cost control is a management control system strategy, crucial to firm's performance. The global financial meltdown and unrestrained competition within the turbulent business environment have left no choice for captains of firms to effectively monitor cost. Control denotes management's effort to influence the actions of individuals who are responsible for performing tasks, incurring costs, and generating revenues. It signifies the procedures employed to determine whether actual performance complies with stated plans. The budget process and control establish firms' objectives, designs procedures, standards for reporting and evaluation (Cooper, & Slagmulder, 1998).

Insights from literature revealed that organisational performance can be investigated using several parameters and theories. Three of such theories which could bear on turbulent business environment are: the contingency theory, the task- technology fit theory and technology acceptance theory. These theories would be merged in explaining the effect of IT on cost control system. Three theories were selected because IT which is one of the two variables under study might seem incomplete if technology acceptance is discussed without technology task- fit as evidenced from literature (Dishaw *et al.,* 1999; Usoro, Shoyelu & Kuofie, 2010).

The contingency theory of management accounting systems provides explanations on how the internal and external environment influences control functions (Chenhall, 2003), as it consists of such aspects as: organisational factors, competitors' actions, market demand, products and process innovations, legal and political constraints (Chenhall & Morris, 1986). Proper management of cost associated with these internal and external constraints would lead to performance (Chenhall & Langfield-Smith, 1998). The perceived environmental uncertainty has been argued to affect the extent to which managers would require cost information, (Ajibolade, Arowomole & Ojikutu, 2010). The more volatile the external

environment, the more strategic cost control function (Angerer, 2006). The internal environment has influence on the extent of firms control (Chenhall, 2003). For example, a firms' cost control structure and lines of authority would impact on cost control (the lever of control) (Simon, 1995; Widner, 2007) and control systems working together would foster performance (Widner, 2007). The contingency theory proposes that in a highly structured situation where procedures are well specified, and authority centralised, control is facilitated through programmed procedures such as management accounting performance criteria in a standard costing system (Ajibolade, 2008).

Goodhue and Thompson, (1995); Davis, 1989; Dishaw *et al.,* (1999) noted that, technical environment has bearing on performance. The task-technology theory and technology acceptance theory have been used together in literature over the decades to predict and explain the user acceptance and utilisation of IT. The two different models have been shown repeatedly to offer significant explanatory power and a combination of both has also been shown to be superior to the individual model (Dishaw *et al.,* 1999; Usoro, *et al.,* 2010). The TTF/TAM posited that performance is attained only when task fit technology and technology is accepted and utilised. This theory models four key constructs which are of interest to this study. The task characteristics, technology characteristics, task- technology fit which in turn affect the outcome variable, performance.

The contingency theory on information technology and processes also acknowledge the need for continuous wide-range of information in a risk and turbulent environment (Trkman & Mecormark, 2009). Timely and accurate cost information (Lucey, 1989) fosters decision making to enhance efficiency, assist appropriate action to ensure organisational performance (Gordon & Narayanan, 1984; Naranjo-Gil & Hartmann, 2007). Accurate and timely information is the foundation of any accounting system. This implies that detailed cost data

are essential to any cost control endeavor. Management must understand—in great detail—how funds have been spent in the past and how they are being spent currently (Anthony & Govindarajan, 1997). As a result, companies invest large sums into sophisticated and error-resistant accounting systems in order to gain a nuanced understanding of their finances. This yearning has brought about suggestions on possible impact of information technology on cost control. Li and Ye (1999) suggest that firm's environment, its strategic orientation, and its integration of information technology will influence the business value and performance. Granlund, (2007: 3) observed that "IT plays a critical role in modern business, and in accounting and management control. It seems that if information systems are not in order in the contemporary business environment, management control processes will not work properly".

1.9 DESCRIPTION OF THE MODEL OF THE STUDY

The model designed for this study was adopted from accepted models in the literature. The model hypothesises that organisational factors influence cost control system and IT control applications. When a fit exists between cost control and IT systems referred to as integration, corporate performance would result. The organisational factors for this study include organisational cost control structure and lines of authority. They represent variables that could influence cost control system and extent of information technology control applications. Cost control system efficiency is in terms of cost control techniques and performance measurement techniques while information technology efficiency is in terms of IT control applications acceptance and utilisation. The performance variables represent elements by which firms' performance is appraised by internal and external decision makers of the organisation; that is financial (profitability): changes in net profit, turnover growth rate, earnings per share and non-financial: product quality, customer value in terms of, (lead time delivery and defect/deficiency level) and market share.

As shown in the model in figure 1.1, organisational factors are hypothesised to influence cost control system and information technology control applications efficiency. The CC-IT systems design that results from amalgamation of the two systems is hypothesised to influence the performance of the firms.

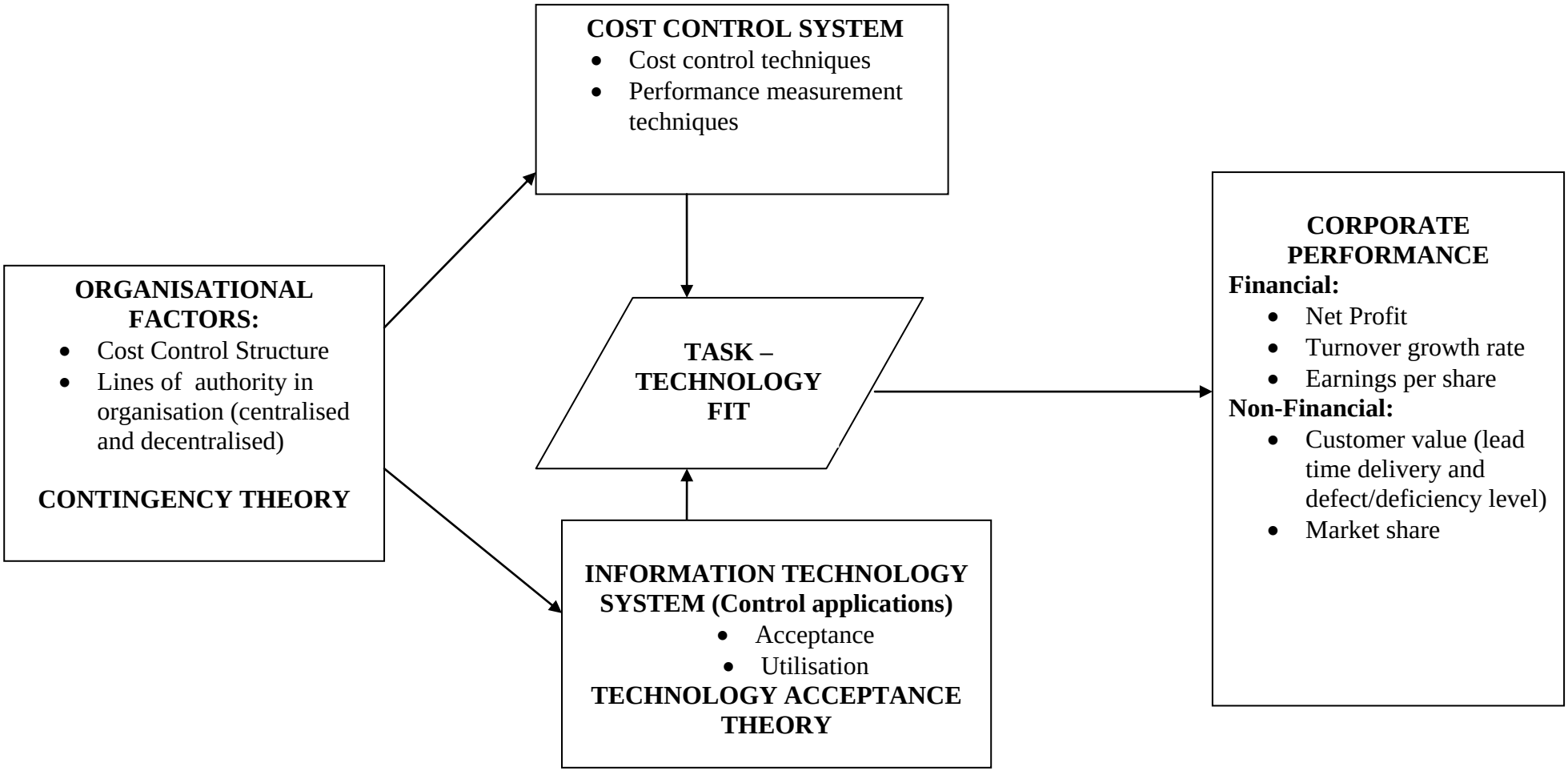
The path originating from the organisational variables indicates the assumption in the study that the a firms' cost control structure and lines of authority would impact on cost control (for example, in terms of compliance to set cost standards and regulations, spending within set limit, confine within the budget and strict adherence to approved centres of cost accumulation) would influence IT and CCS. And that decentralisation either at divisional or departmental levels, greater control, monitoring and work integration would be required from top to bottom (Gordon & Miller, 1976). Based on prior literature, decentralisation required the use of more sophisticated budgeting and performance measurement (Saad, 2010), including demand for more information for the purpose of measuring and controlling performance.

The paths projecting from both cost control system and IT system, to task-IT fit, represents a fit between the two systems. It was assumed that when a fit exist integration of CC-IT systems would be possible. Grahovac and Devedzic (2010) have indicated that IT control applications in the form of expert system (for example, Comex) can brunt on cost management accounting control; Madapusi and Kuo (2007); Madapusi and Ortiz (2009) indicated that cost control techniques when aptly marched with IT, would yield better decision quality and performance.

The path originating from Task-IT fit extends to performance. This indicated the proposition that integration of cost control system and information technology system would result into corporate performance in terms of financial (increase in net profit, turnover growth rate, earnings per share) and non-financial (customer value in terms of, (lead time delivery and defect/deficiency level) and market share.

The paths shown in the model indicates the influence of one variable on the other. The organisational environment is influenced by several internal variables, which are often controlled before improved performance can be achieved (Chenhall, 2003). The model incorporates the contingency theory; the task- technology fit theory and technology acceptance theory viewpoints.

FIGURE 1.1: CONCEPTUAL MODEL SHOWING THE INFLUENCE OF ORGANISATIONAL FACTORS ON COST CONTROL AND INFORMATION TECHNOLOGY SYSTEMS EFFICIENCY AND CORPORATE PERFORMANCE



1.9.1 Description of variables in the model

The focus of this study based on the theoretical model is on variables argued to influence performance in firms, namely: cost management control, task- technology fit and technology acceptance. The extent to which performance can be achieved would depend on the fit between IT system efficiency (control applications efficiency, acceptance and utilisation) and cost control system efficiency (costing techniques and performance measurement). This relationship would be influenced by organsational cost control structure and lines of authority.

i) Organisational Structures

a) Cost Control Structure

Cost control structure of an organisation determines pattern of cost control and the extent to which it influences other activities. Cost controls are structured as cost accumulation centres/or responsibility centres described as cost centres, profit centres, revenue centres and investment centres. Saad, (2010) indicated that management of cost in different cost accumulation centres makes control more intensive, and would result in increased use of more sophisticated budgeting and performance measurement systems.

b Lines of Authority

Authority refers to the manner in which control is exercised in the firm. The lines of authority could be centralised or decentralised. When centralised, authority is held in the hands of a few selected employees and retention of decision-making authority by a high-level manager. However, when decentralised, authority is distributed and organisation members have the right to make decision without obtaining approval from a higher-level manager. The delegation of authority creates a chain of command, the formal channel that defines the lines of authority from the top to the bottom of an organisation. Decentralistion consists of a series of relationships from the highest position in the organisation to the lowest specifying clear reporting relationship for

each person in the organization, which should be followed in both downward and upward communication (Shippes & Manz, 1992).

Decentralisation in the form of departmentalisation is the aspect commonly examined in management accounting research as it is often accompanied with some control problems. It brings about a greater need of control and integrates the work of all departments/units that make up the organisation (Gordon & Miller, 1976). This study hypothesises that the type of cost control structure and lines of authority existing in the firm would influence cost control system and the information technology system's efficiency.

ii) Cost Control System

a) Cost Control Techniques

Cost control is the process of curtailing expenditure, or resources sacrificed to attain set objectives or amount spent on resources used up in production of goods or provision of services (Horngren, Datar, Foster, Ranjan & Itter 2009; Kim, & Ballard, 2001). Cost control involves the use of costing techniques to monitor and evaluate performance. The efficiency in use of these cost control techniques was examined. The cost control techniques include: budgetary control, activity based costing, target costing and value analysis. All of these techniques are geared toward controlling a firm's cost.

b) Performance Measurement techniques

Performance measurement is a multi-dimensional control strategy used by firms, to evaluate processes, check performance of internal targets and sustain the continuation of improvement (Bonache & Maurice, 2010). The results from performance evaluation serve as feedback and input for cost monitoring (Reka, Stefan & Daniel, 2008). The areas of performance measurement examined in this study include the balance scorecard; quality management and quality cost; activity based cost and activity based management; and responsibility cost targets. These areas

were identified in literature as core areas that would produce strategic report for cost control (Kobera, Ngb & Paul, 2007).

iii) Information Technology system

a) Control Applications

Information technology is the modern handling of information by electronic means, which involves its access storage, processing, transportation or transfer and delivery (Leckson-Leckey, Osei and Harvey, 2011). Electronic handling of information has produced advanced applications. In this study, the following information technology control applications that could provide information for cost control were examined. They included: customer relationship management (Edelstein, 2010), suppliers' chain management (Nagurney, 2006), cash control management (HCL, 2009), scheduling of key task- service delivery/production (Cutting, 2010; Edwards & Edwards, 2001), and human and material resource management (Reilly, 1996; Rondeau & Litteral, 2001). These applications could provide real–time (Rom & Rohde, 2007) information support for cost control. This study examined the efficiency in control applications acceptance and utilisation in providing information that would serve as input for cost monitoring.

b) IT Acceptance

User acceptance of information technology control applications is the demonstrable willingness within a user group to employ IT for the tasks it is designed to support. Dillion and Morris, (1996) showed that this concept is not being applied to situations in which users claim they will employ it without providing evidence of use, or the use of IT for purposes unintended by the designers or procurers (Dillion *et al.,* 1996). This concept was examined by measuring the extent to which users perceive the control applications as easy to use and perceived usefulness in carrying out the task it has being intended.

c) IT Utilisation

Utilisation refers to the actual usage of IT control applications on the assigned task. Utilisation concept was an extension of Goodhue's theory on task- technology fit performance chain. Performance can better be assessed not just with fit but on utilisation. This concept was thus examined by measuring the extent to which users acknowledge the actual usage of available IT control applications for the task it is intended.

d) Task- IT fit

Task-IT fit describes the relationship between IT control applications usage and the task it is required to perform (Goodhue *et al.*, 1995). It is expected that, performance impacts will occur, when the IT applications meets the users' needs and provides features that, support the requirements of the task. IT task-fit in the model, measured the alignment of IT control applications with the task of using cost control techniques and performance evaluation. This fit concept was measured in the study by examining the suitability, adaptability and flexibility of using IT control applications in cost control techniques.

iv) Corporate Performance

Corporate performance refers to the accumulated outcome of efforts of a firm. It is the summary of attainment of set goals and objectives of the firm. Corporate performance conveys different understanding to different persons. Corporate performance could be non-financial and/or financial. There is a shift from traditional (financial) to contemporary (non-financial) measures of performance (Hyvonen, 2005; 2008). The growing emphasis on non-financial measures arises from the criticism that financial measures have received. The method has been criticised for excessive internal orientation or being historical and not being able to provide the information managers need in a highly competitive environment. (Ittner & Larcker, 1998). Corporate performance was examined from both angles in order to have a more holistic result. The financial aspect measured was on net profit, turnover growth rate and earnings per share; while the non-

financial aspect measured was on customer value (the difference between realization and sacrifice (Hansen & Mowen, 2005) in terms of, (lead time delivery and defect/deficiency level) and market share.

1.10 OPERATIONAL DEFINITION OF TERMS

The following definitions were adopted for the purpose of this study in this study.

Cost control System: Cost accounting techniques namely budgetary control, activity based costing, target costing and value analysis; and performance measurement techniques namely balance scorecard; quality management and quality cost; activity based cost and activity based management; and responsibility cost targets.

Information Technology System: control applications or computer software, that are used for strategic and control purposes namely, customer relationship management, suppliers' chain management, cash control management, scheduling of key task- service delivery/production and human and material resource management.

CC- IT Systems Integration: refers to the fit in the combination of information technology system and cost control system. The fit is the suitability of IT control applications in carrying out cost control tasks.

Performance: is the accumulated outcome of corporate firm's effort in terms of financial, namely net profit, turnover growth rate and earnings per share; and non-financial aspects namely customer value in terms of, (lead time delivery and defect/deficiency level) and market share. Customer value is the difference between realization and sacrifice, where realisation is what the customer receives and sacrifice is what the firm is given up.

1.11 ORGANISATION OF STUDY

This thesis is organised into six chapters proceeding as follows: the second chapter presents a review of the historical emergence of cost accounting and information technology in accounting.

It sets out theoretical and empirical work relating to cost control and information technology. The chapter discusses related literature in contingency theory and technology task- fit theory and technology acceptance theory, which form the theoretical basis for this research, as well as how well findings in related literatures accept or reject the existing theory.

Chapter three constitutes the research methodology, showing the research design, the population, sampling method, sample size and the sectorial distribution. It presents the data collection procedure and the data collection instrument, and tests of its validity. The procedures for data analysis and model specification were also set out.

Chapter four presents details of data collected in the study and the results of data analysis. It provides the results of the descriptive statistical analyses of data and the results of the test of hypotheses were presented.

A discussion and implication of the findings on cost control efficiency and IT control applications usage efficiency, and integration CC-IT systems on performance were presented in chapter five. The chapter discussed the extent to which these findings are in agreement with the propositions of the study, earlier contingency and information technology studies.

A summary of major findings of the research effort, the conclusion reached based on the findings and limitations of the study, recommendations and suggestions of direction for future research were presented in chapter six.

The last section of this study presents a reference list made out in APA referencing style and relevant appendices.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Business organisations the world over have been challenged by globalisation of the world economy, resulting in the need to pay greater attention to maintaining their competitive advantage and taking advantage of opportunities within the internal and external environment in order to achieve improved performance. Studies have argued for the management of turbulent times with advances in information technology and use of contemporary accounting systems (Chow, Shield & Chan, 1991).

The contingency theory when applied to information technology and processes acknowledges the need for continuous wide-range of information in a risky and turbulent environment (Trkman & Mecormark, 2009), and as applied to management control system provides explanations on the influences of external environment on control tasks (Chenhall, 2003). The external environment has thus featured as an important influence on the extent to which managers would require cost information. Proper management of cost resulting from external constraints is expected to lead to overall performance (Chenhall & Langfield-Smith, 1998).

On the other hand, the task-technology fit theory and the technology acceptance theory explains overall performance in terms of providing useful information for management when a fit exists between task and technology; and acceptance of technology for utilisation (Goodhue & Thompson, 1995; Dishaw & Strong, 1999). This study draws on these three independent perspectives, to examine the effect of integration of cost control management and information technology on corporate performance.

This chapter provides a review of literature relevant to the study from these three perspectives. It provides a description of the development of cost accounting system and cost control systems in the traditional and contemporary form. It presents a discussion on information technology as it relates to control tasks and provision of cost control information. It examines empirical evidences provided to justify a merger of the three theoretical perspectives to form the foundation of this study.

2.2 COST ACCOUNTING SYSTEM

Cost accounting system is the foundation for the operation of management accounting. It is an accounting system designed to provide cost data for management accounting practice of identification, measurement, accumulation, analysis, preparation, interpretation and communication of financial information used by management to plan, evaluate and control within the organisation (Reka, *et al.,* 2008).

A comprehensive cost accounting system serves as a basis for understanding the process of cost formation in the firms' value chain, in order to analyse and manage cost behavior (Lukka & Granlund 1996). They further explain that cost accounting system generally includes four broad areas: cost elements, cost centres, cost objects and operative performance measurement. Kaplan and Cooper (1998) distinguishes four different stages in the integration of cost and performance measurement systems: Stage one systems: systems which are inadequate for financial reporting; Stage two systems: financial reporting driven system; Stage three systems: customized, managerially relevant, but stand-alone systems; Stage four systems: integrated cost management and financial reporting systems. The fourth stage depicts a level where cost and performance

measurement information become integrated into the main stream fabric of organisational reporting and managerial process.

2.3 DEVELOPMENT OF COST ACCOUNTING SYSTEM

The development of cost accounting can be traced back to a period between 8000 BC –mid 18th century. Toffler (1980) described this period as the first phase or wave known as agricultural revolution business activities. This first wave was characterised by agricultural revolution business activities and world trade structured to create few problems. During this first wave accountants were required to keep a record of cash transactions (Wyatt, 2003), and the research of Chatfield and Vangermeersch (1996) proved the existence of cost accounting at the time. It was during this first wave, that Pacioli (father of accounting) developed concerns for cash budgeting and variance accounting (Cunagin & Stancil, 2002).

The second wave was within 18th century – late 20th century. Toffler identified the second wave as industrial revolution phase. During this period, enterprises embarked on production activities. History indicated that the change in production activities created new challenges for accounting (Wyatt, 2003). Cost accounting had to expand to deal effectively with changes during this second wave, and in the process management accounting was developed, to provide accurate cost measures. At the end of the 20th century cost accountants began to study overheads and absorption costing. At this time Church developed the machine-hour method of applying fixed costs (Birnberg & Lofts, 2000).

The third wave (1960 and on-going) saw the introduction of information technology and knowledge workers. It was also a period dominated by service organisations and the line between manufacturing and services became blurred (Toffler, 1980). Two distinct periods emerged during

this wave, reflecting views of management accounting: modern management accounting and post-modern management accounting periods (Birnberg & Lofts, 2000). The modern management accounting phase emphasised decision making. Direct and marginal costing was introduced. The post-modern management accounting phase signaled new era for cost and management accounting as Maher (2000:337) stated: "It became obvious that cost accounting and management control procedures developed to support mass production of products with a high labour content were no longer appropriate for contemporary companies".

Cost and management accounting extended into non-financial areas and field research to gain a better understanding of contemporary business problems and the information needs of managers. According to Wyatt (2002:7), "dissatisfaction with the perceived lack of relevance of historical information grew. It was widely recognised that quantified information, reports only part of the story". Contemporary accountants now make future cash flow projections rather than produce historical analyses and aggregates of past activities (Botes, 2009). The characteristics of performance measures have also changed. The drivers are now information technology, strategic rather than static information on cost management, quality, global market and business processes, reengineering or benchmarking.

2.4 COST CONTROL SYSTEM

A complex business requires frequent information about operations in order to plan for the future, to control present activities, and to evaluate the past performance of managers, employees, and related business segments. To be successful, management guides the activities of groups in the operations of the business according to pre-established goals and objectives (Robin & Kaplan, 1998 cited in Kaplan & Norton, 2001). Management's guidance takes two forms of control. First, the management and supervision of behavior, that deals with the attitudes and actions of

employees which ultimately impacts on success (behavioral management involves certain issues and assumptions not applicable to accounting's control function). Second, the evaluation of performance: measures outcomes of employee's actions by comparing the actual results of business outcomes to predetermined standards of success. In this way management identifies the strengths it needs to maximize, and the weaknesses it seeks to rectify. This process of evaluation and remedy is called cost control (Kaplan & Norton, 2001).

Cost control is a continuous process that begins with the proposed annual budget. The budget helps to organise and coordinate production, and the selling, distribution, service, and administrative functions; and to take maximum advantage of available opportunities. As a fiscal year progresses, management compares actual results with those projected in the budget and incorporates into a new plan the lessons learned from its evaluation of current operations (Cooper 1990).

Management relies on such accounting data and analysis to choose from several cost control alternatives, or management may direct accounting to prepare reports specifically for evaluating such options (Shank & Govindarajan, 1993). All costs may not be viable targets for cost-cutting measures by identifying which costs have strategic significance and which do not. To determine the strategic impact of cost-cutting, management has to weigh the net effects of the proposed change on all areas of the business. For example, reducing variable costs related directly to manufacturing a product, such as materials and transportation costs, could be the key to greater incremental profits. However, management must also consider whether saving money on production is jeopardizing other strategic interests like quality or time to market. If a cheaper material or transportation system negatively impacts other strategic variables, the nominal cost savings may not benefit the company in the bigger picture, for example, it may lose sales. In such

scenarios, managers require the discipline not to place short-term savings over long-term interests (Shank & Govindarajan, 1993; Rotch, 1995).

One trend in cost control has been toward narrowing the focus of corporate responsibility centres, and thereby shifting some of the cost control function to day-to-day managers who have the most knowledge of and influence over how their unit/department spend money. This practice is intended to promote bottom-up cost control measures and encourage a widespread consensus over cost management strategies (Rotch, 1995; Finkelstein, 2002).

Iwarere (2004) aptly stated that, one possible way of solving today's business predicament is the application of an effective cost control and cost reduction process. This calls for operationalisation of cost control, reduction, reengineering, outsourcing, downsizing, rightsizing, mergers and acquisition.

Horngren, Datar, Foster, Rajan and Itter, (2009) defined cost as an amount spent on resources used up in production of goods and provision of services. Kishore (2004) identified cost as the amount of expenditure (actual or notional) incurred on or attributable to a thing. It represents the resources that have been sacrificed or must be sacrificed to attain a particular objective while Adeniji (2009) described cost as an expenditure or outlay of cash, other property, capital stock, or services or the incurring of a liability thereof, identified with goods and services purchased or with any loss incurred, and measured in terms of the amount of cash paid or payable or the market value of other property, capital stock or services given in exchange. These definitions showed that cost in any organisation should not be trivialised, as proper control of cost would reflect on a firms objectives such as profitability, liquidity, survival and growth.

Cost control also known as cost containment is a broad set of cost accounting techniques and management techniques with the common goal of improving business cost-efficiency by reducing costs, or at least restricting their rate of growth. Business use cost control techniques to monitor, evaluate, and ultimately enhance the efficiency of specific areas, such as departments, divisions, or product lines, within their operations. The objective was often to lower the cost of production (Encyclopedia of Business, 2010).

The Business Dictionary (2010) defined cost control as application of (i) investigative procedures to detect variance of actual costs from budgeted cost, (ii) diagnostic procedures to ascertain the cause(s) of variance and (iii) corrective procedures to effect realignment between actual and budgeted costs. Cost control has three basic aspects: the first is to find out the cost centres and their variance (if any), with the industry standards. That is, the first step of cost control is cost analysis which yields a cost sheet. A cost sheet gives a detailed post-mortem report of the costs incurred by the firm at various cost centres. The second is to find out why more costs are incurred than those of the competitors, and the third aspect deals with ways in which costs can be driven to the level at which the competitors are, or lower (The Business Dictionary, 2010).

Cost management from Barfield, *et al.,* (2001) perspective, embraces the whole cost control system, defined as an overall organisation decision support system. That means, there is no decision making without cost implication and the best way to make a sound and informed decision is to have a good and effective cost control system in place. Iwarere (2004) opined that cost control assists in estimating product cost through the use of historical and estimated cost records, while Dwayne (2003) viewed it as a means of evaluating and preparing of future decision, as not only the task of maintaining the set up programmes, but also that of control

diagnosis. Therefore decisions made at various levels in an organisation must have their attention drawn at the right time to variance or deviations from the initial plan.

Cost control according to Beyer & Trawicki, (1992), is the process of curtailing cost to pre-determined norm or standard, usually involving techniques such as budgetary control. It is a system of managing forecast on the different activities of the industry and applying financial cost to each forecast. Cost control by cost reduction; minimise cost by comparing actual cost with budgeted cost as well as taking corrective action. Kishore (2004) described cost control as a procedure whereby actual results are compared against set standard so that waste (redundancies or idleness) can be identified and measured with a view to taking corrective action to rectify the anomaly.

Cost control strategies were seen as necessary to preserve or boost corporate performance and maintain or gain a competitive advantage (Rotch, 1995). Some cost control proponents believe that such strategic cost-cutting must be planned carefully as not all cost reduction techniques yield the same benefit (Hamilton, 1998; Rotch, 1995). Research has shown that the route to higher profitability and improved performance is improving efficiencies and cutting costs (Pandey, (2002). The study further showed that threefold option is open to management to improve profit. First, by increasing the revenue and simultaneously reducing the cost; second, by making revenue constant and reducing the cost; third, increasing the revenue while retaining the cost. However, the option that is always open to management according to Pandey (2002) is to find a means of reducing the cost as it is always difficult to expand the revenue despite the attraction of the first option.

For effective cost management, sunk costs should be considered. Sunk costs are costs that were incurred in the past and are no more relevant in decision making. For example, monies spent to

buy assets for the business and the assets are found to be unproductive. Such asset should be taken off record instead of spending more money on repairs (Drury, 2005).

The utmost success of cost management according to Horngren *et al.,* (2006) is to understand how much it will cost to complete a project and track the progress against the budget. It is also about managing the business costs proactively and keeping a strategic view of the cost drivers as a factor that causally affects cost over a given time span (Horngren *et al.,* 2009).

Other researchers articulate cost control from a behavioural perspective: non-mechanical cost-cutting (Brinke, 2002), strategic effort of human resource unit (Finkelstein, 2002) and human dimension of cost control (Eromosele, 2011). With respect to human dimension of cost control, Eromosele (2011) commented that most organisations tend to ignore the human dimension of cost control and as a result management often do not achieve target set. For cost control to be effective, those implementing the cost control must recognise the behavioural pattern of employee and treat such cost containment initiative as change programme. That effectively means that, there has to be perceived benefit for employees for taking extra-ordinary step to bring about cost-reduction. For example, in a time of widespread retrenchment, employees must be able to link their cost control effort with the preservation of their job and management on their part; must continuously monitor and communicate records in implementing its cost control efforts.

2.5 LEVELS OF COST CENTRES

Proper cost control would require the accumulation of costs in centres. The centres are known as responsibility centres. Responsibility centre refers to applicable organisational units, functions, departments and divisions where the responsible party initiates budgets and controls

action over cost. Drury (2005) defined responsibility centre as segment of an organisation where an individual manager is held responsible for the segment performance. The head of the centre exercises substantial, if not complete control over the activities of people or processes within the centre. Responsibility centres allow management to design control reports to pinpoint accountability (Encyclopedia of Business, 2010). Lin and Yu 2002, described basic principles underlying the responsibility cost control system as (i) setting cost and profit target that take into account market pressures;(ii) assigning target costs to various levels of responsibility centre (iii) evaluating performance based on fulfillment of responsibility cost target; (iv) implementing a reward scheme with built-in incentive mechanisms. The essence of this control system is to establish and measure the responsibility cost standard throughout the entire management cycle in order to promote goal congruence and achieve cost reduction continuously. There are basically four centres:

Cost centre: identifies centres accountable only for expenses. They do not generate revenue but monitored cost in order to yield revenue. Examples include accounting departments, human resource department, and similar area of business that provide internal service (Encyclopedia of Business, 2010).

Profit centre: accepts responsibility for both revenue and expenses. For example, a product line or an autonomous business unit might be considered profit centres. If a profit centre has its own assets, it may also be considered an investment centre, for which returns on investment can be determined (Encyclopedia of Business, 2010).

Investment centre: A centre is classified as such when it is treated as a unit which is measured against its use of capital. The investment centre takes care of revenue, cost and assets. This form

of measurement is more encompassing because it accounts for all uses of capital (Business dictionary, 2011).

Revenue centre: a division that generatres revenue from product sales and/or services provided. The manger in revenue centre is accountable for revenue only (Business dictionary, 2011).

2.6 COST CLASSIFICATION AND BEHAVIOUR

Cost control essentially requires proper identification, classification and understanding of cost behaviour. Costs classification is the process of grouping together items which are similar (Lucey, 1989). Accurate classification of all items is a vital pre-requisite to any form of analysis and control. The classification system must meet the objectives of all the systems which may use the classification (Lucey, 1989). Cost can be classified in accordance with the purpose for which the cost is needed. Some common ways in which costs can be classified are fixed or variable, relevant or irrelevant, traceable or untraceable, direct or indirect, expired or unexpired, controllable or uncontrollable, product or period, types of product and so on (Omolehinwa, 2003 Horngren, *et al.*, 2006; 2009).

Horngren, *et al.*,(2009) differentiate unexpired cost from expired cost. Unexpired costs are resources that have been acquired and that are expected to contribute to future revenue (assets) they are recorded in the balance sheet. When used up and have no potential of contributing to future revenue of the business, they are considered to be expired costs (expenses) in the profit and loss account, a business may incur costs to produce goods for resale and when such goods remain unsold and held in stocks, they are considered to be to be unexpired cost in the balance sheet. When the goods are sold these unexpired costs become expenses as represented in the costs of

goods sold calculation and they are matched against sales revenue to calculate profit and loss (Beyer & Trawicki, 1992).

Horngren *et al.,* (2009) pointed out that costs can be classified as product costs and period costs. Product costs are those costs that are identified with goods purchased or produced for resale. In a production organisation, they are costs that are attached to the product that are included in the stock valuation for finished goods or for partly completed goods (work-in-progress). Drury (2005) averred that in manufacturing firms, all manufacturing costs are treated as product cost and non-manufacturing costs are regarded as period costs.

Controllable and uncontrollable cost was also identified by Horngren, *et al.,* (2006) as any cost that is primarily subject to or not subject to the influence of a given responsibility centre manager for a given time period. The allocation of costs to products is inappropriate for cost control, since the production of a product may consist of different operations, all of which are the responsibility of different individuals, costs and revenue must be traced to individuals who are responsible for their incurrence.

Responsibility accounting is based on the recognition of individual area of responsibility as specified in a firm's organisational structure. Some costs cannot be controlled at lower management levels, so there is need for costs to be classified into controllable and uncontrollable categories in the performance reports that the accountant prepares for each responsibility centre. If costs were not classified this way, it would be difficult to evaluate a manager's performance and in addition, managers may lose interest in cost control if they found that their performance was judged on items that were outside their control. Horngren, *et al.,* (2006) argued that non-controllable costs may be controllable at a higher level of responsibility. For example, a responsibility centre manager may have no control over the number of supervisors employed in

his department, but his superior may make this decision. Hence the supervision costs will be a non-controllable cost on the responsible manager's performance report, but it will be a controllable cost on his superior performance report. This form of classification from Horngren *et al.*, (2009) perspective would entail a detailed analysis of controllable cost so that the responsibility centre manager and his superior can pin-point those costs that do not conform to plan. Drury (2005) added that such controllable cost should further be classified into various important categories of expenses and that the difference between the budgeted and actual results known and variances emphasised.

Asaolu and Nassar (2007) defined cost behavior as the study of the ways in which costs vary or do not vary with the level of activity in an organisation. Omolehinwa, (2003:181) described cost behavior as "the way a cost changes as changes take place in the level of business activity" while Drury (2005) defined cost as expenses, which have been consumed in earning revenue. The term variable, fixed and semi-variable have been traditionally used in the management accounting literature to describe how costs react to change in activity level. Short term variable costs vary in direct proportion to the volume of activity. Hence total variable cost are linear and unit variable cost is constant (Adeniji, 2009). Over a sufficiently long period of time, Adeniji (2009) reported that, virtually all costs are variable. During such a long period of time, contraction in demand will be accompanied by reductions in virtually all categories of costs. For example, senior managers can be relieved of their jobs, machinery may not be replaced and building or land may be sold. Step fixed cost are fixed within specific levels of activity within a given period. They are actually increased or decreased by a constant amount at various activity levels (Asaolu & Nassar, 2007). Semi-variable costs include both fixed and variable components. The cost of maintenance is semi-variable cost consisting of planned maintenance that is undertaken, whatever the level of

activity and variable element that is directly related to the level of activity (Horngren, *et al.,* 2006).

For cost control, it is essential to compare actual and budgeted costs based on the level of activity but, costs must be initially classified into fixed, variable and semi-variable elements so that the budgeted costs can be adjusted to the level of activity under which a manager operates for the period (Adeniji, 2009).

2.7 COST CONTROL TECHNIQUES

Effective cost control requires techniques for cost 'data gathering, classification and analyses' (Lucey, 1989:211). The techniques often used by firms are:

2.7.1 Budgetary Control

Budgetary control is a system of controlling cost which includes the preparation of budgets. Budget is only a part of the budgetary control. However, responsibility accounting uses budgets, variances and reports which are tailored to areas of responsibilities. Budgetary control is a system of accounting in which costs and revenues are analysed in accordance with areas of personal responsibilities so that the performance of the budget officers can be monitored in financial terms with a view to monitor and control costs. For budgetary control approach to work, the organisation must be well organised with clearly defined lines of authority and responsibility. Budgetary control is a comprehensive programme which allows coordination of the activities of various departments and functions; eliminates waste and controls cost by pinpointing efficiency or inefficiency; focuses on maximizing profits through improved performance, careful planning and control; directs capital expenditure in the most profitable manner and creates conducive

environment for the introduction of standard costing techniques (Guinan, Cooprider & Sawyer, 2004).

2.7.2 Standard Costing

A standard is a benchmark or norm for measuring performance. Standards are used widely in managerial accounting where they relate to the quantity and cost of input used in manufacturing goods or providing a service (Garrison, Noreen, & Seal, 2003). Costs standard implies that a target exists for single element which contributes to the product or service. The basic elements being, standard cost per unit of material, standard hour of labour and overhead absorption rate. These pre-determined costs are then compared with the actual costs as they are incurred and variances evaluated with necessary corrective measures.

2.7.3 Value Engineering

Blocher, Chen and Lin, (1999) and Drury (2005) depicted value engineering as a systematic interdisciplinary examination of factors affecting the cost of a product or service in order to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost. Members of the cross-functional team are empowered to find the most optimal processes, materials used, tooling and capital investment requirements and to decide whether to make or outsource the product or service.

Chase, Aquilano and Jacobs, (2004), posited that value engineering's main objective is to achieve equivalent or better performance at a lower cost while maintaining all functional requirements expected by the customers. In order to obtain the necessary information, a company has to conduct surveys and interview the customers. The cost of each function of a product or service is

compared with the benefit to the customer, and then the function would be eliminated, or modified to reduce the cost, or enhance its perceived value so that the value exceeds the cost.

2.7.4 Value Analysis

Cooper and Slagmulder, (1998) and Adeniji (2009), described value analysis as a planned, scientific approach to cost reduction, which reveals the material composition of a product and production designs that modification and improvement can be made which do not reduce the value of the product to the consumers or users. Value analysis involves the examination of each part of a product, service, or system in order to reduce costs without degrading quality.

Chase *et al.,* (2004) explained that value analysis deals with product already in production or services being rendered and is used to analyse product specifications and requirements as shown in production documents and purchase requests or specification of services to be rendered. Blocher *et al.*, (1999) clarified that the result of value analysis may not be as great as the results of value engineering because value analysis is performed during production stage after a product is locked into a good portion of its costs or service delivery has incurred substantial costs.

