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The Influence of Performance Measurement Systems on Managerial Performance through Cognitive and Motivational Mechanisms: Evidence from Manufacturing Companies in Libya

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Abstract

This research study endeavours to offer a better understanding of the relationship between performance measurement systems (PMS) and managerial performance in large and medium-sized manufacturing companies in a developing country, taking into account the role of cognitive and motivational mechanisms. Drawing on an extensive review of relevant literature in management accounting and psychology, a framework is developed to investigate the possible effect of comprehensive PMS on individual outcomes comprising job satisfaction and managerial performance through cognitive and motivational factors, including role clarity, psychological empowerment, mental model confirmation and mental model building. Included in the analysis are the potential different effects of financial and non-financial performance measures and rewards. Primary data were collected by means of a purposely constructed survey questionnaire from 122 strategic business unit managers at large and medium-sized manufacturing companies, from diverse industrial sectors in Libya. In addition to descriptive analysis, inferential statistical tools are used to investigate direct and indirect relationships between PMS and managerial performance. To fully comprehend the mediating effects of cognitive and motivational factors in these relationships, the most advanced and up-to-date tool - the Hayes's (2013) macro called Process through the SPSS package – was applied to examine a total of twelve hypothesised mediated relationships, as well as to determine and report the result of measuring the effect size (i.e. the magnitude of an effect) related to these relationships.

It was established from the descriptive analysis that the comprehensiveness of PMS is significantly high in the participating companies, noting that these companies use a mix of financial and non-financial performance measures and rewards, albeit putting slightly less emphasis on the importance of the latter. The study indicated that there are significant positive effects on the outcome variables of job satisfaction and managerial performance in the direct relationships involving comprehensive PMS, financial and non-financial performance measures and rewards. Interestingly, however, non-financial performance measures and rewards seem to have more impact on both outcome variables than the financial ones. Moreover, role clarity is also found to have a direct positive relationship with psychological empowerment, as does job satisfaction with managerial performance. Although each of the four cognitive and motivational variables explored in this study has a mediating effect on the relationship between comprehensive PMS and the outcome variables, large effect size was achieved only through role clarity and psychological empowerment by testing the indirect effect of comprehensive PMS on job satisfaction. The other indirect relationships of comprehensive PMS account for a medium effect size only. With regard to the indirect effects of both financial and non-financial performance measures and rewards, the results were also significant, except that, as with the direct relationships, non-financial performance measures and rewards seem to have more impact on both outcome variables than the financial ones. The largest effect size here is obtained from the indirect relationship between non-financial performance measures and rewards and job satisfaction through psychological empowerment; all other effects were medium.

Being the first study of its kind on the complexities of PMS in companies operating in a rapidly changing emerging economy, this study contributes to knowledge by combining and testing four cognitive and motivational variables in one comprehensive model, distinguishing between various indirect effects by succeeding in separating and comparing between the effects of financial and non-financial performance measures and rewards and precisely measuring effect size of mediator factors Despite its novel and comprehensive approach, the study's limitations are acknowledges and this leads to constructive suggestions for future research on a multi-faceted topic that needs exploring further in both developed and emerging economy environments.

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List of Abbreviations

COM	**Competence**
CPMS	**Comprehensive Performance Measurement System**
FPMR	**Financial Performance Measures and Rewards**
GC	**Goal Clarity**
IMP	**Impact**
JS	**Job Satisfaction**
MAS	**Management Accounting System**
MCS	**Management Control Systems**
ME	**Meaning**
MMB	**Mental Model Building**
MMC	**Mental Model Confirmation**
MP	**Managerial Performance**
NFPMR	**Non-Financial Performance Measures and Rewards**
PC	**Process Clarity**
PE	**Psychological Empowerment**
PMS	**Performance Measurement System**
RC	**Role Clarity**
SBU	**Strategic Business Unit**
SED	**Self-determination**

Dedication

I wish to dedicate this study to:

My wonderful brothers:

Mohammed

Youssef

Suleiman

Abdel Azeem

My dearest spouse Soad and

My beautiful kids:

Rogia

Rodina

Alfitori

Ali

Rawasi

Tawfic

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First and foremost, I thank Allah Almighty for giving me a shower of his blessings and grace through all the steps of this humble endeavour, without whose help this research would not have been completed. The prophet Mohammed (peace be upon him) said: "who does not thank people does not thank Allah".

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Chapter 1 Introduction

1.1 Introduction

This chapter presents a general introduction to the thesis. It consists of a brief background to the research topic in Section 1.2, an explanation of the rationale for undertaking the research in Section 1.3, followed by the research aim, objectives, and questions in Section 1.4. The research methodology and theoretical framework are provided in Sections 1.5 and 1.6 respectively. The thesis structure is outlined in the final section.

1.2 Research Background and Context

1.2.1 Research Background

This study deals with the relationship between the effectiveness of performance measurement systems (PMS) and managerial performance. The overall aim of the study is to investigate the relationship among the effectiveness of PMS, role clarity, psychological empowerment, individual learning, job satisfaction and managerial performance.

Owing to technological advances and increasing global competition, corporate managers are working in a more and more complicated environment. Thus, they require sophisticated information systems to provide them with sufficient and necessary information to manage their businesses effectively (Bouwens & Abernethy, 2000). Performance evaluation is an essential function of management accounting (Emmanuel, Merchant, & Otley, 1990) and PMS could help managers access and use the information needed to accomplish work objectives and enhance their managerial performance (Hall, 2008, 2011; Lau, 2011; Marginson, McAulay, Roush, & Van Zijl, 2014). Therefore identifying these effects is important, because there might be crucial theoretical differences related to direct and indirect relationship models, which might have practical implications (Shields, Deng, & Kato, 2000).

Moreover, organisations have developed more comprehensive PMS with diverse sets of performance measures which are associated with competitive strategy and offer information covering different parts of the value chain (Chenhall, 2005; Hall, 2011). Previous studies have concentrated on the links between PMS and organisational

performance (Davis & Albright, 2004; Chenhall, 2005) and on the multiple usage of performance measures in terms of judgements related to performance evaluation (Banker, Chang, & Pizzini, 2004). Nevertheless, empirical studies which investigate the behavioural consequences of PMS are somewhat limited (Ittner & Larcker, 1998; Webb, 2004). For instance, studies investigating the relationships between PMS and organisational performance presume that the PMS influence individuals' behaviour within companies, and this in turn assists in achieving organisational goals. As pointed out by Chenhall (2003) and Covaleski, Evans, Luft, and Shields (2007), this assumption is based on '*broad leaps in logic*' (e.g. a useful management accounting system leads to improved job satisfaction and enhanced organisational performance), without a detailed investigation and conclusive evidence to show that the assumed associations do exist.

There has been a growing recognition in the literature about the need to understand how and why PMS may be associated with individual and/or organisational performance. Particularly, as mentioned by psychological theories, it is likely that cognitive and motivational mechanisms (as intervening variables) may offer explanation and clarification of the relationship between PMS and managerial performance (Ilgen, Fisher, & Taylor, 1979; Collins, 1982; Hall, 2008, 2011). These intervening variables, which include for example role clarity, psychological empowerment and individual learning, have attracted a significant research effort over the last fifty years or so. For instance, the lack of role clarity (i.e. role ambiguity) has been linked to job stress (e.g. Rizzo, House, & Lirtzman, 1970) and job dissatisfaction (e.g. Collins, 1982; Jackson & Schuler, 1985). The suggestion by Collins (1982) that management accounting systems can help with the clarity of expected roles seems to find support in the findings of more recent studies.

For example, Chung, Su, and Yu-Ju (2012) reported a clear positive influence of the management system with regards to role clarity and managerial performance. More specifically, the link between PMS as an essential management accounting tool and role clarity has also been reported by Burney and Widener (2007), who found that a PMS is significantly linked to role clarity which has a mediating effect on the relationship between the PMS and managerial performance. Similarly, Hall (2008) has addressed the effect of comprehensive PMS on managerial performance but, in addition to role clarity, his study model also included psychological empowerment and found that both

variables fully mediated the relationship between comprehensive PMS and managerial performance.

With regard to the role of PMS in the learning process, it is a controversial and much disputed subject. One view (e.g. Argyris, 1977 and 1990; Gray, 1990; Hedberg and Jonsson, 1978; Kloot, 1997; Staw and Boettger, 1990) is that rather than helping managers' learning, PMS hinder the process of learning. However, other authors (e.g. Chenhall, 2005; Henri, 2006; Kaplan and Norton, 1996b; Neely and Al-Najjar, 2006) argue that PMS can facilitate learning by enhancing creativity and innovation. For resolving and providing a possible explanation related to these contradictory views, some studies (e.g. Vandenbosch and Higgins, 1996; Hall 2011) indicated that there are particular characteristics of management systems that are expected to assist or impede the learning process. For example, Vandenbosch and Higgins (1996) investigated the relationship between information acquisition and learning based on a cognitive learning perspective (mental model confirmation and mental model building) in the executive support systems context. They presumed that the purpose of information acquisition can identify the type of learning and suggested that, if the system is used to answer specific questions or solve well-defined problems through focused search, it helps to fine-tune operations and verify assumptions, which means to confirm current mental models. On the other hand, if the system is used to scan information to help formulate problems and foster creativity, it may be able to challenge fundamental assumptions and that implies building new mental models. Overall, the results of their study indicated that mental model building was more likely linked to scanning information than to focused search, noting that the system has much more relationship with mental model confirmation than it does with mental model building. In more recent research on comprehensive PMS, Hall (2011) studied the process of confirming and building mental models of strategic business unit managers in Australia to see how PMS affect individual performance. The results of his study show that PMS help confirm managers' mental models, but mental model building happens in specific settings such as for managers with a short organisational tenure and/or from a small-sized strategic business unit. Significantly, the results showed that there were positive effects of both mental model confirmation and mental model building on managerial performance.

However, unlike Burney and Widener (2007) and Hall (2008, 2011), Lau (2011) distinguished between the effects of nonfinancial measures and financial measures in their relation to managerial performance by using role clarity as mediator. He concluded that the effect of nonfinancial measures on managerial performance is substantially stronger than that of financial measures, through role clarity. Although Lau (2011) distinguished PMS in his study in terms of financial and non-financial measures and examined their effects on managerial performance through role clarity, he did not however include motivational factors (e.g. psychological empowerment, incentive scheme) and other cognitive factors (e.g. individual learning) as mediating variables. Nor did he include job satisfaction, despite prior research linking it to role clarity (Marini, Todd, & Slate, 1995).

1.2.2 Research Context

Libya is a developing country, with an economy based upon agriculture until the 1960's. Over the last fifty years it has undergone several changes. These changes have not just been economic but environmental and social as well. In the 1970s and early 1980s, the Libyan economy was driven by expansion in the hydrocarbon sector which until the last decade contributed over 50% to GDP. While the Libyan economy was largely reliant on oil as a major source of wealth, a large amount of money has been allocated by the government to establish industrial enterprises in the non-oil sector over the past decades. Therefore, these sectors significantly increased and now contribute over 70% of GDP. However, the country adopted socialist philosophy under President Gaddafi and faced difficulty in capacity to produce capital goods and consumer goods to accomplish "self-sufficiency" and "self-reliance" (Agnaia, 1996).

The Socialist philosophy of the country largely influenced its economy in terms of business ownership and controlling business objectives. The state predominantly owned Libyan industrial companies, and its government institutions supervised and controlled these companies. Most of those enterprises were fully funded by the government or at least in part by government grants. According to Libyan Commercial, Industrial and Agricultural Chamber (CIAC), 2002), there were over 190 large public enterprises in Libya and their main objective is to provide services and goods to the public rather than to make a profit. Based on the philosophy of state socialism, workers were given the right to administer their enterprises by self-management. Most enterprises were

managed by committees of people who have responsibility to run the business to accomplish all objectives of their enterprises. All the financial regulations and control (including accounting activities) were implemented by the people's committees. All reports (including annual reports) and information must be provided to relevant secretariats (ministries) to ensure instructions and guidelines are being met. Preparing annual reports including income statements and balance sheets is required for all companies. Many top posts of those companies were held by politicians and civil servants. As a result, Libyan enterprises, as public companies, were very sensitive to changes in government policies irrespective of whether the changes were political, social or economic (Agnaia, 1997). Even though the works committees were in place, many day-to-day operations (e.g. responsibilities, management appointments, authorized budgets and employment conditions) were often directed by the central authority.

In the late 1980s and the early 1990s, the US and UN imposed political and economic sanctions on Libya which caused a serious decline in Libyan economic activity leading to worsening economic conditions and falls in the standard of living (Ali, 2014).

Over recent years, the role of the Libyan government has lessened by the deregulation of the economic system. The government has now a more limited role and is confined to public activities such as security, health and education (Sharif, 2000). As a result of increasing competition and deterioration of financial performance related to public companies, a new business environment has emerged for improving the operation and performance of Libyan enterprises, particularly those that are still state-owned. Moreover, while sanctions were lifted by the US and UN in 2003, a series of social, economic and legal reforms have also been undertaken by the Libyan government. This has shown a commitment to the government's move towards a market economy. It has also encouraged the private sector to re-emerge and attracted foreign investment. The government has dedicated a considerable amount of capital to the industrial sector, established oil-related industries to provide intermediate products used as raw materials for other industries and invested in industrial plants to achieve a high level of independency (Gzema, 1999; Ahmed & Gao, 2004; Otman & Karlberg, 2007). The government has also undertaken a number of economic and social development plans

over the years to reduce the dependence on crude oil and to provide more job opportunities for its citizens (Ahmed & Gao, 2004).

In the Libyan economy, industry has gradually become the most vital sector(Otman & Karlberg, 2007)   . This sector has been organised and classified into two sub-sectors which are oil and non-oil (Ahmed & Gao, 2004; Otman & Karlberg, 2007). The oil sector includes companies dealing with oil, gas and petrochemicals, whereas the non-oil sector includes two types of companies: one involved with commodities production, such as construction, metal, chemical, electronics, electrical, furniture, paper, textile, agriculture and food industries, and the other includes service companies , such as transportation, telecommunications, electrical services, hotels and restaurants (Gzema, 1999).

Libyan companies are now classified into small, medium and large based on the number of employees as indicated by the General Public Committee, Resolution (2003). This classification mentions that small companies are defined as those with less than 100 employees, medium size refers to companies with more than 100 employees but fewer than 500 employees and large companies have over 500 employees.

1.2.3 Performance Measurement System in the Libyan Context

Accounting research in less developed countries has increased over the past few decades, maybe owing to the increasingly competitive environment. Nevertheless, most of accounting studies have been linked to financial accounting rather than management accounting. There has been an increasing interest in management accounting in developing countries. A good example of this is the article by Hopper, Tsamenyi, Uddin, and Wickramasinghe (2009) which evaluates management accounting research and highlights opportunities from developing countries perspective.

With regard to Libya, they have been few studies of management accounting practice such as Fakhri (2012) and Elnihewi, Fadzil, and Mohamed (2014) who estimated PMS in Libyan banks. Fahkri's study, (2012) indicated that Libyan companies (banks) used a mixture of performance measures (e.g. BSC) and the extent of using these measures is influenced by several contextual factors such as organisational structure, external environment and strategy. Elnihewi et al. (2014) have addressed the use of non-financial

measures in commercial bank branches in Libya and found that using non-financial measures was slightly high in target sample. Their study also examines the mediating role of performance measures in the relationship between institutional factors (coercive and normative pressure) and organisational performance and found that only coercive pressures affect organisational performance through non-financial performance measures.

Moreover, a few doctoral dissertations on PMS in Libyan organisations (e.g. El-shukri, 2007; Fakhri, 2010; Amhalhal, 2013) and overall management accounting practice (e.g. Abulghasim, 2006; Alkizza, 2006; Leftesi, 2008; Abugalia, 2011) have also been successfully completed. Those who studied PMS reported that most Libyan firms use a mixture of performance measures, although firms seem to rely more on financial measures (e.g. budgets) than on non-financial measures.

Studies of management accounting practice found that the range of management accounting technique used in Libyan companies has increased over last two decades, although the adoption rates of most management accounting practices (i.e. cost, budgets and performance measures) in Libyan companies are usually lower than those adopted by companies in other less developed countries. This was attributed to the absence of adequate knowledge about management accounting practices, lack of financial resources required for adopting them, as well as the absence of the culture to use management accounting information.

1.3 Research Rationale

It is clear from the explanation above that existing studies have only dealt with a small number of variables and used one or two motivational and cognitive variables as mediators, hence leaving many questions needing more in-depth inquiry. As comprehensive PMS are highly likely to include both types of measures, do the influences indicated by the above-mentioned studies arise from utilising financial or non-financial measures? Does using non-financial measures alone generate the same implications as those from using financial measures alone? More significantly, what is the relative importance of non-financial measures compared to financial measures in terms of their effects? In other words, have the findings of studies such as Burney and Widener (2007) and Hall (2008, 2011) arisen substantially by nonfinancial measures, or

essentially by financial measures? In addition to not distinguishing between the financial and non-financial implications in measuring managerial performance, previous studies have adopted the traditional approach to test their mediating relationships, classifying as full and partial, ignoring the previous claims for using the more modern approach (Hayes, 2013) and reporting the effect size measures (e.g. NCES, 2003; AERA, 2006; Hartmann, Naranjo-Gil, & Perego, 2010; Preacher & Kelley, 2011).

The points put forth above are equally important regardless of geographical location, as the development of economic globalisation, the competition in the international market place and economic growth, which create opportunities and challenges in less-developed countries, are becoming more open to adapting and accepting Western business practices. One of the important issues in this context is the effects of PMS on individual performance, through their behavioural effects. In the current literature, the capability to measure these effects can be seen as an important prerequisite for improvement. This research study investigates the relationships between PMS and individual performance through the mediating role of cognitive and motivational mechanisms in manufacturing companies in Libya, a country that has been changing from a planned to a market economy and which has pushed the State to take several steps since the late 1980s, resulting in fundamental changes such as restructuring state-owned enterprises, the emergence of the private sector and growth in foreign direct investment. Apart from the oil and gas companies, most state-owned companies were put under the control and supervision of The General Board of Ownership Transfer of Public Companies and Economical Units, which was delegated to execute the programme of transferring public companies and economic units ownership to the private sector. Prior to the transition period, the socialist philosophy of the country largely influenced the economy with regard to changing a business ownership and the control of business objectives. Most Libyan companies were owned, controlled and supervised by institutions of the State. However, the Libyan accounting system was a derivative of the UK and the US models, due to international investors, especially in the oil sector, which usually comes from these countries and they have influenced the Libyan accounting academics and practitioners to follow these models. The system was not developed to respond to changes in its environment (Kilani, 1988).

Moreover, the sudden uprising in North Africa, starting from Tunisia in late 2010, followed by Egypt and Libya in 2011, which ended in the fall of three regimes in these countries, has had a direct impact on the Libyan economic environment. These recent events also highlighted the managerial needs and the role of MAS, specifically PMS, to provide sufficient information. These changes put immediate pressure on accounting practices to change to meet the requirements of the new business environment.

However, there is not much known about PMS in Libyan organisations. The research effort so far (which starts in the form of an unpublished doctorate) seems to be limited to studying management accounting practices (MAPs) only (e.g. Abulghasim, 2006; Alkizza, 2006; Leftesi, 2008; Abugalia, 2011). The main concern of previous studies has either been to assess the adoption rate, or to explore the usage state of traditional as well as advanced MAPs in Libyan companies. Moreover, their explanation is to do with the adoption and use of MAPs, without considering the impacts of these practices on individual and organisational performance through their impact on the behavioural side.

In response to these questions and claims, this research project seeks in detail to give a clearer picture of the effect of PMS as comprehensive systems, and both financial and non-financial performance measures, on managerial performance through role clarity, psychological empowerment, mental model confirmation and mental model building. In addition to this, it attempts to provide the effect size measures related to indirect relationships of the mentioned systems, in large and medium-size manufacturing companies in Libya.

1.4 Research Aim, Objectives and Questions

As explained in the previous sections, this study aims to examine the relationship among PMS, role clarity, psychological empowerment, mental model confirmation, mental model building, job satisfaction and managerial performance, in large and medium-size manufacturing companies in Libya.

To achieve this main aim, the following objectives are set for this research study:

1. To describe the comprehensiveness of PMS, the importance of financial and non-financial performance measures and rewards, levels of role clarity, levels of

psychological empowerment and types of individual learning in SBUs at manufacturing companies in Libya.

2. To propose and empirically test a research model by identifying the direct and indirect relationships between comprehensive PMS and individual outcomes, through cognitive and motivational factors in SBUs at manufacturing companies in Libya.

3. To investigate the relationship between role clarity and psychological empowerment in SBUs at manufacturing companies in Libya.

4. To investigate the relationship between job satisfaction and managerial performance in SBUs at manufacturing companies in Libya.

5. To examine the differences between financial and non-financial performance measures and rewards used in terms of direct relationships to the individual outcomes and indirectly through the cognitive and motivational factors in SBUs at manufacturing companies in Libya.

To accomplish the above objectives, the following research questions will be pursued:

1. What is the comprehensiveness of PMS, the importance of financial and non-financial performance measures and rewards used in SBUs at manufacturing companies in Libya?

2. Are there any direct or indirect relationships between comprehensive PMS and individual outcomes, through cognitive and motivational factors in SBUs at manufacturing companies in Libya?

3. Does role clarity affect psychological empowerment in SBUs at manufacturing companies in Libya?

4. Does job satisfaction affect the managerial performance in SBUs at manufacturing companies in Libya?

5. Are there any differences between using financial and non-financial performance measures and rewards directly in relation to the job satisfaction and managerial performance and indirectly through cognitive and motivational factors in SBUs at manufacturing companies in Libya?

1.5 Methodology

For the purpose of the current research, and based on an extensive review of the existing theoretical and empirical PMS and psychology literature, care is taken to ensure a wider understanding of the variables that influence the behaviours of managers and also to enhance the validity and reliability of the cognitive and motivational variables measured. In this respect, the factors that possibly influence managerial performance are identified from the existing literature on individual behaviour and then adapted to the Libyan context.

Four behaviour variables, including three aspects of cognitive mechanisms (role clarity, mental model confirmation and mental model building) and one motivational mechanism, namely psychological empowerment, which are assumed to have potential mediating roles on the effects of PMS on both job satisfaction and managerial performance, are adopted for this research. In order to develop the above research questions and hypotheses, direct and indirect relationship models are drawn and adapted from the relevant literature and previous studies.

As explained by Creswell (2014), the research problem, the experience of the researcher and the audience to whom the researcher seeks to report, affect the adoption of a specific research paradigm. The positivism paradigm is adopted to underpin the current study design, which is based on the deductive approach, since the most frequent study methods reported in the empirical literature of psychology theories and MAS/PMS are quantitative studies using questionnaire surveys. This study uses quantitative methods, in terms of survey data collection and appropriate statistical packages are used to test the research hypotheses, which were developed to be consistent with the objectives and questions of the current study.

It is considered that the questionnaire survey technique is the most common approach used by empirical studies in the social sciences for exploring and describing the interplay between variables (Roberts, 1999). Therefore, to achieve the aim and objectives of this study, this technique has been chosen as the main method for data collection. Relevant literature is used to inform the research questionnaire and thus it draws, adopts and adapts questions from prior studies, as well as devising appropriate new ones. The questionnaire includes eight sections; each section consists of a number

of questions linked to a particular research issue. The first and second sections were dedicated to collect general information on the respondents (job, academic qualifications and experience in company and in their position) and the target companies (industry type, company's age, ownership type and SBU size) respectively. The third section dealt with comprehensive PMS. The fourth section was about the level of psychological empowerment related to SBU managers. The fifth section was about the level of role clarity related to SBU managers. The sixth section aimed to collect information related to the mental models of SBU managers. The seventh section was about the degree of satisfaction with each aspect of SBU managers' jobs. The final section asked questions about the managers' performances in the sampled SBUs.

The translated questionnaire of the final English version was piloted before the distribution process, taking into consideration any issues related to the validity and reliability of the study's instrument and then, distributed by hand to managers in 190 SBUs at large and medium-size manufacturing companies in Libya during the period June-August 2013. A total of 135 questionnaires were received. However 13 of them were excluded as they were unusable/partially completed, yielding a total of 122 usable questionnaires (80.26% response rate). The final section of the questionnaire included asking the respondents to fill in their contact details if they were willing to be interviewed after the survey questionnaire. Although no respondent offered to be interviewed, it was planned to renew contact with all respondents at a later stage once an initial analysis of the questionnaires was done. However, this plan had to eventually be abandoned due to the sudden turn of events in Libya in early 2014 and the uncertain security situation in the country. The study used descriptive statistics (e.g. Means and percentages) and advanced statistical techniques (e.g. Simple regression, simple mediation regression and multiple parallel mediation regression) to analyse the collected data using the SPSS statistical package.

1.6 Research Theoretical Model

The theoretical model of the research study is shown in summary form in Figure 1.1 below. It consists of two parts. The first part identifies seven variables, which are: comprehensive PMS, role clarity, psychological empowerment, mental model confirmation, mental model building, job satisfaction and managerial performance. This part focuses on the possible direct effect of comprehensive PMS on job satisfaction and

indirectly through role clarity and psychological empowerment. In addition, the possible direct effect of comprehensive PMS on managerial performance and indirectly through role clarity, psychological empowerment, mental model confirmation and mental model building.