2.7.5 Activity-Based Costing

Many organisations' costs are non-variable and not controllable in the short run by management. Hence traditional responsibility accounting control systems are not particularly helpful for controlling non-variable costs (Drury, 2005). Yong-Woo and Glenn, (2001), showed that, the purpose of activity-based costing is to prevent cost distortion.

> *"Cost distortion occurs because traditional costing combines all indirect costs into a single cost pool. This pool is allocated on the basis of some resource common to all of the company's products, typically direct labour. Cost distortion is prevented in ABC by adopting multiple*

> *cost pools (activities) and cost drivers; it is also to minimize waste or non-value-adding activities by providing a process view. This can be achieved by activity analysis with multiple cost pools (activities) and cost drivers" (Yong-Woo et al., 2001:2)*

The activity-based costing focuses management's attention on the underlying causes of costs. Activity-based costing assumes that resources consuming activities produces cost and that products and services incur costs from designing, engineering, manufacturing, marketing, delivering and servicing activities. Horngren *et al.,* (2009) adjoined that by collecting and reporting the costs consumed by the significant activities of business, it is possible to understand and manage costs more effectively.

The activity-based costing respects the need for managing interdependence and tries to give relevant answers and necessary information. This technique starts from the conception of firm as a group of business processes, where the process is a combination of different, interrelated activities directed towards achieving the set goal. By analysing costing based on its activities, the activities which fail to create any added product value and those that can be considered as unnecessary, as well as those performing particular activities more efficiently, would be known. The activity-based costing gives the information which could indicate some different ways of structuring activities, influencing it in a retroactive way (Antic & Sekulic, 2005).

Johnson (1990) argued that knowing costs by activity is a catalyst that eventually triggers the actions necessary to become competitive. The cost pool for each activity should be established (Drury 2005). Activity costs should be analysed by the factors of production employed to perform such activity. At the activity level, most of the costs can be traced to specific activities, since resources tend to be dedicated to a single activity.

2.7.6 Life Cycle Costing

Life cycle costing technique makes possible for business to estimate and accumulate the costs of a product over the entire life cycle of that product (Adeniji, 2009). This is to determine whether the profits earned during the production phase will cover the cost incurred during the pre-and post production stages. Drury (2005) pointed out that the identification of the cost incurred at different stages of a product's life cycle provides an insight into understanding and managing the total cost incurred throughout its life cycle. In particular, life cycle costing technique helps management to understand the cost consequences of developing and making a product and to identify areas in which cost reduction efforts are likely to be effective.

2.7.7 Tear- down Analysis

Tear-down analysis examines competitor's product so as to identify opportunities for product improvement and/or cost reduction. The competitor's product is dismantled to identify its functionality and design and to provide insights about the processes that are used and the cost to make the product. The aim is to benchmark provisional product designs with the design of competitors and to incorporate any observed relative advantages of the competitor's approach to product design (Chase *et al.*, 2004; Drury, 2005).

2.7.8 Kaizen Costing

Blocher *et al.,* (1999) explained that kaizen costing technique is the application of continuous improvement specifically to reduce costs. It focuses on making production and services delivery processes more efficient. Kaizen costing is used for making improvement to a process through small incremental amounts, rather than through large innovations. It is applied during the production stage of the product life cycle. Adeniji (2009) adjoined that kaizen costing results in

constant reductions by tightening the standard. Cost reduction is achieved primarily through the increased efficiency of the production process and by reducing the cost of components by a pre-specified amount.

2.7.9 Downsizing

Downsizing is the elimination of the numbers of employees in a company (Pearce & Robinson, 2003). According to Otobu, (2005), downsizing is a technique used by the personnel manager to reduce the labour force to a manageable number and thus cutting the overall costs of the organisation. Downsizing as a cost control strategy is implemented if it sounds convincing and fair to the directors. Resistance to change however may start if some at the top positions feel threatened, and could influence even the low ranked workers to refuse to give into the proposed downsizing strategies through planned strikes. Since one of the steps of deciding which worker should be declared redundant, is carried out through job analysis and specifications, no one would be willing to cooperate if they feel downsizing proposal is unethical.

Pearce & Robinson, (2003) explained further that downsizing strategy works best where the company in question is in financial trouble. The understanding of the organisational structure, culture and weakness is important before introducing downsizing. It must be demonstrated that the strategy would bring substantial savings on wages without risking productivity, quality and profitability.

2.7.10 Target Costing

The target costing system requires an aggressive cost management at the product planning stage, the design stage and the production stage. By designing lower cost into the product, companies

realize the best sources of cost savings before the product reaches the production stages. This cost savings cannot be realized with traditional costing systems (Horngren, *et al.*, 2006).

Target costing transcends the functional areas of a company because for target to be successful, integration is needed in the form of cross functional teams comprising engineering, product design, production, purchasing, sales, finance, cost accounting, cost targeting, and in many cases, customers and suppliers. Upper level management support is crucial to the success of target costing because resources need to be allocated to the target costing areas and the cross-functional teams must be empowered to make many critical decisions (Horngren *et al.*, 2009). After the product is designed, estimated costs of production are compared with the target costs. If the estimated costs are higher than the target costs, value engineering is employed to help the company achieve its target (Drury, 2005).

This study examined four of these techniques (budgetary control, value analysis, target costing and activity based costing) as literature have revealed their relevance in controlling cost without risking productivity, quality and profitability.

2.8 PERFORMANCE MEASUREMENT TECHNIQUES

Cost control strategies in a contemporary sense will be incomplete without performance measurement, hence Reka, *et al.*, (2008) posited that in managing intense competitive pressures and meeting with the demands from customers, performance measurement techniques are required. Johnson and Kaplan, (1987:220) indicated that "the decline of manufacturing and rise of service industries led to the need for accurate knowledge of product costs, excellent cost control and performance measurement".

Kaplan and Cooper, (1998:27) while identifying the four stages of a costing system, the fourth stage of effective cost control is, "where cost and performance measurement information become integrated into the mainstream/ fabric of organisational reporting and managerial processes". Hence, in meeting the challenges of today's competitive environment is to develop efficient and effective cost system which also allows performance measure and provides timely and the accurate information to facilitate efforts to control costs, measure and improve productivity and performance. Reka, *et al.,* (2008) identified three areas of cost control management strategies and performance measurement as (i) activity based costing and activity based management; (ii) balanced scorecard and (iii) quality management and quality costs.

2.8.1 Activity Based Costing and Activity Based Management

Activity-Based costing (ABC) is an alternative to the traditional way of assigning cost. ABC as a costing model indentifies the cost pools or activity centres in a firm and assigns costs to products and services (cost drivers) based on the number of events or transactions involved in the process of providing a product or service. ABC can support managers to see how to maximize shareholders value and improve corporate performance (Reka *et. al.,* 2008). In order to measure up with expectations the activity based management (ABM) is added to activity based costing. ABC/ABM couple is a complete management instrument; ABC is a cost calculating system while ABM is a philosophy of performance measurement.

Nemanja, (2011), indicated that managers who use ABM, learn how the structure of costs and their behavior influences the profits, being able to produce changes in the development of the sales prices or to eliminate the waste, to make the necessary changes in quality, efficiency, speed and to select the suppliers and also to facilitate the decision making process on long terms through a process oriented thinking. While ABC provides the necessary information in managing

activities, ABM uses this given information for improving the internal processes, goes beyond cost calculation and budgeting creating a relationship between financial and non-financial information due to the cause-effect relationships. In cost management, Barfield, *et al.,* (2001) adjoined that ABC and ABM can provide information on the overhead impact created by reengineered processes to streamline activities and minimize non-quality work.

2.8.2 Balanced Scorecard

A balanced scorecard is a performance measurement tool that provides managers with a set of measure that gives a fast but comprehensive view of the business. It includes financial and operational measures that serve as drivers for future financial performance (Kaplan and Norton, 1992). A balanced scorecard has four areas that can help an organisation to assess its performance through the use of financial and non-financial as well as internal and external measurement: financial perspective, customer perspective, internal business processes, and learning and growth (Kaplan & Norton, 2001).

In controlling cost the resultant effect on the four aspects of the balanced score card should be anticipated. For example a well managed cost reduction policy through reduced spending would reflect on growth profitability and reduced risk from the shareholders viewpoint. Also, the feedback from the performance measurement process would in turn signal areas to watch out as cost control stand proxy in financial report as reduced expenditure and increased earnings.

2.8.3 Quality Management and Quality Costs

Competing in today's tumultuous environment has placed emphasis on quality. Quality refers to the extent to which products and services satisfy the requirements of internal and external customers (Reka, *et al.,* 2008). Total quality management (TQM) is an effort in this direction. Creating competitive advantage by focusing the organisation on what is important to the

customer. It views the optimal level of quality costs as the level where zero defects are produced (Shim & Siegel, 2009).

Cost of quality according to Shim & Siegel., (2009) is the costs that occurred because poor quality exists. They are costs incurred by investing in the prevention of non-conformances to requirements; appraising a product or service for conformances to requirements; and failure to meet requirements. In cost control management, cost of quality should be properly monitored and controlled.

2.9 PRIOR EMPIRICAL EVIDENCE FROM STUDIES ON COST CONTROL

In a study on responsibility cost control system in China, Lin and Yu, (2002), used Han Dan Iron and Steel Company as case study, to investigate the effect of responsibility cost control system on improving business performance and effective diffusion of management accounting practice under different social and economic systems. The company has adopted a series of management accounting techniques or procedures in its cost control system, including target costing, responsibility accounting, standard costing, flexible budgeting, internal transfer pricing, behavior motivation, performance evaluation, variance analysis and so on. The system has integrated responsibility accounting and cost control by introducing market mechanisms to substantially reduce production costs and raise profitability. Data for the study were gathered by means of interview (chief accountant and directors of few functional departments, including, finance, and accounting, production control, marketing and sales and human resources) at the headquarters and managers of two production plants.

The study revealed that before the overhauling of management and accounting system, the cost accounting system focused mainly on generating cost information to report the execution of the

production plans or spending quota imposed by government authorities but lacked mechanisms for effective cost control at different levels of production processes and control over production spending and other expenditures. To correct these deficiencies in the system the responsibility cost control system was established. The essence of this cost control system is to establish and measure the responsibility cost standards throughout the entire management cycle, that is, planning, implementation, control (monitoring) and evaluation (feedback), in order to promote goal congruence and achieve cost reduction continuously. Performance in the firm was evaluated based on fulfillment of the responsibility cost targets. The cost targets are set separately for each of the main products that are sold to external markets. A pull (backward-working) approach is employed to determine the responsibility costs in ensuring the target market profit.

Responsibility standards are assigned to primary production factories and further broken down within each profit centre. Only the cost targets are disaggregated, step by step, to producing departments, processing sections, working groups or teams, and individual workers. Each of the subordinate unit is treated as a cost centre for the broken-down responsibility cost target (or spending standards). In order to facilitate performance measurement, non-controllable common costs are excluded from the responsibility cost decomposed within primary production factories.

Other functional administrative departments also play an active role in the cost control system. They not only offer necessary data input and verification for the preparation of responsibility cost targets but also participate in monitoring or controlling the implementation of those performance measures relating to their administrative functions (for example, production control, engineering design and technical support, marketing and sales, purchase, quality control, human resources, and so on) . The study also showed that cost-veto mechanism is rigidly enforced at all levels in the companywide responsibility chain.

The study concluded that the responsibility cost control system installed at Han Dan Company, yielded satisfactory outcomes. Managers and workers participating in the interviews agreed overwhelmingly that the responsibility cost control system has contributed positively to a significant reduction in production spending or product costs, and greatly enhanced the company's productivity, profitability and overall performance. Today, Han Dan Company has become a show case of business restructuring, recognised by the government and business community in China (Lin & Yu, 2002). However, the study did not introduce information technology as a variable that facilitate these cost control mechanisms.

In another survey study carried out by Haldma and Laats, (2002) on influencing contingencies on management accounting practices in Estonian manufacturing companies. The study aimed at the design of management accounting systems. The categories of information included in the survey covered cost measurement and appraisal, cost element accounting, cost centre accounting, costing techniques, budgeting and internal performance measurement systems. The respondents included financial directors, chief accountants, senior management accountants and chief executives.

The study revealed that out a total of 62 companies surveyed, 74% of respondents had made changes in different cost aspects concerning their accounting systems. Half of the respondents had planned to make needed changes in their costing system especially in the areas of companies cost allocation methods, the product costing techniques, the implementation of variable costing with the contribution margin approach, and the introduction of the activity-based costing system. Two driving forces made companies develop cost accounting systems, namely the need for more detailed divisional (segmental) performance information and changes in the organisational structure.

Cost centres accounting were introduced by 72% of the companies. The application of cost centre accounting tends to increase in line with company size. As indicated by the survey, 90% of the companies whose sale volumes exceeded 6.5 million Euros applied cost centre accounting and used more sophisticated budgets and performance measurement systems while only 59% of the companies with smaller sales volumes had cost centre and 92% prepare and use budgets for the company as a whole, 47% of these companies prepare for internal business units and 51% applied more detailed cost budgets. The performance measurement and variance analysis between the budgeted and actual results was also carried out at company level. The study concluded that there is a need for certain improvements to be made in the companies' management accounting system without specifying areas of such improvement and did not link the study to the effect of such design on performance.

Other studies on cost control system and aspects covered by such studies are listed on Table 2.1.

Table 2.1: SUMMARY OF PRIOR STUDIES ON ASPECTS OF COST CONTROL SYSTEM

S/N	RESEARCHER	AREAS COVERED
1.	Khandwalla, (1972)	Standard costing, incremental costing,
2.	Brownell (1982)	Performance evaluation
3	Shank & Govindarajan (1993)	Strategic cost management
4.	Simons (2000)	Diagnostic controls, performance evaluation
5	Guilding (1999)	Cost assessment, pricing
6.	Davila (2005)	Product cost and design, product development
7.	Yong-Woo & Glenn (2001)	Activity- based costing: cost hierarchy and drivers
8.	Brinke, (2002)	Cost accounting system, cost control design
9.	Lin & Zengbiao (2002)	Cost control, responsibility accounting, performance evaluation
10.	Yong-Woo & Glenn (2002)	Traditional overhead costing
11.	Jermias (2004)	Product differentiation, cost behaviour
12.	Geyskens, Steenkamp & Kumar (2006)	Transaction cost
13.	Reka, Stefan & Daniel (2008)	Cost calculation, performance measurement
14.	Pierce (2010)	Cost information

Source: Extracted from literature reviewed

2.10 INFORMATION TECHNOLOGY (IT)

IT can be defined as the modern handling of information by electronic means which involves its access storage, processing, transportation or transfer and delivery (Ige, 1995 cited in Leckson-Leckey, 2011). IT is a key component in managing organisations and provides the means to integrate processes, enforce data integrity and better manage resources (Mabert, Soni & Venkataramanan, 2000). IT impacts on the way business processes are carried out and should not be viewed as an enhancer to traditional business procedures but rather as an innovation agent that

enables new and different alternatives in operation of business organisation (Pamulu & Bhuta, 2004).

Dedrick, (2003) and Melville *et al.,* (2004) studies revealed mixed feelings on the relationship between IT and performance. Huang, Ou, Chen & Lin (2006) showed that a relationship exist between IT investment and performance. However, conflicting results suggest that there is no direct relationship between IT investment and firm performance (Yongmei, Hongjian & Junhua, 2008). The relationship between IT and firm performance seems to be more complex than previously theorized (Stoel & Muhanna, 2009). The effect of IT on performance is better measured from usage than cost of investment (Alves, 2010). This thought harmonises with the research of Cane and McCarthy, (2009) that, when the features of technology are useful to the end users and utilised, it will have a positive effect on performance.

2.11 DEVELOPMENT OF INFORMATION TECHNOLOGY IN ACCOUNTING

IT in accounting was developed from the use of computers in solving some accounting problems in the 1950s. IT was used in such routine transactions of accounting as preparing payrolls, preparing receipts, and monitoring the current accounts (Surmen & Dastan, 2008). More active use of computers as a business management tool was in the 1960s. The accounting information system (AIS) which became the most important sub-system of management information system (MIS) was developed during this period (Hyvonen, 2003).

The period 1970-1980 witnessed a period when managers started to demand information that was necessary and useful for them and that could only be obtained through the use of information technology such as client profile, production faults, cost analyses and personnel productivity.

Such demands and similar thoughts created pressures for important changes in the structure of accounting information system. Corresponding to the development in information technology is the widespread development in the use of communication technology which resulted in communicating and sharing of information simultaneously, and this had an important impact on the process of collecting, processing, reporting and analysing the data.

In parallel with the development of accounting standards, uniform chart of accounts and computer software, packet programs became more sophisticated to include such modules as financing, production and cost accounting. This made the profession of accounting and therefore the accounting information system turn into a decision support system beyond simple bookkeeping.

2.12 COST CONTROL AND INFORMATION TECHNOLOGY

IT has radically transformed the nature of business and accounting practice (Hunton, 2002). Granlund & Mouristen (2003) commenting on this transformation stated that the:

> *"initial interest in the relationships between accounting and information technology was gradually taken for granted; accounting was simply not possible without information technology, and the assumption appears to be that IT is the platform for accounting data and IT allows certain sophisticated queries to be performed"* (p.78).

The impact of this drive of change has moved cost accounting and its techniques beyond the traditional role of accumulating facts. Botes, (2009) and Leckson-Leckey, *et al.*, (2011) affirm that, IT has made companies to go beyond financial statements and offer other types of financial and non-financial information even to the direction of an economy and its capacity for continual and sustainable growth. The web has challenged the very nature of accounting, its boundaries, its frameworks and even its fundamental role in society. IT has created a new reporting

environment, from periodicity of reporting to cost accounting information real time reporting (De Toni & Zanutto, 2009).

Information technology provides a platform for firms to develop cost accounting systems and control strategy. Olsen and Cooney, (2000) argue that firms are faced with the challenge of integrating information technology into accounting practice. It has been widely suggested that there are links between cost management accounting systems and information technology (Ittner & Larcker, 2001; Chenhall, 2003; Hyvonen, 2008; Alves, 2010).

Advances in information technology have driven innovation and change in the collection, measurement, analysis and communication of information within and between organisations (Cooper & Dart, 2009). Information technology innovations such as enterprise resource planning systems, e-commerce, the internet electronic data interchange, supply chain management and customer relationship management have been implemented and provide a rich source of information for cost accounting systems (Cooper & Dart, 2009). As yet, there is not much empirical evidence of the link between cost accounting systems and information technology. Dechow and Mouritsen (2005) investigated Danish firms and concluded that a primary lesson from the cases is that control cannot be studied apart from technology. Olsen & Cooney (2000) suggested that data warehousing has influenced the practice of accounting but the relationships are not tested empirically. Data warehousing is valuable for making market projections and investigating of potential markets as well as performing dysfunction analysis regarding sales of particular item. Mishra, (2004) averred that data warehousing is a consolidated database maintained separately from an organisations production system database and so housed timely data and aggregate historical data.

Edelstein, (2010) examined customer relationship management with data mining. Data mining is a process that uses a variety of data analysis and modeling techniques to discover patterns and relationships in data that may be used to make accurate predictions. This analytic CRM managed customer life cycles more cost-effectively, as it can provide information on order processing and defect tracking. Granlund and Malmi (2002), examined the effect of integrated, enterprise-wide information systems on management accounting. They concluded that enterprise resource planning (ERP) projects have led to relatively small changes in management accounting and control procedures. Chen and Chou (2009) however concluded their research on ERP that, more benefits and better performance would result if intervention of environmental factors (the influence of context the organisation stands) and conducted factors (the effects of fit and output of ERP software) are properly managed. Information on human and material resources are also useful for cost control function. Chen and Chou (2009) stated categorically that the latest generation of ERP commercial software package can integrate human and material resources as well as finance information.

Nagurney (2006) explained that the supply chain management provides information for management and cost control. Supply chain management fulfills customer demands through the most efficient use of resources, including distribution capacity, inventory and labour. Supply chain is optimised by liaising with suppliers to eliminate bottleneck, sourcing strategically to strike a balance between lowest material cost and transportation.

Tony (2006) discussed delivery management and how from the planning stage high technical applications can be utilized to save cost. Traditional management accounting recognises labour as

a key variable in determining performance in marginal costing (Lucey, 1989). Bianchi (2005) and Cutting (2010) examined task management/scheduling and applications available to monitor project execution and cost (Commex); with task management and time tracking (Edward and Edward, 2001) applications, tracking performance and fulfillment of assigned tasks, planning time and cost reporting are generated at high speed level.

2.13 INFORMATION TECHNOLOGY APPLICATIONS RELEVANT TO COST CONTROL

Sophisticated accounting applications have being advanced in management accounting that assist in the implementation of management strategies to control cost (Granlund, 2007; Surmen & Dastan, 2008). These include: cost management expert system (Comex) time tracking, task management, service management solution, cash management solution, enterprise resource planning solutions, customer relationship management, supply chain management, activity-based costing software and inventory management among others. Table 2.2 summarises the applications and their functions.

TABLE 2.2: INFORMATION TECHNOLOGY APPLICATIONS RELEVANT TO COST CONTROL

S/N	IT APPLICATIONS	FUNCTIONS	SOURCE
1.	Cost management expert system (Comex).	Collects data on assigned costs of products, services and customers and use it for planning and control.	Danijela & Viadan, (2010)
2.	Time tracking .	Automatic generation of invoices on time spent and hourly rate, and allow for the additional billing of related costs to each client/employee file.	Edward & Edward, (2001)
3.	Task management.	Tracking performance, time and cost reporting	Heiko, Aalst, Rickayzen & Uwe, (2005)
4.	Service management solution (Glovia G2).	Plan, monitor service products, service requisition, calculate detailed costs for services delivered by internal source, work and purchase orders and report these costs.	www.glovia.com/solution
5.	Cash management solution.	Manage the channels of collections, payments, accounting information and real-time reporting.	www.hcltech.com/financial services/retail-corporate-banking
6.	Enterprise resource planning solutions.	Streamline and integrate operations processes and information flows on men, material, money and machine in order to control cost.	www.erpca.com/ERP
7.	Customer relationship management.	Use data mining to monitor customer's life cycle more cost effectively through proper allocation of resources, order processing and defect tracking.	Edelstein, (2009); www.soffront.com
8.	Supply chain management.	Planning best way of product flow, transmitting orders, updating delivery status, returns or service needs, and track the physical status of goods, management of materials and financial information involving all parties.	http://searchmanufacturingerp.techtarget.com
9.	Activity-Based Costing software.	Operational analysis and management control	Hyvonen, Jarvinen & Pellinen, (2003). www.sas.com/solution/abm
10.	Inventory management.	Handles every aspect of inventory management, loss tracking, cycle counting support	www.almyta.com/abc-inventory-sotware.asp

Source: Generated from Different Literature

2.14 THEORETICAL PERSPECTIVES USED IN PRIOR STUDIES ON CC AND IT SYSTEMS

Various researchers have studied separate aspects of management control and information technology. CCS a subset of management control system; performs similar function of providing information useful in decision-making, planning and evaluation (Widner, 2007, Merchant and Otley, 2007). Most studies often examine the broad concept of management control system while others focus on sub areas such as costing (Brinke, 2002), diagnostic costing system such as the use of budgeting (Asel, 2009) performance measurement (Simons, 2000, Merchant and Van der Steede, 2007) and management accounting (Baxter & Chua, 2006). These studies were theoretically explained using cost prototype, psychometric theory, structuation theory, contingency theory, rational choice theory.

The contingency theory has constituted a dominant archetype in management accounting studies. Contingency theory assumes the influence of contextual variables on systems design and application (Chenhall, 2007). According to Chenhall (2003) there are various forms of theoretical fit that have been used to classify contingency-based research: selection, interaction and systems (Drazin & Van de Ven, cited in Asel, 2009). The interaction fit examines the way contextual factors are related to cost control and attempts to assess whether this association is linked to performance and has been intrinsic in emergent studies (Pondeville, 1999; Hyvonen, 2008).

Interaction of cost control system variables with information technology is widespread in contemporary studies (Li & Ye, 1999; Devaraj, 2003; Staples & Seddon, 2004; Pamulu, 2004; Prasad, 2008; Hyvonen, 2008). Several theories have been used to explain information technology interaction with CCS variables such as theory of reasoned action, technology acceptance theory, theory of planned behavior, economic theory, behavioural change theories,

innovation diffusion theory, Human-computer interaction and usability engineering approach, Socio-technical systems theory, task-technology fit theory, technology-performance chain.

Brynjolsson, (1994) studied IT as a factor production that contributes to performance through improved productivity. Applying the economic theory of production to estimate the effects of production inputs on output, IT was found to correlate with productivity growth, and to influence performance. IT can influence intermediate measures such as inventory turnover (Dedrick, 2003). The study concentrated on IT investment effect on production and not on IT usage and effect on overall performance.

Prasad, (2008) studied the use of IT in organisations to derive business value, applying the Giddens' structuration theory (Dillon 1996). Structuration is posited as a social process that involves the reciprocal interaction of human actors and structural features of organisations (Dillion, 1996). Understanding the extent to which IT creates value for organisations depends upon one's ability to understand the meaning the actors (management and employees) attach to technology and how they use it. IT may not contribute to business value if the notion of interactivity between technology and actors are ignored. This study failed to consider contingent factors as the environment and its impact on the structure that could reflect on performance. Among these perspectives, the task-technology fit theory and the technology acceptance theory have dominated most researches on information technology research linking management control variables.

Theory of task-technology fit is the matching of capabilities of the technology to the demands of the task, that is, the ability of IT to support a task. The theory posits that IT will be used if, and only if, the functions available to the user support the activities of the user. Rationally,

experienced users will choose tools and techniques that enable them to complete the task with the greatest net benefit. A common addition to a TTF model is individual abilities (Thompson, Higgins & Howell, 1994; Guinan, Cooprider & Sawyer, 1997; Dishaw, *et al.*,2002). Critics note that users regularly use IT that they do not like because it improves their job performance. TTF take a decidedly rational approach by assuming that users choose to use IT that provides benefits, such as improved job performance, regardless of their attitude toward the IT (Goodhue, 1995). Both aspects, attitude toward the IT and rationally determined expected consequences from using the IT, are likely to affect user's choices to use IT.

Technology acceptance theory models how users of IT come to accept and use technology. Perceived usefulness and perceived ease of use influence the decision on how and when to use a technology. Perceived usefulness is the degree to which a person believes that using a particular system would enhance job performance (Davis, 1989) while perceived ease of use is the degree to which a person believes that using a particular system would be free from effort (Davis, 1989). TAM involves the actual demonstration of usage of IT for the purpose for which it is intended.

Dishaw *et. al.,* (1999) suggested a combination of TTF and TAM to provide a better model of IT utilisation than either an attitude or a fit model provided separately and it focused more on the technology than the ability of the technology to support users as they perform tasks. In the model, TTF constructs, both serve as antecedents of the TAM model constructs, in terms of perceived usefulness and perceived ease of use; and also direct effects on software utilisation, in that, managers will understand better how to provide software that is perceived to be useful and easy to use (Dishaw, *et. al.,* 2002) .

2.14.1 THE CONTINGENCY THEORY PERSPECTIVE

Contingency theory is a class of behavioral theory that suggested that there is no best way to organise a corporation, to lead a company, or to make decisions. Instead, the optimal course of action is contingent (dependent) upon the internal and external situation. It is the design and use of control systems which is subject upon the context of organisational setting in which these controls operate (Christopher, Anthony, & Michael 2007). The contingency approach is based on the assertion that there is no universally appropriate accounting system applying equally to all organisations in all circumstances (Emmanuel, Otley & Merchant, 1990). The theory tackled the contingent nature of environment, technology, organisational structure and management control (Emmanuel, *et al.*, 1990). The suitability of management accounting techniques would depend on organisational contextual variables (Chenhall, 2007).

The contingency theory adopted in management control systems' studies assumes that management accounting tools (which costing is a part) assist mangers in achieving some desired outcomes or goals. When the tool is found appropriate, it is then likely to provide enhanced information to the individuals, improved management decision and long run performance (Halma, & Laats, 2002). While adopting the contingency approach in determining desired overall organisational performance, this study utilised factors in the internal environment. The internal contingencies includes organisational aspects (such as structure and authority), which could influence cost control system efficiency and information technology system efficiency.

Contingency theory also plays a role when assessing the appropriateness of processes (Angerer, 2006). The contingency research stream examined the impact of IT on business performance. A good view can be found in Bergeron *et al.*, (2001), impact of IT on learning, the impact of IT

problem-solving on task performance and impact of IT on organisational overall performance (Vessey 1991, Vessey & Galleta 1991; Leidner & Jarvenpaa 1995; Chan *et al.*, 1997). A common proposition among these research works is that the turbulent environment will induce firms to a more extensive use of information systems. It has been argued that in risky environment, IT should be more flexible and managers more alert to adapt information systems to external changes; and that, information acquisition should be more wide-ranging and continuous (Angerer, 2006).

Lin *et al.,* (2002), examined the contingency influences on responsibility cost control system in China. The study focused on the influence of the external environment in improving business performance and effective diffusion of management accounting practice. The study also made reference to the theory of institutional isomorphism which suggested that innovative management techniques or knowledge will be diffused to other firms in the course of market expansion and competition (Meyer & Rowan, 1977; Lin, *et al.,* 2002). The study used these theories to explain effect of diffusion of management accounting practices under different social and economic systems in China. The study concluded that the economic and business environment brought about diffusion and sharp changes in Chinese enterprises; to adopt more advanced practices of Western business management and accounting resulting in well managed responsibility cost accounting. However, the study did not introduce information technology as a variable to facilitate these cost control mechanisms.

Haldma and Laats, (2002) studied the influences of contingencies on management accounting practices in Estonian manufacturing companies. The categories of information gathered in the survey covered firm size, cost measurement and appraisal, cost element accounting, cost centre

accounting, costing techniques, budgeting and internal performance measurement systems. The study among other findings relating to management accounting system, found out that the application of cost centres tend to increase according to size of the firms. The study concluded that there is a need for certain improvements to be made in the companies' management accounting system without specifying areas of such improvement and did not link the study to the effect of such design on overall performance.

Seaman (2006) investigated the relationship between changes to a firms management accounting and control system and performance under different scenarios of strategic content, using Miles and Snow (1978, cited in Seaman 2006) frame work, categorizing firms as prospectors, defenders, analyzers and reactors in Singaporean firms. A total of 410 firms were surveyed. The study found significant relationship between management accounting control system and performance for defenders, indicating that costing is an important variable for this strategic type. This firm category offer higher products and services at lower prices, as resource efficiency along with cost cutting and improvements in their processes are critical to success; and information capabilities help management disperse information effectively to all functional areas of organisation (Seaman, 2006). This study although discussed managerial-related information as an enhancer of performance, did not introduce the IT criterion as a variable to facilitate cost information dissemination.

Hyvonen (2008) provided an extensive picture of management accounting systems and explore the relationship between management accounting systems, strategy, information technology, manufacturing technology and organisational performance. The study is based on the contingency theory that links different internal organisational characteristics. The study revealed that recent studies draw from the original organisational theorists (for e.g., Burns and Stalker,

1961; Thompson, 1967; Galbraith, 1973) to explain how the efficiency of management control systems depend on the nature of contemporary settings. In Finland industrial manufacturing firms, the study showed adopted contemporary cost accounting system of control. The use of variable costing, activity based- costing (ABC), and balanced scorecard (BSC) was dominant. Australian evidence of the adoption and benefits of both traditional and contemporary management accounting practices were provided (Chenhall *et al.*, 1998).

In adopting the contemporary, the study showed that information technology provides a necessary platform for firms to develop management accounting system and cost control strategies. Olsen *et al.*, (2000) argued that firms are faced with the challenge of integrating information technology into accounting practices; IT in accounting is often about the firm's financial ledgers and reporting systems (Granlund *et al.*, 2003). The study among other things concluded that contemporary management control practices and advanced information technology assists in enhancing performance. Although the study linked IT to manufacturing which it suggests would lead to organisational performance, the study did not isolate cost control as a single variable within management accounting and management control systems that can be integrated into the IT platform to influence performance.

Asel, (2009) investigated the influence of increasing risk and uncertainty on firms and their use of management control systems. In the light of the financial/economic crisis, uncertainty and risk rose enormously for many companies and hence forced many firms to adapt their management control systems to the changing environment. The study used the contingency framework to identify the best design and usage of management control systems in a given context. Referring to the study of Asel, (2009), on the various forms of theoretical fit that have been used to classify contingency-based research in management control systems: selection, interaction and systems,

the study claimed to adopt the selection fit which examined the way contextual factors are related to aspects of management control systems with no attempt to assess whether the association is linked to performance. A summary of prior contingency studies relating to cost control are shown on Table 2.3.

TABLE 2.3: SUMMARY OF EVIDENCES FROM PRIOR CONTINGENCY STUDIES ON COST CONTROLS SYSTEM AND PERFORMANCE

S/N	Researcher	Areas covered	Sample size	Statistical tool	Conclusions
1	Guilding, (1999).	Strategy, Competitor-focused accounting usage, perceived helpfulness.	217 public and private companies	Pearson correlations, paired t-test	Perceived helpfulness, strategic mission in relation to Competitors focused accounting usage is not related to industrial type.
2	Mingfang &Richard, (1999)	Environmental uncerainty, firm strategy, IT, performance	216 firms (513 observations) in USA.	OLS, ROA and ROS, time series analysis Moderated regression	Companies considering IT investment should assess their environmental contexts, strategic directions and top management team arrangement.
3	Yong-Woo & Glenn, (2001)	Firm strategy, activity-based costing: cost hierarchy, cost drivers	NA	Variance analysis	Activity- based costing is process based, prevents cost distortion, reduce or eliminate waste or non-value-added activities.
4	Brinke, (2002).	Firm strategy, Cost control architecture.	NA	Averages variances and trend analysis.	Feedback loops: engineering/ planning, order acceptance, production and accounting feedback loops of information are prerequisite for cost control.
5	Haldma & Laats, (2002).	Environment uncertainty, organisational structure, technology, strategy, cost management, budgeting, control, performance evaluation.	62 larger Estonian manufacturing companies financial directors, accountants and chief executives.	One-way, two-way variance analysis and Fisher's exact test.	Variable costing, marginal-contribution approach and internal performance evaluation are useful tools in management accounting design.
6	Lin & Yu, (2002).	Environment uncertainty, cost control, responsibility accounting, performance evaluation.	18 managers and accounting staff.	Descriptive and trend analysis.	Responsibility cost accounting is an effective tool for cost control under changing business environment.
7	Williams & Seaman, (2002).	Firm size, management controls, information.	232 medium-sized Singaporean firms.	Ordinary least squares regression analysis.	Increase in management accounting controls change provide value added information for managerial decision making and

					control activity.
8	Jermias, (2004).	Organisational structure, strategy, product differentiation, cost behavior.	106 business unit managers.	Means, Spearman's rho correlation.	Fitness level has a positive association with business unit efficiency. Strategic priorities affect the types of controls and management accounting systems used in business units.
9	Seaman, (2006).	Strategy	347 Singaporean firms; controllers and assistant controllers.	Means, Standard deviations, Pearson correlation matrix and ordinary least squares regression analysis.	Positive relationship for three strategic types: defenders prospectors, analysers. Each type reveals different configuration for component changes that comprises of management accounting and control systems.
10	Hyvonen, (2007).	Strategy, performance measurement techniques, IT and firm performance.	51 respondents from forest, metal electronic industries in Finland.	Two-way Regression analysis.	Contemporary management accounting systems in combination with advanced information technology are related to high customer performance.
11	Noah, (2007).	Organisational efficiency, cost control.	22 senior members of staff in transport corporation, Illorin, Nigeria	Mean, standard deviation, Students t-test.	Organisational efficiency results from the application of cost control.
12	Hyvonen, (2008).	Strategy, management accounting control systems, information technology, manufacturing technology.	132 Finnish firms and 6 Finnish manufacturing firms.	Descriptive statistics and theoretical.	Information technology as a construct assists in understanding the relationship between performance and strategy. Manufacturing and information technology together help firms to improve their organisational performance regardless of differentiation strategy.
13	Asel, (2009).	Organisational uncertainty and risk.	Austrian companies; chief financial officers.	Regression analysis and ANOVA.	MCS would have effect on key performance indicators if adapted to the changing environment,
14	Ajibolade, Arowomole & Ojikutu, (2010).	Management accounting systems and perceived environmental uncertainty.	144 manufacturing firms in Nigeria.	Correlation and moderated regression analysis.	More sophisticated MAS design will enhance the performance of the manufacturing companies, if

					tailored to the level of the environmental uncertainty facing the companies.
15	Pierce, (2010).	Firm structure, Cost information.	122 companies based in Ireland.	Simple percentages and correlation.	Cost information and costing system efficiency is linked with management decision. This requires regular input from a wider range of managers.
16	Uyar, (2010)	Environmental uncertainty, Cost and management accounting practices: budgeting, planning and control.	61 companies	Mean, simply percentages, t-test	Companies perceived traditional management accounting tools are still important
17	Kuye & Oghojafor, (2011).	Strategic control.	670 manufacturing firms in Nigeria.	Product moment correlation, regression analysis and Z-test.	Increase involvement in strategic control activities, if manufacturing firms must survive, grow and be competitive.
18	MdAuzair, (2011.)	Business strategy, perceived environmental uncertainty, management control system	520 top hotel managers	Correlation and multiple regression	Cost leadership associated more with bureaucratic MCS while differentiation strategy associated with less bureaucratic MCS.

Source: Generated from literature reviewed

2.14.2 TASK- TECHNOLOGY FIT THEORY PERSPECTIVE

Information technology plays a critical role in accounting and management control and when the process is not properly managed; it would have negative effect on long- run performance (Descow & Mourisen, 2005; Hyvonen *et al*, 2006; Granlund, 2007). Invariably, control cannot be studied apart from technology and context because there is need to understand the meeting point of the technology and type of control (Descow *et al.,* 2005). Information technology becomes more suitable and adaptable when the tasks are well defined and independent notwithstanding the complexity or routine nature (Kangas, 2003). The task-technology fit (TTF) theory (Goodhue, 1995 and Goodhue *et al.,* 2005) explains the need for adaptability. The TTF posit that users will adopt and utilise a particular IT system as long as the task to be performed is supported by the functionality of the system irrespective of the attitude of users. Again, that may not always be true because system functionality minus a positive attitude may not result in system usage: the attitude of the user toward the system has been demonstrated in many instances to be a strong determinant of system adoption and usage (Usoro *et al.,* 2010). The TTF model is represented in Figure 2.1 below:

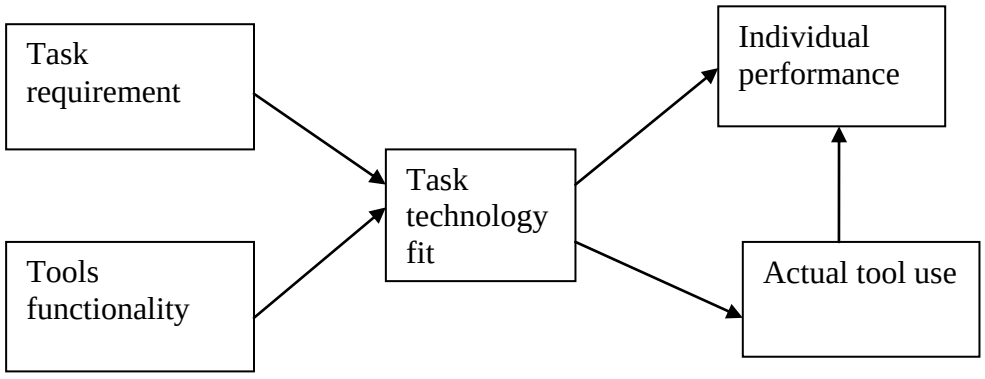


Figure 2:1 A basic task-technology fit (TTF) model (Source: Goodhue *et al.,* 1995)

2.14.3 TECHNOLOGY ACCEPTANCE THEORY PERSPECTIVE

The technology acceptance (TAM) theory explained the need for utilisation (Davis, 1989; Davis, Bagozzi and Warshaw, 1989; Dishaw *et al.*, 1999). User's perceived ease of use and perceived ease of usefulness would influence actual usage and performance. TAM posited that the attitude of an individual to using a particular system is the most important factor that will influence the adoption and utilisation of such a system. The limitation of this assumption as confirmed by research is that, a person using an IT system may not possess positive attitude towards it but because it improves performance or out of necessity would want to use the technology (Tonita, Benedict & Ko, 2004; Klopping & McKinney, 2004). The model is represented in Figure 2.2 below:

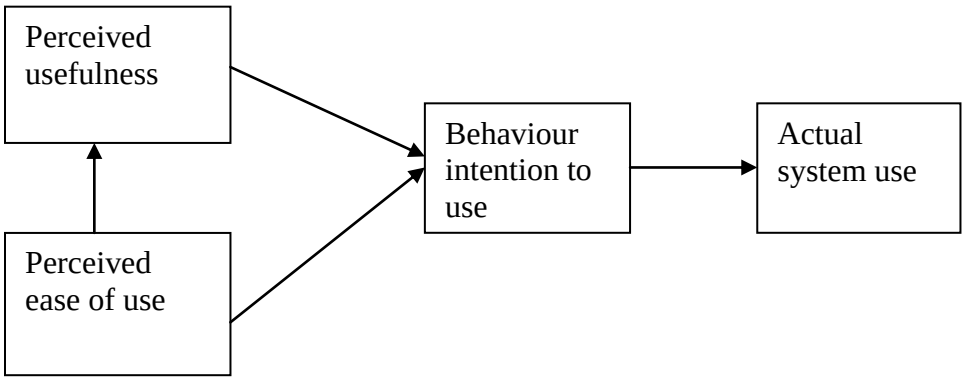


Figure 2.2: Technology acceptance model (TAM) (Source: Vankatesh *et al.*, (2003)

From the TTF point of view, attitude is not important as long as there is a perceived fit between task and functionality of IT system while for TAM attitude is very important for effective utilisation. Since both user attitude and perception of the fit between task and technology are important then it goes without saying that a model that combines the constructs derived from both models should be more effective than an individual model in providing needed explanation. A consideration of the shortcomings of TTF and TAM individually, would clarify the argument for integrating both models in this study.

The first attempt to combine the constructs of both TAM and TTF was done by Dishaw and Strong (1999). Their empirical study revealed that the integrated model from both TAM and TTF provides more explanatory power than either model alone. Furthermore, the study concluded that using the integrated model should lead to a better understanding of choices about using IT. Other researchers have applied the TAM/TTF model to other scenarios with little or no modification to the integrated model from Dishaw and Strong.

Klopping and McKinney (2004) study applied the TAM/TTF model to online shopping. The study concluded that combined TAM/TTF models explained more variance in the actual use than TAM alone or for intension to use. This is significantly different from previous research results (Klopping and McKinney, 2004).

Dishaw, Strong and Brandy (2002) study extends the task-technology fit model with a computer self-efficacy construct. The study explores the similarities and differences among the task-technology fit model and the technology acceptance model developed for studying software utilisation choices of end users; with a view to investigating the relationship between computer self-efficacy (CSE) and the combined technology acceptance (TAM) and the task –technology fit (TTF). CSE has been tested as an antecedent of perceived ease of use in the TAM and also influences perceived usefulness (Adams, Nelson & Todd, 1992), but has not been linked to the TTF model. The study concluded that an understanding of TAM, TTF and CSE contribute to explaining performance and how they overlap. This study simply proposed a model without testing the efficiency of the construct in elucidating performance. A summary of evidences from prior IT studies is shown on Table 2.4.

TABLE 2.4 SUMMARY OF EVIDENCES FROM PRIOR INFORMATION TECHNOLOGY STUDIES AND PERFORMANCE

S/N	RESEARCHER	AREA COVERED	SAMPLE SIZE	STATISTICAL TOOL	CONCLUSION
1.	Davis, (1993)	User acceptance, system characteristics, user perception	112 users of IT	OLS regression	TAM provides an informative representation of the mechanisms and design choices. Such choices are influenced by user acceptance.
2.	Brynjolfsson and Hitt, (1994).	Firm effects and IT.	500 manufacturing and 500 service listing firm in US.	Value- added with Cobb-Douglas specification and multiple regression	Elasticity of IT remains positive and statistically significant to productivity.
3.	Brynjolfsson and Hitt, (1998.)	IT capital and spending.	Three hundred US firms.	Ordinary least squares (OLS).	The study holds that the greatest benefits of IT could be realized by organisation when IT investment is coupled with other complementary investment such as organisational reengineering, restructuring and redesign.
4.	Lee and Menon, (2000).	Cost control and production performance enhancement by IT investment.	Internal data.	Applied both parametric (canonical correlation analysis) and non-parametric (data envelopment analysis).	Cost control and production performance are enhanced by IT investment.
5.	Sicar, Turnbow and Bordoloi, (2002).	Impact of IT on firm performance.	The study used multiyear, cross-sectional data.	Canonical correlation.	A relationship exists between sets of IT investment measures and firm performance.
6.	Massey, Montoya-Weiss, Hung, Ramesh, (2001).	Cultural differences.	150 participants in United States, Japan and Europe.	Descriptive analysis.	Technology can evoke different reactions among individuals with different cultural orientations.
7.	Dishaw, Strong & Brandy, (2002).	Task-technology fit, technology acceptance and self-efficacy	100 students using tools such as Microsoft access, SPSS, Microsoft project, PreModel,	Correlation and Path analysis.	A model that extends the task-technology fit with a computer self-efficacy construct should

		constructs.	or a CASE tool.		be considered when determining software utilisation choices of end users.
8.	Devaraj and Kohli, (2003).	Analyzes monthly data for three-year period on various financial and non-financial measures.	Hospital records.	Longitudinal research design.	IT investment impacts on performance.
9.	Tallon & Kraemer, (2003)	IT business value, Strategic alignment	63 firms	Descriptive statistics, graphs and charts	Strategic alignment can lead to increased payoffs from IT, this relationship is only valid up to a certain point beyond which, paradoxically, further increases in strategic alignment appear to lead to lower IT payoffs.
10	Wong, Leung & Chow, (2003).	Customer relationship management, information co-sharing.	150 Chinese business practitioners.	Factor analysis, ANOVA.	Information competency requires the integration and alignment of all CRM elements along with aspects of service centre and supply chain. Entire company strategy should be build around information diffusion as their core asset.
11	Pamulu &Bhuta, (2004).	IT environment and management, use of software, internet application, staff competency.	48 Indonesian construction firms.	Descriptive statistics: frequency and simple percentages.	The need to aggressively promote relevant government initiatives which would increase strategic use and adoption of IT.
12.	Granlund, M., (2007).	IT, Management accounting, Control.	21 interviewees: software consultants, technology users, software vendors,customers.	Qualitative analysis	The interface of management control and new IT is still an underdeveloped area empirically, theoretically as well as practically.
13.	Irick, (2008).	Information system	Integrated information centre end-users and carefully	Longitudinal analysis.	Task-technology fit is a construct in understanding the

			selected smaller group.		impact of technology on individual performance.
14.	Prasad, (2008).	IT and intangible benefit.s	Executive management, middle management, supervisors and finance professional of five businesses representing banking and insurance, tourism, telecommunications and government sectors.	The results were analyzed in descriptive terms-simple average.	IT was identified as suitable for businesses and high level of intangible benefits.
15.	Chen & Chou, (2009).	Environmental factors, conducted factors, enterprise resource planning (ERP).	69 Enterprises in Taiwan.	Partial least squares, correlations.	Environmental factors (external and internal contexts) and conducted factors (data quality and customization) affect ERP intermediated benefits (including coordination improvement and task efficiency), which in turn influence the overall benefits.
16.	De Toni & Zanutto, (2009).	Web-based information usage	300 persons from 6 average-large companies	Factor analysis, structural equation model LISREL analysis	Technology acceptance has a positive impact on information system use and its impact would be higher if the use is voluntary.
17.	Madapusi & Ortiz, (2009).	ERP, Task-technology, Decision quality	38 firms.	Factor analysis, correlations and multiple regression analysis.	Adequate information is provided by the ERP system to enable efficient and effective decision-making. The ERP system is user friendly and facilitates the easy accessibility of information.
18.	Alves, (2010).	Accounting tasks, IT, Organisational changes.	6 manufacturing firms.	Qualitative analysis.	Accountant's uses of sophisticated management accounting techniques are clearly dependent of IT existence.

19.	Usoro, Shoyelu & Kuofie, (2010).	Task-technology, technology acceptance, use of tourism web-site.	159 tourism web-site users.	Pearson bivariate correlations and hierarchical multiple regression analysis	A combined application of TTF and TAM in developing and updating tourism web-site, but with emphasis on perceived usefulness and trust.
20.	Leckson-Leckey, Osei &Harvey, (2011).	IT investment, Balanced scorecard	15 banks in Ghana	Ratio analysis on financial statement for a 10-year period, t-test, Mann-Whitney U, Wald-Wolfowitz test and Unit root test.	Investment in IT tend to increase profitability (ROA&ROE)
21.	Coltman, Devinney & Midgley, (2011).	CRM strategy, Capabilities.	86 executives from 50 organisations in Australia.	Correlation, t-test, traditional Harmon's ex-post one-factor test.	IT infrastructure on superior CRM capability is indirect and fully mediated by human analytics and business architecture.
22.	Hyvonen, Jarvinen & Pellinen, (2003)	Management accounting system, enterprise resource management, information communication technology	NA	Qualitative study	For companies' strategic management accounting to yield performance, three aspects should be combined: knowledge of accounting, the craft of ICT utilisation and strategic thinking.

Source: Generated from literature reviewed

2.15 CORPORATE PERFORMANCE

Researchers are concerned with corporate performance as an ultimate dependent variable. Performance is so common in management research that its structure and definition are rarely explicitly justified; instead its appropriateness, in no matter what form, is unquestionably assumed (Arnold, Collier & Sutton, 2000). In examining the extent of research of performance in management research, Boyd, Grove and Hitt, (2005) found that in papers published in four leading management journals during 1998-2000, of the six hundred and seventy-seven dependent variables, of which performance was the most frequent, two hundred and eighty-eight (thirty eight percent) were measured using single indicator. Firms are heterogeneous in their use of resources and capabilities and as such would prefer reports showing analysis performance in terms of financial and non-financial (Barney, 1991). Evidence suggests that large organisations use both financial and non-financial performance measures, but favour financial measures (Malina & Selto, 2004); and some small firms also used both measures as shown from the study of Laitinen and Chong (2006) supported by earlier findings of Davig, Elbert and Brown, (2004). The study revealed that small Finnish companies focused on profitability, product margins, customer value and liquidity. Small UK companies were similar, giving less emphasis to overall profitability but also weighing debt levels highly.

Organisational performance which is distinct from organisational efficiency (which is a broader construct that captures performance goals) (Venkatraman & Ranmanujan, 1986), encompasses three specific areas of firm's outcome: financial performance (profits, return on assets, return on investment, and so on); product market performance (Sales, market share,); and shareholder return (total shareholder return, economic value added) (Venkatraman, *et al.,* 1986). The nature

of measurement in these specific areas is either objective measures of performance (accounting and financial market measures) or subjective and quasi subjective measures (such as survey based self reports and Likert responses). The accounting measures are the most common and readily available means of measuring organisational performance. Nevertheless, researches take cognisance of the fact that, these measures can be distorted by accounting policies, human error and deception. Richard, Devinney, Yip, & Johnson, (2009) noted that accounting measure is limited by the fact that they emphasise historic activity over future performance. The apparent predictability and validity of accounting measures as signals of economic returns may have less to do with their validity and more to do with the stationary properties of the environment in which the measurement had taken place. The implication being that the more turbulent the environment, the less clearer the rules of performance (Richard *et al.*, 2009). Hence researchers suggest a measure of financial market measures as they are forward looking and incorporate intangible assets more than accounting data. Firm survival measures are referred to as mixed accounting/ financial market measures as they are better able to balance risk against operational performance issues that are sometimes lost in market measures. These measures are categorised in research as objective measures (Fisher & McGowan, 1983; Lev, 2001).

Fully subjective and quasi-subjective categories of performance measures also exist. The fully subjective are self reported measures that allow researchers to address latent performance constructs directly through interaction with well informed respondents within the context of interest. Subjective measures have traditionally been viewed with a great degree of skepticism based on the fact that the more objective and focal the construct, the less scope there is for bias. Subjectivity introduces increased error, allowing the imperfections of human cognition to play a greater role (Gilovich, Griffin & Kahneman, 2002).

Organisational performance is not a one-dimensional theoretical construct nor is it likely to be characterisable with a single operational measure. In accounting and finance, multi-dimensionality of performance is recognised and discussed theoretically in management literature (Venkatraman, *et al.,* 1986). The dimensionality is related to three sources within the research context: stakeholders for whom the performance measure is relevant; landscape over which performance is being determined and timeframe of the performance measure (Richard, *et al.,* 2009).

Three approaches to organisational performance were identified in literature: the first is where single measure is adopted based on the belief that relationship exist and often supported by theory; the second is where the researcher utilises several different measures to compare analyses with different dependent but identical independent variables; and the third is where researcher aggregates dependent variables, assuming convergent validity based on the correlation between the measures (Goerzin & Beamish (2003); Cho & Pucik, (2005); Miller, (2004). This last approach is most common in subjective measures of performance where the investigator is seeking something akin to trait based psychometric validity (Varadarajan & Ramanujam, 1990).

Most researchers measure financial performance using ROA (Return on assets) (Mingfang & Richard, 1999; Richard, Devinney, Yip & John, 2009). ROA has been criticised as being a misleading or inadequate indicator of the economic rate of return (Fisher & McGowan, 1983; Wier, Hunton, & HassabElnaby., 2004). ROA is also seen as distorted by the failure to consider differences in systematic risk, temporary disequilibrium effects, tax laws, and accounting procedures manipulation (Wier et al., 2004). In this study, financial performance was measured

using accounting-based and market-based measures: turnover growth rate (TGR), change in pre-tax earnings (PTE) and earnings per share (EPS) were computed from the financial statements of the listed firms, in order to derive the benefits associated with forward-looking performance report (Fisher & McGowan, 1983; Lev, 2001). For the most part, extant literature indicated that the combination of financial and non-financial indicators sends a robust and comprehensive set of performance signals to managers (Ghosh & Wu, 2007). Non-financial performance was measured using responses received on customer's value and market share.

Banker (2000) study reported increasing use of non-financial measures. A growing number of literatures suggested that, because current non-financial measures are better predictors of long-term financial performance than current financial measures, they help refocus managers on the long-term aspects of their actions. The results from the study indicated that, non-financial measures of customer values are significantly associated with future financial performance and contain additional information not reflected in the past financial measures. Table 2.5 provides a summary of prior studies measuring performance using accounting and financial/market measures.

TABLE 2.5: SUMMARY OF PRIOR STUDIES MEASURING PERFORMANCE USING ACCOUNTING AND FINANCIAL MARKET MEASURES

NO.	STUDY	RESPONDENTS/ SAMPLE	MEASURES USED
1.	Wier, Hunton & HassabElnaby, (2004).	244 firms	Return on assets (ROA), Return on sales (ROS)
2	Griftith & Myers (2005)	92 supply chain US importers and Japanese Partners	Turnover growth rate (TGR), Net profit (NP)
3	Luo, (2005)	124 firms	Return on investment (ROI)
4	Luo & Chung (2005)	688 cases from 188 business groups	Return on assets
5	Simsek, Veiga, Lubatkin & Dino (2005)	402 small business	Turnover growth rate, Net profit, Shareholder return,
6	Subramaniam & Youndt (2005)	93 executives	Return on equity (ROE), Return on assets
7	Westphal & Bednnar (2005)	228 US Public companies	Return on equity
8	Arthaud-Day, Certo, Dalton & Dalton, (2006)	232 US firms	Return on assets, Shareholder return, (SHR) Sales growth, Turnover growth rate
9	Fiss & Zajac (2006)	112 of Germany's largest firms	Return on assets, Shareholder return,
10	Miller, (2004)	83 banks subsidiaries for 332 firms	Return on assets
11	Newburry, Garberg & Belkin, (2006)	4,605 individual evaluation across 60 US firms	Return on assets, Turnover growth rate
12	Park, Li & Tse (2006)	23,577 Chinese firms between 1992 and 1996	Return on assets, Market share
13	Andersen , Denrell & Bettis, (2007)	4,365 firms in 45 industries during 1991-2000	Return on assets, Return on equity
14	Barkema & Drogendijk (2007)	99 Dutch subsidiaries	Return on sales, Market share,
15	Collis, Young & Goold (2007)	600 headquarters of firms in US, Japan and Chile	Return on capital employed (ROCE), Shareholder return, Turnover growth rate
16	Deutsch,Keil & Laamanen (2007)	1,500 firms	Return on assets
17	Donoher, Reed & Storrud-Barnes (2007)	171 firms	Earnings per share (EPS), Turnover growth rate, Market share
18	Nadkarni & Perez (2007)	212 publicly listed firms in US	Return on investment, Turnover growth rate, Net profit, Market share
19	Sanders & Tuschke (2007)	89 firms	Return on assets, Net profit,
20	Tseng, Tansuhaj, Hallagan & McCullough (2007)	286, 257, 243 and 242 publicly listed US manufacturing firms from 1995 to 2001	Return on investment, Ratio of cash flow to invested capital

Source: Generated from literature reviewed

2.16 SUMMARY OF GAPS IN THE LITERATURE

Management accounting systems and management control systems studies discussing cost system, cost estimation, cost calculation and allocation have often been focused on manufacturing firms (Brinke, 2002; Lin *et al.,* and Hyvonen, 2008), as cost is often associated with product processes. Little or no attention has been devoted to other sectors of the economy; especially the service oriented industries. This study fills the gap by providing information that cuts across all industries in Nigeria.

Studies have shown the possibility of integrating systems within the contingency framework (Haldma *et al.,* 2002; Lin *et al.,* 2002; Reka, *et al.,* 2008). Chenhall, (2003:157) indicated that "future contingency-based frameworks can be advanced by integrating insights from alternate theoretical perspectives into organisational adaptation and functioning". In line with Chenhall's further research suggestion, this research which adopted the contingency framework, utilised insights from alternate theoretical perspectives (Task- Technology Fit theory and Technology Acceptance theory) to study the operation of organisation, in order to achieve improved performance. No known Nigerian study has provided evidence regarding the integration of cost control and information technology systems on performance of NSE listed firms.

Technology and task have often been conceived in contingency theory as part of the internal contextual variables that influences the appropriateness, suitability and efficiency of the management accounting systems and management control systems in an environment (Chenhall, 2003) without consideration on the fit of task and technology while the task-technology theory examines the fit or match of task and technology (Goodhue *et al.,* 1995)

without reference to environmental context. Studies from either perspective have tended to adopt one perspective ignoring the perspective not adopted.

Research on the effects of modern IT on management accounting and the interrelations between the implementation process of new IT and management control (Scapens and Jazayeri, 2003, Dechow and Mouritsen, 2005; Granlund, 2007), incorporates IT as a special factor potentially affecting management control systems and their uses without emphasis on subset of management accounting systems such as cost control and performance measurement techniques.

There has been an obvious dearth of overt connection to firms' performance in management control contingency models. Most of the studies where attempts have been made to provide a link to performance, focused on organisational efficiency or managerial performance (Jermias *et al.*, 2004). These terms are not equivalent to firms' performance; innovation and efficiency measures are generally placed into wider conceptual domain of organisational efficiency (Venkatraman and Ramanujam, 1986) and other management researchers have taken these same variables as their dependent performance measure (Capon, Farley and Hoenig, 1990) a need therefore has been suggested for a link to firm performance

Studies revealed the possibility of standalone systems built to support integrated strategic management. In that case, it is up to users and the different strategic management accounting tools via applications used, that determined extent of strategic solution to yield or not yield improved performance (Granlund, 2007). This study suggests an integration of two systems (cost control and information technology) as applications alone do not drive management accounting logic.

CHAPTER THREE

METHODOLOGY OF THE RESEARCH

3.1 INTRODUCTION

This chapter highlights the methods adopted to test the propositions of this study. It describes the research design, population of the study, the sampling frame, the sampling procedure and presents a statistical profile of sampled firms. It also describes the preparation, validation and administration of the instruments used in data collection and the analytical procedures utilised on the data collected.

3.2 RESEARCH DESIGN

The problem of this study was addressed using a cross-sectional survey setting. The study employed this design, because users' evaluation has been identified to be best means of measuring IT performance (Prasad, 2008). This design was considered appropriate as it allows for a randomly constituted representative to be selected from a very large group; and information so gathered should constitute an important source of quality data (Afaanz, 2009). The use of survey design allows for issues to be addressed in their industrial and environmental context rather than in a laboratory setting. Richard *et al.,* (2009) suggested that performance outcome is better assessed in such context. Young and Selto (1991) also proposed better use of survey research methods, modeling techniques and existing data bases as a way forward in the development and testing of theories relating to changes in management accounting information. The survey design provided primary data on the manager's assessment of the state of control measures and the relevance of IT in cost management.

Accounting measures indicating performance was used to measure financial information contained in the annual reports of firms (Richard *et al.,* 2009). The financial report provides

information on the financial performance of the firms for a one year period, including relevant disclosures as required by regulatory standards. Adeyemi, (2005: 79) stated that "accounting standards are to be observed in the preparation of financial statement to promote acceptance and adoption by preparers and users". The narrower domain of organisational performance is not a one-dimensional theoretical construct nor is it likely to be characterised with a single operational measure. The multi-dimensionality of performance was examined by Richard *et al.,* (2009:5) to relate to three sources within research context: "the stakeholders for whom the performance measure is relevant; the landscape over which performance is determined; and the timeframe relevant in measuring performance".

The study also used the correlation design as the study specifies associational hypothesis for verification. Adeyemi, (2005) described correlation research design as that which attempts to investigate possible relationships among variables without trying to influence those variables. Correlation studies though, do not determine the cause-effect relationship but they do point to them.

3.3 POPULATION

Population refers to the total entities and individuals within these entities qualified to be studied and to provide data for the study. Asika (1991:39) states population as made up of "all conceivable elements, subjects or observations relating to a particular phenomenon of interest to the researcher", and which the "researcher desires to make some inferences" (Emory & Cooper, 2003:42). Since the phenomenon of interest in this study is cost control and IT systems, the population of this study consists of the firms listed on the floor of the Nigerian Stock Exchange market and actively traded during the period covered by the financial report examined (2006-2010 accounting years). Total number of listed firms in NSE as at 2006 was two hundred and ten firms (210). In 2010, a total of two hundred and eighteen (218) firms

were listed in the market. A look at NSE fact book revealed that, a total of 69 firms have either been delisted with new firms listed; while some changed their nomenclature. One hundred and forty-one (141) firms only, of the number listed in 2006 survived the 2008 economic/financial crisis and are still active in the market in 2010. This forms the population of this study. In summary, the population of this study consists of 141 firms listed on the floor of the Nigerian Stock Exchange and actively traded during the period covered by the financial report examined (2006-2010). It was confirmed that such firms have some form of formal structures, procedures and fully audited financial records. The target respondents in these firms are the operational managers, selected from accounting unit and IT resource unit.

3.4 SAMPLING

Sampling is the "procedure for drawing samples from a population" (Asika, 1991:39). It is the reduction of the amount of data to be collected by a consideration of data from a sub-group carefully selected to represent the population. A sample of 103 was selected from the population using the economic sample size formula as applied in modular grant application process (MGAP): [n= $(1+z/m)^2$ x P(1-P) = $(1.95/0.05)^2$ x 0.5(1- 0.5) = 380.25; FPC=n/(1+n/N) = 380.25/[1+(380.25/141)] where z= 95% confidence level; m= margin of error suggested at 5%; P= estimated value for the proportion of a sample that respond in a given way to a survey question suggested at 50% and FPC= finite population correction factor, N = population (Moore & McCabe, 1999). The MGAP allows for indiscriminate selection from a large population and check duplications. This sample size was then selected from the population using stratified sampling technique. Stratified sampling technique was used since sufficient information was available to divide the selected sample into strata. The firms were separated into sectorial distribution and proportionate number taken from across the sectors (n/population x sample), as shown in Table 3.1. This method allows equal chance for members of all sectors to be selected.

TABLE 3.1: SECTORIAL DISTRIBUTION OF FIRMS ACCORDING TO NSE LISTING

S/N	SECTORS	NO. OF FIRMS IN EACH SECTOR	PROPORTIONATE NUMBER SELECTED	PERCENTAGE IN SAMPLE (%)
1	AGRICULTURE/AGRO-ALLIED	5	4	3.88
2	AIRLINE SERVICES	-	-	-
3	AUTOMOBILE & TYRE	1	1	0.97
4	BANKING	16	11	10.67
5	BREWERIES	7	5	4.85
6	BUILDING MATERIALS	4	3	2.91
7	CHEMICAL AND PAINTS	6	4	3.88
8	COMMERCIAL/SERVICES	1	1	0.97
9	COMPUTER & OFFICE EQUIPMENT	5	4	3.88
10	CONGLOMERATES	7	5	4.85
11	CONSTRUCTION	6	4	3.88
12	EMERGING MARKETS	14	10	9.71
13	ENGINEERING TECHNOLOGY	3	2	1.94
14	FOOD/BEVERAGES & TOBACCO	10	7	6.79
15	FOOTWEAR	1	1	0.97
16	HEALTHCARE	7	5	4.85
17	HOTEL & TOURISM	1	1	0.97
18	INDUSTRIAL/DOMESTIC PRODUCTS	7	5	4.85
19	INSURANCE	14	10	9.71
20	MACHINERY (MARKETING)	2	1	0.97
21	MANAGED FUNDS	1	1	0.97
22	MARITIME	1	1	0.97
23	MORTGAGE FIRMS	1	1	0.97
24	PACKAGING	8	6	5.83
25	PETROLEUM (MARKETING)	7	5	4.85
26	PRINTING & PUBLISHING	4	3	2.91
27	REAL ESTATE	1	1	0.97
28	TEXTILES	1	1	0.97
	TOTAL	141	103	100

SOURCE: NIGERIAN STOCK EXCHANGE FACT BOOK, 2006/2010

3.5 SOURCES AND INSTRUMENT OF DATA COLLECTION

Data were collected from both primary and secondary sources. The two sources were used to ensure that reasonably robust and dependable analyses were carried out. The primary data medium is advantageous for its ability to provide avenue for information to be gathered directly from the respondents. Although there might be low response rate and increased cost of carrying out the research, the contributions and benefits of the primary sources were held to supersede the costs in providing objective solution options to the research problem (Adeyemi, 2005).

The primary data instrument a carefully constructed questionnaire, that was self administered. This was developed to capture respondents' self reported information on the firms' cost control structure and lines of authority; information technology efficiency in terms of control applications, acceptance and utilisation; task-fit, cost control system efficiency in terms of costing control techniques and performance measurement techniques; corporate performance in terms of non-financial performance aspect. The questionnaire was divided into seven sections. Section one was designed to collect demographic data about the firm sampled and the respondents on behalf of the firm. Section two to seven sought after information on the above enumerated variables. For easy completion of the questionnaire, most of the questions were constructed using a five-point linear numeric scale.

The secondary data was collected from annual financial reports of the firms as contained in NSE Fact Book for 2006-2010 periods and prior literature on information technology, management and cost accounting. Information from the annual report was used for measuring financial performances such as Earnings per share, Turnover growth rate and Pre-tax earnings.

3.6 MEASUREMENT OF VARIABLES

Nine variables were examined in this study. The variables were:

i. Cost control structure

ii. Lines of Authority

iii. Information technology- control applications

iv. Technology acceptance

v. Technology utilisation

vi. Task- Technology fit

vii. Cost control system efficiency: Cost control techniques and

viii. Performance measurement techniques

ix. Corporate performance: Financial performance and Non-financial performance

These variables were operationalised in the study. These variables except financial performaces were measured using five-point likert scale adapted from the works of Reilly (1996), Madapusi and Ortiz (2009) and Afaanz (2009) and has been used extensively in Venkatesh and Davis (1996), Dishaw and strong, (1999), Mishra, (2004) and Pamulu *et al.,* (2004) with the two extremes of "strongly disagree" or "not efficient" representing (1) and "strongly agree" or "highly efficient" representing (5). This kind of adaptations and modifications is however not uncommon with research works on performance (Klooping & McKinney, 2004; Usoro *et al.,* 2010). The measurement, structure and value connotation of the variables from the survey data are described below.

i. Cost control structure

Firms control structure is also an internal contingent variable that can influence performance (Chenhall, 2003). The firm control structure in this study refers to cost control pattern in the firm, whether cost is accumulated in cost centre, profit centre, revenue centre or investment centre. The responses to these options were ranked for analysis. The cost accumulation setting would have an effect on the manner cost is controlled.

ii. Lines of Authority

Firms lines of authority is identified in literature as an organisational factor (Chenhall, 2003), which is used in this research work as an influencing variable in the integration of cost control systems and IT systems. In section two, question five was designed as a nominal question and requested respondents to indicate the type of authority arrangement, whether it is centralised or decentralised setting. In analysing the responses, one response option was treated as dummy.

iii. Information technology System

Section three, item 10 of the questionnaire dealt with obtaining information to evaluate IT control applications in operations. Five standard questions were used to measure the efficiency of IT control applications on cost control system: Customer relationship management (CRM), Suppliers chain management (SCM), Cash control management (CCM), Scheduling key task-service delivery/production (TS/D), Human and Material resource management (H/MRM). Respondents ratings on all the questions on a five-point scale were summed up and averaged to obtain IT control applications scores. This measure of IT control applications was based on Reilly (1996) study, and has been used extensively in IT application studies (Mishra, 2004; Pamulu *et al.*, 2004). A score of below 3.0 was considered as low IT control applications efficiency, scores of 3.0 and less than 4.0 were regarded as average level efficiency. IT control applications scores of 4.0 and above indicating a high level efficiency of such application. In summary, IT control applications with scores below

4.0 were grouped as average level efficiency and IT control applications of 4.0 and above as high level efficiency for cost control purposes.

iv. Technology acceptance

Section three, item 11 of the questionnaire dealt with the measurement of IT control applications acceptance. It was measured with three questions on perceived ease and usefulness of IT control applications. The scale used in this question was adapted from Venkatesh and Davis (1996) and Dishaw and strong, (1999), where acceptance was tested. This variable was scored on a likert scale of 1 to 5 with the two extremes of "strongly disagree" and "strongly agree". This kind of adaptations and modifications is however not uncommon in this type of research work (Klooping & McKinney, 2004; Usoro *et al.,* 2010). A score of below 3.0 was considered as low acceptance, scores of 3.0 and less than 4.0 were regarded as average level of acceptance, while 4.0 and above as high level acceptance.

v. Technology Utilisation

Section three, item 12 of the questionnaire; measured information technology utilisation. Three questions were asked here to determine the extent of utilisation. The scale used in this question was adapted from Venkatesh and Davis (1996) and Dishaw and strong, (1999), where utilisation was tested. A Likert scale of 1 to 5 with the two extremes of "strongly disagree" and "strongly agree" was used (Usoro *et al.*, 2010). A score of below 3.0 was considered as low utilisation, scores of 3.0 and less than 4.0 were regarded as average level of utilisation, while 4.0 and above as high level utilisation.

vi. Task- Technology fit

Section four of the questionnaire dealt with the measurement of technology task- fit. Literature has shown that 'the most important determinant of performance is the fit between

chosen strategy and its contextual variables' (Jermias & Gani, 2004:3). Fit has been studied in literature from several perspectives. Jermias *et al.,* (2004), identified six perspectives of fit in terms of performance: moderation, mediation, matching, gestalts, profile deviation and covariation. This study identified fit as a moderating variable based on contingency perspective that operationalise fit as statistically derived interaction relationship between two variables (IT and cost control) that predicts the third (Performance). Three questions were asked here to determine the extent of task fit. A Likert scale of 1 to 5 with the two extremes of "strongly disagree" and "strongly agree" was used (Usoro *et al.,* 2010). A score of below 3.0 was considered as low task-fit, scores of 3.0 and less than 4.0 were regarded as average level of task-fit, while 4.0 and above as high level task-fit.

vii. Cost control system

Section five of the questionnaire was designed to measure (i) the extent of development of cost accounting system (item 14 request respondents to describe the extent of development) and (ii) efficiency of operational cost control techniques (items 15&16). Respondents' ratings of variables on question fourteen on a five-point Likert scale were summed up and averaged to obtain cost accounting system development scores. The extent of development was determined from examination of this score. A score of 2.0 and below was considered to signify poor development of the characteristics measured. Cost accounting system development scores above 2.0 and less than 4.0 were regarded as moderately developed. A score of 4.0 and above indicated high development. In summary, cost accounting system development scores below 4.0 were grouped as moderately developed and 4.0 and above as highly developed.

In terms of efficiency of operational cost control techniques, respondents were to indicate the cost control techniques in operation and the extent of perceived efficiency. The scores on

these items on a five-point scale were summed up and averaged to determine the scores of cost control techniques efficiency. The efficiency of cost control techniques was determined from an examination of this score. A score of 2.0 and below was considered to signify either partial or non-operational technique. Such situations are referred to as existing at stage one of costing system development, where costing information are inadequate (Haldma *et al.,* 2002). Cost control techniques efficiency scores between 2.0 and less than 4.0 were regarded as moderately efficient. Such techniques are viewed as within the second stage of cost development system where the cost systems are financially driven (Haldma *et al.,* 2002). A score of 4.0 and above indicates a high efficient level of cost control technique. A stage Haldma *et al.,* (2002) viewed as managerially relevant. In summary, cost control techniques efficiency with scores below 4.0 were grouped as moderately efficient while cost control techniques of 4.0 and above as highly efficient.

viii. Performance measurement techniques

Section five items 18 and 19 measured the efficiency of performance measurement techniques employed by the firm. Respondents were to indicate their perception on the efficiency of performance measurement techniques used in the firm. The measure was adapted from Lin *et.al.,* (2002) and Reka, *et al.,* (2008) and has been used by several researchers (Kaplan & Norton, 1992, 2001; Barfield, *et al.,* 2001 Shim *et al.,* 2009). The extent of efficiency was measured using scores computed from questionnaire items. They were provided in the survey instrument on a five-point scale. The average of the sum of the scores obtained on each item was regarded as the efficiency of each measure, and the average of the sum of the scores obtained on all these items formed the scores for performance measurement techniques (PM). Respondents were to indicate their perception on the efficiency of performance measurement techniques used as cost information source for the firm. A score of 2.0 and below was

considered to signify low efficiency, a score above 2.0 and less than 4.0 were regarded moderate efficiency. PM scores of 4.0 and above indicated high efficiency.

ix. Corporate performance

Corporate performance was assessed in terms of financial and non-financial variables. Venkatraman and Ramanujam (1986) argued that business performance should include both financial performance (such as sales growth and profitability) and operational performance (such as market share and new product introduction).

Non-financial performance

Section six identified non-financial performance that can be derived from proper management of cost and information technology such as customer value: lead time delivery; defect or deficiency level and market share. Respondents were required to rate these non-financial performance. The scores of these items on a five-point scale were summed up and averaged to determine the scores for non-financial performances. A score of below 3.0 was considered as poor non-financial performance; scores of 3.0 and less than 4.0 were regarded as low non-financial performance. Non-financial performance scores of 4.0 and above indicated a high non-financial performance. In summary, scores below 4.0 were grouped as low non-financial performance and above 4.0 as high level non-financial performance.

Financial Performance

The financial aspects were determined from annual reports from the listed firms. The financial performance was measured using accounting-based measures (Mingfang & Richard, 1999), computed from the financial statements of the listed firms: changes in pre-tax earnings, earnings per share, and turnover growth rate.

Changes in pre-tax earnings: Earnings refer to the amount of profit that a company produces during a specific period, which is usually defined as a quarter (three calendar months) or a year. Earnings typically refer to after-tax net income. Ultimately, a business's earnings are the main determinant of its share price, because earnings and the circumstances relating to them can indicate whether the business will be profitable and successful in the long run (Investopedia, 2011). Pre-tax earnings therefore refer to the amount of profit before tax. In this study, changes in profit produced by a firm prior to taxation charges in a year was considered in determination of financial performance, as actual earnings might be distorted with varied degree of tax imposition (Spikoks, 2009).

Earnings per Share (EPS): This equals simply to the total net profit (earnings) divided by the total number of shares. EPS is how much net profit one share of the company is producing. Obviously the higher this ratio is, the better, because the value of the share will increase. When the company publishes proportion of its profits that will be paid out as dividend to the stockholders, the higher the EPS the better, since more dividends will be received after each shares owned (CSANAD, 2011). Another implication of the Earnings per Share ratio is that it serves as an indicator to investors in determining the stock they should invest into. EPS evaluates solely the performance of the company and do not consider stock market prices of the company. The advantage of this is that EPS is not dependent on such factors as market optimism, pessimism or consensus (CSANAD, 2011). In this study, percentage increase in EPS would mean improved performance.