The second part includes eight variables, namely: financial performance measures and rewards (FPMR), non-financial performance measures and rewards (NFPMR), role clarity, psychological empowerment, mental model confirmation, mental model building, job satisfaction and managerial performance. This part seeks to identify the possible differences that could   exist between financial performance measures and rewards (FPMR) and non-financial performance measures and rewards (NFPMR) in their direct relationships with both job satisfaction and managerial performance and indirectly through role clarity, psychological empowerment, mental model confirmation and mental model building.

Figure 1.1 Research Theoretical Model
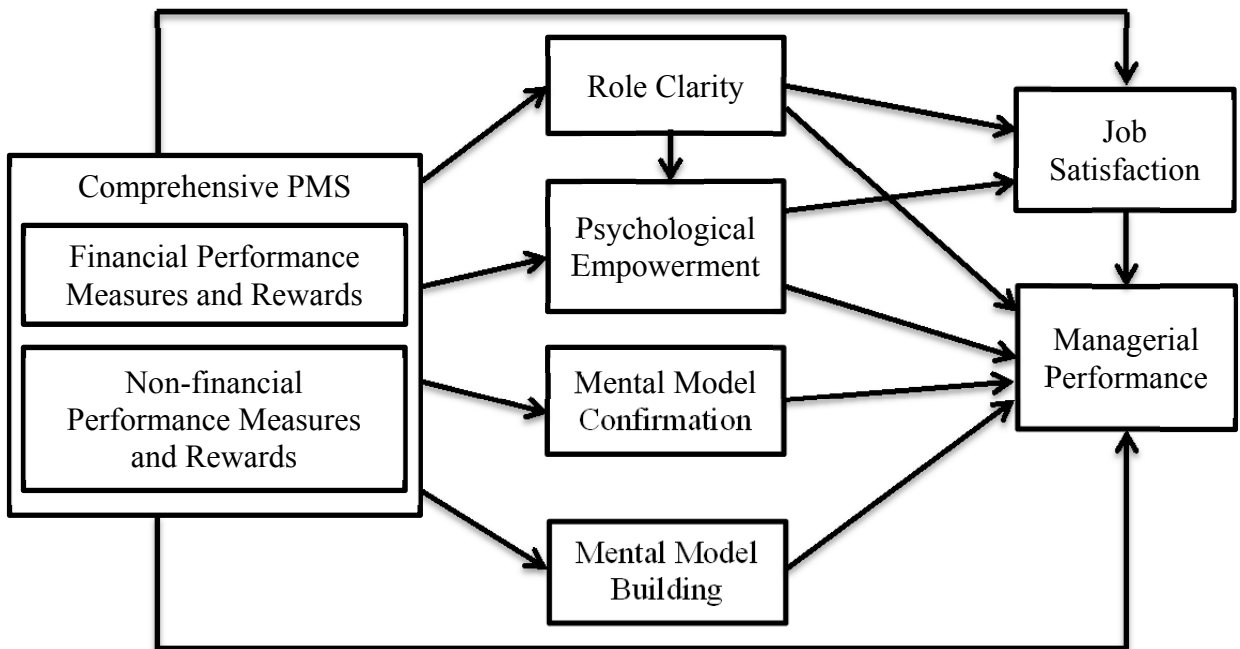
1.7 Thesis Structure

The remainder of the thesis consists of seven chapters. Chapter Two presents an overview of PMS and its definition, as well as identifies the popular PMS types addressed in the management accounting literature. The chapter also provides insights about psychology theories used in management accounting studies. It deals with the theoretical literature overview related to the research interests.

Chapter Three discusses and summarises the available relevant prior empirical research studies and is divided into two main parts, which are empirical research on budgetary participation and rely on accounting performance measures and its consequences, as well as comprehensive PMS and its outcome variables. This chapter begins with a summary of empirical studies for each part, comparisons between these studies and ends by presenting their limitations.

Chapter Four shows the development process of the research hypotheses which are presented into two groups, in which the research variables are discussed, the chosen philosophy is justified, as well as providing an overview of the research methodology to achieve the research objectives. Additionally, this chapter offers details of the research process, data collection method in the questionnaire form and the statistical techniques utilised for analysing the gathered data.

Chapter Five presents the descriptive analysis of the research findings that seek to achieve the first research objective. The data in this chapter identifies the extent of PMS comprehensiveness and the importance of PMS types (financial and non-financial performance measures and rewards) used by manufacturing companies in Libya. In addition, it also presents cognitive and motivational levels of the SBU managers at the sample companies, expressed in psychological variables such as role clarity, psychological empowerment, mental model confirmation, and mental model building. In addition, the chapter provides a description of managers' satisfaction about their jobs and performance level. It presents the data analysis, mostly based on the mean scores and sometimes on the percentages.

Chapter Six provides the results of the hypotheses testing for the first group by using two types of statistical techniques, including simple regression and mediation regression (SPSS with Process macro).

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It also discusses the findings related to the effect of comprehensive PMS directly on its individual outcomes (job satisfaction and managerial performance) and indirectly through cognitive and motivational variables (role clarity, psychological empowerment, mental model confirmation, and mental model building) with effect size measures. It similarly examines and discusses the relationship between role clarity and psychological empowerment, beside the effect of job satisfaction and managerial performance. In this chapter, data are analysed to achieve the second, third and fourth research objectives (first group of hypotheses).

Chapter Seven examines the second group of hypotheses and presents and discusses results related to both types of PMS relationships. It deals with the different effects of financial and non-financial performance measures and rewards directly on their outcomes (job satisfaction and managerial performance), cognitive and motivational variables (role clarity, psychological empowerment, mental model confirmation, and mental model building), and indirectly through cognitive and motivational variables (role clarity, psychological empowerment, mental model confirmation, and mental model building) with effect size measures. This chapter also applied simple regression and mediation regression for testing the hypotheses, in order to attain research objective five.

Finally, Chapter Eight summarises the main research results and the contributions of this research study are discussed. At the end of this chapter, the limitations and suggestions for future research are also presented.

1.8 Summary

This chapter has provided the current study's overview, related to its background, aim and objectives. The study concentrates on the role of cognitive and motivational mechanisms in explaining the effects of comprehensive PMS on individual behaviour, identifying the different expected effects derived from financial and non-financial performance measures and rewards in different types of relationships (total effects, direct effects and indirect effects) among both systems and their consequences, as well as presenting effect size measures for mediating variables (indirect relationships).

More detailed insights related to the relevant theoretical literature of PMS are presented in the next chapter.

Chapter 2 Performance Measurement Systems (PMS): A Theoretical Perspective

2.1 Introduction

This chapter reviews the relevant theoretical literature related to the main issues of PMS. Section 2.2 provides an overview of PMS. Defining comprehensive PMS is presented in Section 2.3. This is followed by a discussion of PMS characteristics and types of PMS in Sections 2.4 and 2.5 respectively. Different Psychological theories are displayed in Section 2.6 related to management accounting research, including role theory, psychological empowerment theory and learning theory. Section 2.7 describes and discusses the theoretical framework. Finally, a summary and conclusion are presented in Section 2.8.

2.2 Overview of PMS

Using PMS to facilitate the implementation of strategy and enhance organisational performance is frequently recommended (Davis & Albright, 2004). PMS include financial and non-financial performance measures and have been linked to the business strategy of an organisation. For example, balanced scorecards (Kaplan & Norton, 2001) and multi-criteria key performance indicators can be considered as comprehensive PMS (Cheng, Luckett, & Mahama, 2007; Hall, 2008). In the last few decades, the adoption of these types of systems has increased steadily (Rigby, 2001). Companies which are under heavy pressure to deliver value, not just for shareholders but also for other stakeholders, believe that it can help them in this task (Ittner & Larcker, 2001, 2003). This might explain why many companies have made great investments in the development and maintenance of PMS (Neely, Yaghi, & Youell, 2008). From a research point of view, there has been some knowledge about why companies adopt these types of systems (e.g. Chenhall & Langfield-Smith, 1998; Hoque & James, 2000; Henri, 2006a). However, there is less knowledge about their actual consequences (Lee & Yang, 2011).

2.3 Defining Comprehensive PMS

Before executing a review of the comprehensive PMS' consequences, it is necessary to clarify what comprehensive PMS means. In the literature there is a lack of an agreed definition of PMS, due to the fact that several definitions are proposed by scholars from different perspectives (Franco-Santos et al., 2007). Some authors have defined comprehensive PMS in terms of their features. For example, Cheng et al. (2007) pointed out that PMS, such as the balanced scorecard, is advocated to use an assortment of financial and non-financial performance measures. Other authors have defined comprehensive PMS not only from its features, but also in terms of its roles or main processes. For instance, Gates (1999, p. 4) defined comprehensive PMS as a system that *"translates business strategies into deliverable results, combining financial, strategic and operating business measures to gauge how well a company meets its targets"*. Moreover, Neely, Gregory, and Platts (1995, p. 1229) have defined PMS as the array of measures which are utilized for quantifying actions in terms of efficiency and effectiveness, while the definition of efficiency is "a measure of how economically the firm's resources are utilized when providing a given level of customer satisfaction", and the effectiveness is "the extent to which customer requirements are met". In addition, PMS can be referred to as an information system which is used by managers to follow the process of the implementation of business strategy through comparing actual results against the pre-set strategic goals and objectives. PMS usually encompass systematic methods for setting business goals which are linked to periodic feedback reports (Simons, Dávila, & Kaplan, 2000, p. 337).

Researchers pointed out that following this definition might generate quite incomplete performance measurement, because measurement itself could not improve performance. For example, Slizyte and Bakanauskiene (2007) stated that organisations can manage their performance through their performance measurement. Despite the fact that performance measurement is for comparing between actual performance and pre-established target, but in order to be effective the business strategic plan must be linked to performance measurement when it is applied. Slizyte and Bakanauskiene (2007) also mentioned that is essential for organisations to use performance measurement information for managing, improving their performance and identifying what has been achieved. Additionally, Henri (2006a) and Ullrich and Tuttle (2004) argue that a comprehensive system should cover all important areas of the organisation; While,

Nanni, Dixon, and Vollmann (1992) claim that integrating measures with strategy and actions across functional boundaries, as well as support organisation which face competitive environments, should also be included. In this context, comprehensive PMS can be defined as the breadth of performance measures that describe the important parts relating to the operations of a SBU, integrating measures with strategy which reflects strategy and across the value chain of firms and showing relevant cause-and-effect relationships (Chenhall, 2005; Hall, 2008; Homburg, Artz, & Wieseke, 2012). The most commonly used characteristics related to PMS will be discussed in the following section.

2.4 PMS Characteristics

Through a systematic literature review of PMS, on the one hand, some authors, (e.g. Franco-Santos et al., 2007) highlighted that PMS is divided into three aspects in terms of its characteristics: (1) features which mean elements of a PM system; (2) roles which refer to the purposes of PMS; and (3) processes that reflect a series of actions for constituting PMS. Regarding the characteristics of PMS, it has been argued that two characteristics are necessary for PMS to be effective; these characteristics are the performance measures used and the supporting resources such as infrastructure, which might be an information system or an array of processes or employees needed to support them (Franco-Santos et al., 2007). Moreover, linking performance measures with organisations' strategies is another requirement for them (Franco-Santos et al., 2007). Despite the fact that Franco-Santos et al. (2007) clarified that there are thirteen performance measurement processes (information provision, measures design/selection, data capture, data analysis, target setting, identify needs/wants of stakeholders, planning, decision making, strategic objectives' specification, interpretation, performance evaluation, reward and reviewing procedures) found in the literature, their last classifications were summarised to a group of five major processes which are measures' design and selection, data's gathering and analysis, managing information, evaluate and reward performance and system reviews.

By contrast, others have focused on the importance of studying the dimensions of information relating to contemporaneous PMS (e.g. Malina & Selto, 2001; Ittner, Larcker, & Randall, 2003; Luft & Shields, 2003; Chenhall, 2005). In these studies, for example, some important characteristics of more comprehensive PMS have been clarified. Malina and Selto (2001) stated that a comprehensive PMS contains a group of

critical performance metrics. The authors indicated that the balanced scorecards were considered to be comprehensive if they presented overall measures relating to performance of business. In their study, one manager expressed that the balanced scorecard tries to provide us with a wider business group of measures of success than would be obtained by the conventional financial or market share. It links an array of things with each other, making sense to manage the business (Malina & Selto, 2001, p. 70). An important characteristic of comprehensive PMS is a broad set of measures (Ittner, Larcker, & Randall, 2003). This characteristic is considered as supplementing financial and nonfinancial measures in order to capture key dimensions of strategic performance, which are reflected in long-term accounting measures.

Although some researchers of management accounting (e.g. Chenhall, 2005; Bisbe, Batista-Foguet, & Chenhall, 2007; Hall, 2008) implicitly addressed the components of comprehensive PMS, the study of Homburg et al. (2012) explicitly showed comprehensive PMS from three angles, which are breadth, strategic fit and cause-and-effect relationships. These dimensions reflect the key elements of comprehensiveness in PMS. The first element, breadth, is the extent to which the comprehensive PMS provides a diverse picture of the SBU's function through an assortment of financial and nonfinancial, as well as leading and lagging measures of managerial performance (Ittner, Larcker, & Randall, 2003; Pauwels et al., 2009). The second element, strategy fit, refers to the extent to which the comprehensive PMS reflects the targets of a SBU (Banker et al., 2004). The third element, cause-and-effect relationships, indicates the extent to which the comprehensive PMS provides information about causes and effects within significant parts relating to the operations of the strategic business unit and links measures to strategy and across the value chain, thus *"making the business model explicit"* (Pauwels et al., 2009, p. 5). Based on the breadth dimension which clarifies the comprehensive PMS, the following types of performance measurement can be inferred.

2.5 Types of Performance Measures
There are two main categories of performance measure, financial measures and non-financial measures.

2.5.1 Traditional Financial Measures

Accounting systems provide several financial measures, including costs, revenues and profits. At various organisational levels, these measures can be calculated (Datar, Kulp, & Lambert, 2001). Conventional financial measures are used to identify the key financial drivers in order to create shareholder wealth. This wealth is created when the organisations obtain a rate-of-return on invested capital that is greater than their cost of capital. Thus, financial measures are concerned basically with evaluating the managers' ability to create value for shareholders. Furthermore, providing financial information for instance to present and potential investors, financial analysts, auditors and government are essential functions for financial measures. This information usually exhibits in the annual financial statements comprising the balance sheet, statement of cash flows and income statement (Slater, Olson, & Reddy, 1997). Budgets and reliance on accounting performance measures are important sources of financial information.

In the management accounting literature, budgetary participation and reliance on accounting performance measures are two of the most important research topics (Shields & Shields, 1998). The former is defined as a process which involves subordinate managers, affects them and determines the budget (Hopwood, 1976; Brownell, 1982c; Young, 1988; Birnberg, Shields, & Young, 1990b). The latter seeks to examine the influences of - and the variables effecting - using accounting data (budgets) to evaluate managerial performance. More specifically, Harrison (1993, p. 319) has referred to reliance on accounting performance measures as:

> *".....the extent to which superiors rely on, and emphasize those performance criteria which are quantified in accounting and financial terms, and which are pre-specified as budget targets"*

The conventional role of accounting data is to evaluate performance and as such an "independent and fair" scorecard system is usually challenged. For instance, the concept of balanced scorecard (BSC) which is provided by Kaplan and Norton (1992), explicitly criticizes the restricted use of accounting measures to evaluate managerial or organisational performance. Furthermore, a close link has been found between this research field and that of budgetary participation. Actually, the seminal work of Hopwood (1972) is viewed as the reliance on accounting performance measures field

and the likely influences of reliance on accounting performance measures have already been discussed and presumed by Argyris (1952).

In the early 1900s, when PMS were presented for the first time, it was found that financial measures were widely used by the DuPont Company. Moreover, financial measures play an important role in assessing the previous financial situation and performance of the organisation. Despite the fact that these measures should be selected on theoretical foundations, they also should connect with empirical evidence which proves their effectiveness. Each financial measure involves both unique and common information. Unique information is derived from a particular measure that is not shared by the other measures in the factor (Chen & Shimerda, 1981). A measure contains the common information, which is represented by factors. However, financial performance measures which reflect the competitiveness of manufacturing companies are important tools to evaluate these companies in a highly competitive environment; these measures should be carefully determined within evaluating processes, because performance evaluation is critical when accurate and appropriate (Yalcin, Bayrakdaroglu, & Kahraman, 2012).

Some studies (e.g. Chenhall & Langfield-Smith, 1998; Joshi, 2001; Dossi & Patelli, 2010; Odar, Kavčić, & Jerman, 2012) have demonstrated that financial measures were the first most widely used PMS, and only later notice that non-financial measures became more important. McKinnon and Bruns (1992) explored within US firms about 100 financial and non-financial measures. They found that the most widely used measures were profit and income to evaluate firm performance. Lapointe-Antunes, Cormier, and Magnan (2008) pointed out that the return on equity was the most common ratio examined, followed by both the return on assets and the leverage (return on equity components in the DuPont formula). A study was conducted by Odar et al. (2012) on a PMS in 167 Slovene large, medium-sized and small companies. It was found that traditional performance measurement techniques were mainly used in these companies and non-financial performance measures were used only occasionally. Similarly, Delen, Kuzey, and Uyar (2013) used decision tree analysis to evaluate companies' performances and the sample for their study consisted of all Turkish public companies listed on the Istanbul Stock Exchange from 2005 to 2011. The study

indicated that using a group of financial measures (i.e. Earnings Before Tax-to-Equity Ratio and Net Profit Margin) were the most important financial measures used.

Moreover, Chenhall and Langfield-Smith (1998) addressed conventional financial measures, such as budgeting related to controlling costs (ranked 1) and budget variance analysis (ranked 3) and traditional financial measures, such as return on investment (ranked 2), divisional profit (ranked 4) and controllable profit (ranked 8) in large Australian manufacturing companies. They found that those measures offered relatively high benefits, confirmed the importance of traditional financial measures of performance and were widely adopted. Hyvönen (2005) empirically provided evidence that the three most beneficial practices in management accounting were conventional financial measures, variable costing and budgeting related to controlling costs, through using Finnish manufacturing companies. Many of these companies were investment-intensive, so controlling costs was important. In this context, traditional accounting measures have used profit as a simple accounting measure and earnings management which rely on past results, followed by non-financial measures which have emphasised future performance instead of past results (Odar et al., 2012). Financial measures which are commonly used are: return on assets, return on investment, internal rate of return, return on equity, price variance, earning per share, inventory turnover, receivable turnover, capital turnover, return on sales, net income/sales, working capital/total assets, etc. The measures are usually used to evaluate the organisations' past performance. According to Budde (2007), the use and application of financial measures have been encouraged by accounting standards.

Despite the widespread use of traditional PMS, there was a growing realisation that these measures have failed for showing changes in the circumstances of competitiveness and reflecting modern organisations' strategies (Kennerley & Neely, 2002; Anderson & McAdam, 2004; Yalcin et al., 2012; Yadav & Sagar, 2013). Recent years have seen numerous attempts to create more dynamic models related to measuring business results, but the attempts by those involved in the practice of management accounting have attracted scant interest (Odar et al., 2012). Furthermore, conventional financial measures have faced many criticisms in the literature for several reasons (Hayes & Abernathy, 1980; Dixon, Nanni, & Vollmann, 1990; Bititci, 1994; Yadav & Sagar, 2013). These reasons are related to, for example, the changing work environment,

increase in the intensity of competition, quality awards, change of external demands, change of organisational roles, specific improvement initiatives and the power of information technology (Chenhall & Langfield-Smith, 1998; Neely, 1999; Hyvönen, 2005; Yadav & Sagar, 2013). Therefore, financial performance measures have several limitations which push them to be less applicable in a more competitive environment. These criticisms for example include:

- Ittner and Larcker (1998) have outlined the limitations of ==conventional== financial ==performance== measures in that they: (1) lack predictability, (2) are ==looked back on history==, (3) reward short-run, or inappropriate behaviour, (4) are not actionable, offering little information for solving problem, (5) ==fail to capture main changes of business== until it is too late, (6) are too ==summarized and aggregated== for guiding managerial action, (7) reflect functions but not cross-functional processes, within an organisation and (8) do not have adequate consideration for evaluating intangible assets.

- Conventional PMS have emphasised the development of measures that lack focus and mainly rely on the priorities of accounting policy (Kloot & Martin, 2000).

- Traditional financial measures are inadequate to measure and manage an organisation's performance, due to the fact that these measures communicate little about future and long-term performance (Kaplan, 2001).

- The idea of depending solely on traditional performance measures was criticized by Gumbus (2005, p. 620) who argued:

  "Organisations that focus solely on financial measures can be compared to a race car driver that only monitors their speed during a race. Suppose you are a race car driver at the Indy 500 and are monitoring your car by looking at the RPM (revolutions of the engine per minute) gauge on your dashboard. You are not noticing the MPG (miles per gallon of gas), nor the MPH (miles per hour or speed your car is travelling), nor the temperature gauge. You might win the race, but you are also putting yourself and your car at risk by not monitoring these other gauges and focusing extensively on the RPM dial. You might run out of gas, overheat the engine, crash another car in your lane and make other errors in navigating the course."

Some findings of prior empirical studies (e.g. Ittner, Larcker, & Randall, 2003; Chow & Van der Stede, 2006; Jusoh, Ibrahim, & Zainuddin, 2008) have pointed out that using financial measure has not significantly contributed towards an organisation's performance. Burgess, Ong, and Shaw (2007) argued that for organisations to be able to survive in a competitive market, they should overcome the narrow confines of outdated financial performance measures and use a new group of operational measures. Moreover, on-time information is necessarily provided to managers, supervisors and operators by these measures to make daily decisions. Measures should be characterised as flexible, primarily non-financial and can be changed according to need (Kaplan & Norton, 1992; Ghalayini & Noble, 1996).

2.5.2 Non-financial Measures

Non-financial performance measures refer to measures that offer information about performance in non-monetary terms, such as worker satisfaction and customer satisfaction (Verbeeten & Boons, 2009). Brazel, Jones, and Prawitt (2010) have argued that those measures are operational measures and often disclosed elsewhere in the annual report, but are not in the financial statements. Moers (2006) has classified non-financial measures into two types. First, internal non-financial performance measures which directly relate to the tasks performed, such as efficiency and productivity. Second, the external non-financial performance measures which consist of non-financial measures that show performance in the market, such as market share and customer satisfaction. Several aspects of organisations (e.g. customers, employees, innovation, quality, community and environment) have been covered by non-financial performance measures. Thus, these measures are diverse and broad (Lau & Sholihin, 2005). Recently, non-financial performance measures have become increasingly important to use. Medori and Steeple (2000) have suggested that using non-financial performance measures originated from two reasons, which include problems resulting from reliance only on traditional financial measures in manufacturing and the influences of global competition and world class manufacturing.

However, using non-financial measures does not imply replacing financial measures, which remain important, but non-financial measures have an ability to predict and complement financial measures (Govindarajan & Gupta, 1985; Henri, 2004). In this context, Otley (2007, p. 30) stated:

For example, I can point you to a firm that has a strong financial control system and has shown excellent financial performance. But I can also point you to another firm with much weaker financial controls that also shows excellent performance. It does this by deploying a range of non-financial performance measures which are of key importance in managing its operations.

White (2008) has examined a combination of using financial and non-financial performance measures and their effects on outcomes of strategic PMS, including information quality and effectiveness. However, the findings showed that both measures are positively correlated to both outcomes, but non-financial performance measures were indicated to have stronger effect on both outcomes than that of the financial ones. Medori and Steeple (2000) argued that since the 1990s, incorporating financial and non-financial measures has been a great topic. They suggested that this emphasis is not only owing to the fact that non-financial performance measures overcome the limitations of using only financial performance measures, but many advantages are provided by using non-financial measures. These incorporate: (A) non-financial measures are more timely than that of financial measures, (B) non-financial measures are meaningful to the workforce, therefore helping continual improvement, (C) non-financial measures are precise and very measurable, (D) non-financial measures have the ability to change and differ over time as the market requires change, thus tending to be more flexible and (E) the measures are consistent with organisational goals and strategies. In addition, financial performance measures are directed to short term profitability, whereas non-financial performance measures are concerned with long term profitability (Chenhall & Langfield-Smith, 2007).

The study of Stivers, Covin, Hall, and Smalt (1998) revealed that non-financial measures (e.g. customer satisfaction, customer service, delivery performance, process quality and product quality) within the USA and Canada are highly important in setting firm goals. The findings of Xiong, Wenbin, and Lin (2008) illustrated that the higher the level or extent that companies adopt non-financial measures, the better the influence. Particularly, the study showed that the more companies concentrate on and use non-financial measures (e.g. internal process quality, coordination and employee satisfaction), the more effectively companies will implement cost control to reduce costs. Likewise, profitability of companies will increase because companies' customer-oriented measures assist promoting sales and keeping customers. Emphasis on learning

and innovation measures motivates individuals for innovation and seeking out improvement methods. Additionally, if firms pay more attention to individual learning and growth, individual satisfaction would be increased. The findings of Baiman and Baldenius (2009) mentioned that the efficiency of project implementation and upfront investments would be improved by paying the managers of divisions discrete bonuses tied to non-financial performance measures, such as new product development. Likewise, Verbeeten and Boons (2009) pointed out that non-financial measures have more frequently been used for strategic and operational decisions, the evaluation of managers' performance and communication of strategy. Ghalayini and Noble (1996) have listed the main characteristics and advantages of non-financial measures in comparison to those of conventional measures. Similarly, Burgess et al. (2007) compare between these two approaches, as shown in Table 2.1.