Turnover growth rate: Turnover refers to the amount of money taken by a business in a particular period. In this study, sample cuts across different types of firms and industry, manufacturing and service; the calculation of turnover growth rate was computed based on what it meant for such firm. In accounting, it is the number of times an asset is replaced

during a financial period or the number of shares traded for a period as a percentage of the total shares in a portfolio or of an exchange. Investopedia (2011) explains that turnover in accounting, often refers to inventory or accounts receivable. A quick turnover is desired because it means that inventory is not sitting on the shelves for too long. In business, turnover is referred to as revenue. That is income a company receives from its normal business activities, usually from the sale of goods and services to customers. In many countries, such as the United Kingdom, revenue is referred to as turnover (Williams, Susan, Bettner, & Carcello, 2008). In general usage, turnover is income received by an organisation in the form of cash or cash equivalents, income received from selling goods or services over a period of time (Williams *et al.,* 2008). In Banks turnover refers to the amount of revenue a bank generates over a given period of time. Turnover refers to the amount of money brought into the bank (Wisegeek, (2011). Turnover was computed as a deduction of the sum of total deposits from total loans and advances. In insurance companies turnover was computed as a deduction of total subscriptions or fees received from total outstanding claims within a given period usually one year. The turnover growth rate is determined further by calculating the percentage change in turnover between the years under study. An increase in the percentage is a positive indication of improved financial performance.

3.7 VALIDATION OF MEASURING INSTRUMENT

Most of the prior studies that used the measurement instruments in this study were utilised in developed countries. It is considered necessary to validate these instruments in the Nigerian context. Three types of validity were assessed: Content, Convergent and Discriminant validity.

i Content Validity

Content validity ensures consistency between the measurement items and extant literature. This was achieved through several procedures: A first draft of the questionnaire was given to

two Ph.D students; the corrected version was given to two ICT lecturers (one senior lecturer and one lecturer grade 1); four accounting lecturers (two professors and two senior lecturers). They all made suggestions that were incorporated to improve the content validity of the instrument. They also made useful recommendations especially in terms of the reduction of the length of the final survey instrument as provided in appendix 1B. Then, a pilot- testing on the instrument was carried out, by distributing thirty-six copies of the questionnaire to managers, in 18 companies, one each in accounting unit and IT resource centre. Thirty copies were returned duly completed and the results were used to obtain statistical measures of the components of construct validity of the variables.

ii. Convergent Validity

The convergent validity was assessed by examining composite reliability and average variance extracted (AVE) from the measures (Ferrell, 2009). The study used the Cronbach's alpha to determine internal consistency, variability and reliability of instrument. *Composite reliability (CR):* The data on Table 3.2 shows the computed figures for variables measured. Nunnally (1978 cited in Ping, 2005) suggested minimum acceptable reliability from 0.7. The result revealed that all the variables measured are reliable as the computed figures are more than the minimum. *Average variance extracted (AVE)*: AVE is a measure of the amount of variation that a latent or existing construct is able to explain from the observed variables to which it is theoretically related. A compelling demonstration of convergent validity was an AVE of 0.5 or above. The result on Table 3.2 confirmed the convergent validity, that the all the AVE figures for the variables are above the compelling level.

iii. Discriminant Validity

The discriminant validity was verified by looking at the square root of the average variance extracted as recommended by Fornell and Larcker (1981). In other words, if AVE is greater

than the square of the construct's correlations, it is evidence of discriminant validity. Although there is no firm rule for discriminant validity, correlation with other latent variables less than 0.7 are frequently accepted as evidence of discriminant validity **(**Bagozzi & Phillip, (1982). The result in Table 3.3 confirmed the sufficient discriminant validity: the square root of the AVE for each construct was greater than all of the inter-construct correlations involving the construct (Chen & Chou, (2009). Thus, the discriminant validity was supported.

Table 3.2: INSTRUMENT COMPOSITE RELIABILITY VALUES/AVE

	Items	Cronbach Alpha	AVE	CR
Task-Fit	2	0.741	0.62911	0.75204
Acceptance	2	0.861	0.71992	0.862009
Utilisation	2	0.735	0.60777	0.87789
IT- Control	5	0.807	0.61452	0.915755
Non-financial Perf	3	0.797	0.70301	0.907522
Cost Control Techniques	8	0.766	0.72255	0.90400
Perf Measure techniques	2	0.91	0.91814	0.93400

Table 3.3: CORRELATION BETWEEN CONSTRUCTS- DISCRIMINANT VALIDITY

	task_fit	acceptance	utilisation	IT_control	Non-Financial performance	Cost control techniques	Perf measure techniques
Task-fit	*1*						
Acceptance	*-.527*	*1*					
Utilisation	*.196*	*-.087*	*1*				
IT-control	*.134*	*-.059*	*.363*	*1*			
Non-Financial perf	*.012*	*.145*	*-.120*	*.242*	*1*		
Cost control technique	*.274*	*-.205*	*-.030*	*-.180*	*.110*	*1*	
Perf measure tech.	*.344*	*-.189*	*.088*	*.224*	*.052*	*.204*	*1*

Table 3.4: THE SQUARE ROOT OF AVE: THE COEFFICIENTS OF DISCRIMINANT VALIDITY

	Task_fit	Acceptance	Utilisation	IT_control	Non-Financial performance	Cost control techniques	Perf measure techniques
Square root of AVE	*.793*	*.848*	*.780*	*.784*	*.838*	*.850*	.958

3.8 ADMINISTRATION OF THE DATA COLLECTION INSTRUMENT

The validated instrument was administered on two hundred and six respondents from one hundred and three listed firms in Nigeria. The target respondents were operational managers, one each from accounts unit and IT resource centre. Prior studies (Simons, 1987; MdAuzair, 2011) on management control systems also focused on top-managers. They possessed sufficient knowledge about the financial operational environment and accounting information and communication systems. For instance, they were: (i) recognised as the official experts on the extent and functioning of existing accounting information system and information technology system in the organisation; (ii) empowered to advise top management of needed changes including the administration of implementing new management accounting and IT systems. In addition, they were considered, (iii) most likely to be knowledgeable on the various uncertainties confronting the operating departments throughout the organisation, particularly in the more centralised organisational structure featured commonly in Nigeria and (iv) positioned at a level of authority commensurate with variables modeled in this study.

As noted by Isa *et al.,* (2005), one or two members of this group is not an unduly small sampling of option, where reliable information about matters of concern to the study may be primarily obtained from management at the top. The average response time for each administered questionnaire was 20 minutes. Asel, (2009) noted in his study that twenty minutes response time was ideal for responding to a well constructed questionnaire.

The current addresses of the listed firms were obtained from 2010/11 FactBook of the Nigerian stock exchange commission. The distribution of copies of the questionnaire and retrieval of same took place between August 2011 and November, 2011.

3.9 DATA ANALYSIS PROCEDURES

The following descriptive and inferential statistical procedures were used to examine the propositions of this study:

i. The descriptive statistics namely the mean, standard deviations, percentages and frequency counts were employed to answer research questions one and three.

ii. Ratio analyses were used to explain financial indicators of performance. The trend time series analysis were used to determine the firm's performance over time. The trends were graphically presented (in appendix 5). The Pre-tax Earnings, Turnover growth rate and Earnings per Share were computed from annual financial report covering 2006 to 2010; and was used for computing the financial performance variables in research questions two, four and seven; hypotheses 1,2 and 6.

iii. Regression analyses were further performed on the financial performance indicators to determine the effect of components of cost control systems on performance; the effect of IT control applications on performance; and the effect of integration of CC - IT systems on corporate performance.

iv. Correlation analysis was used to examine the existence of relationship between variables. The hypothesised relationship between cost control techniques and information technology control applications as stated in each of the null hypothesis 1 to 6 were initially tested in order to provide answer to research questions one to seven.

v. Research questions two and four were also examined through the test of the null hypotheses 1 and 2 using ANOVA.

vi. Research questions four, five and seven were examined through the test of the null hypotheses 3 and 6 using multiple regression analysis.

vii. Research question six was examined through the test of the null hypotheses 5 using correlation coefficient.

3.10 MODEL SPECIFICATION

The following models are specified for the study:

Hypothesis one was tested using models 1 and 2.

$$Perf_i=\beta_0 + \beta_1 \text{CCT } bud_i + \beta_2\ CCTvalue_i + \beta_3\ CCTactivity_i + \beta_4\ CCTtarget_i\ e_i \quad (1)$$

Where

Perf = performance (non-financial (NFP), pre-tax earnings (PTE), earnings per share (EPS) and total growth rate (TGR)
CCT = cost control technique
bud = budgetary control
value = value analysis
activity= activity based costing
target = target costing
βs = these are the estimated regression coefficients
e = the error term in a regression model, and
i = index (proxy) for performance

$$Perf_i=\beta_0 + \beta_1 \text{PMT } bsc_i + \beta_2\ \text{PMT } qcm_i + \beta_3 \text{PMT } abcm_i + \beta_4\ PMT\ rsc_i + e_i \quad (2)$$

Where

Perf = performance (NPF, PTE EPS and TGR)
PMT = performance measurement technique
bsc = balance score card
qcm = quality cost management
abcm= activity based costing and management
rsc = responsibility costing
βs = these are the estimated regression coefficients
e = the error term in a regression model, and
i = index (proxy) for performance

Hypothesis two would be tested using model 3

$$Perf_i=\beta_0 + \beta_1 \text{IT } crm_i + \beta_2\ \text{IT } scm_i + \beta_3 \text{IT } ccm_i + \beta_4\ \text{IT } tsd_i\ \beta_5 \text{IT } hmm_i + e_i \quad (3)$$

Where

Perf = performance (NPF, PTE EPS and TGR)
IT = information technology control applications
crm = customer relationship management

scm = supply chain management
ccm= cash control management
tsd = task scheduling and delivery
hmm = human and material management
βs = these are the estimated regression coefficients
e = the error term in a regression model, and
i = index (proxy) for performance

Hypothesis three and four would be tested using models 4 and 5

$$CCS\ eff_i = \beta_0 + \beta_1 \text{ OV } struct_i + \beta_2 \text{ OV } auth_i + e_i \quad (4)$$

Where

CCS eff = cost control system efficiency
OV = organisational variable
struct = cost control structure
auth = lines of authority
βs = these are the estimated regression coefficients
e = the error term in a regression model, and
i = index (proxy) for performance

$$IT\ eff_i = \beta_0 + \beta_1 \text{ OV } struct_i + \beta_2 \text{ OV } auth_i + e_i \quad (5)$$

Where

IT eff = information technology system efficiency
OV = organisational variable
struct = cost control structure
auth = lines of authority
βs = these are the estimated regression coefficients
e = the error term in a regression model, and
i = index (proxy) for performance

Hypothesis 6 would be tested using model 6

$$Perf_i = \beta_0 + \beta_i\, int_i + e_i \quad (6)$$

Where

Perf = overall corporate performance (NPF, PTE EPS and TGR)
int = cost control plus information technology
βs= these are the estimated regression coefficients
e = the error term in a regression model, and
i = the number of respondents representing the firms.

Performance: There are 4 measures of firm performance adopted in this study; namely non-financial, pre-tax earnings (PTE), earnings per share (EPS) and total growth rate (TGR). Since it will be inappropriate to merge all these into a single index of performance, each of the model is estimated four times to represent each of these four performance measures.

3.11 LIMITATION OF RESEARCH METHODOLOGY

This study utilised the cross-sectional survey setting, though this setting affords the researcher to determine the frequency of variables examined, it is however limited by the fact that a non-response to a variable is susceptible to bias and if the sample is not an accurate representation of the population, generalisation of findings might be difficult. The stratified sampling technique which involved dividing the population into distinct subgroups according to some important characteristics becomes problematic where the character used is not sufficiently distinct. Selecting the required sample from each stratum if not random could be bias.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

4.1 INTRODUCTION

This study was designed to examine the integration of cost control and information technology systems and effect on corporate performance in NSE listed firms. Adopting the contingency, Task-Technology Fit and Technology Acceptance theories and based on prior empirical evidences of the relationship between management accounting system and IT, it was hypothesised that cost control structure and lines of authority would influence cost control system and information technology system, and an integration of both systems would lead to performance. This chapter is devoted to presenting the results of the analytical procedures performed on the data collected to tests these propositions. Analyses were carried out with the aid of Statistical Package for Social Sciences (SPSS version 15.0).

4.2 ANALYSIS OF QUESTIONNAIRE RESPONSE RATES

The total responses received from the questionnaire distributed to two hundred and six respondents from one hundred and three sampled firms, revealed that some firms declined to complete their copies of questionnaire while it was impossible to retrieve the copies

delivered to some firms despite repeated calls and e-mails, resulting in a total of one hundred and fifty-six (156) usable responses. This represented a response rate of 76%. The responses received were spread across twenty-seven industrial sectors identified within the sample frame except for Maritime and Textile. A summary of the distribution of questionnaire and responses received according to sector is presented in Table 4.1.

TABLE 4.1: SUMMARY OF SECTORIAL ADMINISTRATION OF QUESTIONNAIRE AND RESPONSE RATE

Sectors	Administered	Returned	Response rate (%)	Unusable responses	Valid responses	Valid response rate (%)
Agriculture/Agro-Allied	*8*	*2*	*25*	*0*	*2*	*25*
Automobile & Tyre	*2*	*2*	*100*	*0*	*2*	*100*
Banking	*22*	*20*	*91*	*0*	*20*	*91*
Breweries	*10*	*4*	*40*	*0*	*4*	*40*
Building Materials	*6*	*5*	*83*	*0*	*5*	*83*
Chemical And Paints	*8*	*7*	*88*	*0*	*7*	*88*
Commercial Services	*2*	*2*	*100*	*0*	*2*	*100*
Computer & Office Equipment	*8*	*6*	*75*	*0*	*6*	*75*
Conglomerates	*10*	*10*	*100*	*0*	*10*	*100*
Construction	*8*	*6*	*75*	*0*	*6*	*75*
Emerging Markets	*20*	*8*	*40*	*0*	*8*	*40*
Engineering Technology	*4*	*2*	*50*	*0*	*2*	*50*
Food/Beverages & Tobacco	*14*	*12*	*86*	*0*	*12*	*86*
Footwear	*2*	*2*	*100*	*0*	*2*	*100*
Healthcare	*10*	*8*	*80*	*0*	*8*	*80*
Hotel & Tourism	*2*	*2*	*100*	*0*	*2*	*100*
Industrial/Domestic Products	*10*	*10*	*100*	*0*	*10*	*100*
Insurance	*20*	*16*	*80*	*0*	*16*	*80*
Machinery (Marketing)	*2*	*2*	*100*	*0*	*2*	*100*
Managed Funds	*2*	*2*	*100*	*0*	*2*	*100*
Maritime	*2*	*0*	*0*	*0*	*0*	*0*
Mortgage Companies	*2*	*2*	*100*	*0*	*2*	*100*
Packaging	*12*	*12*	*100*	*0*	*12*	*100*
Petroleum (Marketing)	*10*	*8*	*80*	*0*	*8*	*80*
Printing & Publishing	*6*	*4*	*67*	*0*	*4*	*67*
Real Estate	*2*	*2*	*100*	*0*	*2*	*100*

Textile	***2***	***0***	***0***	***0***	***0***	***0***
Total	***206***	***156***	***76***	***0***	***156***	***76***

Note: Values generated by author from analysis of data from questionnaire survey (2011)

4.3 ANALYSIS OF DEMOGRAPHIC DATA

Table 4.2 showed that although the key individuals targeted in the survey were managers in accounts and IT resource units, some other cases were recorded, where assistant executive officers (21.2%) were delegated to complete copies of the questionnaire. All respondents had at least a B.Sc/BA/HND suggesting that respondents were sufficiently educated to correctly complete the questionnaire (Table 4.3). The responding firms in terms of size, showed a considerable number of firms within 101-500 employee range representing 34.96%; above 1000 category size of firms represents 26.21%. A profile of these firms according to their sizes and employee distribution is provided in Table 4.4.

Table 4.2: Analysis of Department and division of Respondents (Employees)

Department/division	Frequency	Percentage
Accounting	62	39.7
IT	61	39.1
Others	33	21.2
Total	156	100.0

Table 4.3: Analysis of educational qualification of Respondents

Qualification(s)	Frequency	Percentage
HND/B.Sc	69	44.2
M.Sc/MBA	33	21.2
Professional	54	34.6
	156	100.0

Table 4.4: Analysis of Firm Size Category

Size of Organisation in terms of No. of employees	Frequency (firms in each category)	Percentage
Less than 100	24	23.30
101-500	36	34.96
501-1000	16	15.53
Above 1000	27	26.21
Total	103	100.0

4.4 ANALYSIS OF DATA ON ALL THE VARIABLES IN THE QUESTIONNAIRE USING DESCRIPTIVE AND INFERENTIAL STATISTICS

The eight variables were examined in the questionnaire: (i) cost control structure; (ii) lines of authority; (iii) information technology system- control applications: (iv) technology acceptance;(v) technology utilisation (vi) task-technology fit; (vii) cost control system: cost control and performance measurement techniques; (viii) corporate performance: non-financial. The statistical description in terms of frequency, percentages, means and standard deviation are presented.

Organisational Variables: Firm's lines of authority showed that more firms 53.2% of the respondent's firm had centralised setting, with 48.7% of respondent's firm having profit centres structure. A 59.61% of the respondenents were of the view that cost control structure would have effect on the way cost control is being managed in the centres *(See Appendix 3, Section 2 Table 1).*

The task- technology fit data, showed that the available information technology control applications, well suit the various cost control tasks with a mean score of 4.23, and the various IT control applications are well adapted to various assigned cost control tasks, with mean score of 4.16 *(see Appendix 3, Section 4, Table 5).*

In the aspect of non-financial performance, 47.4% of respondents rated meeting with lead time from receipt of order to delivery to customer as very good with mean scores of 4.14 and Standard deviation of 0.761; and about 38% agreed that market share is excellent.*(see Appendix 3, Section 6, Table 8).*

Table 4.5 showed the mean scores of other multi-item variables measured in the study. Mean scores for cost control system = 3.9736 with standard deviation of 0.65762 indicating moderate efficiency and IT control applications = 4.0667 with standard deviation of 0.61648 representing high efficiency.

Table 4.5: RESULT RELATING TO THE DESCRIPTIVE STATISTICS OF THE MULTI-ITEM VARIABLES MEASURED IN THE STUDY

		Cost control structure	Lines of authority	Task-fit	acceptance	utilisation	IT-control	Cost Control	Perf measure	non-financial performance	Average PTE (%) (2006-2009)	Average EPS (%) (2006-2009)	Average TGR (%) (2006-2009)
N	Valid	*156*	*156*	*156*	*156*	*156*	*156*	*156*	*156*	*156*	*156*	*156*	*156*
	Missing	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mean		*0.53*	*1.89*	*4.1571*	*4.1891*	*4.2564*	*4.0667*	*3.9736*	*3.5491*	*4.0641*	*105.5369*	*128.0299*	*89.0005*
Std. Error of Mean		*0.040*	*0.082*	*0.05908*	*0.05091*	*0.04971*	*0.04936*	*0.05265*	*0.04120*	*0.05466*	*6.83505*	*14.18431*	*1.77085*
Std. Deviation		*0.501*	*1.026*	*0.73792*	*0.63587*	*0.62084*	*0.61648*	*0.65762*	*0.51454*	*0.68273*	*85.36971*	*177.16196*	*22.11785*
Variance		*0.251*	*1.053*	*0.545*	*0.404*	*0.385*	*0.380*	*0.432*	*0.265*	*0.466*	*7,287.988*	*31,386.361*	*489.199*
Range		*1*	*3*	*4.00*	*3.00*	*2.50*	*3.60*	*2.25*	*2.56*	*4.00*	*752.50*	*1,288.33*	*182.00*
Minimum		*0*	*0*	*1.00*	*2.00*	*2.50*	*1.40*	*2.75*	*1.89*	*1.00*	*-253.50*	*-209.00*	*52.00*
Maximum		*1*	*3*	*5.00*	*5.00*	*5.00*	*5.00*	*5.00*	*4.00*	*5.00*	*499.00*	*1,079.33*	*234.00*

The first step in the analysis of data using inferential statistics, is exploring the minimum border of the relationships between the predictor variables and the dependent variables in bi-variate correlations. The Pearson's product moment correlation provides a measure of linear association between two variables that have been measured on interval or ratio scales (Easton & McColl, 2011).

The relationships between organisational factors and cost control system and IT system were examined using correlation analysis. The six null hypotheses as stated in chapter one were thereafter tested using correlation to examine the existence of relationship between key variables; regression analysis to ascertain the amount of variations in the dependent variable which can be associated with changes in the value of an independent or predictor variable in the absence of other variables; and analysis of variances (ANOVA) examines variation arising from the influence of several dependent variables on the independent variable (in this case performance). These tests helped to provide answers to research questions one to seven.

4.4.1 Correlation Analysis

The results as shown in the correlation matrix in Table 4.6 revealed that all the main variables were positive and significant (at 0.01 level of significance) to non-financial performance except for cost control structure and lines of authority. The variables did not show significant correlation with financial performance except for performance measurement techniques efficiency that is highly negative and significant. At $p< 0.05$, only utilisation of control applications was highly negative and significant to Pre-tax earnings (PTE), and PTE was slightly positive and significantly correlated with earnings per share (EPS). Lines authority was highly negative but significantly related to total growth rate (TGR). Other variables were not significantly related to any of the financial performances.

TABLE 4.6: RESULT RELATING TO CORRELATIONS COEFFICIENTS

	1	2	3	4	5	6	7	8	9	10	11	12
1. Org cost control structure	***1***											
2. Org. lines of authority	***.803****	***1***										
3.Task –IT Systems Fit	***0.13***	***-0.109***	***1***									
4. Acceptance	***-.176****	***.165****	***.366****	***1***								
5. Utilisation	***-0.099***	***0.075***	***.429****	***.399****	***1***							
6. IT control applications	***-0.253***	***0.436****	***.644****	***.374****	***.358****	***1***						
7. Cost control techniques	***-0.218****	***0.307****	***.707****	***.420****	***.322****	***.617****	***1***					
8. Perf measure techniques	***0.061***	***-.179****	***.508****	***.433****	***.366****	***.616****	***.911****	***1***				
9. Non-Financial Performance indicators	***-0.1***	***0.093***	***.381****	***.277****	***.319****	***.697****	***.406****	***.396****	***1***			
10. Average PTE (%) (2006-2009)	***-0.031***	***0.012***	***-0.11***	***-0.071***	***-.169****	***-0.106***	***-0.157***	***-.209****	***-0.049***	***1***		
11. Average EPS (%) (2006-2009)	***0.095***	***-0.093***	***-0.015***	***0.019***	***-0.134***	***-0.102***	***-0.044***	***-0.009***	***-0.026***	***.177****	***1***	
12. Average TGR (%) (2006-2009)	***0.054***	***-.175****	***0.062***	***0.022***	***0.022***	***0.041***	***0.085***	***0.13***	***0.089***	***-0.04***	***0.101***	***1***

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

4.5 ANALYSIS OF DATA RELATING TO RESEARCH QUESTIONS

Research questions were analysed using descriptive, inferential statistics and relevant test of the null hypotheses.

4.5.1 Analysis of data relating to research question (i): How developed are the cost accounting systems in Nigerian firms?

The descriptive analysis on costing system development, was examined based on four stages as outlined in literature: (i) Inadequate cost information (ICI), (ii) Financial reporting driven (FRD), (iii) Customized, managerially relevant, but stand-alone systems (CMSS),(iv) Integrated cost management and financial reporting systems (ICMFS). The result (*see Appendix,* Section 5, and Table 6a) indicated that 64.7% of firms were in stage two and three of cost system development and using full cost approach. Based on the details in chapter three on the average of sum of the scores obtained from each item on cost system development, the frequencies with a total mean scores of 3.65, indicated moderately developed costing system. Table 4.7 presents the summary panel of cost accounting system development at 95% confidence level.

TABLE 4.7: MEAN SCORES OF COSTING SYSTEM DEVELOPMENT IN THE RESPONDENTS' FIRMS

	N	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Moderately developed	***101(64.7)***	***3.2326***	***0.26227***	***0.02270***	***3.2653***	***3.4783***	***2.53***	***3.66***
Highly developed	***55(35.3)***	***4.3426***	***0.40266***	***0.04421***	***4.5305***	***4.6532***	***4.00***	***5.00***
Total	***156(100)***	***3.6534***	***0.65762***	***0.05265***	***3.8696***	***4.0776***	***2.75***	***5.00***

4.5.2 Analysis of data relating to research question (ii): What effect does cost control system utilised by the firms have on performance?

To answer research question (ii), a descriptive analysis was was carried out, and null hypothesis (i) was tested.

The types of cost control techniques efficiency were examined in terms of performance. Efficiency was measured using scores computed from questionnaire items (*see chapter three*). The frequencies as shown in Table 4.8 indicated that majority of the firms (51.3%) utilse cost control techniques described as being moderately efficient with means scores below 4.00 (3.4328), while firms (48.7%) had highly efficient cost control techniques usage with mean score of 4.5428. The overall mean scores of cost control techniques of firms sampled was also found to be moderately efficient with less than 4.0 (3.9736) at 95% confidence level. Further analysis of cost control system revealed respondents strong agreement in the following areas: properly designed and effective cost system with mean score of 4.11; and cost data influence on management decisions with mean score of 4.08. Budgetary control was highly utilised and most efficient of the cost control techniques examined, showed a mean score of 4.05 (*see Appendix 3*).

TABLE 4.8: MEAN SCORES OF COST CONTROL TECHNIQUES ADOPTED IN THE RESPONDENTS' FIRMS

	N (%)	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Moderately efficient	***80(51.3)***	***3.4328***	***0.29429***	***0.03290***	***3.3673***	***3.4983***	***2.75***	***3.88***
Highly efficient	***76(48.7)***	***4.5428***	***0.40288***	***0.04621***	***4.4507***	***4.6348***	***4.00***	***5.00***
Total	***156(100)***	***3.9736***	***0.65762***	***0.05265***	***3.8696***	***4.0776***	***2.75***	***5.00***

The frequencies as shown in Table 4.9 indicated that majority of the firms (75.6%) utilised performance measurement outcome as cost control input, represented by mean scores of 3.3489 and overall mean perception scores was 3.5491 indicating moderate efficiency.

TABLE 4.9: MEAN SCORES OF PERFORMANCE MEASUREMENT EFFICIENCY IN THE RESPONDENTS' FIRMS

	N (%)	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Less efficient	***1 (0.7)***	***1.8889***	**.**	**.**	**.**	**.**	***1.89***	***2.89***
Efficient	***118(75.6)***	***3.3489***	***0.36047***	***0.03318***	***3.2832***	***3.4146***	***3.14***	***3.94***
Highly efficient	***37 (23.7)***	***4.2327***	***0.17115***	***0.02814***	***4.1757***	***4.2898***	***4.00***	***5.00***
Total	***156(100)***	***3.5491***	***0.51454***	***0.04120***	***3.4678***	***3.6305***	***1.89***	***5.00***

Further, the balance scorecard performance measurement technique was found to be used most, representing about 81.4% of respondents' firms. 53.2% acknowledged that the balance scorecard is effective in customer aspect in terms of the strategy for creating value and differentiation (*see Appendix 3,* Section 5, Tables 7a and 7b).

Test of Null Hypotheses (i): Cost control systems have no significant effect on performance of firms in Nigeria.

Cost control system was examined by reference to cost control techniques and performance measurement techniques employed.

The result from the regression analysis and ANOVA relating to cost control techniques showed the effect on the four measures of performance as follows:

$$Perf_i = \beta_0 + \beta_1 \text{CCT } bud_i + \beta_2\ CCTvalue_i + \beta_3\ CCTactivity_i + \beta_4\ CCTtarget_i + e_i \quad (1)$$

$Perf_1 =$ 1.730 + 0.766 bud +0.054 value + 0.137 activity +0.053 target + 0.49399

Model 1 on non-financial performance (NFP) was significant ($p<0.01$), with $R^2 = 0.507$. That means cost control techniques (CCT) can explain 50.7% variation in non-financial performance. The fitness of the model is explained by a fairly higher F-ratio of 38.822; suggesting a better prediction of NFP.

$Perf_2 =$ 108.660 + 3.685 bud +5.282 value + 14.148 activity +4.053 target + 84.26659

Model 2 on pre-tax earnings (PTE) was significant with R^2 of 0.373 ($p > 0.01$), explaining about 37% variation in PTE, and fairly low F-ratio of 22.475, explaining the fitness of the model.

$Perf_3 =$ 111.051 + .757 bud +.068 value +(-.110) activity +.080 target + 177.40067

Model 3 on earnings per shares (EPS) was not significant ($p> 0.01$), with R^2 of 0.023.

$Perf_4 =$ 101.913 + .755 bud +.066 value +(-.130) activity +.060 target + 21.02748

Model 4 on turnover growth rate (TGR) was significant ($p< 0.01$), with R^2 of 0.119, explaining about 11.9% variation in TGR, and low F-ratio of 5.099, explaining the fitness of the model.

Budgeting technique was observed in all the performance models to be more efficient than other CCT with significant βs ($p <0.01$).

The result from the regression analysis and ANOVA relating to cost control techniques, is shown on Table 4.10A &B, where budgetary control, value analysis and target costing were significant in the model on non-financial performance (NFP) ($p<0.01$); β =0.911, 0 .086, 0.063 respectively with R^2 value of 0.507. It meant that CCT can explain 50.7% variation in NFP. The fitness of the model is explained by a fairly high F-ratio of 38.822; suggesting a better prediction of NFP. Model 2 on pre-tax earnings (PTE) was next significant with F-ratio of 22.457 and R^2 of 0.373 ($p< 0.01$), explaining about 37% variation in PTE.

TABLE 4.10A: RESULTS RELATING TO COST CONTROL SYSTEMS (COST CONTROL TECHNIQUES) EFFECT ON PERFORMANCE OF FIRMS IN NIGERIA

Coefficients

			Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	**1**		β	**Std. Error**	β		
		(Constant)	***1.730***	***.349***		***4.957***	***.000***
		Budgetary	***.766***	***.084***	***.911***	***9.119***	***.001***
		Value analysis	***.054***	***.146***	***.063***	***0.369***	***.000***
		Activity- based	***.137***	***.169***	***.076***	***0.810***	***.014***
		Target costing	***.053***	***.064***	***.086***	***0.828***	***.000***
Model	**2**	**(Constant)**	***108.660***	***13.583***		***7.999***	***.000***
		Budgetary	***3.685***	***3.332***	***.146***	***1.106***	***.010***
		Value analysis	***5.282***	***.6556***	***.175***	***8.057***	***.020***
		Activity- based	***4.148***	***.8301***	***.264***	***4.997***	***.000***
		Target costing	***4.053***	***1.051***	***.319***	***3.856***	***.000***
Model	**3**	**(Constant)**	***111.051***	***10.458***		***10.619***	***.000***
		Budgetary	***1.757***	***1.092***	***.680***	***0.002***	***.000***
		Value analysis	***.068***	***.1155***	***.025***	***0.589***	***.836***
		Activity- based	***-.110***	***.1215***	***-.083***	***-0.905***	***565***
		Target costing	***.080***	***.1084***	***.101***	***0.738***	***.037***
Model	**4**	**(Constant)**	***101.913***	***9.476***		***10.755***	***.017***
		Budgetary	***2.755***	***1.094***	***.880***	***2.518***	***.000***
		Value analysis	***1.066***	***.2135***	***.425***	***4.993***	***.869***
		Activity- based	***-2.130***	***.6209***	***-.087***	***-3.386***	***597***
		Target costing	***1.060***	***.5022***	***.121***	***2.111***	***.037***

1 a. Dependent variable: Non-Financial Performance
2 a. Dependent variable: PTE
3. a. Dependent variable: EPS
4. a. Dependent variable :TGR

TABLE 4.10B: MODEL SUMMARY AND ANOVA FOR COST CONTROL SYSTEMS (COST CONTROL TECHNIQUES) IMPACT ON PERFORMANCE

(i) Model Summary for NFP

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	**1**	***.712[a]***	***.507***	***.494***	***0.49399***

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

(ii) ANOVA[b] FOR NFP

			Sum of Squares	df	Mean Square	F	Sig.
Model	1	Regression	*31.239*	3	*10.413*	*38.822*	*0.000*
		Residual	*36.667*	*152*	*.241*		
		Total	*67.906*	*155*			

a. Predictors: budgetary control, value analysis activity-based and target costing

b. Dependent Variable: Non-financial performance

(iii) Model Summary for PTE

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	2	*.6115* [a]	*.373*	*.356*	*84.26659*

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

(iv) ANOVA FOR[b] PTE

			Sum of Squares	df	Mean Square	F	Sig.
Model	2	Regression	*78115.232*	3	*26038.411*	*22.457*	*0.000*
		Residual	*1120546.6*	*152*	*37.017*		
		Total	*1198661.832*	*155*			

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

b. Dependent Variable: Pre-tax earnings

(v) Model Summary for EPS

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	3	*.152* [a]	*.023*	*.002*	*177.40067*

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

(vi) ANOVA FOR EPS[b]

			Sum of Squares	df	Mean Square	F	Sig.
Model	3	Regression	*20.422*	3	*6.807*	*0.889*	*0.029*
		Residual	*46.609*	*152*	*0.3066*		
		Total	*67.031*	*155*			

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

b. Dependent Variable: Earnings per share

(vii) Model Summary for TGR

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	**4**	*.345* [a]	*.119*	*.096*	*21.02785*

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

(viii) ANOVA FOR TGR

			Sum of Squares	df	Mean Square	F	Sig.
Model	**4**	**Regression**	*9058.130*	*3*	*3019.377*	*5.099*	*0.001*
		Residual	*66767.741*	*152*	*439.261*		
		Total	*75825.871*	*155*			

a. Predictors: (Constant), budgetary control, value analysis activity-based and target costing

b. Dependent Variable: Turnover Growth Rate

The other techniques within cost control system examined on performance were the use of performance measurement techniques (PMT). The regression results are as follows:

$$Perf_i = \beta_0 + \beta_1 \text{ PM } bsc_i + \beta_2 \text{ PM } qcm_i + \beta_3 \text{ PM } abcm_i + \beta_4 \text{ PM } rsc_i + e_i \qquad (2)$$

$Perf_{1=}$ 1.091 + .788 bsc +.093 qcm + .025 abcm +.109 rsc + 0.47366

Model 1 on NFP revealed that the efficiency of PMT had significant effect on NFP ($p<0.01$), R^2=0.337, explaining about 33.7% variation in NFP and fairly low F ratio of 19.188, explaining the fitness of the model, suggesting a better prediction.

$Perf_{2=}$ 187.622 + 8.066 bsc + 5.199qcm +-6.084 abcm +-1.007 rsc + 62.64544

Model 2 on PTE was not significant ($p<0.01$), but at $p<0.05$ with R^2 of 0.138, explaining about 13.8% variation in PTE, and the fitness explained by extremely low F= 6.044

$Perf_{3=}$ 145.662 + 13.854 bsc +-3.743 qcm + 7.293 abcm +-6.218 rsc + 176.86409

Model 3 on EPS was not significant.

$Perf_{4=}$ 106.880 + 3.765 bsc +5.184 qcm + 12.126 abcm +-4.173 rsc + 23.05136

The model on TGR was significant ($p<0.01$), $R^2=0.277$, explaining about 27.7% variation in TGR, and the fitness explained by fairly low F= 14.463

Further, the balance score card was more efficient than other PMT with significant beta in all the models ($p <0.01$).

The result relating to performance measurement techniques (PMT) as shown on Tables 4.11A & B, revealed that the efficiency of PMT had significant effect on NFP and turnover growth rate (TGR) ($p<0.01$), explaining 33.7% ($R^2=0.337$) variation in NFP and 27.7% ($R^2=0.277$) of TGR. PMT explained 13.8% ($R^2=0.138$) variation in PTE ($p<0.05$). Further, the balance score card was more efficient than other PMT with significant βs in all the models ($p <0.01$).

TABLE 4.11A

RESULTS RELATING TO COST CONTROL SYSTEMS (PERFORMANCE MEASUREMENT TECHNIQUES) IMPACT ON PERFORMANCE OF FIRMS IN NIGERIA

			Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	**1**		β	**Std. Error**	β		
		(Constant)	***1.091***	***.469***		***2.326***	***.000***
		Bal score card	***.788***	***.094***	***.814***	***8.383***	***.000***
		Qual cost mgt	***.093***	***.145***	***.036***	***.641***	***.625***
		Act bas cos mgt	***.025***	***.189***	***.063***	***.132***	***.043***
		Resp cost mgt	***.109***	***.066***	***.082***	***1.652***	***.152***
Model	**2**	**(Constant)**	***187.622***	***24.169***		***7.763***	***.000***
		Bal score card	***8.066***	***4.322***	***.015***	***1.866***	***.000***
		Qual cost mgt	***5.199***	***5.698***	***.192***	***.912***	***.323***
		Act bas cos mgt	***-6.084***	***2.463***	***-.398***	***-2.470***	***.044***
		Resp cost mgt	***-1.007***	***4.051***	***-.020***	***-.249***	***.804***
Model	**3**	**(Constant)**	***145.662***	***15.005***		***9.707***	***.000***
		Bal score card	***13.859***	***10.152***	***.153***	***1.365***	***.000***
		Qual cost mgt	***-3.743***	***13.469***	***-.222***	***-.278***	***.015***
		Act bas cos mgt	***-7.293***	***8.321***	***-.060***	***-.876***	***.265***
		Resp cost mgt	***-6.218***	***8.528***	***.101***	***-.729***	***.467***
Model	**4**	**(Constant)**	**106.880**	**15.765**		**6.779**	**.000**
		Bal score card	***3.765***	***3.574***	***.108***	***1.053***	***.000***
		Qual cost mgt	***5.184***	***6.338***	***.157***	***.818***	***.006***
		Act bas cos mgt	***12.126***	***8.101***	***.282***	***1.497***	***.136***
		Resp cost mgt	***-4.173***	***1.011***	***-.317***	***-4.128***	***.000***

1 a. Dependent variable: Non-Financial Performance
2 a. Dependent variable: PTE
3. a. Dependent variable: EPS
4. a. Dependent variable :TGR

TABLE 4.11B: MODEL SUMMARY AND ANOVA FOR COST CONTROL SYSTEMS (PERFORMANCE MEASUREMENT TECHNIQUES) IMPACT ON PERFORMANCE

(i) Model Summary for NFP

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	1	.581[a]	.337	.319	0.47366

a. Predictors: (Constant),bal score card, qual cost and mgt, act bas cos mgt, resp cost and mgt

(ii) ANOVA FOR NPF

			Sum of Squares	df	Mean Square	F	Sig.
Model	1	Regression	28.422	3	9.474	19.188	0.000 [a]
		Residual	33.644	152	.221		
		Total	62.066	155			

a. Predictors: (Constant) bal score card, qual cost and mgt, act bas cost mgt, resp cost and mgt

b. Dependent Variable: non-financial performance

0

(iii) Model Summary for PTE

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	2	.371 [a]	.138	.115	62.64544

a.Predictors: (Constant), bal score card, qual cost and mgt, act bas cost mgt, resp cost and mgt

(iv) ANOVA FOR PTE

			Sum of Squares	df	Mean Square	F	Sig
Model	2	Regression	68113.131	3	22704.377	6.044	0.017 [a]
		Residual	1050542.9	152	911.466		
		Total	1118656.031	155			

a. Predictors: (Constant), bal score card, qual cost and mgt, act bas cost mgt, resp cost and mgt

b. Dependent Variable: Average PTE (%) (2006-2009)

(v) Model Summary for EPS

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	**3**	***.226[a]***	***.051***	***.026***	***176.86409***

a. Predictors: (Constant), bal score card, qual cost and mgt, act bas cos mgt, resp cost and mgt

(vi) ANOVA[b] FOR EPS

			Sum of Squares	df	Mean Square	F	Sig.
Model	**3**	**Regression**	***246063.58***	***3***	***82021.193***	***2.029***	***0.173 [a]***
		Residual	***4618602.4***	***152***	***30385.542***		
		Total	***4864665.98***	***155***			

a. Predictors: (Constant), bal score card, qual cost and mgt, act bas cost mgt, resp cost and mgt

b. Dependent Variable: Average EPS (%) (2006-2009)

(vii) Model Summary for TGR

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	**4**	***.526[a]***	***.277***	***.258***	***23.05136***

a. Predictors: (Constant), bal score card, qual cost and mgt, act bas cos mgt, resp cost and mgt

(viii) ANOVA[b] FOR TGR

			Sum of Squares	df	Mean Square	F	Sig.
Model	**4**	**Regression**	***11149.583***	***3***	***3716.528***	***14.463***	***0.000 [a]***
		Residual	***64696.290***	***152***	***425.633***		
		Total	***75845.873***	***155***			

a. Predictors: (Constant), bal score card, qual cost and mgt, act bas cost mgt, resp cost and mgt

b. Dependent Variable: Average TGR (%) (2006-2009)

4.5.3 Analysis of data relating to research question (iii): To what extent is IT control applications accepted and employed in cost control systems?