Table 2.1 Comparison between Traditional and Non-Traditional Performance Measures

Item	Traditional Financial-based PMS	Contemporary PMS
Basis of system	Accounting standards	Company strategy
Types of measures	Mainly financial	Both financial and non-financial
Focus of measures	Internal and historical	Internal and external
Audience	Intended for middle and top managers	All employees
Shop floor relevance	Ignored	Used
Frequency	Lagging (weekly or monthly)	Real-time metrics (hourly or daily)
Maintenance	Expensive	Relevant
Integration	Ignored	Integration exists
Linkage with reality	Indirect and misleading	Direct and accurate
Local-global relevance	Static, non-varying	Dynamic, situation structure dependent
Stability	Static, non-changing	Dynamic, situation timing dependent
Format	Fixed	Flexible
Purpose	Monitoring	Improvement
Function	Allocate blame	Encourage creativity and learning
Decision making	Structured	Unstructured
Effect on continuous improvement	Impedes	Stimulates
Linked to strategy	No/less link to strategy	Derived from strategy

Source: Burgess et al. (2007, p. 588).

The following section provides a clarification to psychology theories that have proven useful in management accounting research. These theories encompass Role Theory, Psychological Empowerment Theory and Learning Theory.

2.6 Psychological Theories: Overview

Psychology is a field dedicated to studying the mind of humans (e.g., attitudes, cognition and motivation) as well as behaviour (actions, communications). However, other social science theories are usually adopted in management accounting studies with their aims to explain and predict behaviour. Psychology varies from those theories in concentrating on individual rather than organisational and social behaviour and also on subjective phenomena, such as internal mental representations, rather than objective phenomena like quantities, as in market prices and organisational size.

However, management accounting studies have frequently used several social science theories, which have the intention of explaining and predicting behaviour, the psychology theories involved in this research presume that behaviour depends on mental representations of employees, which may diverge from other theories in important directions such as concentrating on individual rather than organisational and social behaviour and on subjective phenomena (e.g. mental representations) rather than objective phenomena (e.g. market prices and size of organisation).These cognitive representations, which work as an effective environment raises motives and emotions, and directs overt behaviour to its purpose or goal (Baldwin, 1969). Therefore, the influence of a specific type of management accounting system on the behaviour of employees is associated not only with how objectively informative the system is about factors that impact the welfare of employees, but also how understandable the system is (i.e., how well usable mental representations of the system can be formed by the employees and linked this system to other mental representations), and how the system encourages the cognition, attention and/or motivation of employees.

Psychology theory has been adopted in management accounting research more than 50 years ago by Argyris (1952, 1953), who addressed the concepts of this theory which depends on human relationships and group dynamics, to test how the social context of budgeting (e.g. superior–subordinate relationship, group dynamics among subordinates) influences individuals' minds and behaviour, especially their motivation and

interpersonal relationships. Argyris emphasised how motivational mechanisms and social psychology issues are very important to the management accounting system. Other later researchers, for example Stedry (1967), stated that psychology theory is important to explain and predict the effects of management accounting systems. In his study, he used motivation theory's conceptions to examine the effects of budget goal difficulty on individual performance. Moreover, social psychology theories' conceptions have been used by Hopwood (1972) who addressed the accounting information used by superiors to evaluate how subordinates influence subordinates' stress and the relationships with other individuals.

Cognitive psychology theory has been used to study how and how well individuals subjectively process accounting information to make planning and decisions, as well as control judgments. This type of research started with Barefield (1972) who investigated decision makers' ability when they used aggregated versus disaggregated data in their simple decision making task and Mock, Estrin, and Vasarhelyi (1972) who examined how the accounting information feedback interacts with the cognitive style of individuals to influence operating decisions. From that date onwards, psychology theory has been widely adopted for explaining and predicting how management accounting techniques (e.g. budgeting and performance evaluation) and their organisational context, impact the minds and behaviour of employees, particularly regarding their decisions, judgments, satisfaction and stress.

In the following sub-sections, psychology theories, including role theory, psychological empowerment theory and learning theory, as well as their concepts, are presented and discussed.

2.6.1 Role Theory

This theory has used a group of structures derived from anthropology, social psychology and sociology to explain and predict how individuals work in a social context (Deutsch & Krauss, 1965; Shaw, 1982; Birnberg, Luft, & Shields, 2006). The theory assumes that the behaviour of individuals is influenced by role expectations and rules that are held by others in terms of how individuals are expected to behave in a particular role (e.g. supervisor, worker) (Deutsch & Krauss, 1965; Katz & Kahn, 1978; Shaw, 1982). In literature, role ambiguity and role clarity have been often used

interchangeably to refer to the degree of understanding individuals have of roles and are generally considered the opposite of one another.

In management accounting studies, the theory has two key concepts which are role conflict and role ambiguity. Role conflict occurs when people are faced with conflicting inter- or intra-role expectations and it is impossible for them to conform to all of the expectations. Kahn, Wolfe, Quinn, and Snoek (1964) stated that role ambiguity (i.e. lack of clarity) will result when the employees do not have enough information which is required in an organisational position. These employees will use coping behaviours which could consist of: (a) trying to solve the problem, (b) attempting to avoid the stress' source, or (c) mechanisms of defence that may distort the reality of the situation. Accordingly, as a result of ambiguity, it is probable that the dissatisfaction of individuals would be increased and their performances would be less efficient. Role conflict or ambiguity may raise stress, tension and anxiety caused by the contradiction of knowledge, which may lead to coping and defensive behaviours, involving actions of aggression and communication, feelings of hostility towards others, lack of job satisfaction and the loss of self-confidence, self-esteem, trust and respect between individuals, as well as physiological problems (Kahn et al., 1964). Moreover, role clarity is derived from an individual's beliefs concerning the expectations and behaviours linked to their job role (Kahn et al., 1964). Sawyer (1992) demonstrated that role clarity consists of two aspects, which are goal clarity (to what extent the outcome goals and objectives of the job are clearly identified and well defined) and process clarity (the extent to which the individuals are confident about how to execute their job).

DeCoster and Fertakis (1968) adopted role theory to organize and investigate the issue raised by Argyris (1952, 1953): how budgeting and the interaction of supervisors with their superior influence the budget-induced pressure on the supervisors. The assumption was that the more supervisors respond to role expectations of their superior, in terms of budget-related behaviour and performance, the more pressure they will face and which is caused by role conflict and ambiguity. For instance, when the superior emphasizes several budget goals (e.g. increasing profits and increasing quality, as well as customer service), subordinates are more likely to face role conflict and ambiguity due to the fact that they will not know how to achieve all of the budget goals simultaneously.

Hopwood (1972) used role theory to examine how using budget and performance information by superior managers to evaluate the performance of their follower managers causes the job-related stress of the latter managers. That is it results in increasing role ambiguity and conflict, owing to the fact that budget based accounting information is an incomplete representation of managers' actions and performances and when superior managers use this type of information to evaluate subordinate managers, this can influence the latter managers' role conflict and ambiguity, and hence stress. In other words, when this type of information (incomplete) is used to evaluate performance, subordinate managers are more likely to feel that they are not correctly evaluated and thus to experience role conflict, ambiguity and stress.

The findings of DeCoster and Fertakis (1968) and Hopwood (1972) have had an important influence on management accounting research. In particular, many later studies investigate how role ambiguity or role clarity and role conflict mediate the effects of management accounting (e.g. budgeting, evaluating performance) on job-related stress, dysfunctional behaviour and performance. For example, Hall (2008) has examined the indirect effect of comprehensive PMS on managerial performance through role clarity and found that role clarity has a mediating role on this relationship.

2.6.2 Psychological Empowerment Theory

Psychological empowerment is the belief of individuals who have the necessary skills and knowledge for performing their work well, which could make a difference in the company (Spreitzer, 1995a). In terms of psychological approach, researchers argue that changes in both the employee's internal mental operation and the external job environments enhance psychological empowerment. For instance, behaviours and structures of an organisation which allow access to information of the organisational mission and performance, connected with rewards rely on employees' performance, could help in facilitating psychological empowerment (Spreitzer, 1995a). Moreover, as mentioned by Thomas and Velthouse (1990), psychological empowerment can be promoted or impeded through how individuals interpret experiences and events. These authors believe that training individuals to interpret events in ways can either promote or decrease their feelings of competence and control. Psychological empowerment refers to the ongoing ebb and flow of individuals' attitudes and perceptions about the environment of their work.

According to some researchers (e.g. Burke, 1986; Thomas & Velthouse, 1990; Appelbaum, Hébert, & Leroux, 1999; Forrester, 2000; Tiu Wright, Harrison, Waite, & Hunter, 2006), to empower refers to giving power to. Power has a number of meanings. One of the legal meanings is authority, thus the empowerment can imply authorization. Moreover, power can be used for describing capacity, as defined by Conger and Kanungo (1988) in self-efficacy. The other meaning of power is energy. Therefore in this context, to empower can also imply to energise, which is best captured for this term to mean motivational usage. The word empowerment has become popular in recent managerial literature due to the fact that it has provided a non-traditional paradigm of motivation. The wide usage of this term has arisen at a time when a search has been forced by global competition and change for alternative managerial forms for encouraging commitment, innovation and risk-taking (e.g. Harrison, 1983; Kanter, 1983; Walton, 1985; Thomas & Velthouse, 1990).

Empowerment is an involvement initiative for new employees, which is controlled and implemented by management to promote their commitment and to raise the quality of product and services (Lashley, 1995; Wilkinson, 1998). There has been recognition that empowerment of employees is one of the essential components of managerial and organisational effectiveness, which increases when power and control within the organisation are shared (Ergeneli, Ari, & Metin, 2007).

The literature of empowerment has presented insights into various non-information system related disciplines such as: mental health, sociology, politics, education, women, children (disciplines) and psychology. This last notion of empowerment is known as psychological empowerment which has been the most widely used form of empowerment and has been validated across multiple sectors and organisations. A closer look at the literature on empowerment of the previously mentioned disciplines reveals that a psychological empowerment measurement scale is employed in the majority of those studies, which also addressed empowerment as a motivational concept in the workplace.

In the literature review, many studies have addressed the concept of empowerment and its definition, but there is no general agreement on the definition of the concept. Psychological empowerment defines it as increasing intrinsic task motivation manifested in a set of four cognitions, including meaning, competence, self-

determination and impact (Thomas & Velthouse, 1990; Spreitzer, 1995a). Higher levels of these cognitions reflect higher intrinsic task motivation (Thomas & Velthouse, 1990), and consequently are likely lead to more concentrated attention on tasks, persistence during tasks and greater effort and enhanced task strategies (Mitchell & Daniels, 2003; Pinder, 2014). Obtaining adequate information on performance is seen to enhance psychological empowerment. Linking theories of feedback to psychology illustrates that information on performance may increase psychological empowerment by offering information about behaviour and performance of tasks (Ilgen et al., 1979; Locke, Shaw, Saari, & Latham, 1981; Collins, 1982; Luckett & Eggleton, 1991). Particularly, if an individual obtains feedback on their results of operations, intrinsic task motivation would be increased (Ilgen et al., 1979). The greater the amount of information offered about individuals' jobs, the greater would be the motivating potential of the jobs (Ilgen et al., 1979). This is owing to the fact that doing a task without providing knowledge on the results, leading to receiving a small amount of feedback from the manager, is likely to be dissatisfying, frustrating and therefore decreases their intrinsic motivation (Luckett & Eggleton, 1991).

Some authors (e.g. Bowen & Lawler, 1992; Spreitzer, 1995a, 1996; Quinn & Spreitzer, 1997) have argued that there is an association between how employees are told about their performance and levels of motivation. They pointed out that providing employees with information about both their own and company performance is essential to enhance empowerment. A lack or absence of this information has the opposite effect and acts as a de-motivator. Despite the fact that the practices of empowerment are very common in environments of work, academic studies have more than one approach regarding the meaning and results of the concept. To deal with empowerment, much research recognizes two different approaches that have been used in theory and practice.

One of these approaches is the relational approach, or the social structural perspective of empowerment, which emphasises environmental components. This approach defines empowerment as a group of management practices and activities that offer workers power, authority and control (Bennis, 1984; Conger & Kanungo, 1988; Conger, 1989; Warren & Nanus, 1997). Based on this perspective, studies consider empowerment as a form of participation and define it as the transmission of power to those employees who feel less powerful in their organisations. Proponents of the relational perspective

describe empowerment as the management practices and activities that provide workers the right to use and control the organisational resources (Niehoff, Moorman, Blakely, & Fuller, 2001). Adopting this relational approach expresses that empowerment is the efforts which increase the participative levels of employees, particularly in the process of decision making and encourages them to participate more actively in the whole organisation in general.

Chebat and Kollias (2000) compared the practices of empowerment to Old comedies in Italy. They indicated that the general characteristic of these plays is that there are some common ideas which are associated to characters, plan and scene, but there is no written text available. Some authors in the empowerment field related to managerial behaviour believe that for empowering workers, managers should positively offer emotional atmosphere, encourage and reward in noticeable and personal methods, express confidence, enhance initiative and responsibility and build on success (Conger, 1989). The advantages of empowerment from the perspective of a rational approach is to increase the capacity of employees for problem solving, help them to realise their full potential (Klagge, 1998), sharing insights related to the performance of organisations, providing information which affects an organisation's performance and direction and providing workers the power for making their own decisions (Bowen & Lawler, 1992).

2.6.2.1 Relational or Social Structural Perspective of Empowerment

Much research has been conducted on this approach. In the view of this approach, the essential principle is that employees make necessary changes at the structural level to be able to behave in an empowered way. In this context, the relationship between the superior and subordinate are investigated in terms of the distribution of power. These researches were mainly concentrated at unit level and organisational level. In a study by Kanter (1977), which was a classic study related to the development of the social-structural theory of empowerment, empowerment is defined from the viewpoint of this perspective as having power in the organisation (Burke, 1996). Power implies ability to make decisions concerning one's own job and to have authority over the organisational resources. According to the relational construct approach, empowerment is the process of sharing power (through delegation of responsibility) between leaders or managers and subordinates (Conger & Kanungo, 1988). In this approach, employees have been given more freedom to perform their job. In the literature, this approach has received

considerable attention through addressing managerial participation, decision making, involvement of employees, distribution of delegation and power (e.g. Dachler & Wilpert, 1978; Cotton, Vollrath, Froggatt, Lengnick-Hall, & Jennings, 1988).

2.6.2.2 Motivational or Psychological Perspective of Empowerment

The psychological approach concentrates on psychological dimensions of empowerment (Liden, Wayne, & Sparrowe, 2000). The relational approach of empowerment fails to interpret the biases which are inherent in perception (Jones, 1990), in addition to its failure to ensure that the employees feel empowered. The psychological approach has concentrated on the employee's perception and experience of empowerment. This approach has been clarified by the works of Conger and Kanungo (1988), as well as Thomas and Velthouse (1990). As stated by Spreitzer (1996), employees' interpretations and the perceptual realities are what matters and not the efforts made by the management.

In work environments, the attitudes and perceptions of employees have been treated as a necessary mediating factor (intervening) in any empowerment process model (Robbins, Crino, & Frededall, 2002). The emphasis in this approach is on the beliefs and perceptions that are associated with competence, power, self-efficacy and control (Psoinos & Smithson, 2002). According to the study by Mishra and Spreitzer (1998), who pointed out that individuals feel fright and have a tendency for avoiding situations that they think surpass the skills which they own, whilst they behave confidently and are involved in activities when they are judged to be capable of treating these situations which would otherwise be threatening. This also relates to the psychological empowerment approach.

2.6.2.3 Antecedents of Psychological Empowerment

The effectiveness of an organisation can be increased by empowering their employees. However, there are some pre-requisites that have been identified to encourage and facilitate empowerment efforts, according to structural approach studies, but there is a lack of consensus on how it should be done.

A number of contextual factors have been addressed and discussed by Conger and Kanungo (1988), who pointed out that these factors might affect individual's self-

efficacy and thus, their empowerment. Their study dealt with factors relating to the organisation; involving poor communication and network forming systems, work design, including lack of role clarity and unrealistic roles, supervisory styles which related to negativism, as well as high control and reward systems involving lack of competence based rewards. Empowerment needs individuals to take decisions related to the work, and to use suitable actions to execute these decisions. It has been mentioned that the above factors impede the implementation of effective empowerment. For example, Chiles and Zorn (1995) indicated that a lack of relevant information, a strict atmosphere and negative communication with management, had a negative effect on empowerment in the organisation. Kirwan (1995) states that there are four key elements for an empowerment programme to succeed. Kirwan (1995) demonstrated that a successful empowerment programme required four key elements, which are top management support, reward, training and that the programme should warrant fanfare. Randolph's study (1995) provided the three keys to empowerment, including sharing information, communicating a vision and teamwork. Other authors specified that autonomy, skill and knowledge, self-esteem and internal locus of control are antecedents of empowerment.

Spreitzer (1995a) identified that an organisation's resources, support, structure, culture and access to strategic information are considered to be antecedents of an individual's empowerment. Quinn and Spreitzer (1997) also identified several organisational factors, including understanding the vision and goals of top management by the employees and existing good communication with management, which have affected empowerment. Ongori and Shunda (2008) emphasized that to successfully achieve the empowerment process of employees, the following six pillars should be put in place by management: resources, coaching, alignment, information, climate and training of employees. Ghani, bin Raja, and Jusoff (2009) stated that there are five important factors: accessing and providing information, resources, organisational supports, opportunity for learning and developing and trust, as antecedents of empowerment. Bordin, Bartram, and Casimir (2007) asserted that job security, supervisory social support, employee participation and the access to information, had a key role in predicting psychological empowerment.

More recently, a review research study has been done by Maynard, Gilson, and Mathieu (2012) on psychological empowerment and its antecedents, which are leadership, individual characteristics, organisational support, structural empowerment and work

design. Seibert, Wang, and Courtright (2011) who have addressed the antecedents of psychological empowerment, indicated that there are five major factors which are similar to the classification of Maynard et al. (2012), but they considered that structural empowerment is a part of the construct of high-performance managerial practices.

Previous research has considered that the following components are the empowerment antecedents:

1) **Leadership.** Based on the study of Spreitzer (2008), a supportive, trusting association with a leader is a key antecedent of psychological empowerment. It is expected that positive forms of leadership increase workers' perceptions of psychological empowerment owing to the essential role which leaders play in forming the job experience of subordinates (Liden, Sparrowe, & Wayne, 1997; Yukl, 2010). Information related to strategic or operational goals which is provided by leaders, allows their subordinates to see the value of their job and hence to increase meaningfulness. Subordinates may also be allowed to participate and granted autonomy, which is reflected in increasing the feelings of employees in terms of self-determination and impact. Moreover, leaders should behave as an example and offer coaching and feedback to their followers which are great sources of self-efficacy information to promote feelings associated with competence (Bandura, 1997).

2) **Individual Characteristics.** It has been suggested that differences of individuals and schemes of interpretation have an important impact on the subjective assessments of tasks that shape perceptions of psychological empowerment (Thomas & Velthouse, 1990). Similarly, Spreitzer in her studies (e.g. 1995b, 2008) has explicitly addressed individual differences and identified psychological empowerment as the manner that employees see themselves with regards to the environment associated with their tasks. In line with Spreitzer's view, it is considered that characteristics of individuals, particularly those that reflect the self-concept of a person, are antecedents to perceptions of psychological empowerment. Seibert and colleagues (2011) investigated competencies of individuals (gender, education, age, job level and tenure) and found that all these factors significantly and positively related to psychological empowerment.

3) **Organisational Support** refers to the extent of providing components, including material, social and psychological resources to a worker in the context of work, that

relates to the daily operation of any one worker and comprises variables such as climate and culture as well as formalising and decentralising levels (Spreitzer, 1996). Prior studies (e.g. Sparrowe, 1994; Liden et al., 2000; Gomez & Rosen, 2001) indicated that there are several different sources of organisational support associated with psychological empowerment. Seibert and colleagues (2011) revealed that the association between organisational support and individual psychological empowerment was significantly positive in 49 previous studies.

4) **Work Design.** Although the theory of psychological empowerment has shared roots with the theory of job characteristics (Hackman & Oldham, 1980), its conceptualisation has been extended in several important ways (Spreitzer, 1996). For instance, the cognitions or critical psychological states of self-determination and meaning have been included by the models of both theories. However, the model of psychological empowerment theory also incorporates cognitions related to feelings of impact and competence which are not included in the other theory model. The theory of job characteristics clarifies how the basic and most important part of job characteristics (e.g. autonomy, task significance) are associated with self-determination and meaning and the findings of some meta-analysis (e.g. Fried & Ferris, 1987; Humphrey, Nahrgang, & Morgeson, 2007) provided evidence supporting these propositions. The essential job characteristics of task significance and autonomy should also enhance the feeling that one has influence within one's work unit, owing to the increased chance one has to personally make choices regarding ways to achieve tasks that are seen as significant to the organisation.

5) **High-performance Managerial Practices** are identified as a small group of best practices of human and management resources that organisations may utilise for optimizing the value they obtain from their workers. These practices include participative decision making, share of information, decentralisation, contingent compensations and inclusive training (Pfeffer, 1998; Zacharatos, Barling, & Iverson, 2005; Combs, Liu, Hall, & Ketchen, 2006; Liao, 2009; Seibert et al., 2011). It is thought that the practices improve performance due to the fact that they provide more amounts of information and control over the work. Higher levels of psychological empowerment are likely to be facilitated by these practices, owing to the fact that they affect all four dimensions of psychological empowerment (Spreitzer, 1996;

Patterson, West, & Wall, 2004; Liao, 2009). It is recommended that for an individual to be empowered, more information must be available in organisations (Kanter, 1977). Some authors (e.g. Chiles & Zorn, 1995; Randolph, 1995; Bordin et al., 2007; Ghani et al., 2009) have mentioned that information is an important antecedent of psychological empowerment. Information gained from PMS and reward systems can also enhance empowerment in organisations (Spreitzer, 1995a). Increased information and control implies that employees understand the fit between their work roles and the larger strategies and goals of the organisation and they feel that their work is personally meaningful. For employees who have more information, it allows them to better determine what actions they should take, which is reflected in increasing feelings of self-determination. Moreover, increasing high-performance managerial practices, including knowledge, ability and skills lead to enhanced employees' work roles in terms of their feelings of competence. Finally, high-performance managerial practices which have a large level of input and control lead individuals to think that they have greater influence within their job unit or organisation.

2.6.2.4 Consequences of Psychological Empowerment

Numerous studies have evidence that the outcomes of psychological empowerment include: job involvement (Menon, 2001) reduced turnover intent, better performance, productivity and higher service quality (Lashley, 1995b; Geralis & Terziovski, 2003), organisational commitment (Liden et al., 2000; Menon, 2001; Bordin et al., 2007), extra-role behaviour (Menon, 2001), innovation, upward influence and self-efficacy. Psychological empowerment directly affects the intrinsic satisfaction resulting from a productive function of work within the industry. Moreover, managerial effectiveness, such as job satisfaction and managerial performance, are frequently mentioned by many studies as very important psychological empowerment consequences (Liden et al., 2000; Menon, 2001; Bordin et al., 2007; Meyerson & Kline, 2008; Dickson & Lorenz, 2009; Hall & Smith, 2009).

A) Job Satisfaction

Job satisfaction is considered as one of the important motivating components. Many studies have shown that attitudes of employees and their feelings towards their jobs and/or job experiences have been found to have a significant influence on their

performance. Seibert et al. (2011) found the results of 53 studies indicated that there are stronger significant psychological influences on job satisfaction than on organisational commitment, strain, or turnover intentions.

Job satisfaction is the pleasurable emotional state arising from the appraisal of an individual's job or job experiences (Locke, 1976). That is, when an individual assesses a specific facet of a job (e.g. the level of autonomy in a position) which greatly positively affects their satisfaction, if the expectations associated with this facet are met. However, the satisfaction is negated if the expectations are not met, compared to a person who doesn't assess that facet. Job satisfaction and dissatisfaction are defined as a function of the perceived association between what a person expects and obtains from their job and how much importance or value is attributed to it (Kemelgor, 1982). Job satisfaction refers to the feelings of individuals about the rewards they have obtained on the job (Lawler 1990). Hsiao and Kohnke (1998) mentioned that a defined job is an emotional response of people to their job that results from their expectations of the job and the reality of the job situation.