Acceptance and utilisation was measured using scores computed from questionnaire items (*see chapter three*). A total of 99.4% of the respondents perceived costing assignment as not too tasking as IT controls applications was seen to be easy to use. The highest mean score of 4.25 was recorded on "respondents perceive the information technology control applications is useful to carry out costing assignment"; representing high level acceptance; and 4.47 mean score was recorded for the response on "respondents like using the available IT control applications regularly"; representing high level utilisation *(See appendix* 3, Table 4*)*. The overall mean score for IT control applications acceptance and utilisation on cost control tasks are acceptance 4.1891 and utilisation 4.2564 with standard deviation at 0.63587 and 0.62084 respectively. This represents a high level acceptance and utilisation of IT control applications for cost control task as shown in Tables 4.12 and 4.13.

TABLE 4.12: RESULT RELATING TO ACCEPTANCE OF IT CONTROL APPLICATIONS FOR COST CONTROL

	N	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Low	***40(25.6)***	***3.3625***	***0.33945***	***0.05367***	***3.2539***	***3.4711***	***2.00***	***3.50***
High	***116(74.4)***	***4.4741***	***0.43160***	***0.04007***	***4.3948***	***4.5535***	***4.00***	***5.00***
Total	***156(100)***	***4.1891***	***0.63587***	***0.05091***	***4.0885***	***4.2897***	***2.00***	***5.00***

TABLE 4.13: RESULT RELATING TO UTILISATION OF IT CONTROL APPLICATIONS FOR COST CONTROL

	N	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Low	***31(19.9)***	***3.3065***	***0.33360***	***0.05992***	***3.1841***	***3.4288***	***2.50***	***3.50***
High	***125(80.1)***	***4.4920***	***0.41632***	***0.03724***	***4.4183***	***4.5657***	***4.00***	***5.00***
Total	***156(100)***	***4.2564***	***0.62084***	***0.04971***	***4.1582***	***4.3546***	***2.50***	***5.00***

4.5.4 Analysis of data relating to research question (iv): To what extent do different IT control applications affect performance of the firms?

In proffering answer to research question (iv), a descriptive analysis was done and null hypothesis (ii) was tested.

The different IT control applications efficiency was measured using scores computed from questionnaire items (*see chapter three*). The overall mean score for IT control applications level efficiency was 4.0667 representing high level efficiency as displayed in Table 4.14. Supplier chain management control applications were found to be most effective, accounting for a mean score of 4.12 and standard deviation of 0.882 (*see appendix 3:* Section 3, Table 3).

TABLE 4.14: IT CONTROL APPLICATIONS EFFICIENCY

	N	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Low level efficiency	***1(0.06)***	***1.4000***	**.**	**.**	**.**	**.**	***1.40***	***1.40***
Average level efficiency	***65(41.7)***	***3.5138***	***0.26213***	***0.03251***	***3.4489***	***3.5788***	***2.40***	***3.80***
High level efficiency	***90(57.7)***	***4.4956***	***0.35121***	***0.03702***	***4.4220***	***4.5691***	***4.00***	***5.00***
Total	***156(100)***	***4.0667***	***0.61648***	***0.04936***	***3.9692***	***4.1642***	***1.40***	***5.00***

Further observation revealed that, information technology system efficiency was high in the following areas: central IT unit oversees the computerised accounting operations with mean score of 4.11; IT adequately caters for all control tasks performed in the firm with mean score of 4.06; and information technology has had effect on various management control task with mean scores of 4.03 (*see Appendix:* Section 3, Table 2).

Analysis of control applications usage efficiency showed that the Suppliers chain management (SCM) and Scheduling key task-service delivery/production (TSD) applications had high efficient utilisation with mean scores of 4.12 and 4.08 respectively (*see Appendix* Section 3, Table 3).

In ascertaining the effect of different IT control applications on performance, null hypothesis (ii) was tested.

Test of Null Hypotheses (ii): There is no significant difference in the effect of the various IT control applications on performance.

The test of significant difference in the effect of the various IT control applications on performance of firms are shown on Tables 4.15.

$$Perf_i = \beta_0 + \beta_1 \text{ IT } crm_i + \beta_2 \text{ IT } scm_i + \beta_3 \text{ IT } ccm_i + \beta_4 \text{ IT } tsd_i + \beta_5 \text{ IT } hmm_i + e_i \quad (3)$$

$Perf_1$ = 1.530 + 0.766 crm + 0.054 scm + 0.137 ccm + 0.053 tds + 0.85 hmm + 0.44176

Model 1 on NFP, the efficiency of IT control applications on cost control systems was significant ($p<0.01$), with R^2 of 0.474, that is explaining about 47.7% variation of non-financial performance. With fairly high F value of 28.273; explaining the fitness of the model.

$Perf_2$ = 107.360 + 3.645 crm + 5.282 scm + 14.148 ccm + 4.053 tds +3.407 hmm + 63.48659

Model 2 on PTE was not significant.

$Perf_3$ = 107.360 + 3.645 crm + 5.282 scm + 14.148 ccm + 4.053 tds +3.407 hmm + 57.22047

Model 3 on EPS was not significant.

$Perf_4$ = 107.360 + 3.645 crm + 5.282 scm + 14.148 ccm + 4.053 tds +3.407 hmm + 23.04765

The model on TGR was significant ($p< 0.01$), with R^2 of 0.237; IT control applications explaining 23.7% variation in TGR

Task scheduling and delivery (TDS) control application was observed to be significant ($p<0.01$), in all the models.

The result as shown on (Table 4.15 A) revealed that in model 1 on NFP, the efficiency of IT control applications on cost control systems can explain about 47.7% of non-financial performance. F value of 28.273 ($p<0.01$) showed the fitness of the model in explaining non-financial performance. On financial performance: PTE and TGR models were also slightly significant with R^2 of 0.171 and 0.237 respectively explaining the variation on the effect of IT control application components on performance.

On Table 4.15 b, coefficient analysis of model 1 and 4 was carried out since they revealed better explanatory effect of IT application control variables on performance. Model 1 showed that TDS is significant at $p<0.01$ with t-values at .822, β 0.685; cash control management (CCM) t-values of 0.280, β = 0.057 while supplier chain management (SCM) t-value at 0.321 and β coefficient value of 0.031. Model 4 revealed that task delivery and scheduling (TDS) is significant ($p< 0.01$), with t-values at 0.305 β = 0.305 and SCM t-value = 8.094, β coefficient value is 0.145. The null hypothesis two was thus rejected.

Table 4. 15A THE EFFECT OF IT CONTROL APPLICATIONS ON COST CONTROL SYSTEMS EFFICIENCY

ANOVA[b]

			Sum of Squares	df	Mean Square	F	Sig.
Model	**1**						
		Regression	*36.686*	*4*	*9.172*	*28.273*	*.000*
		Residual	*39.608*	*151*	*.262*		
		Total	*76.294*	*155*			
Model	**2**						
		Regression	*59608.567*	*4*	*14902.142*	*6.394*	*.056*
		Residual	*1174447.8*	*151*	*7777.8*		
		Total	*1234056.367*	*155*			
Model	**3**						
		Regression	*134587.42*	*4*	*33646.855*	*5.173*	*.473*
		Residual	*4974120.6*	*151*	*32941.196*		
		Total	*5108708.02*	*155*			
Model	**4**						
		Regression	*6109.805*	*4*	*1527.451*	*9.629*	*.001*
		Residual	*85536.467*	*151*	*566.467*		
		Total	*91646.272*	*155*			

a. Predictors: (constant), CRM, SCM, CCM, TSD, HMM;
b. Dependent variable:
1. non-financial performance
2. dependent variable: PTE
3. dependent variable :EPS
4. dependent variable :TGR

SUMMARY OF THE MODEL [a]

		R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	1	*.691* [a]	*.477*	*.463*	*.47176*
	2	*.414* [a]	*.171*	*.021*	*26.48659*
	3	*.378* [a]	*.143*	*.081*	*57.22047*
	4	*.487* [a]	*.237*	*.049*	*23.04765*

a. Predictors: (constant), CRM, SCM, CCM, TSD, HMM;

TABLE 4.15B: REGRESSION RESULTS OF THE EFFECT OF THE VARIOUS IT CONTROL APPLICATIONS ON PERFORMANCE

			Unstandardized Coefficients		**Standardized Coefficients**		
Model	**1**		***β***	**Std. Error**	***β***	**t**	**Sig.**
		(Constant)	***1.530***	***.367***		***4.169***	***.000***
		CRM	***.766***	***.162***	***.511***	***4.728***	***.013***
		SCM	***.054***	***.168***	***.031***	***.321***	***.000***
		CCM	***.137***	***.167***	***.057***	***.280***	***.004***
		TDS	***.053***	***.064***	***.685***	***.828***	***.000***
		HMM	***.085***	***.048***	***.067***	***1.771***	***.023***
Model	**2**	**(Constant)**	***142.601***	***18.312***		***7.787***	***.000***
		CRM	***3.212***	***3.043***	***.030***	***1.055***	***.041***
		SCM	***3.430***	***1.494***	***.046***	***2.296***	***.067***
		CCM	***7.422***	***4.870***	***.058***	***1.524***	***.050***
		TDS	***5.244***	***1.853***	***.028***	***2.830***	***.000***
		HMM	***3.266***	***1.774***	***.146***	***1.841***	***.011***
Model	**3**	**(Constant)**	***102.421***	***19.312***		***5.303***	***.000***
		CRM	***2.512***	***1.843***	***.030***	***1.363***	***.024***
		SCM	***2.450***	***1.194***	***.046***	***2.052***	***.027***
		CCM	***3.372***	***4.170***	***.058***	***.809***	***.070***
		TDS	***-5.622***	***1.253***	***-.028***	***-4.487***	***.000***
		HMM	***-3.245***	***1.574***	***-.146***	***-2.062***	***.053***
Model	**4**	**(Constant)**	***107.360***	***13.723***		***7.823***	***.000***
		CRM	***3.645***	***3.552***	***.176***	***1.026***	***.028***
		SCM	***5.282***	***.6526***	***.145***	***8.094***	***.040***
		CCM	***4.148***	***.4401***	***.233***	***9.425***	***.000***
		TDS	***4.053***	***1.051***	***.305***	***3.856***	***.000***
		HMM	***3.407***	***2.056***	***.296***	***1.657***	***.026***

1 a. Dependent variable: Non-Financial Performance
2 a. Dependent variable: PTE
3. a. Dependent variable: EPS
4. a. Dependent variable: TGR

4.5.5 Analysis of data relating to research question (v): To what extent do organisational structures (lines of authority and cost control structure) influence the efficiency of cost control system and information technology system?

The correlation analysis showed significant relationship between lines of authority /cost control structure and cost control system/information technology system. Cost control strcture is significantly correlated negatively with CCS (CCT only) ($p<0.05$) and lines of authority is significantly correlated positively with IT system and CCS (in terms of CCT and negatively in terms of PMT) ($p<0.05$) r =0.436, 0.307 and -0.179 respectively.

Two null hypotheses were tested inorder to answer research question (v).

Test of Null Hypotheses (iii): Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of cost control system.

Confirming significant relationship with some of the variables in CC system, a linear regression model was used in explaining the extent of the relationship.

$$CCS_i=\beta_0 + \beta_1 \text{ OV } struct_i + \beta_2 \text{ OV } auth_i + e_i \quad (4)$$

CCS = 4859 + 0.774 struct + -0198 auth + 0.74586

The regression on cost control system was found to be statistically significant ($p < 0.05$), with $R^2 = 0.142$; that is; only 14.2% variation in efficiency of cost control system can be explained by cost control structure and lines of authority. The fitness of the model can be explained by F-ratio on Tables 4.16

TABLE 4.16: REGRESSION RESULTS OF THE EFFECT OF ORGANISATIONAL STRUCTURES (LINES OF AUTHORITY AND COST CONTROL STRUCTURE) ON THE EFFICIENCY OF COST CONTROL SYSTEM

	Beta	Stdzd. Beta	P_value
Constant	**4.859**	**-**	**0.000**
Organisation cost control structure	**0.774**	**0.639**	**0.000**
Organisation lines of authority	**-0.198**	**-0.309**	**0.022**
Adjusted R^2	**0.142**		
F (P_value)	**13.457 (0.043)**		

Dependent variable: Cost control system

Test of Null Hypotheses 4: Organisational structures (lines of authority and cost control structure) have no significant effect on the efficiency of information technology system.

Confirming significant relationship with some of the variables IT system, a linear regression model was used in explaining the extent of the relationship.

$$IT_i = \beta_0 + \beta_1 \text{ OV } struct_i + \beta_2 \text{ OV } auth_i + e_i \quad (5)$$

IT = 4.551 + -0.045 + struct + 0.016 auth + 0.66364

The regression on information technology control applications was found to be statistically significant ($p < 0.05$), with $R^2 = 0.157$, that is, 15.7% variation in efficiency of information technology system can be explained by organisational factors of cost control structure and lines of authority. The fitness of the model can be explained by F-ratio on Tables 4.17.

TABLE 4.17: REGRESSION RESULTS OF THE EFFECT OF ORGANISATIONAL STRUCTURES (LINES OF AUTHORITY AND COST CONTROL STRUCTURE) EFFECT ON THE EFFICIENCY OF INFORMATION TECHNOLOGY SYSTEM

	Beta	Stdzd. Beta	P_value
Constant	**4.551**	**-**	**0.000**
Organisation cost control structure	**-0.045**	**-0.038**	**0.046**
Organisation authority	**0.016**	**0.049**	**0.039**
Adjusted R^2	**0.157**		
F (P_value)	**12.995 (0.014)**		

Dependent variable: IT control applications

4.5.6 Analysis of data relating to research question (vi): What is the extent of correlation between cost control system and available information technology control applications?

Research question (vi) was answered by means of descriptive and correlation analysis. Null hypothesis (v) was tested.

The descriptive analysis of all variables as shown on Table 4.5 revealed that Task-fit had a mean score of 4.1571 representing high level of CC-IT fit.

Test of Null Hypotheses (v): There is no association between cost control system and information technology control applications adopted by firms.

The results of the correlation analysis on Table 4.18 indicated that a positive significant relationship exists between cost control techniques and performance measurement techniques and IT controls applications = 0.617 and 0.616 ($p < 0.01$). Further investigation revealed that the measure of Task-IT system fit is significant with relatively high positive correlation for cost control techniques (0.644); performance measurement techniques (0.707) and IT control applications = 0.508 ($p < 0.01$). This suggested a rejection of the null hypothesis five of no association between cost control systems of using cost control system and IT control applications.

Table 4.18: RESULTS OF CORRELATIONS COEFFICIENTS OF ASSOCIATION OF COST CONTROL SYSTEM AND INFORMATION TECHNOLOGY CONTROL APPLICATIONS

	1	2	3	4	5	6	7	8
1.Org cost control structure	**1**							
2.Org. lines of authority	**-.803***	**1**						
3. Acceptance	**-.176***	**.165***	**1**					
4. Utilisation	**-0.099**	**0.075**	**.399****	**1**				
5. IT control applications	**-0.253**	**0.436***	**.374****	**.358****	**1**			
6. Cost control techniques	**-0.218***	**0.307***	**.420****	**.322****	**.617****	**1**		
7. Perf measure techniques	**0.061**	**-179***	**.433****	**.366****	**.616****	**.911****	**1**	
8. Task- IT systems fit	**0.13**	**-0.109**	**.366****	**.429****	**.644****	**.707****	**.508****	**1**

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

4.5.7 Analysis of data relating to research question (vii): To what extent does a relationship exists between performance and the level of association (fit) observed between cost control system and information technology control applications?

Research question (vii) was answered by reference to null hypothesis (vi).

Test of Null Hypotheses (vi): There is no significant relationship between performance and the level of association (fit) observed between cost control system and information technology control applications.

The proposition was tested in the regression as shown in model 6.

$$Perf_i = \beta_0 + \beta_i int_i + e_i \qquad (6)$$

$Perf_1 = 1.820 + 0.662$ int + 0.42398

The result of the regression analysis is presented in Table 4.19. The regression on NFP was statistically significant ($p< 0.01$) with $R^2 = 0.570$, that is, CC-IT systems relationship can explain 57.0% of variation in NFP; fitness of the model explained by F-ratio = 67.822, is high and significant, in explaining non-financial performance.

$Perf_2 =$ 219.919 + -28.146 int + 65.24875

Model 2 on PTE was not significant.

$Perf_3 =$ 146.101 + -22.133 int + 59.44069

Model 3 on EPS was not significant.

$Perf_4 =$ 108.333 + 1.168 int + 25.18987

TGR model was statistically significant ($p< 0.01$), with $R^2 = 0.290$ that is, explaining about 29.0% variations in TGR; F value of 48.663 showed that the model is significant in explaining TGR.

TABLE 4.19: REGRESSION RESULTS OF THE EFFECT OF INTERGRATED CC-IT SYSTEMS ON PERFORMANCE

	Non-financial performance			*Average PTE*			*Average EPS*			*Average TGR*		
	Beta	Stdzd Beta	P-value	Beta	Stdzd Beta	P- value	Beta	Stdzd Beta	P- value	Beta	Stdzd Beta	P- value
(Constant)	1.820	-	0.000	219.919	-	0.000	246.101	-	0.052	108.333	-	0.000
CCS-IT	0.662	0.524	0.000	-28.146	-0.178	0.030	-22.133	-0.067	0.415	1.168	0.029	0.717
Adjusted R^2	0.570			0.098			-0.019			0.290		
	67.822 (0.000)			12.612 (0.033)			0.456 (0.664)			48.633 (0.000)		

Dependent variables: Non-financial performance; Average PTE; Average EPS; Average TGR

The proposition that there is no significant relationship between performance and the level of association observed between cost control system and information technology control applications was null hypothesis six. The result of the regression analysis is presented in Table 4.19. The regression was statistically significant ($p< 0.01$), with CC-IT systems relationship explaining 57.0% of variation in NFP, and about 29.0% in financial performance: TGR. The fitness of the model explained by F-ratio = 67.822, is high and significant, in explaining non-financial performance while an F value of 48.663 ($p<0.01$) shows that the model is significant in explaining TGR. The models on CC-IT systems relationship on other financial indicators- pre-tax earnings (PTE) and earnings per share (EPS) were not significant.

The result for financial performance -PTE revealed that Adj $R^2 = 0.098$ which shows that CC-IT systems integration can explain only about 9.8% of PTE. Low F value of 12.612 was significant ($p<0.05$), in explaining PTE. The null hypothesis of no significant effect on performance was rejected.

4.6 ANALYSIS OF SECONDARY DATA: ACCOUNTING MEASURES AND CORPORATE PERFORMANCE

The effect of integration of cost control and information technology systems on corporate performance might reflect not only on non-financial performance but also on financial performance. Financial performance was determined through ratio analyses. The influence of integrated cost control and information technology system is represented by proxy on change in earnings, turnover growth, and earnings per share. The financial information relating to these variables are deduced from the annual financial report of NSE listed banks. The analyses covered 2006-2010 financial report, with 2005 as base year (BYr) *(See Appendix 4).*

In drawing inferences from the analysis, 2008 financial year was used as a bench mark in determining whether firms managed their resources including cost properly. The year 2008 was the pivotal period noted for global financial and economic crisis that was hard to deal with by many firms (Asel, 2009; Okeke, 2009), and the stock exchange market crumbled (Ajakaiye & Fakiyesi). Several firms left the market as buyers withdrew their funds with adverse effect on market capitalization (Ajakaiye, *et al.*,2009). It is assumed in this study therefore, that only firms who engaged in strategic cost control management and sophisticated information technology could increase revenue as would be indicated by the three accounting variables measured.

4.6.1 Computation of Change in Pre-tax Earnings (PTE)

The percentage change in pre-tax earnings for sampled firms within the study period were computed from the financial statements using 2005 earnings before tax, as base year. It was determined by recourse to change in period 2 divided by change in period 1 multiplied by 100. (For the result, *see appendix 4, Table 9).* It is assumed in this study that, earnings would increase as cost is controlled especially when overheads and information relating to cost control is properly managed on IT platform. With the large number of firms involved, an industrial average is computed and plotted graphically. The trend graph of each industry is presented in '*appendix 5'*. The period 2006 to 2010, Agricultural/agro-allied, Emerging market, Mortgage, Petroleum marketing industries experienced downward trend in their earnings prior to taxation; while Automobile & tyre, Conglomerates, Insurance, Machinery marketing, Maritime, Packaging industries experienced an upward trend in pretax earnings. Industries such as Chemicals & paints, Computer & office equipment, emerging technology and Industrial/domestic product witnessed a downward trend from the year 2008. In summary, the total industrial average for change in PTE, shows a slow but steady upward trend since 2008.

4.6.2 Computation of Change in Earnings per Share (EPS)

The percentage change in earnings per share for sampled firms within the study period were presented *(see appendix 4, Table 9*). The information were extracted from the financial statement and computed as change in EPS period 2 divided by change in EPS period 1 multiplied by 100. An industrial average is computed and plotted graphically (*see appendix 5).* The result revealed that from 2008, Breweries, Building materials, Chemical & paint, Commercial services, Construction, Emerging market, Emerging technology, Insurance, Maritime, Mortgage companies, Packaging and Petroleum marketing witnessed a steady downward trend in earnings per share while Agriculture/agro-allied, Automobile & tyre, Banking, Printing & publishing, Real estate among others experienced an upward trend in EPS after 2008. The industrial average in total showed a sharp upward EPS trend from 2008.

4.6.3 Computation of Turnover Growth Rate (TGR)

The percentage turnover growth rate for sampled firms within the study period were presented (*see appendix 4, Table 10).* It was computed as change in turnover between periods, divided by previous turnover multiplied by 100. An industrial average is computed and plotted graphically (*see appendix 5).* The result revealed that from 2008, a downward trend was experienced by the following industries: Construction, Industrial and domestic product, footwear and packaging while Agriculture/agro-allied, Automobile & tyre, Banking, Building materials, Chemical and paints, Conglomerates, Emerging market, Emerging technology, Maritime, Petroleum marketing, Printing and Publishing industries experienced steady growth from 2008. The total for all industries in terms of TGR reflects this steady growth.

CHAPTER FIVE
DISCUSSIONS AND INTERPRETATIONS OF FINDINGS

5.1 INTRODUCTION

This chapter presents the discussion and interpretation of the findings of the study. For proper structuring, the discussion is presented in five subsections. The first subsection expounded the findings from cost control system efficiency. Subsection two provided the findings on IT control applications efficiency and the application of technology acceptance theory. Subsection three discussed the findings from influence of contingency variables. Subsection four presented a discussion on task-technology theory in relation to association of IT control applications and cost control systems. Subsection five was devoted to a discussion of the findings on the relationship and effect of cost control and information technology systems' integration on performance.

5.2 FINDINGS ON COST CONTROL SYSTEM EFFICIENCY

Results in relation to objectives one and two provided solution for cost control system efficiency.

5.2.1 Results for objectives (i) in response to Research Questions (i) on extent of cost accounting system development

Findings on research question one, provided solution to objective one, on the extent of cost accounting system development: 64.7% of firms were in stage two and three of cost system development. With reference to Kaplan *et al.,* (1998) description of stages of costing system development, the analysis from this study showed responses on costing system development as moderately developed system. This result is consistent with earlier findings in Haldma and Laats, (2002) on Estonian manufacturing companies, where the study found 74% of companies surveyed, had undeveloped cost accounting system and had to make changes in different aspect of the accounting systems. Kaplan *et al.,* (1998) confirmed that the fourth

stage depicts a level where cost and performance measurement information become integrated into the main stream/fabric of organisational reporting and managerial process.

A Total means score of 3.6534 was recorded for cost system development, which also implied moderately developed cost accounting system. From the indicators measured in respect of cost system development, the lowest response means score was recorded on, the effective utilisation of COMEX software for cost assignment, planning and control while the highest means score was recorded for responses on the design of cost control system. Literature has shown that the design of cost accounting system efficiency is paramount to having a functioning cost control (Adeniyi 2001; Uyar, 2010). Software for cost assignment, planning and control are essential for cost management and strategic planning (Granland, 2007).

5.2.2 Results for objectives (ii) in response to Research Question (ii) on extent of cost control systems efficiency

Research question two sought to examine the extent of efficiency of cost control techniques and performance measurement techniques employed by the Nigerian firms. Null hypothesis one was tested. The result revealed that majority of the firms (51.3%) utilsed cost control techniques which was described as moderately efficient while firms (48.7%) described the usage as highly efficient. The overall mean score for cost control techniques of firms sampled was also found to be moderately efficient with less than 4.0 (3.9736).

It was further revealed from performance measurement techniques employed, that majority of the firms (75.6%) utilsed performance measurement techniques which was described as moderately efficient while firms (23.7%) described the usage as highly efficient. The overall mean score for cost control techniques of firms sampled was also found to be moderately efficient with less than 4.0 (3.5491).

The regression analysis that tested hypothesis one showed from the coefficient analysis that budgetary control was significant in all the performance models. In model one (non-financial performance) budgetary control had a higher β, followed by target costing and value analysis (β =0.911, 0.086, 0.063; respectively $p<0.01$). Cost control techniques explained 50.7% variation of non-financial performance, and about 37% variation in pre-tax earnings. The fitness of model one was explained by F-ratio of 26.472; suggesting a better prediction of non-financial performance model.

For performance measurement, the coefficient analysis showed that balance score card was significant in all the performance models ($p<0.01$). Performance measurement techniques explained 33.7% variation of non-financial performance, and 27.7% variation in turnover growth rate. The fitness of model one was explained by F-ratio of 35.534; suggesting a better prediction of non-financial performance model.

These findings are in harmony with the result from Uyar (2010) on a study of companies in Egypt, where the use of balance score card and advanced cost accounting technique was found to be described as rather low and slow (less effective). The use of performance measurement techniques in cost control system was emphasised in the works of Reka *et al.* (2008) where cost management system was linked with performance measurement systems to achieve corporate performance. Mansyur, (2009) argued that performance measurement techniques communicate financial and non-financial objectives and provide an overall summary of performance necessary for control purposes.

5.3 FINDINGS ON IT CONTROL SYSTEM EFFICIENCY AND APPLICATION OF TECHNOLOGY ACCEPTANCE THEORY

Results in relation to objective three and four provided solution for IT control system efficiency.

5.3.1 Results for objectives (iii) in response to Research Question (iii) on extent of IT control applications' acceptance and utilisation

Research question 3, which sought to ascertain the level of IT control applications acceptance and utilisation on cost control systems in listed firms, provided answer to objective three. The study indicated that 99.4% of the respondents perceived costing assignment as not too tasking as IT control applications was accepted as easy to use. High level utilisation was shown as 100% response rate was recorded on, respondents like using the available IT control applications regularly. The overall mean score of IT control applications acceptance, 4.4741 and utilisation 4.4920 represented a high level acceptance and utilisation of IT control applications in cost control system.

This finding is consistent with the study of Usoro *et al.,* (2010) which argued that acceptance of IT would lead to effective utilisation of such technology. The study confirmed the use of TAM/TTF models as a sound theoretical foundation for the study of IT users. According to literature, acceptance affects the extent of utilisation of IT application (Klopping & McKinney, 2004; Usoro *et al.* 2010). Dishaws *et al.,* (2002) study found that acceptance and utilisation are necessary in the selection of IT applications and software.

5.3.2 Results for objectives (iv) in response to Research Question (iv) on efficiency of IT control applications

Findings on analysis of research question four, provided solution to objective four, on the extent to which different IT control applications affect performance of the firms. Null hypothesis two was tested. The study revealed that, IT control applications on cost control systems explained about 47.7% of non-financial performance; 17% of pre-tax earnings and

13% of turnover growth rate. The fitness of the non-financial performance model was explained by F value of 28.273 ($p<0.01$).

TDS, CCM and SCM were significant at 0.01 in the non-financial performance model; with TDS β cofficient value at 0.685, CCM β at 0 .057 while SCM β coefficient value at 0.031. This result suggested a rejection of the null hypothesis two of no significant difference of IT control applications on performance.

The study of Cooper and Dart (2009) and Alves (2010), similarly found the use of advanced information technology in the form of control applications such as enterprise resource planning systems, supply chain management and customer relationship management was effective in providing cost control information and had effect on performance.

5.4 FINDINGS ON THE INFLUENCE OF CONTINGENCY VARIABLES

Results for objective (v), in relation to research question (v) on the influence of organisational factors

To achieve objective (v), research question (v) was answered and null hypothesis (iii) and (iv) tested. Research question five sought to find out the effect of organisational cost control structure and lines of authority on cost control system and information technology system efficiency. The test of null hypothesis three revealed that organistional factors can explain about 14.2% ($R^2 = 0.142$) of cost control efficiency. The F value of 13.457 ($p<0.05$) indicated that the fitness of the model is significant in explaining cost control system efficiency. This result suggested a rejection of the null hypothesis three of no significant influence. These results would be interpreted as evidence that cost control structure and lines of authority have significant influence on cost control efficiency. The amount of variation suggests a weak association.

The test of null hypothesis four showed that organistional factors can explain about 15.7% (Adj R^2 = 0.157) of IT-control applications efficiency. The F value of 12.995 ($p<0.05$) indicated the fitness of the model in explaining IT-control applications efficiency. These results would be interpreted as evidence that cost control structure and lines of authority have significant influence on IT-control applications efficiency. However, the amount of variation suggests a weak association.

The expectation of significant effect of organisational factors was therefore supported. That means the efficiency of cost control system and of information technology control applications will vary with cost control structure and lines of authority. The evidence is in conformity with earlier evidence of moderating effect of organisational factors (Afaanz, 2009).

5.5 FINDINGS ON THE APPLICATION OF TASK-TECHNOLOGY THEORY

Results for objective (vi), in relation to research question (vi) on the extent of fit between cost control systems and IT control applications

To achieve objective (vi), research question (vi) was answered and null hypothesis (v) tested. Research Question (vi) ascertained the extent of association between cost control systems (costing technique and performance measurement) and available information technology control applications. The correlation analysis indicated that, Task-IT system fit is significantly positive and correlated with cost control techniques; performance measurement techniques and IT control applications ($p< 0.01$). This suggests a rejection of the null hypothesis of no association between cost control system and IT control applications. This could be interpreted to mean that there is a fit between CC and IT systems. This result support extant literature that system fit is necessary in the selection of IT applications and software (Vessey *et al.,* 1991; Dishaws *et al.,* 2002; Angerer, 2006). Information technology becomes more suitable and adaptable when the tasks are well defined and independent notwithstanding the complexity or routine nature (Kangas, 2003).

5.6 FINDINGS ON ASSOCIATION OF CC-IT SYSTEMS AND EFFECT OF THE RELATIONSHIP ON PERFORMANCE

Results for objective (vii), in relation to research question (vii) on relationship between CC-IT systems and performance

To achieve objective (vii), research question (vii) was answered and null hypothesis (vi) tested. Research question seven sought to find out the effect of the relationship observed between cost control system and information technology system on performance. The regression analysis showed that CC-IT systems can explain about 57.0% (Adj $R^2 = 0.570$) of non-financial performance. The F value of 67.822 ($p<0.01$), indicated that the fitness of the model was significant in explaining CC-IT systems integration on non-financial performance. Also, the integrated system explained 29.0% variation of turnover growth rate (TGR), with F value of 48.633 explaining the fitness of the turnover growth rate model. The models on CC-IT integrated systems on other financial indicators- pre-tax earnings (PTE) and earnings per share (EPS) were not significant.

These results suggest that a systematic relationship exists between integration and performance. It provided weak support for the expectation in the study, that integration may be used as influence on the performance of listed firms especially in terms of non-financial performance. This is consistent with the findings of Pondeville, (1999) and Hyvonen (2007 and 2008) where an IT interaction with management control systems (cost control) was linked to performance.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This study attempted to provide empirical evidence on the effect of utilising cost control systems and IT systems in terms of control applications to improve corporate performance in listed firms in Nigeria. The study collected data and tested hypotheses regarding various relationships existing between cost control techniques, performance measurement techniques and IT control applications, acceptance and utilisation; influence of organisational variables; and integrated cost control systems on corporate performance. This chapter presents a summary of the research, its conclusion, implication for practice and recommendations. Next, the contributions made to management accounting and information technology systems literature. Lastly, it discusses the limitations in the findings and provides some suggestions for future research directions.

6.2 SUMMARY

This research was stimulated by reports on the global economic and financial crisis and its effect on performance of firms listed on the floor of the stock exchange market (Ajakaiye *et al.*, 2009) which led to several debates on survival strategies. Globalisation of the world economy has challenged business organisations all over the world to pay greater attention to maintaining their competitive advantage and adapt their control systems to the changing environment (Asel, 2009). Also with the availability of sophisticated technology, firms are optimising their business strategies and control systems (Madapusi, 2009).

The aim of this study was to provide empirical evidences on the extent to which enhanced corporate performance could be achieved through the association of efficient cost control

system and information technology control applications while controlling influences of organisational variables.

In order to achieve the aim of the study a model was developed proposing influences of two organisational variables: cost control structure and lines of authority on cost control system efficiency and IT system efficiency, then when a fit exist, referred to as the IT-Task fit, the relationships would result into performance: non-financial and financial. Seven research questions drawn from this model and objectives stremming there from guided the conduct of the research and informed the formulation of six hypotheses. The model was tested using data collected from one hundred and fifty six (156) respondents and analysed using statistical tools including means, standard deviations, correlations, regression and analysis of variance.

The first specific objective of the study was to find out whether the cost accounting system in NSE listed firms were developed sufficiently to enable integration. The evidences provided, fair support of the expectation, as most firms cost accounting system were moderately developed. With reference to Kaplan *et al.,* (1998) on the description of stages of cost accounting system development, 64.7% of the listed firms were in stages two and three; where financial reporting drives costing system, customized and managerially relevant, but stand-alone systems.

The second objective on cost control systems' efficiency, which included ascertainment of efficiency of cost control techniques and performance measurement techniques. The result showed moderately efficient cost control techniques. This result suggested that, cost management is not very thorough in the listed firms examined. Evidences were also provided in support of the proposition that there is difference in the effect of cost control techniques on performance.

Ascertainment of efficiency of performance measurement techniques, as input platform for cost control, the balanced score card technique was found to be used more by firms,

representing 81.4%, when compared with other performance measurement techniques. The use of the balanced score card had better effect on non-financial performance and with significant βs in all the models ($p<0.01$). The result from test of hypothesis revealed a strong support for the proposition of a significant difference in the effect of cost control techniques on performance; and significant difference in the effect of performance measurement techniques on performance. These results suggest that performance measurement techniques are effective as input platform for cost management. This position highlights the argument put fowardin Ajibolade (2008), that measuring performance and cost control constitute pillars of performance.

The third objective was to ascertain IT control applications efficiency and the extent of IT control applications acceptance and utilisation in meeting cost control tasks in listed firms. The result showed that 99.4% of the respondents perceived IT control applications as easy to use. High level utilisation was revealed in the 100% response rate recorded on the issue of using the available IT control applications regularly. The expectation of high IT control applications acceptance and utilisation on cost control systems was achieved. This finding is consistent with the study of Usoro *et al.* (2010) which argued that acceptance of IT would lead to effective utilisation of such technology.

On the extent of different IT control applications on performance which was objective four, the study found that among the various IT control applications enumerated for cost control purposes, the supplier's chain management application was found to be most effective, represented by a highest mean score. The test of hypothesis on the efficiency of the different components of IT control applications effect on performance, the study showed a strong support for the proposition in terms of non-financial performance and turnover growth rate. According to literature, acceptance affects the extent of utilisation of IT application (Klopping & Mckinney, 2004; Usoro *et al.* 2010) and effect on performance.

The fifth objective was to determine the effect of organisational factors: control cost control structure and lines of authority on cost control system and information technology control applications efficiency. Evidences provided a weak support for the proposition that cost control structure and lines of authority influences cost control system and information technology control applications efficiency. Cost control structure of the firm and lines of authority can explain about 14.2% variation of cost control efficiency and about 15.7% variation of IT-control applications efficiency. This is an indication that cost control structure of the firm and the lines of authority had a significant effect on cost control system and IT control applications efficiency.

The sixth objective was to provide evidence on the extent of association between cost control system and available information technology control applications. The result showed strong positive support for a fit between variables within cost control system and IT control applications available. This evidence support extant literature on the need to ensure a fit between tasks and selection of IT applications and software (Vessey *et al.,* 1991; Dishaws *et al.,* 2002; Angerer, 2006).

The seventh objective was to provide evidence on whether a relationship exists between performance and the extent of association (fit) observed between cost control system and information technology control applications. The evidence provided a strong support for the expectation that CC-IT systems integration would enhance non-financial performance; it weakly supported financial performance in the area of turnover growth rate. The amount of variation explained by CC-IT integrated systems on non-financial performance was 57.0% and for turnover growth rate, 29.0%. This result supported the proposition that CC-IT systems integration has effect on performance. Table 6.1 shows the summary of propositions and results.