Job satisfaction is an attitude that individuals have about their work and which is derived from their perception of the work and the degree of fit between the individuals and their organisations. Employees who have more control over their work and their decision power in flat organisation, feel more satisfied with their jobs (Ivancevich & Matteson, 1980). Job satisfaction is described as how individuals feel amongst different aspects of their jobs (Spector, 1997). When individuals feel that their jobs are meaningful and enjoyable, these motivate them to perform their jobs. The nature of job satisfaction means that people would tend to stay with a job which is satisfying them and quit a job which is dissatisfying them.

B) Managerial Performance

It has been shown that managerial performance has long been an interesting research area. An organisation's success in accomplishing its objectives largely depends on the performance of its managers. When managers of the organisation as a whole are jointly able to perform their duties properly, they are able to accomplish the goals and objectives set. The prior literature related to managerial performance addressed the topic according to three perspectives: (a) the functions, behaviours and managers' roles, (b)

the managers' traits and skills and (c) the managers' decisions (Borman & Brush, 1993). The oldest studies of functions, behaviours and roles of managers identified the managerial functions, such as planning, organising, directing and controlling these are still used by recent research (Borman & Brush, 1993; Hall, 2008, 2011).

It is recognized that managerial performance can be measured, after implementing a management accounting information system within an organisation. Managerial performance can be impacted through the influence of information on the cognitive and motivational mechanisms of the managers. It is considered that managerial performance is described as a form of existence where managers have accomplished their work as effectively as possible (Soobaroyen & Poorundersing, 2008), but for this research, performance is defined as the perception of a manager about managerial activities, which consisted of multi-dimensions of activities, such as planning, investigation, coordination, evaluation, supervision, staffing arrangements, negotiations and representations (Mahoney, 1963).

In psychological research, it is considered that Spreitzer was a pioneer in studying the effect of empowerment on the performance of individuals. Particularly, one study of Spreitzer (1995a) has indicated that there was a relationship between psychological empowerment and managerial effectiveness, while her study with her colleagues in 1997 proved a positive association with employee effectiveness. However, managerial performance as a variable is not only used in psychological studies (role clarity, psychological empowerment and learning) or accounting studies, but is frequently included in both types of studies and used with a variety of motivational and cognitive variables. For example, it is adopted in accounting studies (Chalos & Poon, 2000; Otley & Fakiolas, 2000; Chong & Chong, 2002; Wentzel, 2002; Parker & Kyj, 2006) and in studies that have cognitive and motivational variables (Imoisili, 1989; Mia, 1989; Brownell & Dunk, 1991; Dunk, 1993a; Burney & Widener, 2007; Hall, 2008; Burkert, Fischer, & Schäffer, 2011; Hall, 2011; Lau, 2011; Chung et al., 2012; Din & Yatim, 2013; Hammad, Jusoh, & Ghozali, 2013; Mah'd, Al-Khadash, Idris, & Ramadan, 2013; Salmon, 2013).

2.6.2.5 Models of Psychological Empowerment

Some authors such as Conger and Kanungo (1988), Thomas and Velthouse (1990), Spreitzer (1995a) and Menon (2001) have developed different types of psychological empowerment models which are summarised below.

1) Empowerment in the View of Conger and Kanungo

It has been considered that the study of Conger and Kanungo (1988) on psychological empowerment is a starting point in literature. Their work was the first study that criticized the approach of empowerment, due to the fact that the approach only focused on the sharing of power and delegated authority. The approach of Conger and Kanungo's for empowerment was based on Bandura's (1997) self-efficacy theory, which assumes that individuals who think in themselves that they are capable can set more challenging goals (Locke & Latham, 1990; Bandura, 1997). According to Conger and Kanungo (1988), empowerment is defined as a process that enhances the feelings of employees' self-efficacy in organisations by determining the circumstances which enhance powerlessness and remove them by providing efficacy information, which is derived from both formal and informal organisational practices and techniques.

In this context, the effect of empowerment is the initiation and persistence of behaviour to achieve task objectives by empowered individuals. It is clear that empowerment interventions and the feeling of being empowered have been distinguished: (1) conditions including organizational factors, reward system, supervision and the nature of the job lead to a psychological state of powerlessness, (2) using strategies and techniques of management, such as participative management, job enrichment, feedback system, goal setting, competence based reward and modelling, (3) using four sources such as vicarious persuasion, enactive attainment, vicarious experience and emotional arousal to provide self-efficacy information to subordinates until they overcome the state of powerlessness, (4) the results gained from self-efficacy information provided to subordinates who were empowered and(5) the behavioural effects emerged as a result of the achievement of tasks.

The first condition involves organisational factors, namely; access to relevant information, labour problems, available equipment within the organisation and

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technological changes. The second condition refers to the supervisory style, such as high control, some control and non-controlling, whilst the third condition is related to the reward system and the fourth one is related to the job design, for example lack of role clarity, or lack of meaningful goals. It is stated that these conditions cause powerlessness in organisations.

According to the second stage of this model, Conger and Kanungo suggested that when management techniques such as goal setting, modelling and participative management were implemented, the feeling of powerlessness could be reduced for employees who experienced it in the first stage. According to Conger and Kanungo, in the third stage, the technique of Bandura (1989) can be used by employees. The conditions of powerlessness are removed when the employees are provided with self-efficacy information, by using vicarious experience, enactive attainment, emotional arousal and verbal persuasion. This will lead the employees to be empowered in the fourth stage. In the fourth stage the empowering experience leads to behavioural effects on subordinates, which are noticed in stage five. Therefore, the subordinates are enabled and it is believed that their self-efficacy is to be increased. The initiation and persistence of behaviour leads to the achievement of objectives.

Table 2.2 The Process of Empowerment by Conger-Kanungo (1988)

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Conditions leading to a psychological state of powerlessness	The use of managerial strategies and techniques	To provide self-efficacy information to subordinates using four sources	Results in empowering experience of subordinates	Leading to behavioural effects
• Organisational factors • Supervision • Reward system • Nature of	• Participative management • Goal setting • Feedback system • Modelling • Contingent/ competence based reward • Job enrichment	• Enactive attainment • Vicarious experience • Vicarious persuasion • Emotional arousal	• Strengthening of effort performance expectancy, or belief in personal efficacy	• Initiation/ persistence of behaviour to accomplish task objectives
		Remove conditions listed under Stage 1		

Source: Conger and Kanungo (1988, p. 475)

2) Thomas and Velthouse -Cognitive Model of Empowerment

Thomas and Velthouse (1990) described empowerment as a very complicated concept and could not be fully explained by one dimension of construct, such as self-efficacy. In this model, empowerment is defined as a group of cognitions that assists to create an active-orientation to the individual's job. The authors suggested four psychological cognitions or task assessment (a cognitive model of empowerment) that promotes an individual's intrinsic motivation towards a task. The cognitive model of Thomas and Velthouse (1990) was different from the model of Conger and Kanungo in three different ways: (A) empowerment has been defined as intrinsic task motivation; (B) self-efficacy is only one of the four cognitions when a sufficient set of task assessment is identified and (C) the model of empowerment tries to capture an interpretive perspective. The model of Thomas and Velthouse (1990) has used the four psychological cognitions namely; impact, competence, meaningfulness and choice. They have considered that these cognitions have been influenced by six key variables which comprised; events of environment, global and task assessments, styles of interpretation, interventions and behaviours.

3) Spreitzer's Model of Empowerment

Spreitzer (1995a) has used the Thomas and Velthouse model as a foundation to develop a scale to measure the four components of empowerment. She renamed meaningfulness cognition to 'meaning' and choice cognition was renamed to 'self-determination' and conducted her study (1995a) in an industrial firm and an insurance company. In this study, it is found that the dimensions of psychological empowerment, which included meaning, competence, self-determination and impact, are combined additively for creating an overall construct of psychological empowerment leading to managerial effectiveness. It is also found that when any one of those dimensions is absent, the effect of empowerment will be reduced, but will not completely eliminate it. Similarly Spreitzer, Kizilos, and Nason (1997) found that no single dimensional empowerment alone can predict all organizational outcomes, such as satisfaction, effectiveness and low job-related strain. They indicated that workers need to experience all four dimensions of empowerment so as to accomplish all of the hoped for results of empowerment. These dimensions are *meaning* (the value placed on the job judged with regard to own ideals or standards of the individual), *competence* (individuals' belief in

their capacity to execute a work with skill), *self-determination* (individuals' belief regarding the degree of choice they have in initiating and executing work behaviours) and *impact* (the extent to which individuals believe they can affect outcomes of the job).

Spreitzer et al. (1997) deduced that the interdisciplinary literature on empowerment, which has drawn on various aspects from psychology, sociology, social work and education, ensure that these four dimensions truly captured the core of empowerment. According to this study, it has also been found that there was wide support for these four dimensions of empowerment across the literatures.

4) Menon's View of Empowerment

A completely new set of dimensions has been put forward by Menon (1999) who defined the state psychological empowerment *"as a cognitive state characterized by a sense of perceived control, perception of competence and internalization of goals"* (Menon, 1999, p. 161).

According to Menon's (2001) study, it is proposed that psychological empowerment is a psychological state which can be measured. He indicated that psychological empowerment is important due to several reasons. Firstly, despite the fact that policies and practices are introduced by organisations to empower their employees, it is possible to obtain the real benefits of empowerment only if the individuals actually experience or perceive empowerment i.e. the psychological state of empowerment. Secondly, while there are various nature actions that could be considered as empowerment, the most efficient among them is to concentrate on the employees' psychological states. Thirdly, psychological empowerment acts as a mediating link between the empowerment practices and behavioural and other individual outcomes, such as job satisfaction. The conceptualization of psychological empowerment is captured by three dimensions which are subsequently derived, namely:

Perceived Control: It relates to belief about authority, autonomy to make decisions, resources' availability and autonomy to schedule work and work performance. This dimension is similar to the 'choice' dimension in the model of Thomas and Velthouse (1990) and the 'self-determination' dimension of Spreitzer's models (1995a).

Perceived Competence: It refers to belief in the capabilities of individual in order to meet given situational requirements. It reflects role-mastery which not only involves achievement of assigned task, but also handling non-routine role related situations.

Goal Internalisation: It is related to feelings of significance, enjoyment and community and owning organisations' goals. Menon (2001) stated that this conceptualization is a unique feature in the model. The Goal Internalisation is similar to the Meaning dimension which used by Spreitzer (1995a).

2.6.3 Individual Learning Theory

Previous studies (e.g. Sprinkle, 2000; Henri, 2006; Widener, 2007) have tended to present learning as a single construct while learning theories generally have indicated two different, yet related, learning processes. For instance, single- and double-loop learning (Argyris & Schon, 1978), exploitation and exploration (March, 1991; Gupta, Smith, & Shalley, 2006) and mental model confirmation and mental model building (Piaget, 1954; Festinger, 1962; Flavell, 1963; Norman, 1982). According to theorists who employ conceptualised learning based on two dimensions, studying learning in terms of multiple dimensions can assist in enhancing understanding of how MCS/PMS are linked to various types of learning processes (Piaget, 1954; Festinger, 1962; Flavell, 1963; Argyris & Schon, 1978; Norman, 1982; March, 1991; Gupta et al., 2006). Moreover, paying more attention to the learning constructs in terms of conceptual specifications may help to reduce uncertainty and ambiguity about their meaning, which can lead to more rigorous conclusions regarding relationships between MCS/PMS and, for example, learning structures (Bisbe et al., 2007).

Generally, any entity could learn by the processing of information which may lead to change in its potential behaviours. It is believed by cognitive theorists that individuals' minds engaged in processing have a mediating role between the stimuli of environment and manifest responses. Behaviour is not owned by the stimulus, but is something that originates from interactions between the stimulus, the active mind and the recipient's memory (Vandenbosch & Higgins, 1995). For several of them, learning is constituted by changes in the potential for behaviour, instead of behaviour itself (Lovell, 1980). However, others are believed that learning needs more than potential. For instance, Norman (1982, p. 3) refers to learning as "purposeful remembering and skilful

performance". Moreover, Huber (1991) and Lovell (1980) define learning as the potential or possibility of change in performance ,instead of changes in behaviour itself. Based on this definition, the cognitive school of learning offers a theoretical base to investigate learning. Particularly, Craik (1943) explained mental models in relation to individual learning.

New and significant insights may be as a result of learning. However, it is not required to be instantaneous behavioural change, as individuals may change their mental models rather than choosing to reconstruct their behaviour (Friedlander, 1983). Thus, learning is represented as that stated by cognitive learning theorists, that a change in the potential behaviour (changed mental models), not a change in behaviour itself (Lovell, 1980; Friedlander, 1983; Huber, 1991).