Table 6.1: SUMMARY OF PROPOSITIONS AND RESULTS

Hypotheses	Independent Variables	Dependent Variables	Expectations in model/ Significant impact	Results
H_{01}	Cost control techniques: - udgetary control - alue analysis - ctivity based costing - arget analysis Performance measurement techniques: - Balance score card; - Quality management and quality cost; - Activity based cost and activity based management; - Responsibility targets	Performance: - on-financial - re-tax earnings - arnings per share - Turnover growth rate	Significant difference between effect of cost control techniques on performance and significant difference between effect of performance measurement techniques on performance	For cost control techniques: - on-financial : Strongly supported - re-tax earnings: Supported - arnings per share and Turnover growth rate: Not supported For performance measurement techniques: - Non-financial : Strongly supported - Turnover growth rate Strongly supported - Pre-tax earnings: supported - Earnings per share supported
H_{02}	IT control applications: CRM, SCM, CCM, TSD, and HMM	Performance: -	Significant difference in the effect of components of IT	Non-financial : Strongly supported Turnover growth rate:

		on-financial - re-tax earnings - arnings per share - urnover growth rate	control on performance	Supported Pre-tax earnings: Not Supported Earnings per share : Not supported
H_{03}	Organisational Structure: cost control structure and Lines of authority Authority	Cost control system efficiency	Significant influence of Organisational factors (cost control structure and Lines of authority Authority) on cost control system efficiency	Weakly supported
H_{04}	Organisational Structure: cost control structure and Lines of authority Authority	IT control applications efficiency	Significant influence of organisational factors (cost control structure and Lines of authority Authority) on IT control applications efficiency	Weakly supported
H_{05}	NIL	NIL	Significant association between cost control system and IT control applications	Strongly supported

H_{06}	CC-IT systems Integration	Performance: - on-financial - re-tax earnings - arnings per share - Turnover growth rate	There is significant relationship between integrated cost control - information technology system and performance	Non-financial : Strongly supported Turnover growth rate: supported Pre-tax earnings:Not supported Earnings per share: Not supported

6.3 CONCLUSION

The application of cost and management accounting system on the platform of sophisticated IT control applications has been advocated by researchers as a practicable panacea to the problems emanating from economic and financial predicaments. This study has further provided evidence that well developed cost accounting system which is a basis for cost control technique efficiency when enabled by advanced IT control applications would enhance performance. This is based on the assumption that cost control systems help to produce concrete cost data on firm's activities and resources that assist management to take decisive actions that would result in efficiency and profitability (Barfield, *et al.,* 2001). Budgetary control and balance score card techniques were shown as efficient tools in influencing performance.

Also, information technology control applications are presumed to have grown beyond simply processing information faster to inferring greater meaning and value in support of internal firm's operations (Rondeau *et al.,* 2001). The study has shown that users acceptability and utilisation of IT control applications for what it is designed, would influence the integration process. The interaction of cost control techniques and IT control applications would not only facilitate dissemination of cost control information real time but will led to better integrated processes in the form customer relationship management from a total customer perspective (Burgess *et al.,* 2006); supply chain management; cash control management, task management and deliveries. These new development and improvement in information technology (IT) in relation to accounting control applications (Granlund, 2007), provides proper information to enable management accounting systems (which costing system is a part), to relate and support the formulation, implementation and control of techniques to accomplish enhanced performance (Gerdin, 2005).

This study, by providing evidence on the link between the CC-IT systems integration and performance has generally achieved its aim. It has provided findings in support of the proposition that effective utilisation of cost control techniques and related IT control applications will enhance performance if a fit exist between cost control system and information technology system. Evidence has been found for a modest influence of cost control structure and lines of authority on cost control system and information technology system. The implication of this is that, firms with undefined internal cost control structure and lines of authority might need to give a consideration to these oganisational factors, since these reflected significantly on the systems. This study, probably a pioneer study in Nigeria, on integrated cost control system built on three models, has yielded results compatible with research findings in developed countries. Any generalisation of this study should however be done with caution bearing in mind the limitations of the study. Suggestions for future research direction have been offered in view of these limitations.

6.4 IMPLICATION FOR PRACTICE AND RECOMMENDATIONS

This study has provided evidence to support that efficient utilisation of cost control techniques along with performance measurement techniques and IT control applications will enhance performance if a fit exist between cost control system and IT control applications efficiency. The study found agreement with an earlier research by Noah (2007), where poor usage of cost control was identified in the service organisations in Nigeria; and difficulty of strategic alignment of IT as platform for accounting processes in firms (Granlund, 2007). The major implication of these findings for the management of cost and IT control applications is that, there is need for development of costing system in organisations upon which cost control system can be built. The importance of cost accounting system as reiterated in Uyar (2010), are the decreasing profitability, increasing costs, competition and economic crises. A poorly developed cost accounting system cannot anchor cost control system (Uyar, 2010). In

developing costing system, IT systems should be considered, as it is expected that IT platform would lead to more efficient use of the limited resources (money, man and material) at firms disposal and ultimately to enhanced performance.

In order to derive the potential benefits from information technology applications usage, there is need to consider and adapt such technology to firms' cost control structure. This thought was conveyed in the works of Kathuria *et al.,* 1999 (cited in Hyvonen, 2008) that misalignment between IT applications and firm's needs and priorities would not derive benefits to the firm.

Evidences provided showed that integrated cost control and IT systems did not sufficiently enhance all financial performance indicators reported. The implication of this is that, for IT enabled cost control system to yield performance, the strategy should be linked to the specific objective a firm wishes to achieve. For instance, in the research work of Uyar (2010) costing techniques were summarised according to decreasing order of importance to the firm.

Evidence was provided that IT control applications was accepted and utilised ensured efficiency. The implication of this is that when firms are building cost control system on IT platform, strategic objective should be well adapted with task to be accomplished. This involves ensuring that users perceive the ease and usefulness of the application, to effectively utilise it for assigned cost control. Adaptability of cost control techniques with IT control applications could vary from one firm to another (Granlund, & Malmi, 2002). The integrated system should be complex and not complicated. A complex system refers to a system with multiple connections and where in principle, everything is integrated and related to each other; while a complicated system is simply one which in technical term is multi-layered and consisting of different technologies. It consists of some 'dead-ends' in the sense that not all modules of the total system communicate with each other but are stand-alone and only get data input from some other modules (Quattrone *et al.*, 2005). In complex intertwining,

Dechow and Mouritsen (2005) suggestion becomes relevant. In integrating cost control and IT systems, firms must first have a comprehensive analysis of the networks of human and non-human actors, how things are to be accounted for, the sophistication of cost control techniques to use and the relevant software packages (control applications).

Developing integrated systems for improving corporate performance would require knowledge and skills on the part of accounting professionals. This is where accounting professional bodies and educational institutions offering accounting, have roles to play in regular reviews of management accounting education curricula. Accounting and accounting-related research findings would enrich and update practitioners' knowledge in the organised Continuing Education Programmes. In similar vein, accountants on the job should be exposed to in-house on the job training in order to improve proficiency which could translate into long run performance. On a final note, accountants will do a firm much good when they keep abreast of research findings and utilise such information where relevant in their area of responsibility.

6.5 CONTRIBUTIONS TO KNOWLEDGE

This study was carried out to provide information that may help improve the performance of NSE listed firms as well as to make valuable contributions to management control practice, management accounting and management information system literature from Nigeria.

This research has made contributions in the following areas:

i. The study has provided evidence that different IT control applications have different impact on performance. The effect would depend on the extent of fit to task, acceptability and utilisation of each control application.

ii. Evidences from the study showed that different cost control techniques have different effect on firm performance. The extent of effect was shown to depend on the type of technique applied, along with the performance measurement technique in place.

iii. This research filled the literature gap on the effect integration of cost control and IT systems would have on performance of Nigerian firms. The study provided evidence that a moderately developed cost accounting system cannot enable an effective cost control system.

iv. The study provided an integrative framework extending the task technology/ technology acceptance models to cost control system. This evidence suggests that knowledge of task-technology fit, technology acceptance and contingency theories could be integrated to study influences of cost control and information technology systems. This will probably be the first of such a study on firms in Nigeria.

6.6 LIMITATIONS

The result of this study must be interpreted with caution as with many cross-sectional survey studies. Although the study had a wide coverage, selecting sample firms from all the twenty-eight industrial sectors in Nigeria, it should be noted that some firms have been excluded from the sampling frame following the economic sampling technique applied and others did not respond to the questionnaire administered. The exclusion of some firms constitutes a limitation to the findings of the study. It may be difficult to correctly say, with utmost degree of accuracy therefore, that the sample correctly represented the listed firms in Nigeria. The model used in the study presents the author's perception of the major influences on CC-IT systems integration. It however does not embrace all possible variables within cost control/IT systems and performance of the firms studied.

The significant result demonstrated in non-financial performance may be attributable to more variables than those considered in this study. It is possible for instance; that some strategic

initiatives might be in existence whose influence might not be easily separated from the effect of CC-IT systems integration which is noticed on performance. In same vein, the influential organisational variables examined were just two out of several others. Therefore, caution is required in emphasising organisational variables. Also it is limited by the fact that external factors which the contingency literature argues have influence on the activities of the firm were not considered. Moreso, environmental uncertainties might have had effect on the outcome of the firms' activities especially during the period of economic and financial down turn marked by high global competition.

6.7 FUTURE RESEARCH DIRECTION

This study was undertaken as a result of the gap observed in literature on the role integrated CC-IT systems play in firms' performance in Nigeria. It is anticipated that this study an initial attempt in providing an understanding on the effect of cost control and information technology systems, will arouse the interest of researchers in this area. This study has` provided evidence supporting many hpothesised relationship among cost control and performance measurement techniques, IT control applications' acceptance and utilisation, cost control structure, lines of authority, task-IT fit, as suggested in extant literature on contingency and task-technology fit and technology acceptance theories. Several research projects may however be undertaken as a follow up to the current research, in the following areas:

First, this study demonstrated the effect of integrated CC-IT systems on performance in selected listed firms. Further studies can be conducted in ascertaining whether there would be difference in performance of listed firms with CC-IT integrated systems and for those firms not listed.

Secondly, in this study, the effect of organisational factors in terms of cost control structure and lines of authority were examined. Research can be carried out on the effect of several other internal organisational factors and even a consideration of external factors' influence on integrated CC-IT systems and effect on performance.

Third, this study demonstrated the effect of different IT control applications on cost control system in terms of users' expectations (Madapusi, *et al.*, 2009). This study did not consider CC system's ability to meet users' expectations in terms of comprehensiveness, cost details, and accuracy, as was done for IT system. Further research can launched into these areas.

Fourth, this study demonstrated the effect of the technical perspective of IT utilisation. The attitudinal aspect of IT acceptance and usage was not considered in this research work. Research linking these variables with integration and effect on performance will be a worthwhile study for the future.

Fifth, this study has demonstrated the effect of a holistic view of cost control system. The effect of each component of cost control strategy and each component of IT control applications on performance was not measured. This can serve as an area for further research.

REFERENCES

Abdel-Kader, M., & Luther, R., (2008). The impact of firm characteristics on management accounting practices: A UK-based empirical analysis. *The British Accounting Review*, 40 (1):2-27.

Adams, D. A., Nelson, R.. R., & Todd, P.A., (1992). Perceived usefulness, ease of use and usage of information technology: A replication. *Management Information System Quarterly* 16 (2): 229.

Adeniyi A. A., (2001). *An insight into management Accounting* (2nd ed..). Lagos: Valiu Analysis Consult.

Adeniji, A. A., (2009). *An insight into management accounting* (4th ed.). Lagos: Eltoda ventures limited.

Adeyemi, S. B., (2005).*The impact of accounting standards on financial reporting in Nigeria*. Unpublished Doctoral Thesis, Department of Accounting University of Lagos, Nigeria.

Afaanz, O., (2009). *Management control systems packages: An empirical analysis of the relationship between design, use and performance*. Retrieved on the 11th January, 2011 from www.afaanz.org/openconf/2010/modules/request.php*? module=oc.*

Ajakaiye, O., & Fakiyesi, T., (2009). Global financial crisis. *Discussion Series Paper 8: Nigeria*. Retrieved on the 13th May, 2011 from www.odi.org.uk/resources/download/3310pdf.

Ajibolade, S.O., (2008).*The impact of improved MAS on manufacturing Sector performance in Nigeria*. Unpublished Doctoral Thesis, Department of Accounting University of Lagos.

Ajibolade, S.O., Arowomole, S.A.A. & Ojikutu, R. K., (2010). Management accounting systems,perceived environmental uncertainty and companies performance in Nigeria. *International Journal of Academic Research* 2(1) , January: 195-201.

Altinkemer, K., Ozcelik, Y. & Ozdemir, Z., (2010). Productivity and performance effects of IT-enabled reengineering: A firm-level analysis. Retrieved from 17th October, 2011 from *is2.lse.ac.uk/asp/aspecis/20070005.pdf.*

Alves, M. G., (2010). Information technology roles in accounting tasks – A multiple-case. *International Journal of Trade, Economics and Finance*,1(1): 1-15.

Alreck, P. L.& Settle, R. B., (1995). *The survey research handbook*. (2nd ed.). Chicago: Richard D. Irwin Inc.

Andersen, T. J., Denrell, J. & Bettis, R. A., (2007). Strategic responsiveness and Bowma's risk-return paradox. Strategic *Journal of Management*, 28:407-429.

Angerer, A., (2006). *The impact of automatic store replenishment on performance*. Business and Economics Retrieved on 12th February, 2011 from books.google.com.ng/books.

Anthony, R. N., & Govindarajan, V., (1997). *Management Control Systems.* Chicago: Irwin.

Antic, L. J. & Sekulic, V., (2005). Organising as the phase of management process and management accounting. *Economics and Organisation* 2(3):237-245.

Arnold, V., Collier, P. A. & Sutton, S. G., (2000). The effect of experience and complexity on order and recency bias in decision-making by professional accountants. *Accounting & Finance,* 40: 109-134.

Asaolu, T. O & Nassar, M. L., (2007). *Essentials of management accounting and financial management.* Ile-Ife: Cedar productions.

Asel. J. A., (2009). *Risk management and management control – The impact of financial crisis on the use of management control systems*. Retrieved on the 13th May, 2011 from www.edamba.eu/userfiles/file/AselJohannes.

Asika, N., (1991). *Research methodology in the behavioural sciences*. Lagos: Longman Nigeria Plc.; 39

Ayodele S. A., & Falokun, G. O., (2003). *The Nigerian economy: structure and pattern of development*. Ibadan: Jodad Publishers

Bagozzi, R. P. & Phillip, H. F., (1982). *Assessing construct validity in personality research: Application.* Retrieved on the 13th May, 2011 from Deepblue.lib.umich.edu/../0000590

Bagozzi, R. P., (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information systems* 8(4):244-254.

Baines, A. & Langfield-Smith, K. (2003). Antecedents to management accounting change: a structural equation approach. *Accounting Organisation and Society* 28: 698.

Banker, R. D., (2000). An empirical investigation of an incentive plan that includes non-financial performance. *The Accounting Review*, 75(1):65-92.

Barfield, J. T., Raiborn, C.A. & Kinney, M. R., (2001). *Cost accounting traditions and innovations.* (4th ed). Cincinnati, USA: South Western publishing, Thomson learning.

Barkema, J & Drogendijk, K., (2007). Approaches to sequential internationalisation. *International Journal of Management Review* 9(1): 31-51.

Barney, J., (1991). Firms resources and sustained competitive advantage. *Journal of Management,* 17: 99-120.

Baxter, J. & Chua, W. F., (2006). Alternative management accounting research: whence and whither. *Accounting, Organisations and Society* 28: 126.

Beyer, R. & Trawicki, D. J., (1992). *Profitability accounting*. (4nd ed.). New York: Ronald Press.

Bianchi, R., (2005). *Six key elements for better Task management*. *Technology Republic*. Retrieved on the 5th of May, 2011 from, http://en.wikipedia.org/wiki/ task management..

Birnberg, J. G. & Lofts, A., (2000). Organisational development and transformational learning. *Issues in Accounting Education* 11(1):168-190.

Bisbe, J., & Malagueno, R., (2009). The choice of interactive control systems under different innovation management modes. *European Accounting Review*, 18(2): 371-405.

Blocher, E.J., Chen, K.H. & Lin, T.W., (1999). *Cases and readings in strategic cost management for use with cost management. A strategic emphasis.* USA:McCraw Hill company inc.

Bonache, A. B.& Maurice, J., (2010). A best evidence synthesis on the link between budget participation and management performance. *Journal of Applied Economic Sciences*, 2(12): 34-47.

Botes, V L., (2009). *Changes facing management accountants in postmodern times. Chapter four.* Retrieved on the 24th July, 2010 from www uir.unisa.ac.za/bitstream/handle/10500/1935/04chapter4.pdf.

Boyd, B. K., Grove, S. & Hitt, M. A., (2005). Construct measurement in strategic management research: Illision or reality? *Strategic Management Journal*, 26: 246.

Brierley, J. A., Cowton, C.J & Druru, C., (2001). Research into product costing practice: A European perspective. *European Accounting Review* 10:215-256.

Brinker, B. J., (1993). Theme issues on business process reengineering. *Journal of Cost management* (Fall): 4-14.

Brinke, E., (2002). *Costing support and cost control in manufacturing firm*. Retrieved on the 11th of August, 2011 from *doc.utwente.nl/40351/1/t000001d.pdf.*

Brownell, P., (1982). *The role of accounting data in performance evaluation, budgetary, participation and organisational efficiency*. PrimaVera Working Paper Seris 98-26. University Van Amsterdam.

Brynjolfsson, E., (1993). The productivity paradox of IT. *Communications of the ACM* 35, December; 66-77.

Brynjolfsson, E., (2002). *Information technology and productivity: A review of the literature.* MIT Sloan school of Management, Cambridge: Massachusetts academic press.

Brynjolfsson, E. & Hitt, L., (1994). *Information technology as a factor of production: The role of differences among firms*. Sloan Working Paper 3715: 1-26.

Brynjolfsson, E. & Hitt, L., (1998). Beyond the productivity paradox: computers are the catalyst for bigger changes. *Communications of the ACM 41(8):49-55.*

Burgess, K., Singh, J. S. & Rana, K., (2006). Supply chain management: a structured literature review and implications for future research. *International Journal of Operations and Production Management*. 26(7): 703-729.

Burns, T. & Stalker, G., (1961). *The management of innovation*. London: Tavistock. Chapter 8: 103-108.

Business dictionary, (2011). *Revenue and Investment centres*. Retrieved on the 13th May, 2011 from http://www.businessdictionary.com/definition/revenue-center.html.

Campbell, D., (2009). *Organisational design and control*. Retrieved on the 22nd June, 2010 from papers.ssm.com.

Cane, S., & McCarthy, R., (2009). Analysing the factors that affect information systems use: a task-technology fit meta-analysis. *Journal of Computer Information Systems*.The Fall.

Capon, N., Farley, J. U. & Hoenig, S., (1990). Determinants of financial performance: A meta-analysis. *Management Science*, 36: 1149.

Chan, Y., Huff, S., Barclay, D. & Copeland, D. (1997). Business strategic orientation, information systems strategic orientation and strategic alignment. *Information Systems Research* 8:125-150.

Chan, Y, Sabherwal, R. & Thatcher, J. B., (2006). Antecedents and outcomes of strategic IS alignment: An empirical investigation. *IEEE T Eng Management* 53:27-47

Chase, R., Aquilano, N. & Jacobs, R., (2004). *Management for Competitive Advantage.* (10th ed.). Irwin: McGraw-Hill.

Chatfield, M. & Vangermeersch, R. G. J., (1996). *The history of Accounting: An encyclopedia*. U.K: Taylor & Francis Group.

Chen, C., & Chou, S.W., (2009). Environmental factors and conducted factors that influence the ERP benefits. *PACIS proceedings*. Retrieved on 26th June, 2011from www. pacis.net.org/file/2009/12/paper28 title.

Chenhall, R. H., (2003). Management control systems design within its organisational context: findings from contingency-based research and directions for the future. *Accounting, Organisations and Society,* 28(2-3):127-168.

Chenhall, R. H., (2007). Theorizing contingencies in management control research. In C.S. Chapman, A. Hopwood, M.D shields, (Eds.)., *Handbook of management Accounting Research.* Elsevier: Oxford: 805-829.

Chenhall, R. H., & Morris, D., (1986). The impact of structure, environment and interdependence on the perceived usefulness of management accounting systems. *The Accounting Review*, 61(1): 16-35.

Chenhall, R. H., & Langfield-Smith, K., (1998). Adoption and benefits of management accounting practices: An Australian study. *Management Accounting Research* 9(7): 1–19.

Chhibber, P., (1998). *Property right, control and firm performance*. Retrieved on the 6th of May, 2011 from www. books.google.com.ng/books.

Cho, H. J. & Pucik, V., (2005). Relationship between innovativeness, quality, growth, profitability and market value. *Strategic Management Journal*, 26(6): 555-579.

Chong, V. K. & Chong, K. M (1997). Strategies choices, environmental uncertainty and SBU performance: A note on the intervening role of management accounting systems. *Accounting Business Research* 27: 268-276.

Chow, W.K., Shield, T. J, & Chan, J., (1991). *The effect of Information technology capability, organisational culture on export performance*. Retrieved on the 13th May, 2011 from www.freepatentsonline.com/article/j.

Chow, G., Heaver, T. D. & Henriksson, L. E., (1995). *The role of information integration in facilitating 21st century theory-based perspective.* Retrieved on 11th June, 2011 fromwww.freepatentsonline.com/article/transportaion.

Christopher, S. C., Anthony, G. H. & Michael, D. S., (2007). *Contingency theory and business environment.* Business -& Economics volume 1: 478 Retrieved on the 16th of April, 2011 from *books.google.com.ng/books?isbn=0080445640.*

Collis, N, Young, L & Goold, P., (2007). How the size of a company, corporate strategy, and governance system impact corporate headquarters and their performance. *European Accounting Review*, 18(2): 295-370.

Coltman, T., Devinney, T. M., & Midgley, D. F., (2011). Customer relationship management and firm performance. *Journal of Information Technology: Advance online publication*, 25 January;doi:10.1057/jit.2010.39.

Cooper, R. & Slagmulder, R., (1998). *Advanced management accounting*. Retrieved on the 13th May, 2011 from www.lipas.uwasa.fi..//AMA-part%2520B.

Cooper, R., (1990). Cost classification in unit-based and activity based manufacturing cost systems. *Journal of Cost Management*, 4(3): 4-14.

Cooper, P. & Dart, E., (2009). *Change in the management accountant's role drivers and diversity*. University of Bath, School of Management. Working paper series.

CSANAD (2011). *Earnings per Share - Interpreting EPS.* Retrieved on the 20th of October,2011 from http://csanad.hubpages.com/hub/Earnings-per-Share.

Cunagin, C & Stancil, J. L., (2002). *Cost accounting: A history of innovation* Retrieved on the 23th May, 2011 from www.ucumberlands.edu/academics/history.

Cutting, T., (2010). *Relationship vs Task oriented management*. 3rd March; Retrieved on the 16th of May, 2011 from http://www.pmhut.com/relationship-vs-task- oriented-management.

Danijela, G., & Viadan, D., (2010). *A cost management expert system*. Expert System with Applications 37 (12), December. Retrieved on 18th march, 2011 from*www.informatik.uni-trier.de/~ley/db/.../a.../**d**/Devedzic:Vladan.htm.*

Danneels, E., (2002). The dynamics of product innovation and firm competences. Strategic *Management Journal* 23(9): 109-112.

Davig, W., Elbert, N. & Brown, S., (2004). Implementing a strategic planning model for small manaufacturing companies: An adaptation of the balanced scorecard. *Advanced Management Journal*, 69(1): 22.

Davila, T., (2005). *The Promise of management control system for innovation and strategic change*. Retrieved on 13th October, 2011 from www.slides/share.net.

Davis, F. D., (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13(3):319-340.

Davis, F. D., Bagozzi, R. P.& Warshaw, P. R., (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8): 982-1003.

Davis, F. D., (1993). Users acceptance of information technology: System characteristics, user perceptions and behavioural impacts. *International Journal of Man-Machine Studies 38; 475-487.*

Davis, P., Dibrell, C. & Janz, B., (2002). The impact on the strategy-performance relationship:Implication for managers. *Industrial Market Management* 31(7): 339, 347.

Dechow, N & Mouritsen (2005). Enterprise resource planning systems, management control and the quest for integration. *Accounting, Organisations and Society*, 30:691-733.

Dedrick, J., (2003). Information technology and economic performance: A critical review. *ACM Computing Surveys*, 35(1):1-28.

DeLone, W. H. & McLean, E. R., (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information System* 19(4); 9-30.

DeLone, W. H. & McLean, E. R., (1992). Information system success: The quest for the dependent variable. *Information systems Research* 3(1): 60-95.

Descow, N. & Mourisen, J., (2005). Enterprise resource planning systems, management control and the quest for integration. *Accounting, organisation and Society* 30:691- 733.

Dess, G. G., & Robinson, R. B., (1994). *Measuring organisational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit.* Retrieved on the 11th of June, 2011 from *www.freeonline library .wiley.com/doi/10.1002/smj.4250050306/pdf.*

De Toni, A. & Zanutto, G., (2009). *Web-based information systems success: A measurement model of technology acceptance and fit*. Retrieved on 18th march, 2011 from www.iamot.org/conference/index.php/ocs/9/paper/view/1835/84.

Deutsch, D., Keil, N., & Laamanen, A., (2007). *Decision-making in acquisition*: effect of outside director compensation and firm acquisition behavior. *Journal of Management Review*, 33(1) 30-56

Devan, S. & Kraemer, K.L., (1998). International dimensions of the productivity paradox.*Communications of the ACM*, 41,8 (1998), 56-62.

Devaraj, S. & Kohli, R., (2003). Performance impacts of Information Technology: Is actual usage the missing link. *Management Science* 49(3): 273-289.

Dillion, A. & Morris, M. G., (1996). User acceptance of new information technology: theories and models. In William (ed.) *Annual Review of information Science and Technology*, 31: 3-32.

Dishaw, M. T. and Strong, D. M., (1999). Extending the technology acceptance model with task-technology fit constructs. *Information and Management Journal*, 36(1): 9.

Dishaw, M. T. and Strong, D. M., & Brandy, D. B., (2002). *Extending the task-technology fit model with self efficacy construct.* Paper presebted at 2nd English Americas Conference on information system. Retrieved on 18th February, 2011 from www.ieeexplore.iee.org/ie/15/47pdf.

Donoher, B., Reed, L., & Storrud-Barnes, P., (2007). Managerial equity ownership, contingent compensation and the restatement of misleading financial disclosures. *Accounting, Organisations and Society*, 1; 79-89.

Drury, C. & Taylor, M., (1994). Product costing in UK manufacturing organisations. *The European Accounting Review*, 3: 443.

Drury, C., (2005). *Management and cost accounting*. (6thed). London: Thompson Learning.

Durden, C. & Perera, H., (2011). *The role of management accounting in organisational control systems: Preliminary evidence of an organic approach*. Retrieved on the 11th October, 2011 from www.eprints.jeu.edu.ac/7522.

Dwayne, E., (2003). *Cost reduction guide, proven methods that reduce cost and increase profit*. London: Blackwell publishers.

Easton, V. J. & McColl, J. H., (2011). *Paired data, correlation and regression. Statistics Glossary* (v1.1). Retrieved on the 18th November, 2012 from www.stats.gla.ac.uk/steps/glossary

Edelstein, H., (2010). *Building profitability customer relationships with data mining*. Retrieved on the 13th May, 2011 from www.crmodyssey.com/ Building-profitable-customer relationships-with data- mining-pdf.

Edward, L. L., & Edwards, J. S., (2001). *Introduction to paralegal studies and the law: a practical approach. Cengage Learning*: 263. Retrieved on the 16rth of April, 2011 from http://en.wikipedia.org/wiki/Time_tracking_software.

Efendi, J, Mulig, E. & Smith, L., (2006). Information technology and systems research in accounting. *Journal of Emerging Technologies in Accounting*, 3: 117.

Egbunike, P.A., (2009). Imperatives of advanced manufacturing technology in Nigeria: Implications for manufacturing account practices. *Journal of Association of National Accountants of Nigeria*, 17(3): 33-54.

Emory, C. W. & Cooper, D. R., (2003). *Business research methods*. (4th ed.) Illinois: Richard D Irwin Inc.

Emmanuel, C., Otley, D., & Merchant, K., (1990). *Accounting for management control.* (2nd ed.). London: Chapman and Hall. Retrieved on the 16th of April, 2011 from www.books.google.com.ng.

Encyclopedia of Business, (2010). *Profit margin-expenses*. (2nd ed.). Reference for business.

Eromosele, V., (2011). *The human dimension of cost containment*. Working paper. The Nigerian Liquefied Natural Gas Plc, (NLNG) Lagos.

Ferrell, A. M., (2009). Average variance extracted. Retrieved on the 4th August, 2011 from *www.duplication.net.au/ANZMAC09/papers/ANZMAC2009-389.pdf.*

Finkelstein, J., (2002). *People: Managing the human resource function to the bottom line.* Retrieved on the 11th of August, 2011 from www.futuresense.com.

Fisher, F. M. & McGowan, J. J., (1983). On the misuse of accounting rates of return to infer monopoly profits. *American Economic Review*, 73: 82-97

Fisher, J., (1995). *Use of nonfinancial performance measures*. On *Readings in Management Accounting.* In S.M. Young, (Ed.). 329-335. Englewoods Cliffs, NJ: Prentice Hall.

Fiss, K. & Zajac, M., (2006). Framing of strategic change. *Management Accounting Research* 13:399-421.

Fornell, C. & Larcker, D. F., (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18(1): 39-50

Galbraith, J., (1973). *Designing complex organisations*. USA: Addison Wesley Publishing Company.

Garrison, R. H., Noreen, E.W. & Seal, W., (2003). *Management accounting*. Cambridge: McGraw-Hill Education.

Garg, A. Ghosh, D., Hudick, J. & Nowacki, C., (2003). Roles and practices in management accounting today. *Strategic Finance* 85: 30-35.

Gerdin, J., (2005). Management accounting system design in manufacturing departments: an empirical investigation using a multiple contingencies approach. *Accounting, Organisations and Society* 30 (2): 99– 126.

Ghosh, D., Wu, A., (2007). *Relevance of financial and non-financial measures to financial analysts :Experimental evidence.* Retrieved on the 9th June, 2011 from www.aaahq.org/MAS/MASPAPERS2007/disclosures/ *Ghosh%20and%20Wu.pdf.*

Gilovich, T., Griffin, D. & Kahneman, D., (2002). *Heuristics and biases: the psychology of intuitive judgement.* New York, Cambridge University Press.

Goerzin, A. & Beamish, P. W., (2003). Geograhic scope and multinational enterprise performance. *Strategic Management Journal*, 24(13): 1290-1306.

Goodhue, D. L., & Thompson, R. L., (1995). Task- technology fit and individual performance. *IS Quarterly* (19)2: 213-236.

Goodhue, D. L., & Thompson, R. L., (2005). Task-technology fit. *American Society for Information Science and Technology* 56(11). Retrieved on the 13thMay, 2011 from *www.istheory.yorku.ca/tasktechnologyfit.htm.*

Gordon, L. A., & Narayanan, V. K., (1984). Management accounting systems, perceived environmental uncertainty and organisation structure-an empirical investigation. *Accounting, Organisations and Society*, 9(1): 33-47.

Gordon, L. A. & Miller, D., (1976). A contingency framework for the design of accounting information systems. *Accounting, Organisations and Society*, 1; 59-69.

Grahovac, D. & Devedzic, V., (2010). Comex: A cost management expert system. *Expert Systems with Applications* 37(12):1-2.

Granlund, M., & Malmi, T., (2002). Moderate impact of ERPS on management accounting: A lag or permanent outcome? *Management Accounting Research* 13(3): 299-321.

Granlund, M. & Mouristen, J., (2003). Introduction: problematizing the relationship between management control and information technology. *European Accounting Review*, 2(1):78.

Granlund, M. & Taipaleenmaki, J., (2005). Management control and controllership in new economy firms- a life cycle perspective. *Management Accounting Research* 13:299-321.

Granlund, M., (2007). *On the interface between management accounting and modern information technology- A literature review and some empirical evidence*. Tarku School of Economics, *Working Paper*. Retrieved on the 18th June, 2011 from http://ssrn.com.

Griftith, G., & Myers, Y., (2005). The fit of relational norm governance and performance *Accounting Organisations and Society*, 34(7):483-535.

Guilding, C., (1999). Competitor-focused accounting: an exploratory note. *Accounting Organisations and Society*, 24(7):583-595.

Guinan, P. J., Cooprider, J. G. & & Sawyer, S., (1997). The effective use of automated application development tools. *IBM Systems Journal* 36(1);124-139.

Guinan, P. J., Cooprider, J. G., Sawyer, I., (2004). *The handbook of budgetary control*. (2nded). Leighton Buzzard UK: Graham Burns Publishers.

Haldma, T., & Laats, K., (2002). *Influencing contingencies on management accounting practices in Estonian manufacturing companies*. University of Tartu, *Faculty of Economic and Business Adminstration paper* No. 13. Retrieved on the 23rd May, 2011 from http://www.unitartu.haldmalaats.con.pp

Hamilton, M. M.,(1998). Who's chainsawed now? Dunlop out as sunbeam's losses mount. *Washington Post*, 16 June.

Hansen, D. R., & Mowen, M. M., (2005). Cost management: Accounting and Control. (5th ed.). South-Western: Thomson.

Hayes, D. C., Hunton, J. E. & Reck, J. L., (2001). Market reaction to ERPS implementation announcements. *Journal of Information Systems* 15(1): 3-18.

HCL, (2009). *Cash management*. Financial services consult. Retrieved on the 23rd May, 2011 from http://www.heltech.com/financial-services/retail-corporate- banking/cash.

Heiko, M., Aalst, M. P., Rickayzen, A.R., & Uwe, V., (2005). Challenges for business processes and task management. *Journal of Universal Knowledge Management*, 0(2). Retrieved on the 22nd January, 2010 from https://en.wikipedia.org/wiki/Task_management

Hopwood, A., (1972). An empirical study of the role of accounting data in performance evaluation. *Journal of Accounting Research, (Supplement)* 10:156-182.

Horngren, C. T., Datar, S.M. & Foster, C., (2006). *Cost accounting. A managerial emphasis.* (12th ed.). New Jersey: Prentice Hall Inc.

Horngren, C. T., Datar, S.M., Foster, G., Rajan, M. and Itter, C., (2009). *Cost accounting.* A managerial emphasis. (13th ed). NY: Prentice Hall

Huang, S., Ou, C., Chen, C. & Lin, B., (2006). An empirical study of relationship between IT investment and firm performance: A resource-based perspective. *European Journal of Operational Research*, 173: 984-999.

Hunton, J. E., (2002).Blending information and communication technology with accounting research. *Accounting Horizons*, 16(1): 55-67.

Hunton, J. E., Lippincott, B. & Reck, J., (2003). Enterprise resource planning systems: comparing firm performance of adopters and non-adopters. *International Journal of Accounting Information Systems*, 4: 165-184.

Hyvonen, T., (2003). Management Accounting and Information system: ERP vesus BoB. *European Accounting Review* 12(1):155-173.

Hyvonen, J., (2005). Adoption and benefits of management accounting systems: evidence from Finland and Australia. *Advance Journal of International Accounting* 18 (2): 97–120.

Hyvonen, T., Jarvinen, J., Pellinen, J., Rahko, T., (2006a). The role of standard software packages in mediating management accounting knowledge. *Qualitative Research in Accounting and Management*, 3(2):145-160.

Hyvonen, J., (2008). *Linking management accounting and control systems, strategy, information technology, manufacturing technology and organisational performance of the firm in contingency framework*. Retrieved on the 22nd January, 2010 from www. herkules.oul.fr/isbn

Hyvonen, T., Jarvinen, J., Pellinen, J., Rahko, T., (2006). *The impact of accounting hybridisation to ERP implementation – Case Finnish Defence Forces*. Paper presented at the 29th Annual Congress of the EAA, Dubin. Retrieved on the 22nd January, 2010 from www.casfininish.force/ann/cong.

Imoisili, O A., (1985). The role of budget data in the evaluation of managerial accounting: a value-based management performance. *Accounting, Organisations and Society*, 14:325-335.

Investopedia, (2011). *Earnings per share*. Retrieved on the 20th of October, 2011 from http://www.investopedia.com/terms/e/eps.asp#ixzz1bKQVbWpm#.

Investopedia, (2011). *Profit before tax*. Retrieved on the 20th of October, 2011 from www.http://www.investopedia.com/terms/p/profitbeforetax. asp#ixzz1bKA1zde4.

Irick, M. L., (2008). Task- technology fit and information systems efficiency. *Journal of Knowledge Management Practice* 9(3): 1-12.

Isa, C. R., & Foong, S.U., (2005). Adoption of advanced accounting practices: Case study of manufacturing firms in Malayasia. *World Review of Science Technology and Sustainable Development* 2(1):35-45.

Ittner, C. D., & Larcker, D. F., (1998). Assessing empirical research in managerial accounting: a value-based management perspective. *Journal of Accounting Economics* 32(5), 349–410.

Iwarere, H. T., (2004). *Contemporary cost accounting*. (3rd ed.). Egbe-Lagos: Bhoti International publishing Limited.

Jermias, J. & Gani L., (2004). *Linking strategic priorities, organisational configurations and MAS with business efficiency: Experience from Indonesian public held companies.* Retrieved on the 13th March, 2011 from www.businesssfu.ca/fac.

Johnson, H.T., (1990) *Customers and values. Bringing a global perspective to management accounting education in performance excellence in manufacturing and service organisations*. (Turney ed). USA: American Accounting Association.

Johnson, H. T., & Kaplan, R. S., (1987). *Relevance lost: The rise and fall of management accounting*. Boston: Harvard Business School Press.

Kaplan, R. S., & Johnson, H. T., (1987). The rise and fall of management accounting. *Management Accounting Review*, 31:220

Kaplan, R. S. & Norton, D.P., (1992). The balanced scorecard- measures that drive performance. *Harvard Business Review*, 70 (1): 71-79.

Kaplan, R. S., (1994). Devising a balanced scorecard matched to business strategy. *Planning Review*: 15-17.

Kaplan, R. S., & Norton, D. P., (1996). *The Balanced score card: Translating strategies into action*. Boston Mass: Harvard Business School press.

Kaplan, R.S., & Atkinson, A. A., (1998). *Advanced Management Accounting*. New Jersey: Prentice Hall.

Kaplan R. S. & Cooper, R., (1998). *The Design of Cost Management Systems.* Upper Saddle River, NJ: Prentice Hall.

Kaplan, R.S. & Norton, D. P., (2001). Transforming the balanced scorecard from performance measurement to strategic management. *Accounting Horizon*, 15 (1): 87-104.

Kaplan, R. S. & Norton, D. P., (2001). *The strategic focused organisation: balanced score card.* Retrieved on the 22nd January, 2011 from www.book.google.com.ng/books.

Kelly, M., (1994). Productivity and Information Technology: The elusive connection. *Management Science*, 40(11): 140-142.

Kelly, S., (2004). *ICT and the mediation of organisational work*. Retrieved on the 22nd January, 2011 from www.ucd.ie.

Kennedy, T & Affleck-Graves, J., (2001). The impact of activity-based costing technique on firm performance. *Journal of Management Accounting Research*, 13: 19-45.

Kim, Y.W. & Ballard, G., (2001). *Activity-based costing and its application to lean construction.* Retrieved on 18th February, 2011 from *kczx.gzhu.edu.cn/.../ACTIVITY.*

Kimball, J., & Ross, S., (2002). *The data warehouse toolkit: the complete guide*. West Sussex: John Wiley and Sons.

Kishore, R. M., (2004). *Management accounting.* New Delhi: Taxmann Allide Publishers.

Klopping, I. M. & Mckinney, E. M., (2004). Extending the technology acceptance model and the task-technology fit model to consumer e-commerce, information technology. *Learning & Performance Journal* 22 (1):35.

Kobera, R., Ngb, J., & Paul, B. J., (2007). The interrelationship between management control mechanisms and strategy." *Management Accounting Research* 18(4): 425-452.

Kuye, O. L, & Oghojafor, B. E. A., (2011). Strategic control and corporate performance in manufacturing industry: Evidence from Nigeria. *European Journal of Social Sciences* 22(2):177-187.

Kraev, E., (2003). *Structural adjustment policies*. Retrieved on the 12nd June, 2010 from www.egor.ch/papers.

Laitinen, E. K. & Chong, G., (2006). How do small companies measure their performance? *Problems and Perspectives in Management*, 4(3):49-68.

Leckson-Leckey, G.T.Y., Osei, K. A. & Harvey, S. K., (2011). Investment in information technology and Bank business performance in Ghana. *International Journal of Economics and Finance*, 3(2), May: 133-142.

Lee, B. & Menon, N. M., (2000). Cost control and production performance enhancement by IT investment. *Journal of Decision Support Systems* 30(2): 153-169.

Leidner, D. E., & Jarvenpaa, S. L. (1995). The use of information technology to enhance management school. *MIS Quarterly* 19(3): 293-312.

Lev, B., (2001). *Intangibles: Management, measurement and reporting*.Washington: Brookings Institution.

Li, M. & Ye, L., (1999). Information technology and firm performance: Linking with environmental, strategic and managerial contexts. *Information management* 35:43-51.

Lichtenberg, F., (1999). *IT and its impact on productivity & growth.* Retrieved on the 2nd of June, 2010 from www.niesr.ac .uk/research.

Lichtenberg, F. R., *(*2004). The Output Contributions of Computer Equipment and Personnel: A Firm- Level Analysis, *NBER Working Papers.* Retrieved on the 12th October, 2011 from books.google.com.ng/books?isbn=0470563583.

Lin, Z. J. & Yu, Z., (2002). Responsibility cost control system in China: a case of management accounting application. *Management Accounting Research* 13:447-467.

Lodh, S., & Gaffikin, M., (2003). Implementation of an integrated accounting and cost management system using the SAP system: A field study. *European Accounting Review*, 12 (12): 85-121.

Loveman, G. W., (1994). *An assessement of the productivity impact on information technology*. Retrieved on the 13th May, 2011 from www. ccs.mit.edu/papers/CCSWP201.

Loveman, G. W., (2000). *Information technology investment and firm role of IT*. Retrieved on the 24nd September, 2010 from www. nus.academia.edu.

Lucey, T., (1989). *Costing*. (3rd ed.) Great Britain, Channel Island: The Guernsey Press Co. Ltd.

Lucey, T. (1992). *Management accounting*. (3rd ed.). Bush green London: DP Publications Ltd.

Lukka, K. & Granlund, M., (1996). Cost accounting in Finland: current practice and trends of development. *The European Accounting Reviews*, 5 (1): 1-28.

Luo, F., (2005). Perception of procedural justice in alliance. *European Accounting Review*, 32 (10): 185-199.

Luo, F., & Chung, G., (2005). Performance impact of network ties during market transition. *Journal of management information systems* 46 (8): 38-50.

Mabert, V. A., Soni, A. & Venkataramanan, M. A., (2000). Enterprise resource planning survey of U.S. manufacturing firms. *Production Inventory Management Journal* 41(6): 52–58.

Macintosh, N. B., (1995). *Management accounting and control systems*. Irwin: John Wiley and sons.

Madapusi, A., (2008). Post-implimentation evaluation of enterprise resource planning (ERP) systems. *Doctoral dissertation*. University of North Texas.

Madapusi, A., & Kuo, C. C., (2007). *Assessing data and information quality in ERP systems*. Proceedings of the Decision Science Institute Annual meeting, Arizona. Retrieved on 12th March, 2010 from www.swdsi.org/swdsi2007/papers/7D07.pdf

Madapusi, A., & Ortiz, D. C., (2009). *An empirical assessment of the impact of ERP task-technology fit on decision quality*. Retrieved on 12th March, 2010 from www.swdsi.org/swdsi2009/papers/9D03.pdf *Management;* Review Issue.

Maher, K., (2000). *Management accounting education at the millennium*. Retrieved on 12th March, 2010 from www.aaajournals.org/doi/pdf/10.2308

Mahmood, M. A. & Mann, G. J., (2000). Special Issue: Impacts of Information Technology Investment on Organisational Performance. *Journal of management information systems* 16 (4): 3-10.

Mak, Y.T., (1989).Consistency fit internal consistency and financial performance. *Journal of Business Finance and Accounting*, 16 (2):273-300.

Malina, M.A. & Selto, F.H., (2004). Choice and change of measures in performance measurement models. *Management Accounting Research*, 15 (4): 441-469.

Mansyur, S., (2009). *The effect of management control system on performance of SMEs in South Sulawesi Indonesia*. Retrieved on 15th November, 2011 from cab.uum.edu.my/amgbe/173pdf.

Massey, A. P., Montoya-Weiss, M., Hung, C. & Ramesh, V., (2001). Cultural perceptions of task-technology fit. *Communications of the ACM* 44(12):83-84.

McKeen, J. D. & Smith, H. A., (1993). *The relationship between information technology use and organisational performance*. In R. Banker, R. Kauffman & M. A. Mahmood (Eds.). Strategic information technology management: perspectives on organisational growth and competitive advantage Harrisburg, PA: Idea Group Publishing: 405–444.

McNair, C. J., Mosconi, W. & Norris T. (1998). *Meeting the technology challenge: cost accounting in a JIT environment.* Montrace NY: NAA.

MdAuzair, S., (2011). The effect of business strategy and external environment on management control systems: A study of Malaysian Hotels. *International Journal of Business and Social Science* 2 (13); special issue July: 236-244.

Melville, N., Kraemer, K & Gurbaxamni, V., (2004). IT and organisational performance: An integrative model of IT business value. *MIS Quarterly* 28: 2,283-321.

Merchant, K. A. & Otley, D.T., (2007). A review of the literature on control and accountability. *Handbook of Management accounting Research*. In C.S.Chapman, A.G. Hopwood, and M. D. Sheilds (ed.). Amsterdam: Elsevier Press: 785-804. Retrieved on the 22nd September, 2011 from www. books.google.com.ng.

Merchant, K. A. & Van der Steede, W.A., (2007). *Management control systems – Performance, measurement, evaluation and incentives*. (2nded.). Esssex: Prentice hall.

Metka, T., Darja, P. Zeljko, S., (2007). *Management control systems, strategy and performance: The case of a Slovenian Company*. Retrieved on the 22nd September, 2011 from www.econpapers.repec.org/article/idsijtrgm.

Mia, L., (1993). The role of MAS information in organisations: an empirical study. *British Accounting Review* 25: 269-285.

Mia, L., (2006). Just-in-time manufacturing, management accounting systems and profitability. *Accounting Business Research* 30(7): 137–151

Miller, D.J., (2004). Firms' technological resources and the performance effects of diversification: A longitudinal study. *Strategic Management Journal*, 25 (11): 1097-1120.

Mingfang, L. & Richard, Y., (1999). Information technology and firm performance: Linking with environmental, strategic and managerial contexts. *Information and Management*, 35; 45-51

Mitra, S., & Chaya, A. K. (1996). Analyzing cost-efficiency of organisations: the impact of information technology spending. *Journal of Management Information Systems.* 13(2):29 - 57.

Mishra, R. K., (2004). *Role of information technology in supply chain management.* Retrieved on the 6th Jume, 2011 from http://www.indiamba.com.Faculty_Column /FC461.

Mitussis, D., (2006). *Mapping the re-engagement of CRM*. Retrieved on t he 22nd March, 2011 from www.emeraldinsight.com/journals.htm.

Moore, D. & McCabe, G., (1999). Finite population. Retrieved on the 4th August, 2011 from *grants.nih.gov/grants/funding/ modular/eval/Sample_MGAP .doc*grants.ih.go.

Morrison, R. C. J. & Berndt, E., (2001). *Information technology investment, employ, economic growth*. Retrieved on the 2nd June, 2010 from www.pacid-net.org/file2003.

Morrow, M., (1992). *Activity based management new approaches to measuring performance and managing costs*. New York: Woodhead-Faulkner.

Nadkarni, P., & Perez, P., (2007). Managerial mindsets and internalisation. *Journal of Management Accounting Research* 69(12), 21–36.

Nagurney, A., (2006). *Supply chain network economics: Dynamics of prices, flow, and profits*. NY: Edward Elgar publishing.

Nanni, A. J., Dixon, J. R. & Vollman, T. E., (1992).Integrated performance measurement: management accounting to support the new manufacturing realities. *Journal of Management Accounting Research* 54(11), 1–19.

NaranjoGil, D., & Hartmann, F., (2007). Management accounting systems, functional differentiation and managerial efficiency. *Accounting Organisations and Society*, (1):735-756.

Nemanja, B. M., (2011). *Analysis of influence of costs on profit and corporate efficiency of the enterprise: a case study*. Retrieved on the 13th May, 2011 from www.custoseagronegocioonline.com.

Newburry, Garberg & Belkin, (2006). Attractiveness of foreign companies. *Economic Review* 34(6):98-106.

Noah, A. O., (2007). Organisational efficiency of cost control in the service industry: A case study of Kwara State Transport Corporation, Ilorin. *Ilorin Journal of Social Science*, 12(1):38-52.

NSE, (2006). *Nigerian Stock Exchange Fact book*. Lagos, Nigeria: The Nigerian Stock Exchange.

NSE, (2007). *Nigerian stock exchange Fact book*. Lagos, Nigeria: The Nigerian Stock Exchange.

NSE, (2009). *Nigerian stock exchange Fact book*. Lagos, Nigeria: The Nigerian Stock Exchange.

NSE, (2010/11). *Nigerian stock exchange Fact book*. Lagos, Nigeria: The Nigerian Stock Exchange.

Okeke, M., (2009). Economy: Search for new paradigm persists. *Zenith Economic Quarterly* 4(3):5-10.

Olsen, D. H. & Cooney, V., (2000). The strategic benefits of data warehousing: An accounting perspective. *Information Strategy Executive Journal Winter*, 37.

Omolehinwa, E., (2003). *Coping with cost accounting*. (2nd ed.). Lagos, Nigeria: Pumark Publishing. Ltd.

Otley, D. T., (1987). Budget use and managerial performance. *Journal of Accounting research* 11: 241-259.

Otobu, D., (2005). *Industrial relations: Theory and controversies*. Lagos: Malt house Press Ltd. Retrieved on 13th October, 2011 from www.ilo.org/public/egg/ira/document.

Palmer, J. W. & Markus, M. L., (2000). The Performance Impacts of Quick Response and Strategic Alignment in Specialty Retailing. *Information System Research* 11(7):241 259.

Pamulu, M. S. & Bhuta, C., (2004). *Strategic management of information technology in construction industry:the Indonesian perspectives*.Retrieved on 24th March, 2011from www eprints.qut.edu.au/5515/1/5515.pdf.

Pandey, I. M., (2002). *Element of management*. (3rd ed.). New Delhi, India: Vikes publishing house, PVT limited.

Park, S. H., Li, S. & Tse, D. K., (2006). Market libralisation and firm performance in China. *Journal of Marketing Review* 36: 67-98.

Pearce, J. A. & Robinson, R. B., (2003). *Strategic management: Formulation, implementation and control*. (8th ed.). New York:McGraw-Hill higher education.

Pierce, B., (2010). *Costing systems the factors associated with success*. Retrieved on the 22ndSeptember, 2011 from www.accountancyireland.ie/archieve/2010/february.

Ping, R. A., (2005). *What is the average variance extracted for a latent variable interaction (or quadratic)* Retrieved on 21st September, 2011 from http://home.att.net/-rping/ave1.doc.

Pondeville, S., (1999). Management control system and environmental performance: a Tentative contingency approach. *Eighth International Conference of Greening* of industry Network November 14-17.

Prasad, A., (2008). Information technology and business value in developing economies: A study of intangible benefits on information technology investments in FIJI. *Electronic Journal of Information Systems in Developing Countries*, 34(2):1-11.

Quattrone, P., & Hopper, T., (2001). What does organisational change mean? Speculations on a taken for granted category. *Management Accounting Research* 12 (4) :403-435.

Quattrone, P., & Hopper, T., (2005). A time-space odyssey: management control systems in two multinational organisations. *Accounting, Organisations and Society*, 30(7/8):735-764.

Rayburn, L. G., (1989). *Principles of Cost Accounting*. (4th ed). London: Irwin.

Reid, G. C., & Smith, J. A., (2001). The impact of contingencies on management accounting system development. *Management Accounting Researc*h, 11; 427-450

Reilly, P., (1996). *Human resource planning: An introduction.* IES *Report 312*, Institute for Employment Studies. Retrieved on the 22nd April, 2011 from www.employment-studies.co.uk/pubs/summary.php?id=312

Reka, V. I., Stefan, P.& Daniel, C. V., (2008). *Cost and management systems between cost calculation and performance measurement*. Retrieved on the 22nd April, 2011 from www.steconomice.uoradea.ro/anale/volume/2008/v3-finances-banks.../280.pdf.

Richard, P. J., Devinney, T.M., Yip, G.S. and Johnson, G., (2009) Measuring organisational performance: Towards methodological best practice. *Journal of Management,*Review Issue 35(3):718-804

Rom, A., & Rohde, C., (2007). Enterprise resource planning systems, strategic enterprise management systems and management accounting: DA Danish study. *Journal of Enterprise information management*, 19(1):50-66.

Rondeau, P. J. & Litteral, L. A., (2001). Evolution of manufacturing planning and control systems: from reorder point to enterprise resource planning. *Production and Inventory Management Journal* 42 (2): 54 58.

Rotch, W., (1995). *Cases in Management Accounting and Control Systems.* (3rd ed). Englewood Cliffs, NJ: Prentice Hall.

Roztocki, N., Pick, J. & Navarrete, C., (2004). IT investments in developing countries: Editorial Introduction. *Electronic Journal of Information Systems in Developing Countries,* 19: 1-3.

Saad S. A., (2010). *Budgetary slack: The effects of truth-inducing schemes on slack and performance*. Retrieved on the 4th of November, 2011 from http://faculty.ksu.edu.sa/Alrwaita/Doc pdf.

Scapens, R. & Jazayeni, M., (2003). ERP systems and management accounting change: opportunities or impacts? A research Note. *European Accounting Review*, 12 (1), 205.

Seaman, A. E., (2006). Strategic information content and performance: The impact of management accounting and control system changes. *The Review of Business Information Systems* First Quarter, 10(1): 59-66.

Searchmanufacturingerp.com (2011). *Supply chain management (SCM).* Retrieved on 9th June, 2011 from http://searchmanufacturingerp. techtarget.com definition /supply-chain.

Shank, J. K., & Govindarajan, V., (1993). *Strategic Cost Management.* New York: Free Press.

Shannon, P. P. & Nuculita, A. V., (2007). *Valuing a business: the analysis and appraisal of closely held companies.* Retrieved on the 22nd June, 2010 from books.google.com.

Shim J. K. & Siegel, J. G., (2009). *Modern cost management and analysis*. Retrieved on the 13th May, 2011 from www.imtuoradea.ro/auo.fmte/files-2009/m.

Shippes, F, & Manz, C., (1992). *Employee self-management without formally designated teams: an alternative road to empowerment*. Retrieved on 24th August from media.wiley.com/product_data/excerpt/78/EHEP0004/EHEP000478.pdf.

Sicar, S., Turnbow, J. L. & Bordoloi, B., (2002). Framework for assessing IT investment and firm performance. *Journal of Management Information System 16(4):69-97.*

Simons, R., (1995). *Levers of control. How managers use innovative control to drive strategic renewal*. Boston, MA: Harvard Business School Press

Simons, R., (2000). *Performance measurement and control systems for implementing strategy*. New Jersey: Prentice Hall.

Soludo, C. C., (2005). Consolidating the Nigerian banking industry to meet the development challenges of the 21st century. An *address delivered on the special meeting of Bankers Committee* held on July 6, CBN headquarters, Abuja.

Stoel, M. D., & Muhanna, W. A., (2009). IT capabilities and firm performance: A contingency analysis of the role of industry and IT capability type. *Information & Management*. 46: 181-189.

Staples, D. S., & Seddon, P., (2004). *Testing the technology-to-performance chain model*. Retrieved on the 18th of March, 2001 from www.highbeam/testing-technology performance-chain.

Spiwoks, M., (2009). Deceptive unity: Surprising characteristics of pre-tax corporate profit forecasts. *International Research Journal of Finance and Economics*, Issue 26. Retrieved on the 19th October, 2011 from http://www.eurojournals.com/finance.htm.

Surmen, Y. & Dastan, A., (2008). *The relationship between the historical development of the accounting information System and its applications and information technologies.* Retrieved on 23rd November, 2009 from www.mufad.org/index2.

Tallon, P. P., Kraemer, K. L., (2003). *Investigating the relationship between strategic alignment and IT business value: the discovery of a paradox*. Irvine: Idea group publishing.

Teng, J., & Calhoun, K., (1996). Organisational computing as a facilitator of operational and managerial decision making: an exploratory study of managers´ perceptions. *Decision Sciences, Fall: 673-710.*

Trkman, P., & Mecormark, K., (2009). Supply chain risk in turbulent environments- A conceptual model for managing supply chain network risk. International *Journal of Production Economics*, 119(2): 247-258.

Tatum, M., (2009). *What is cash control?* In Harris, B., (Ed.). Retrieved on the 23rd of May, 2011 from http://www.wisegeek.com/what -is- cash- control.htm.

The Business Dictionary. Cost control. Retrieved on 27th March, 2010 from www.buzzle.com

Thompson, J., (1967). *Organisations in action*. New York: McGraw-Hill.

Thompson, R.L., Higgins, C.A. & Howell, J.M., (1994). Influence of experience on personal computer utilisation: Testing a conceptual model. *Journal of Management Information Systems* 11(1):167-187.

Toffler, A., (1980). *The third wave*. United States: Bantam Books.

Tonita, P. M., Benedict, G. C. & Ko, D. R., (2004). What drives consumers to shop on-line? A literature review. *International Journal of Service Industry Management*, 15 (1):102-122.

Tony management consultant, (2006). *What is delivery management?* July 6; Retrieved on 23rd May, 2010 from http://it.toolbox.com/blogs/delivery-doctor/what-is-delivery-management.

Usoro, A., Shoyelu, S. & Kuofie, M., (2010). Task-technology fit and task acceptance models applicability to e-tourism. *Journal of Economic Development, Management, IT, Finance and Marketing*, 2(1): 1-32.

Uyar ,A., (2010). Cost and management accounting practices: A survey of manufacturing companies. *Eurasian Journal of Business and Economics*, 3(6): 113-125.

Varadarajan, P. R & Ramanujam, V., (1990). The Corporate Performance Conundrum: A Synthesis of. Contemporary Views and an Extension. *Journal of Management Studies*, 27(5): 463-483.

Venkatraman, N, & Ramanujam, V., (1986). Measurement of business performance in strategy research: A comparison of approaches. *The Academy of management Review*, 11(4): 801-814.

Venkatesh, V. & Davis, F. D., (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences* 27 (3): 451-481.

Venkatesh, V., Morris, M. G& Davis, F. D., (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3): 425-478.

Vessey, I., (1999). *Cognitive Fit: An empirical study of information Acqusition*. Retrieved on the 13th May, 2011 from www.isr.journal.informs.org/./63.pdf

Vessey, I., & Galletta, D., (1991). Impacts of decision task,data and display on strategies. Retrieved on the 13th May, 2011 from www.tau.ac.il/.impact.pdt

Waring, F.G., (1996). Industry difference in the persistence of firm specific returns. *American Economic Review* 86: 1253-1265

Westphal, H., & Bednnar, K., (2005). Biases against strategic action in low performing firms. *The Academy of management Review*, 30(4): 701-724.

Widener, S. K., (2007). An empirical analysis of the levers of control framework. *Accounting, Organisations and Society*, 32(7-8): 757-788.

Wier, B., Hunton, J. & HassabElnaby, H. R., (2004). Enterprise resource planning and non-financial performance incentives. *Journal of Engineering and Management Technology*, 21: 307-330.

Wilson, D., (1993). Assessing the impact of IT on oranisational performance. In R. Banker, R. Kauffman, & Mahmood M.A (Eds.). *Strategic information technology performance*.Harrisburg, PA: Idea group.

Williams, J. R., Susan, F. H., Bettner, M. S. & Carcello, J. V., (2008). *Financial & Managerial Accounting*. Irwin: McGraw-Hill.

Wisegeek, (2011). *What is bank turnover?* Retrieved on the 19th October, 2011 from http://www.wisegeek.com/what-is-bank-turnover.htm.

Wong, Y.H., Leung, T. K.P. & Chow, S.W.K. (2003). *Beyond Customer Relationship Management: Information co-sharing and relationship positioning.* Paper presented at Academy of Business & Administrative Sciences International conference, Brussels: Belgium.Retrieved on the 2nd September, 2011 from www.sba.muohio.edu.

Wyatt, A. R., (2003). *Accounting professionalism*. Retrieved on the 13th May, 2011 from www. aaahq.org/AM2003/wyatt.

Yong-Woo, K. & Glenn, B., (2001). Activity-based costing and its application to lean construction. 9th Annual *Conference Proceedings* of the International Group for Lean Construction, National University of Singapore, August.

Yong-Woo,K.& Glenn, B., (2002). Case-study – Overhead cost analysis. *Proceedings of International Group for Lean Construction*. 10th August; Gramado: Brazil.

Yongmei, L., Hongjian, L. & Junhua H., (2008). IT capability as moderator between IT investment and firm performance. *Tsinghua Science and Technology*. 13(3): 329- 336

Young, S. M. & Selto, F. H., (1991). New manufacturing practices and cost management: Review of the literature and directions for research. *Journal of Accounting Literature*, 2(1):265-298.

APPENDIX 1A

RESEARCH QUESTIONNAIRE COVERING LETTER

_____

_____

_____

Dear sir/Madam,

COMPLETION OF QUESTIONNAIRE FOR COLLECTION OF DATA ON: INTEGRATION OF COST CONTROL AND IT SYSTEMS: EFFECT ON CORPORATE PERFORMANCE IN NIGERIA

You are please requested to complete the enclosed questionnaire designed to gather information about NSE listed firms' cost control and IT systems and their effect on the companies' performance. This study is part of the requirement for the award of a Ph.D degree in accounting. The aim of this study is to provide information on tested techniques that would assist in improving the performance of NSE listed firms. The questionnaire is to be completed by senior managerial staff in the accounts unit and IT resource centre of listed firms, who are sufficiently familiar with their companies IT environment and accounting systems. Most of the questions are designed using a rating scale for ease of completion. You are kindly requested to tick the box corresponding to your choice of response.

Your cooperation is solicited in the completion of all questions in the questionnaire, as incompletely filled questionnaire might pose a problem during data analysis. You are assured that the information provided will be used in strict confidence and for academic purpose only.

Thank you for taking time off to attend to this questionnaire.

Omorogbe, Comfort, BSc., MSc.
Department of Accounting,
University of Lagos, Nigeria.
Tel: 070-33694199

APPENDIX 1B

RESEARCH QUESTIONNAIRE

SECTION 1 – Demographic Data:
Please tick as appropriate

1. Highest qualificat(s): B.Sc/BA/HND ☐ M.Sc/MBA ☐
Ph.D ☐ Professional ☐ Others

2. Size of organisation in terms of numbe employees: ☐
Less than 50 ☐ 51 -100 ☐ – 500 501 – 0 above 1000

3. Department/division: (Kindly state) ----------

4. Job Title: (Please specify)----------

SECTION 2 – ORGANISATIONAL VARIABLES:

Lines of Authority

5. How would you describe your firms' control structure in terms of authority ☐ ☐
Centralised Decentralised

Cost Control Structure

6. How would you describe the cost control structure in your firm?
Cost centre ☐ Profit centre ☐ Revenue centre ☐ Investment centre ☐

7. Does the firms' control structure affect the manner in which cost is managed in these centres?
It does very much ☐ It does ☐
I am not too sure ☐ t does not ☐ t does not at all ☐

Tick the appropriate answer based on your degree of agreement or disagreement with the statements below. Note: SA=Strongly Agree; A=Agree; FA=Fairly Agree; D= Disagree; SD=Strong Disagree.

SECTION 3: Information Technology System Efficiency:

8. **IT System Efficiency**

S/N	ITEM	SA	A	FA	D	SD
A	There exists a well developed central information technology (IT) unit.					
B	The central IT unit oversees the computerised accounting operations					
C	Innovations in accounting operations are quickly effected in the accounting information system.					
D	The data base management system simultaneously manages management information system and accounting information systems.					
E	The automated process generates reports for management at fixed regular interval.					
F	Regular upgrades have enabled increased productivity and identify a market niche that would never have been possible without the connectivity.					
G	IT adequately caters for all control tasks performed in the firm.					
H	Information technology has had effect on various management control task					
J	Technology impact on these above control related task have improved performance					

IT Control Applications' Efficiency

9.

S/N	ITEM	Excellent	Very good	Good	Bad	Very bad
	How would you rate the efficiency of the following IT control applications in relation to assigned tasks and control?					
I	Customer relationship management (CRM)					
Ii	Suppliers chain management (SCM)					
Iii	Cash control management (CCM)					
Iv	Scheduling key task-service delivery/production (TSD)					
V	Human and Material resource management (HMM)					

IT Acceptance For Cost Control

10.

S/N	ITEM	SA	A	FA	D	SD
A	I perceive the information technology control applications are useful to carry out costing assignment.					
B	I perceive costing assignment will not be too tasking as IT control applications will be easy to use.					
C	I perceive the available IT control applications will improve my skill.					

IT Utilisation For Cost Control

11**.**

S/N	ITEM	SA	A	FA	D	SD
A	I like using the available IT control applications regularly.					
B	My use of IT control applications makes my work easy.					
C	I use the available IT control applications because it makes me deliver reports promptly as at when required.					

SECTION 4 – IT- Task-fit

12**.**

S/N	ITEM	SA	A	FA	D	SD
A	The available information technology control applications, well suit various cost control tasks.					
B	The various IT control applications are well adapted and flexible to various assigned cost control tasks.					
C	The use of IT control applications in cost management has led to efficiency on assigned task.					

SECTION 5 - Cost Control System Development:

13. **Extent of development:**

i).What is the extent of development of cost accounting system in your firm?

(a) Stage one: inadequate cost information ☐

(b) Stage two: financial reporting driven cost system ☐

(c) Stage three: develop customized, managerially relevant, but ☐

stand-alone systems

(d) Stage four: integrated cost management and financial ☐

reporting systems

ii). What costing approach is in operation in your firm?

a) Full costing ☐

b) b) Marginal costing ☐

iii) **ASPECTS OF COST SYSTEM EFFICIENCY**

S/N	ITEM	SA	A	FA	D	SD
A	Cost control systems are properly designed and effective.					
B	Cost control systems data influence management decisions					
C	Cost management system was intensified after the economic/financial crisis of 2009 in your firm					
D	Cost control system lacks mechanism for effective cost management.					
E	Cost control exists at different levels of production process/service delivery.					
F	There are no cost incentive programs for individual.					
G	Internal units or producing units have been regrouped according to their functions relating to operational goals in order to manage cost.					
H	Cost- veto (cost standards are applied as the most important indicator) mechanism is enforced.					
I	Flexible budgeting technique is utilized for responsibility cost target.					
J	Cost management experts system (COMEX) is effectively utilized in cost assignment, planning and control.					
K	Cost is accumulated at various levels to effectively manage cost.					

Cost Control Techniques

14. The cost control techniques operational in your establishment:

Tick those that are functional in your firm. Indicate whether they are highly operational (HO), operational (OP), averagely operational (AO), partially operational (PO) or not operational (NO). If it exists then tick its efficiency on the next box as either: excellent, (EX) very good (VG) good (G) bad (B) or very bad (VB)

S/N	COST CONTROL TECHNIQUES	HO	OP	AO	PO	NO
A	Budgetary control					
B	Value analysis (for product/service already in production/operation)					
C	Activity-based costing (ABC)					
D	Target costing					

15. Describe the outcome of cost control techniques efficiency (Assess that which is appropriate to your firm).

S/N	COST CONTROL TECHNIQUES	EX	VG	G	B	VB
A	Budgetary control					
B	Standard costing					
C	Activity-based costing (ABC)					
D	Target costing					

Performance Measurement Technique Efficiency

16. Does your firms' performance measurement system provide input for cost monitoring?

Yes ☐ No ☐

17. Identify the performance measurement in place in your firm: **(Tick)**

S/N	PERFORMANCE MEASURES	RESPONSE
A	Balanced score card	
B	Quality management and quality cost	
C	Activity based cost and activity based management	
D	Responsibility cost targets	

18. How would you rate the efficiency of the existing performance measurement techniques in your firm, in providing input for cost control? (Rate only where the performance measurement technique is applicable)

S/N	ITEM	Excellent	Very effective	Effective	Less effective	Not effective
A	**ASPECTS OF BALANCED SCORE CARD**					
i	Financial					
ii	Customer					
iii	Internal business					
iv	Learning and growth					
B	**ASPECTS OF QUALITY MANAGEMENT AND QUALITY COST**					
i	Prevention of defect					
ii	Appraisal of product					
iii	Prevention of internal failure					
iv	Prevention of external failure					
C	**ASPECTS OF ACTIVITY-BASED COST AND ACTIVITY-BASED MANAGEMENT**					
i	Proper identification of cost pools and cost drivers					
ii	Increasing throughput by reducing non-value added activities					
iii	Minimizing non-quality work					
D	**ASPECTS OF RESPONSIBILITY COST TARGETS**					
i	Targets based on information relating to market demand, sales projection and profit analysis					
ii	Use of pull (backward-working) approach					
iii	The design of multi-tier responsibility centre					
iv	Use of moving averages of market prices based on specific period sales forecasting					

SECTION 6 – Non-Financial Performance

19.

S/N	ITEM	Excellent	Very good	Good	Bad	Very bad
	Please rate the following non- financial performance in relation to					
	Customer's Value:					
I	Meeting with Lead time from receipt of order to delivery to customer					
Ii	Minimal Defect level or Deficiency or disappointment times					
Iii	Market Share					

APPENDIX 2

LIST OF SAMPLED FIRMS LISTED IN NSE

CODE NUMBER	NAME OF SECTOR/ FIRM
	AGRICULTURE/AGRO-ALLIED
001	ELLAH AKES PLC
002	LIVESTOCK FEEDS PLC.
003	OKITIPUPA OIL PALM PLC.
004	PRESCO PLC.
	AUTOMOBILE & TYRE
005	R T BRISCOE (NIGERIA) PLC.
	BANKING
006	ACCESS BANK PLC.
007	DIAMOND BANK PLC.
008	ECOBANK NIGERIA PLC.
009	FIRST BANK OF NIG. PLC.
010	FIRST CITY MONUMENT BANK PLC.
011	GUARANTY TRUST BANK PLC.
012	SKYE BANK PLC.
013	UNION BANK (NIG) PLC.
014	UNITED BANK FOR AFRICA PLC.
015	UNITY BANK PLC.
016	WEMA BANK PLC.
017	ZENITH BANK PLC.
	BREWERIES
018	GOLDEN GUINEA BREWERIES PLC
019	GUINNESS NIGERIA PLC
020	INTERNATIONAL BREWERIES PLC.
021	NIGERIAN BREWERIES PLC.
022	JOS INTERNATIONAL BREWERIES
	BUILDING MATERIALS
023	CEMENT CO. OF NORTHERN NIGERIA PLC
024	NIGERIAN ROPES PLC.
025	NIGERIA WIRE IND. PLC.
	CHEMICAL AND PAINTS
026	BERGER PAINTS PLC.

027	DN MEYER PLC.
028	IPWA PLC.
029	NIGERIA-GERMAN CHEMICALS PLC.
	COMMERCIAL/SERVICES
030	TRANS-NATIONWIDE EXPRESS PLC.
	COMPUTER & OFFICE EQUIPMENT
031	HALLMARK PAPER PRODUCTS PLC.
032	THOMAS WYATTT (NIG) PLC.
033	TRIPPLE GEE & COMPANY PLC.
	CONGLOMERATES
034	A. G. LEVENTIS (NIG) PLC.
035	CHELLARAMS PLC.
036	P Z INDUSTRIES PLC.
037	U A C NIGERIA PLC.
038	UNILEVER NIGERIA PLC.
	CONSTRUCTION
039	CAPPA & D'ALBERTO PLC.
040	COSTAIN (W A) PLC.
041	G. CAPPA PLC.
042	ARBICO PLC
	EMERGING MARKETS
043	ADSWITCH PLC.
044	ANINO INTERNATIONAL PLC
045	CAPITAL OIL PLC.
046	JULI PLC
047	KRABO NIGERIA
048	ROKANA INDUSTRIES PLC
049	TROPICAL PET. PRODUCTS PLC.
050	UDEOFSON GARMENT FACT. NIG. PLC.
051	UNION VENTURES PET. PLC.
052	W.A. ALUM. PRODUCTS PLC.
	ENGINEERING TECHNOLOGY
053	INTERLINKED TECHNOLOGIES PLC.
054	NIGERIAN WIRE & CABLE PLC.
	FOOD/BEVERAGES & TOBACCO
055	7-UP BOTTLING CO. PLC.
056	CADBURY NIGERIA PLC.
057	FLOUR MILLS (NIG) PLC.
058	NATIONAL SALT CO. (NIG) PLC.
059	NESTLE NIGERIA PLC.
060	NIGERIAN BOTTLING CO. PLC.
061	UNION DICON SALT PLC.
	FOOTWEAR
062	LENNARDS (NIG) PLC.
	HEALTHCARE
063	EVANS MEDICAL PLC.
064	GLAXO SMITHKLINE CONSUMER PLC.
065	MAY & BAKER NIGERIA PLC.
066	NEIMETH INT. PHARM PLC.
067	PHARMA-DEKO PLC.
	HOTEL & TOURISM
068	THE TOURIST COMPANY OF NIGERIA
	INDUSTRIAL/DOMESTIC PRODUCTS
069	ALUMACO PLC.

070	B. O. C. GASES PLC.
071	FIRST ALUMINIUM NIGERIA PLC.
072	VITAFOAM COMPANY PLC.
073	VONO PRODUCTS PLC.
	INSURANCE
074	AIICO INSURANCE PLC.
075	CORNERSTONE INSURANCE PLC.
076	GREAT NIGERIA INSURANCE PLC.
077	LAW UNION & ROCK INSURANCE PLC.
078	LINKAGE ASSURANCE PLC.
079	MUTUAL BENEFITS ASSURANCE PLC.
080	NEM INSURANCE PLC.
081	NIGER INSURANCE CO. PLC.
082	PRESTIGE ASSURANCE CO. PLC.
083	UNIC INSURANCE PLC.
	MACHINERY (MARKETING)
084	STOKVIS (NIG) PLC.
	MANAGED FUNDS
085	C & I LEASING PLC
	MARITIME
086	JAPAUL OIL MARTIME SERVICES PLC.
	MORTGAGE COMPANIES
087	UNION HOMES SAVINGS AND LOANS PLC.
	PACKAGING
088	ABPLAST PRODUCTS PLC.
089	BETA GLASS CO. PLC.
090	GREIF NIGERIA PLC.
091	NAMPAK NIGERIA PLC
092	POLY PRODUCTS (NIG) PLC.
093	STUDIO PRESS (NIG) PLC.
	PETROLEUM (MARKETING)
094	AFRICAN PETROLEUM PLC.
095	CONOIL PLC.
096	MOBIL OIL NIGERIA PLC.
097	OANDO PLC.
098	TOTAL NIGERIA PLC.
	PRINTING & PUBLISHING
099	DAILY TIMES PLC.
0100	LONGMAN NIG. PLC.
0101	UNIVERSITY PRESS PLC.
	REAL ESTATE
0102	UACN PROPERTY DEVELOPMENT CO. PLC.
	TEXTILES
0103	UNITED NIGERIA TEXTILES PLC.

APPENDIX 3

DESCRIPTIVE ANALYSIS OF QUESTIONNAIRE ITEMS

SECTION 2: ORANISATIONAL VARIABLES

TABLE 1: RESPONSES ON ORGANISATIONAL VARIABLES

	Frequency	%
Firms' control in terms of lines of authority		
Centralised	83	53.2
Decentralised	73	46.8
Total	156	100.0
Cost control structure in your firm		
Cost centre	6	3.8
Profit centre	76	48.7
Revenue centre	69	44.2
Investment centre	5	3.2
Total	156	100.0
Firms' cost control structure affects the manner in which cost is managed in the centres		
It does very much	43	27.56
It does	50	32.05
I am not too sure	29	18.59
It does not	19	12.18
It does not at all	15	09.62
Total	156	100.0

SECTION 3: INFORMATION TECHNOLOGY SYSTEM EFFICIENCY

TABLE 2: RESPONSES ON (IT) SYSTEM EFFICIENCY

S/N	ITEM	SA	A	FA	D	SD	Total	Mean	Std. deviation
a	There exists a well developed central information technology (IT) unit.	44 (28.2)	74 (47.4)	35 (22.4)	2 (1.3)	1 (0.6)	156 (100.0)	4.01	0.787
b	The central IT unit oversees the computerised accounting operations	49 (31.4)	79 (50.6)	25 (16.0)	2 (1.3)	1 (0.6)	156 (100.0)	4.11	0.758
c	Innovations in accounting operations are quickly effected in the accounting information system.	48 (30.8)	64 (41.0)	41 (26.3)	2 (1.3)	1 (0.6)	156 (100.0)	4.00	0.827
d	The data base management system simultaneously manages management information system and accounting information systems.	45 (28.8)	71 (45.5)	36 (23.1)	2 (1.3)	2 (1.3))	156 (100.0)	3.99	0.831

e	The automated process generates reports for management at fixed regular interval.	38 (24.4)	68 (43.6)	41 (26.3)	8 (5.1)	1 (0.6)	156 (100.0)	3.86	0.868
f	Regular upgrades have enabled increased productivity and identify a market niche that would never have been possible without the connectivity.	47 (30.1)	67 (42.9)	38 (24.4)	2 (1.3)	2 (1.3)	156 (100.0)	3.99	0.846
g	IT adequately caters for all control tasks performed in the firm.	56 (35.9)	58 (37.2)	38 (24.4)	3 (1.9)	1 (0.6)	156 (100.0)	4.069	0.859
h	Information technology has had effect on various management control task	55 (35.3)	61 (39.1)	32 (20.5)	5 (3.2)	3 (1.9)	156 (100.0)	4.03	0.929
j	Technology impact on these above control related task have improved performance	50 (32.1)	76 (48.7)	29 (18.6)	-	1 (0.6)	156 (100.0)	4.12	0.745

TABLE 3: RESPONSES ON (IT) CONTROL APPLICATIONS USAGE EFFICIENCY

S/N	**ITEM**	**Excellent**	**Very good**	**Good**	**Bad**	**Very bad**	**Total**	**Mean**	**Std. deviation**
	How would you rate the efficiency of the following IT control applications in relation to assigned tasks and control?								
i	Customer relationship management (CRM)	47 (30.1)	68 (43.6)	38 (24.4)	2 (1.3)	1 (0.6)	156 (100.0)	4.01	0.811
ii	Suppliers chain management (SCM)	62 (39.7)	59 (37.8)	28 (17.9)	6 (3.8)	1 (0.6)	156 (100.0)	4.12	0.882
iii	Cash control management (CCM)	51 (32.7)	71 (45.5)	30 (19.2)	2 (1.3)	2 (1.3)	156 (100.0)	4.07	0.828
iv	Scheduling key task-service delivery/production (TSD)	55 (35.3)	62 (39.7)	36 (23.1)	2 (1.3)	1 (0.6)	156 (100.0)	4.08	0.831
v	Human and Material resource management (HMM)	48 (30.8)	69 (44.2)	38 (24.4)	1 (0.6)	-	156 (100.0)	4.05	0.760

TABLE 4: RESPONSES ON (IT) CONTROL APPLICATION ACCEPTANCE AND (IT) UTILISATION

S/N	ITEM	SA	A	FA	D	SD	Total	Mean	Std. Deviation
	IT Acceptance								
A	I perceive the information technology control applications are useful to carry out costing assignment.	59 (37.8)	77 (49.4)	20 (12.8)	-	-	156 (100.0)	4.25	0.668
B	I perceive costing assignment will not be too tasking as IT control applications will be easy to use.	51 (32.7)	88 (56.4)	16 (10.3)	1 (0.6)	-	156 (100.0)	4.21	0.643
C	I perceive the available IT control applications will improve my skill.	61 (39.1)	61 (39.1)	29 (18.6)	3 (1.9)	2 (1.3)	156 (100.0)	4.13	0.870
	IT Utilisation								
A	I like using the available IT control applications regularly.	83 (53.2)	63 (40.4)	10 (6.4)	-	-	156 (100.0)	4.47	0.616
B	My use of IT control applications makes my work easy.	53 (34.0)	76 (48.7)	25 (16.0)	1 (0.6)	1 (0.6)	156 (100.0)	4.15	0.752
C	I use the available IT control applications because it makes me deliver reports promptly as at when required.	58 (37.2)	58 (37.2)	32 (20.5)	5 (3.2)	3 (1.9)	156 (100.0)	4.04	0.939

SECTION 4: IT TASK- FIT

TABLE 5: RESPONSES ON (IT) TASK -FIT

ITEM	SA	A	FA	D	SD	Total	Mean	Std. Deviation
IT- Task-fit								
The available information technology control applications, well suit various cost control tasks.	60 (38.5)	76 (48.7)	18 (11.5)	-	2 (1.3)	156 (100.0)	4.23	0.752
The various IT control applications are well adapted and flexible to various assigned cost control tasks.	58 (37.2)	72 (46.2)	22 (14.1)	1 (0.6)	3 (1.9)	156 (100.0)	4.16	0.831
The use of IT control applications in cost management has led to efficiency on assigned task.	62 (39.7)	60 (38.5)	22 (14.1)	9 (5.8)	3 (1.9)	156 (100.0)	4.08	0.970

SECTION 5 - COST CONTROL SYSTEM EFFICIENCY

TABLE 6A: RESPONSES ON COST CONTROL SYSTEM DEVELOPMENT

	FREQUENCY	PERCENTAGE
The extent of development of cost accounting system in the firm		
Stage one: inadequate cost information		
Stage two: financial reporting driven cost system	34	21.79
Stage three: develop customized, managerially relevant, but stand-alone systems	54	34.52
Stage four: integrated cost management and financial reporting systems	47	30.13
	34	21.79
What costing approach is in operation in your firm?		
Full costing	101	64.7
Marginal costing	55	35.3
Total	156	100

EFFICIENCY OF COST SYSTEM

TABLE 6B: RESPONSES ON ASPECTS OF COST SYSTEM EFFICIENCY

S/N	ITEM	SA	A	FA	D	SD	Total	Mean	Std. deviation
A	Cost control systems are properly designed and effective.	50 (32.1)	79 (50.6)	24 (15.4)	-	3 (1.9)	156 (100)	4.11	0.800
B	Cost control systems data influence management decisions	54 (34.6)	67 (42.9)	31 (19.9)	2 (1.3)	2 (1.3)	156 (100)	4.08	0.842
C	Cost management system was intensified after the economic/financial crisis of 2009 in your firm	47 (30.1)	63 (40.4)	40 (25.6)	4 (2.6)	2 (1.3)	156 (100)	3.96	0.882
D	Cost control system lacks mechanism for effective cost management.	34 (21.8)	66 (42.8)	45 (28.8)	9 (5.8)	2 (1.3)	156 (100)	3.78	0.899
E	Cost control exists at different levels of production process/service delivery.	42 (26.9)	73 (46.8)	38 (24.4)	1 (0.6)	2 (1.3)	156 (100)	3.97	0.811
F	There are no cost incentive programs for individual.	46 (29.5)	58 (34.2)	40 (25.6)	9 (5.8)	3 (1.9)	156 (100)	3.87	0.971
G	Internal units or producing units have								

	been regrouped according to their functions relating to operational goals in order to manage cost.	43 (27.6)	66 (42.3)	44 (28.2)	1 (0.6)	2 (1.3)	156 (100)	3.94	0.837
H	Cost- veto (cost standards are applied as the most important indicator) mechanism is enforced.	33 (21.2)	73 (46.8)	43 (27.6)	5 (3.2)	2 (1.3)	156 (100)	3.83	0.841
I	Flexible budgeting technique is utilized for responsibility cost target.	31 (19.9)	70 (44.9)	47 (30.1)	6 (3.8)	2 (1.3)	156 (100)	3.78	0.852
J	Cost management experts system (COMEX) is effectively utilized in cost assignment, planning and control.	29 (18.6)	63 (40.4)	54 (34.6)	6 (3.8)	4 (2.6)	156 (100)	3.69	0.907
K	Cost is accumulated at various levels to effectively manage cost.	44 (28.2)	49 (31.4)	55 (35.3)	6 (3.8)	2 (1.3)	156 (100)	3.81	0.935

COST CONTROL TECHNIQUES

TABLE 6C: RESPONSES ON COST CONTROL TECHNIQUES USAGE

S/N	COST CONTROL TECHNIQUES	HO	OP	AO	PO	NO	Total	Mean	Std. deviation
A	Budgetary control	51 (32.7)	63 (40.4)	41 (26.3)	-	1 (0.6)	156 (100)	4.04	0.806
B	Value analysis (for product/service already in production/operation	42 (26.9)	61 (39.1)	53 (34.0)	-	-	156 (100)	3.93	0.780
C	Activity-based costing (ABC)	54 (34.6)	54 (34.6)	47 (30.1)	1 (0.6)	-	156 (100)	4.03	0.822
D	Target costing	50 (32.1)	53 (34.0)	49 (31.4)	3 (1.9)	1 (0.6)	156 (100)	3.95	0.878

TABLE 6D: RESPONSES ON COST CONTROL TECHNIQUES EFFICIENCY

S/N	COST CONTROL TECHNIQUES	EX	VG	G	B	VB	Total	Mean	Std. Deviation
A	Budgetary control	43 (27.6)	80 (51.3)	32 (20.5)	-	1 (0.6)	156 (100)	4.05	0.734
B	Value analysis (for product/service already in production/operation	47 (30.1)	68 (43.6)	40 (25.6)	1 (0.6)	-	156 (100)	4.03	0.766
C	Activity-based costing (ABC)	46 (29.5)	65 (41.7)	45 (28.8)	-	-	156 (100)	4.01	0.766
D	Target costing	53 (34.0)	59 (37.8)	41 (26.3)	3 (1.9)	-	156 (100)	4.04	0.826

PERFORMANCE MEASUREMENT TECHNIQUES

TABLE 7A: RESPONSES ON PERFORMANCE MEASUREMENT TECHNIQUES

S/N	PERFORMANCE MEASURES	Frequency	Percentage
a	Balanced score card	127	81.4
b	Quality management and quality cost	95	60.9
c	Activity based cost and activity based management	91	58.3
d	Responsibility cost targets	92	59.0

TABLE 7B: RESPONSES ON EXISTING PERFORMANCE MEASUREMENT TECHNIQUES PROVIDING COST CONTROL INPUT

S/N	ITEM	Excellent	Very effective	Effective	Less effective	Not effective	Total	Mean	Std. deviation
a	***ASPECTS OF BALANCED SCORE CARD***								
I	Financial	22 (14.10)	44 (28.2)	48 (37.8)	12 (7.7)	1 (0.6)	127 (100)	3.58	0.91236
ii	Customer	18 (14.2)	56 (44.1)	42 (33.1)	10 (7.9)	1 (0.8)	127 (100)	3.63	0.85266
iii	Internal business	16 (10.26)	46 (29.5)	43 (33.9)	20 (12.8)	2 (1.3)	127 (100)	3.43	0.95552
iv	Learning and growth	23 (14.7)	47 (30.2)	33 (25.9)	23 (14.7)	1 (0.6)	127 (100)	3.53	1.01415
b	***ASPECTS OF QUALITY MANAGEMENT AND QUALITY COST***								
I	Prevention of defect	13 (8.33)	45 (47.0)	13 (13.7)	23 (14.7)	1 (0.6)	95 (100)	3.48	1.04029
ii	Appraisal of product	10 (6.41)	38 (40.0)	18 (18.9)	27 (17.3)	2 (1.3)	95 (100)	3.28	1.05853
iii	Prevention of internal failure	21 (13.46)	38 (40.0)	11 (11.6)	22 (14.1)	3 (1.9)	95 (100)	3.55	1.16481
iv	Prevention of external	22	30	14	27	2	95	3.47	1.15632

	failure	(14.10)	(31.6)	(14.7)	(17.3)	(1.3)	(100)		
c	***ASPECTS OF ACTIVITY- BASED COST AND ACTIVITY- BASED MANAGEMENT***								
I	Proper identification of cost pools and cost drivers	17 (10.9)	30 (32.9)	19 (20.9)	24 (26.4)	1 (0.6)	91 (100)	3.42	1.10620
ii	Increasing throughput by reducing non-value added activities	13 (8.33)	26 (28.6)	13 (14.3)	36 (39.6)	3 (1.9)	91 (100)	3.11	1.17804
iii	Minimizing non-quality work	12 (7.69)	30 (32.9)	15 (16.5)	31 (19.9)	3 (1.9)	91 (100)	3.19	1.14418
d	***ASPECTS OF RESPONSIBILITY COST TARGETS***								
I	Targets based on information relating to market demand, sales projection and pro fit analysis	23 (14.7)	33 (21.2)	13 (14.1)	22 (14.1)	1 (0.6)	92 (100)	3.60	1.13931
ii	Use of pull (backward-working) approach	12 (7.69)	36 (23.1)	12 (13.0)	30 (32.6)	2 (1.3)	92 (100)	3.28	1.12246
iii	The design of multi-tier responsibility centre	15 (9.62)	20 (21.7)	19 (20.7)	37 (23.7)	1 (0.6)	92 (100)	3.12	1.14663
iv	Use of moving averages of market prices based on specific period sales forecasting	8 (5.13)	43 (27.6)	11 (11.9)	29 (18.6)	1 (0.6)	92 (100)	3.30	1.0455

SECTION 6 – NON-FINANCIAL PERFORMANCE

TABLE 8: RESPONSES ON NON- FINANCIAL PERFORMANCE

Please rate the following non- financial performance in relation to:

S/N	**ITEM**	**Excellent**	**Very good**	**Good**	**Bad**	**Very bad**	**Total**	**Mean**	**Std. deviation**
	Customer's Value:								
i	Meeting with Lead time from receipt of order to delivery to customer	45 (28.8)	74 (47.4)	36 (23.1)	-	1 (0.6)	156 (100.0)	4.14	0.761
ii	Minimal Defect level or Deficiency or disappointment times	47 (30.1)	71 (45.5)	37 (23.7)	-	1 (0.6)	156 (100.0)	4.04	0.773
iii	Market Share	60 (38.5)	55 (35.3)	40 (25.6)	-	1 (0.6)	156(100.0)	4.11	0.831

APPENDIX 4

TABLE 9: COMPUTATION OF PRE-TAX EARNINGS (PTE), EARNINGS PER SHARE (EPS) AND TURNOVER GROWTH RATE (TGR)

No.	Percentages / Sampled Company Code	2006			2007			2008			2009			2010		
		PTE (%)	EPS (%)	TGR (%)	PTE (%)	EPS (%)	TGR (%)	PTE (%)	EPS (%)	TGR (%)	PTE (%)	EPS (%)	TGR (%)	PTE (%)	EPS (%)	TGR (%)
	AGRICULTURE/AGRO ALLIED															
1	001	**NA**			**87**		**75**	**138**		**79**	**40**		**187**	**50**		
2	002	**NA**	**186**	**96**	**8**	**1163**	**62**	**22**	**76**	**39**	**58**	**153**	**109**	**168**		
3	003	**250**	**347**	**117**	**117**	**78**	**87**	**NA**			**NA**			**NA**		
4	004	**155**	**158**	**112**	**123**	**614**	**93**	**24**	**9**	**57**	**29.5**	**338**	**99**	**NA**		
	AUTOMOBILE & TYRE															
5	005	**41**	**38**	**59**	**83**	**109**	**81**	**96**	**121**	**81**	**217**	**264**	**132**	**NA**		
	BANKING															
6	006	**NA**	**NA**	**NA**	**13**	**8**	**58**	**42**	**50**	**90**	**73**	**123**	**90**	**NA**		
7	007	**NA**	**NA**	**NA**	**14**	**-3**	**58**	**44**	**63**	**65**	**320**	**327**	**99**	**NA**		
8	008	**45**	**56**	**42**	**50**	**79**	**29**	**-1124**	**-1133**	**64**	**15**	**5**	**275**			
9	009	**NA**	**165**	**NA**	**84**	**67**	**71**	**53**	**523**	**163**	**89**	**463**	**52**			
10	010	**NA**	**NA**	**NA**	**48**	**57**	**49**	**35**	**47**	**163**	**500**	**540**	**128**			
11	011	**67**	**88**	**74**	**56**	**97**	**240**	**77**	**90**	**137**	**130**	**146**	**45**			
12	012	**36**	**33**	**19**	**28**	**45**	**33**	**35**	**4**	**69**	**1000**	**1768**	**189**			
13	013		**NA**	**NA**	**76**	**120**	**71**	**52**	**62**	**64**	**49**	**43**	**141**			
14	014	**50**	**141**	**21**	**41**	**72**	**111**	**52**	**83**	**65**	**431**	**3140**	**141**			
15	015	**19**	**390**	**31**	**165**	**63**	**39**	**11**	**5.6**	**41**	**57**	**88**	**211**			
16	016	**NA**	**NA**	**NA**	**2022**	**600**	**54**	**0.6**	**-2**	**68**	**200**	**241**	**135**			
17	017	**60**	**70**	**58**	**60**	**95**	**56**	**45**	**53**	**47**	**160**	**467**	**154**			
	BREWERIES															
18	018															
19	019	**NA**	**NA**	**NA**	**79**	**80**	**85**	**82**	**98**	**90**	**94**	**88**	**78**	**95**	**931**	
20	020	**70**	**70**	**128**	**811**	**187**	**54**	**18**	**767**	**62**	**187**	**21**	**58**			
21	021	**75**	**76**	**93**	**59**	**58**	**77**	**73**	**74**	**77**	**90**	**92**	**88**			
22	022	**75**	**75**	**192**	**106**	**352**	**93**	**72**	**72**	**39**						
	BUILDING MATERIALS															
23	023	**-364**	**647**	**93**	**5.8**	**29**	**79**	**10**	**8**	**81**	**73**	**73**	**83**			
24	024	**65**	**56**	**93**	**137**	**113**	**123**	**66**	**73**	**83**	**32**	**22**	**104**			
25	025	**35**	**50**	**111**	**80**	**131**	**77**	**417**	**533**	**59**	**102**	**164**	**94**			

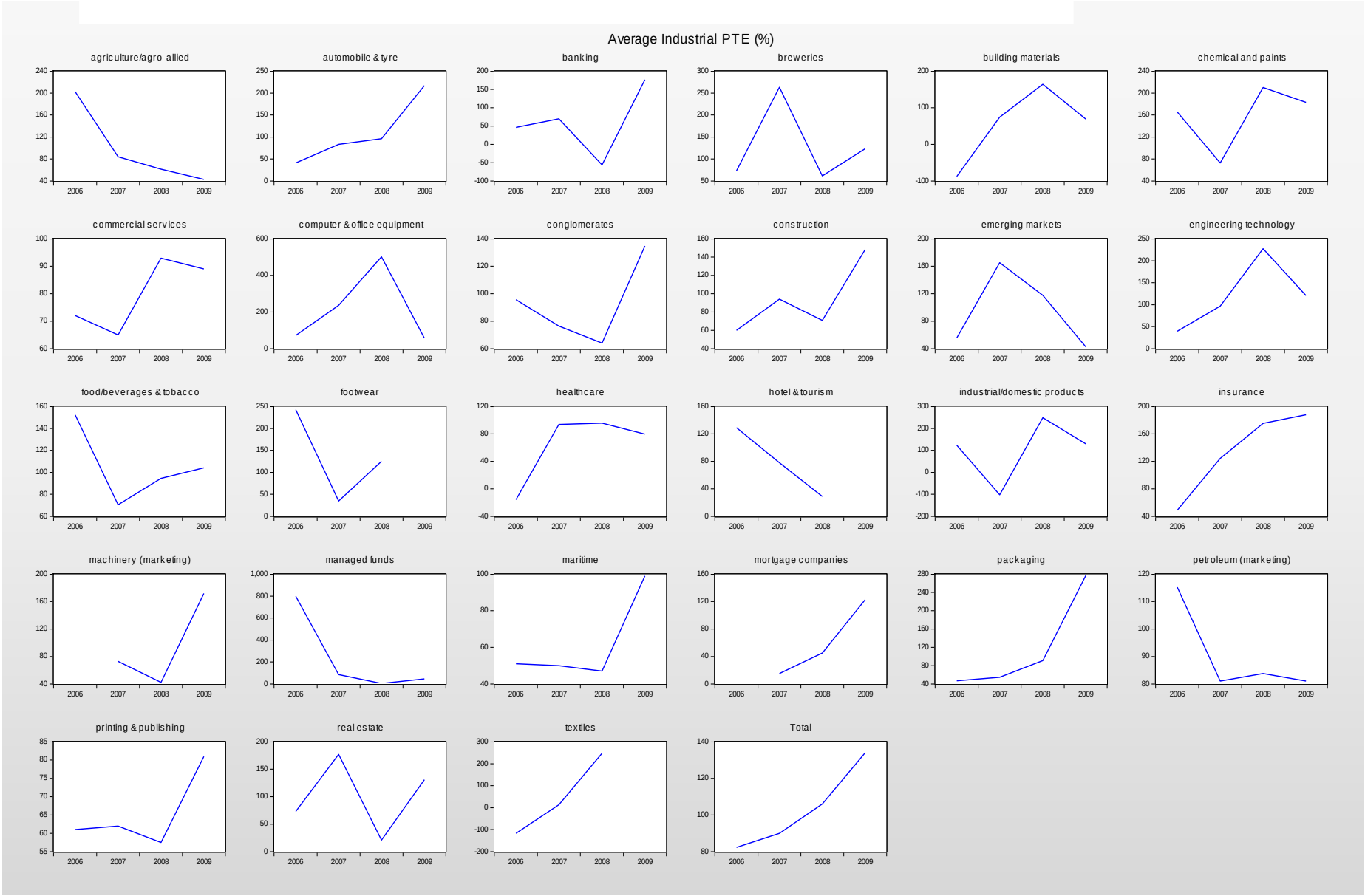
	CHEMICAL AND PAINTS															
26	026	**62**	**57**	**83**	**52**	**71**	**101**	**86**	**119**	**90**	**76**	**107**	**107**			
27	027	**440**	**37**	**68**	**57**	**344**	**96**	**30**	**320**	**92**		**21**				
28	028	**67**	**88**	**83**	**67**	**105**	**62**	**252**	**742**	**86**	**290**	**418**	**141**			
29	029	**94**	**81**	**100**	**114**	**109**	**95**	**473**		**92**						
	COMMERCIAL/ SERVICES															
30	030	**72**	**114**	**67**	**65**	**65**	**72**	**93**	**94**	**80**	**89**	**86**	**89**			
	COMPUTER & OFFICE EQUIPMENT															
31	031	**72**	**77**	**109**	**662**	**650**	**90**	**6.25**	**6**	**63**						
32	032	**NA**		**NA**	**7**	**NA**	**65**	**1450**		**75**	**40**	**100**	**81**	**226**	**-3**	
33	033	**NA**	**NA**	**NA**	**43**	**40**	**61**	**51**	**51**	**81**	**73**	**106**	**78**	**380**	**-10.21**	**193**
	CONGLOMERATES															
34	034	**84**	**89**	**98**	**68**	**60**	**99**	**60**	**83**	**64**	**99**	**90**	**83**			
35	035	**NA**	**NA**	**NA**	**50**	**34**	**73**	**69**	**109**	**79**	**311**	**93**	**88**	**24**	**61**	**84**
36	036	**NA**	**NA**	**NA**	**90**	**92**	**82**	**90**	**112**	**82**	**78**	**82**	**87**	**96**	**167**	**102**
37	037	**95**	**51**	**79**	**69**	**114**	**92**	**52**	**66**	**70**	**113**	**105**	**95**		**91**	
38	038	**108**	**-100**	**131**	**105**	**-154**	**76**	**49**	**41**	**89**	**73**	**64**	**84**			
	CONSTRUCTION															
39	039	**52**	**309**	**84**	**41**	**15**	**77**	**165**	**165**	**94**			**NA**			
40	040	**19**	**20**	**199**	**1305**	**-1369**	**33**	**30**	**31**	**79**	**66**	**-387**	**61**			
41	041		**309**			**15**			**165**							
42	042	**109**	**1300**		**110**	**14**		**17**	**29**		**231**	**2400**				
	EMERGING MARKETS											**11**				
43	043	**NA**	**NA**	**NA**	**66**	**98**	**67**	**1598**	**755**	**163**	**5**		**42**	**60**	**64**	**57**
44	044															
45	045	**34**	**22**	**104**	**103**	**662**	**62**									
46	046	**21**	**38**	**102**	**475**	**325**	**70**									
47	047															
48	048															
49	049															
50	050		**69**			**24**										
51	051	**112**		**13**	**17**		**172**	**75**	**74**	**73**	**80**	**86**	**285**			
52	052		**26**			**406**										
	ENGINEERING TECHNOLOGY															
53	053	**44**	**50**	**34**	**113**	**131**	**166**	**38**	**19**	**27**	**140**	**1167**	**98**			
54	054	**35**	**NA**	**111**	**80**	**120**	**77**	**417**	**533**	**59**	**102**	**164**	**94**			
	FOOD/BEVERAGES & TOBACCO															
55	055	**NA**	**NA**	**NA**	**87**	**648**	**81**	**79**		**90**	**112**	**105**	**88**	**84**	**81**	**83**
56	056	**60**	**-63**	**153**	**5**	**83**	**96**	**4700**	**27**	**79**	**121**	**290**	**96**			
57	057	**NA**	**NA**	**NA**	**64**	**33**	**82**	**99**	**118**	**83**	**181**	**183**	**71**	**21**		**81**

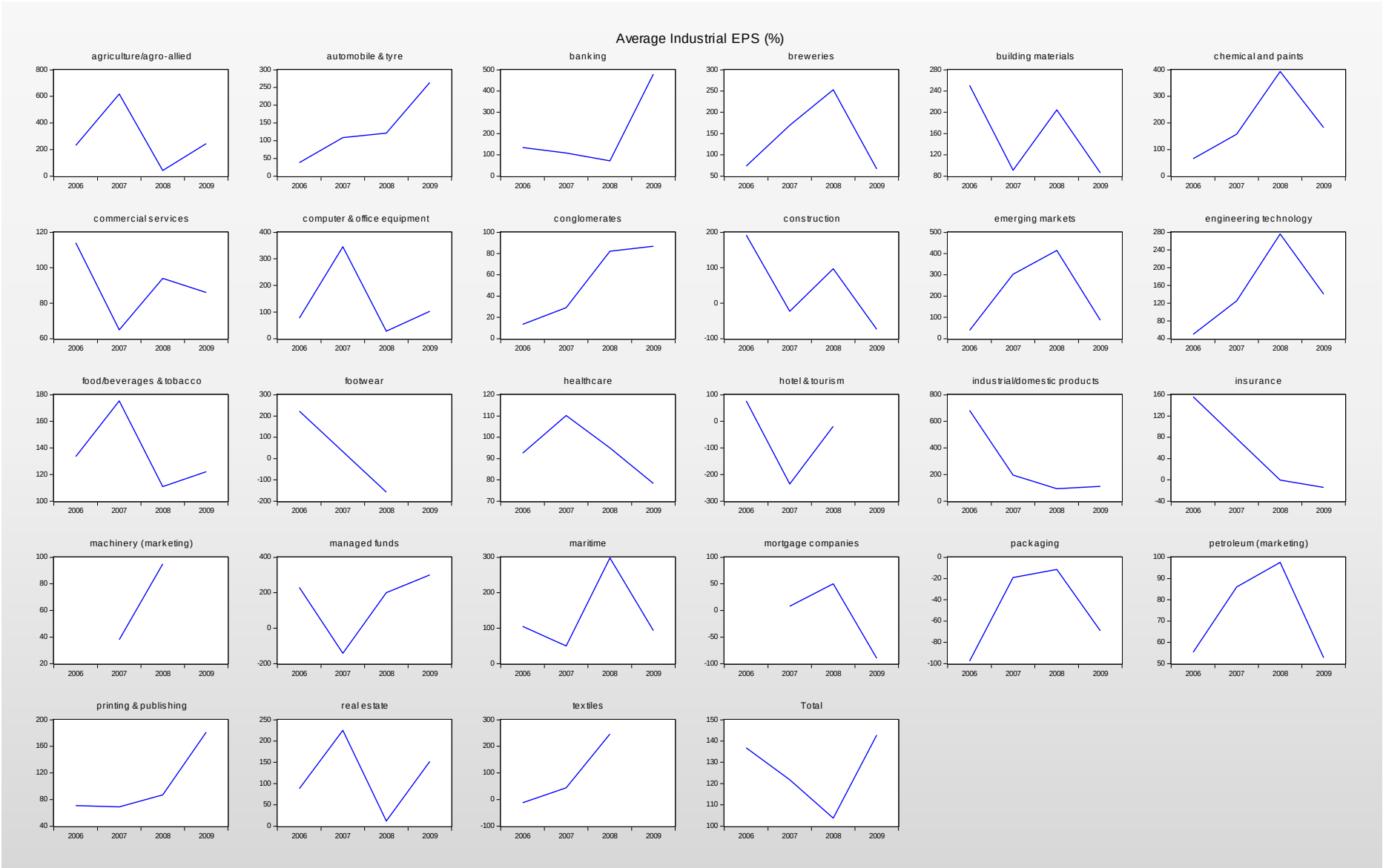
58	058	**79**	**73**	**46**	**1400**	**75**	**216**	**92**	**116**	**79**	**70**	**70**	**90**		**23**	
59	059	**96**	**94**	**89**	**97**		**86**	**73**	**70**	**86**	**85**	**85**	**75**			
60	060	**185**	**223**	**93**	**25**	**38**	**87**	**178**	**2420 0**	**85**	**56**	**0.2**	**89**			
61	061	**341**	**341**	**234**	**75**			**93**	**93**							
	FOOTWEAR															
62	062	**243**	**223**	**107**	**35**		**112**	**125**	**-158**	**81**						
	HEALTHCARE	**51**														
63	063	**93**	**60**	**79**	**50**	**42**	**92**	**96**	**69**	**71**						
64	064	**58**	**90**	**83**	**131**	**130**	**111**	**63**	**65**	**75**	**75**	**75**	**86**			
65	065	**123**	**157**	**89**	**67**	**100**	**58**	**94**	**50**	**71**	**123**	**182**	**118**			
66	066	**-3380**	**177**	**103**	**72**	**167**	**80**	**104**	**120**	**77**	**41**	**-22**	**104**			
67	067		**-21**	**87**	**149**	**112**	**82**	**123**	**171**	**71**						
	HOTEL & TOURISM															
68	068	**129**	**77**	**84**	**78**	**-236**	**84**	**29**	**-18**	**98**						
	INDUSTRIAL/DOMESTIC PRODUCTS															
69	069	**82**	**82**	**110**	**192**	**187**	**120**	**345**	**30**	**63**						
70	070		**106**	**86**		**57**	**70**		**104**	**100**		**89**	**84**			
71	071	**650**	**3075**	**93**	**5**	**-1**	**99**	**123**	**164**	**108**						
72	072	**57**	**50**	**87**	**46**	**63**	**66**	**64**	**64**	**75**	**130**	**135**	**84**			
73	073	**-296**	**100**	**26**	**-651**	**669**	**71**	**462**	**100**	**223**						
	INSURANCE															
74	074	**25**	**33**	**96**	**187**	**225**	**65**	**12**	**89**	**64**	**179**	**60**	**88**			
75	075	**174**	**500**	**63**	**60**	**43**	**102**	**57**	**-140**	**86**	**634**	**100**	**105**			
76	076	**35**	**200**	**315**	**316**	**-167**	**25**	**42**	**-21**	**100**	**16**	**19**	**84**			
77	077	**92**	**138**	**77**	**49**	**37**	**51**	**428**	**300**	**79**	**25**	**33**	**103**			
78	078	**-1005**	**NA**	**79**	**25**	**285**	**21**	**205**	**-174**	**70**						
79	079	**32**	**51**		**61**	**25**		**-81**	**-68**		**314**	**-475**				
80	080	**38**	**-28**	**72**	**2888**	**88**	**32**	**89**	**89**	**59**	**61**	**53**	**84**			
81	081	**43**	**49**		**91**	**106**		**843**	**-539**							
82	082	**71**	**93**		**67**	**59**		**90**	**119**		**115**	**120**				
83	083	**79**	**370**	**68**	**98**		**98**	**68**	**340**	**67**	**160**	**-23**	**99**			
	MACHINERY (MARKETING)															
84	084	**799**	**229**	**50**	**85**	**-142**	**9**	**3**	**200**	**66**	**45**	**300**	**83**			
	MANAGED FUNDS															
85	085	**NA**	**NA**		**73**	**38**		**42**	**95**		**172**			**3**		
	MARITIME															
86	086	**51**	**105**	**38**	**50**	**50**	**60**	**47**	**298**	**59**	**99**	**93**	**85**			
	MORTGAGE COMPANIES															
87	087	**NA**	**NA**		**15**	**8**		**45**	**50**		**123**	**-90**				
	PACKAGING															
88	088		**100**			**100**	**73**		**100**			**100**				
89	089	**30**	**57**	**94**	**47**	**44**	**111**	**73**	**80**	**77**	**80**	**86**	**85**			
90	090	**64**	**-14**	**99**	**8**	**-191**	**95**	**22**	**-616**	**83**	**719**	**-15**	**78**			
91	091	**39**	**36**	**68**	**143**	**-89**	**89**	**57**	**63**	**96**	**274**	**-540**	**72**			

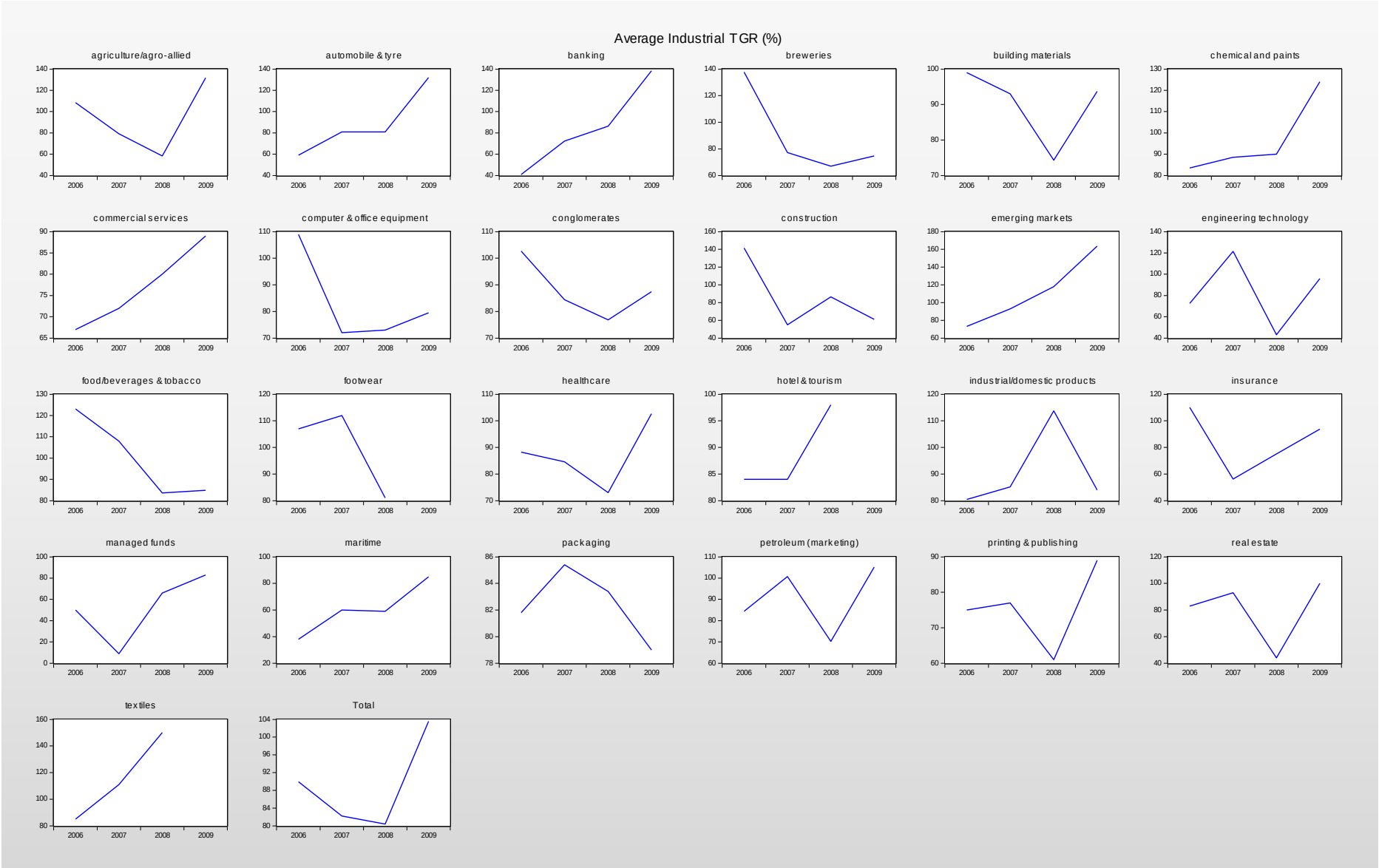
92	092	**17**	**-873**	**100**	**44**	**5**	**59**	**104**	**104**	**99**	**34**	**23**	**81**			
93	093	**84**	**108**	**48**	**31**	**17**		**200**	**200**	**62**						
	PETROLEUM (MARKETING)						**79**									
94	094	**150**	**-165**	**52**	**29**	**38**	**105**	**101**	**114**	**68**	**78**	**-72**	**97**			
95	095	**75**	**93**	**83**	**109**	**108**	**93**	**115**	**143**	**69**	**81**	**79**	**123**			
96	096	**134**	**141**	**100**	**144**	**152**	**113**	**69**	**76**	**82**	**63**	**66**	**106**			
97	097	**69**	**64**	**87**	**56**	**55**	**92**	**60**	**81**	**55**	**77**	**81**	**101**			
98	098	**148**	**144**	**100**	**67**	**77**		**74**	**74**	**77**	**106**	**110**	**99**			
	PRINTING & PUBLISHING															
99	099						**75**		**60**			**283**				
100	0100	**61**	**71**	**75**	**62**	**74**	**79**	**45**	**114**	**50**	**91**	**80**	**119**		**105**	
101	0101	**NA**	**NA**	**NA**		**64**		**70**		**72**	**71**		**59**			**83**
	REAL ESTATE															
102	0102	**73**	**88**	**83**	**177**	**225**	**93**	**21**	**12**	**44**	**131**	**152**	**100**			
	TEXTILES															
103	0103	**-117**	**-12**	**85**	**13**	**44**	**111**	**248**	**246**	**150**						

Note: 2005 was base year

APPENDIX 5
GRAPHS: INDUSTRIAL AVERAGE TREND FOR PTE, EPS, TGR




Average Industrial EPS (%)
agriculture/agro-allied
automobile & tyre
banking
breweries
building materials
chemical and paints
commercial services
computer & office equipment
conglomerates
construction
emerging markets
engineering technology
food/beverages & tobacco
footwear
healthcare
hotel & tourism
industrial/domestic products
insurance
machinery (marketing)
managed funds
maritime
mortgage companies
packaging
petroleum (marketing)
printing & publishing
real estate
textiles
Total


Average Industrial TGR (%)
agriculture/agro-allied
automobile & tyre
banking
breweries
building materials
chemical and paints
commercial services
computer & office equipment
conglomerates
construction
emerging markets
engineering technology
food/beverages & tobacco
footwear
healthcare
hotel & tourism
industrial/domestic products
insurance
managed funds
maritime
packaging
petroleum (marketing)
printing & publishing
real estate
textiles
Total