- **Mental Models**

Several of the overlapping constructs and terms to disentangle in relationship to cognitive theories of learning should be considered. Bartlett (1932) suggested that a mental structure (called a schema) should guide memory. He defined a schema as the past reactions related to an active organisation, or its past experiences, which should always be supposed to be operating in any well-adapted organic response (Bartlett, 1932). He defines the active nature of schemata as it is emergent in nature, and constantly reshaping and developing in response to experiences (Boland & Greenberg, 1992). The mind's workings as described by Craik (1943) in respect of mental models refers to: reasoning consists of creating models in the mind that have similar structures and relationships to those of the external processes they imitate. According to Tolman (1948), learning involves the environment's building representations (called cognitive maps) that are consulted prior to behaviour. Brewer (1987) distinguishes between varied terms, classifies them and indicates that using the expression of a mental model can be referred to all forms regarding mental representation, from any field, general or specific, causal, intentional or spatial.

Cognitive psychology literature and relevant studies have demonstrated that the learning process occurs through two distinct yet related ways. Based on the first perspective, which is mental model confirmation, individuals obtain new information that fits into their existing mental models and assists them in confirming what was already held to be

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correct or true (Piaget, 1954; Flavell, 1963; Vandenbosch & Higgins, 1996). In this case, new information and experiences have been received and integrated within managers' existing mental models (Norman, 1982; Friedlander, 1983; Vandenbosch & Higgins, 1995). Through this process, existing mental models in the current set of norms and rules are refined, corrected and extended (Argyris & Schon, 1978; March, 1991; Gupta et al., 2006). However, there is an intimate relationship between mental models and institutions and North (1994, p. 363) stated that *"Mental models are the internal representations that individual cognitive systems create to interpret the environment; institutions are the external ... mechanisms individuals create to structure and order the environment."*

Under the second perspective, which is mental model building, individuals' mental models are rearranged, redefined and developed, so as to interpret and incorporate new information which is potentially contradictory (Flavell, 1963). In this case, under the existing cognitive structures of managers, new information and experiences are meaningless, which requires new mental models (Piaget, 1954; Festinger, 1962; Flavell, 1963; Norman, 1982). This leads to existing mental models being no longer appropriate for a given situation, which requires concentrating on experimentation for developing new alternatives, norms and rules (Argyris & Schon, 1978; March, 1991; Gupta et al., 2006).

Engaging in both mental model confirmation and building by managers is to assure successful performance (March, 1991; Gupta et al., 2006). Mental model confirmation helps the efficiency and productivity of managers by utilising existing mental models for identifying and solving problems (March, 1991). For uncertain and ambiguous situations, mental model building is very important in helping managers deal with them by promoting flexibility, creativity and innovation (March, 1991; Vandenbosch & Higgins, 1995). However, both learning processes are important, as mental model confirmation is likely to be a behaviour, whereas mental model building is much riskier, combining new ideas, routines and ways of thinking (Quinn, 1980; March, 1991; Vandenbosch & Higgins, 1996). In addition, cognitive dissonance theories mention that individuals tend to selectively perceive cues of the environment in order to confirm existing mental models (Festinger, 1962).

2.7 Implications for the Current Study

In the PMS literature, some authors (e.g. Kaplan & Norton, 1996b; Epstein & Manzoni, 1998) have argued that a major assumption beyond improving more comprehensive PMS is that they could enhance managers' performance. Some authors (e.g. Ilgen et al., 1979; Collins, 1982; Luckett & Eggleton, 1991) have argued that psychological theories are likely to explain the effects of comprehensive PMS on managerial outcomes through cognitive and motivational factors. In this regard, the relationship between comprehensive PMS and managerial performance is expected to be indirect, through clarifying managers' role expectations, providing feedback to enhance managers' intrinsic task motivation and to help managers in learning (Collins, 1982; Luckett & Eggleton, 1991; Buckmaster, 1999; Parsons, 2007; Micheli & Manzoni, 2010). Studies that have investigated the links between PMS and organisations' outcomes (to improved job satisfaction and enhanced organisational performance) presume that such systems influence the individuals' behaviour within the organisation, which in turn facilitates accomplishing their goals (Kaplan and Norton, 1996b; Neely, 1995). It is argued that role clarity could be improved by using more comprehensive performance information. For example, Collins (1982) indicated that management accounting systems could be used to inform employees and/or managers about what is expected from them in terms of financial information and budgetary controls . Moreover, it is mentioned that feedback is a central component of management accounting systems (Luckett & Eggleton, 1991).

From the feedback literature, feedback indicates the degree to which conducting the work activities required by the results of job in the individuals obtaining clear and direct information about the effectiveness of their performance (Hackman & Oldham, 1976). Specifically, comprehensive performance information can help to clarify roles of individuals in their organisations by making specific the goals and appropriate behaviours linked to a job role (Ilgen et al., 1979). Feedback helps individuals in clarifying their roles and thus has an important effect on the perceived role clarity (Teas, Wacker, & Hughes, 1979; Singh, 1993; Evans et al., 2002). It is expected that individuals whose roles are clarified are more likely to be satisfied with their jobs than those who have not had this. Furthermore, feedback is an important motivational

characteristic that influences job design and provides the intrinsic motivation (i.e. psychological empowerment) (Armstrong, 1996; Mukherjee & Malhotra, 2006).

Psychological empowerment is viewed by empowerment theorists as the mechanism through which contextual variables influence individual attitudes and behaviours (Conger & Kanungo, 1988; Thomas & Velthouse, 1990a). In keeping with this theoretical view, Seibert, Silver and Randolph (2006) expected that psychological empowerment is a mechanism by which the empowerment climate influences individual behaviours and attitudes. They have indicated that psychological empowerment is assumed to mediate the relationship between the empowerment climate (i.e. providing information) and both individual outcomes (performance and job satisfaction).

Comprehensive PMS as feedback mechanisms provide information to evaluate the efficiency of managers in assessing the accuracy of basic assumptions about their business and operating environment. Their relevance in providing feedback has been identified as an important part of the resource allocation process in normative models of management accounting (Horngren and Foster, 1991). Several studies (e.g. McKinnon & Bruns, 1992; Chenhall & Morris, 1993; Kaplan & Norton, 1996c) have demonstrated that one of the most important ways in which PMS can influence and improve the performance is to help individuals update their mental models and develop learning capabilities. Franco-Santos, Lucianetti, and Bourne (2012) indicated that the cognitive processes of managers can be supported and fed by comprehensive PMS. Through the literature of cognitive and social psychology, providing information from comprehensive PMS can lead to individual learning by helping managers confirm and build mental models of their businesses (Buckmaster, 1999; Parsons, 2007; Micheli & Menzoni, 2010).

The review of literature in this chapter has shown that a number of previous theories have been utilized to explain certain side of the behavioural aspects. For example, role theory has been used to explain and predict how people function in a social context, and it assumes that the role expectations and norms that are held by others influence the behaviour of individuals (concerning how individuals in a specific role are anticipated to act). While the psychological empowerment theory is interested in motivating individuals to shape their work role and context, the learning theory which is part of cognitive psychology theories implies how individuals' cognitive processing of

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management accounting information effects thinking, specifically, decisions and judgments.

For the purpose of this study the three theories are combined to provide a richer basis for understanding and explaining individual behaviour than would be possible from considering one of the theories alone. This is depicted in the study's theoretical model which was partly describe in chapter One (see section 1.6) and which will explain in more detail in chapter four (see section 4.2).

2.8 Summary

In this chapter a theoretical background related to the main issues has been provided. An overview about PMS has been presented. After following the definition of comprehensive PMS, showing the role and characteristics of PMS and identifying the distinctive types of PMS investigated in previous research, the chapter offered an overview of psychological theories that have been addressed in management accounting. The role clarity, psychological empowerment, mental model confirmation, mental model building, job satisfaction and managerial performance variables that have been examined in relation to MAS/PMS has been highlighted. Finally, implications of the current study were presented.

In the next chapter, empirical literature relevant to the purposes of the current study is reviewed in detail.

Chapter 3 Relevant Empirical Studies Based on Psychology Theories

3.1 Introduction

The previous chapter showed and discussed the relevant theoretical literature concerning psychology theory, comprehensive PMS definition, PMS types, job satisfaction and managerial performance. This chapter aims at reviewing relevant empirical literature and is organised into two sections. The first section focuses on empirical studies related to participative budgeting and reliance on accounting performance measures, and the second section addresses the empirical research related to the comprehensive PMS.

3.2 Empirical Studies of Participative Budgeting and Reliance on Accounting Performance Measures

For more than 50 years, management accounting research has yielded a considerable number of studies regarding the relationships amongst participative budgeting, reliance on accounting performance measures and individual-level variables, such as job satisfaction or managerial performance. Scholars studying these subjects, mainly concentrate on two variables, budgetary participation and reliance on accounting performance measures (Hartmann, 2000). The aim of this first section is to critically review previous studies of participative budgeting and reliance on accounting performance measures. Table 3.1 summarises and presents a total of 83 studies. As can be seen in this table, the studies were published between 1952 and 2014 and the majority of them were conducted in developed countries (66 studies), specifically the USA, UK, and Australia. Very little research was conducted in developing countries (17 studies). Most of these studies focused on the effects of financial performance measures on their outcomes variables. These included role clarity, psychological empowerment and managerial performance. They were carried out using a variety of relationship models, including, direct, interactive and intervening models.

3.2.1 Evaluation Criteria

The criteria used to critically review prior articles are informed by approaches found in some of the analysed studies (e.g. Shields & Shields, 1998; Shields et al., 2000). These criteria are: method of data collection and sample characteristics, Model type and

theoretical framework, as well as variables studied. Each study is reviewed and discussed in detail according to the criteria and followed by a summary, which can be found in Table 3.1. A comparison between their findings and the limitations of prior research are followed.

3.2.2 Participative Budgeting and Reliance on Accounting Performance Measures

Studies under this category focused on budgetary participation and reliance on accounting performance measures, as MCS/PMS mechanisms that influence job satisfaction and performance. The relationship between reliance on accounting performance measures, including budgetary participation and performance, has attracted the attention of several researchers for some time (Argyris, 1952; Becker & Green, 1962; Brownell, 1981; Birnberg, Shields, & Young, 1990a).

Moreover, reliance on accounting performance measures indicate the extent to which superiors depend on, and assert those performance criteria which are pre-set as budget targets and measured in terms of accounting and finance reliance on accounting performance measures show only one aspect of the PMS' functions (Briers & Hirst, 1990; Hartmann, 2000). In regard to the effects of reliance on accounting performance measures on individual-level variables, there are two different views. The first considers that reliance on accounting performance measures are relatively incomplete, as they only cover aspects of performance related to accounting terms. Thus, strong emphasis on using these types of measures might result in negative consequences for subordinates who are evaluated by these measures, if they perceive that other facets of their performance are equally or more important to them (Hopwood, 1972; Hirst, 1981). Hopwood (1972) concludes that subordinate managers perceived the manner of use, rather than that of the nature of reliance on accounting performance measures, can threaten them. Furthermore, he stated that the measures (e.g. a budget constrained evaluative style) give rise to doubts towards superiors, job-related tension and feelings of unfair evaluation.

The second view is that reliance on accounting performance measures has functional consequences, due to the fact that budgets offer clear and specific goals. Therefore, they provide objective and verifiable ways to evaluate performance (Ross, 1994) and may act as mechanisms for reinforcement and motivation (Marginson & Ogden, 2005a, 2005b).

In this manner, reliance on accounting performance measures may decrease job-related tension and increase job satisfaction (Lau & Tan, 2003).

Some studies mentioned that there were a range of dysfunctional effects which related to using financial measures involving: group based negative behaviour (Argyris, 1952), interdepartmental strife (Argyris, 1960), "gaming" (Hofstede, 1968), data manipulation (Hopwood, 1972), job-related tension (Hopwood, 1972), budgetary slack (Merchant, 1985) and short-termism (Merchant, 1990; Van der Stede, 2000). In general, PMS based on financial orientations have a passive perspective which pushes calls for the evanescence of budgeting (Hope & Fraser, 2003), and can have behaviour effects, since the early observations of (Argyris, 1952, 1953) who stated the phrase "Human problems with budgets". Studies related to reliance on accounting performance measures have used a variety of models, which are direct relationship models, interacting or moderating relationship models and intervening or mediating relationship models.

3.2.2.1 Direct Relationship Model

Management accounting research started to study reliance on accounting performance measures by focusing on the direct relationship between reliance on accounting performance measure variables and its consequent variables. For example, the study of DeCoster and Fertakis (1968) applied role theory to discover how superiors use budgets as a way of expressing their own patterns of leadership, by distributing a questionnaire to a sample of 31 supervisors in companies from the Directory of Washington State Manufacturers. It is recognised that the role stress of managers becomes the central topic of most management accounting research which is built on role theory (e.g. Otley, 1978; Hirst, 1981; Merchant, 1990; Dunk, 1993b; Ross, 1994; Abernethy & Stoelwinder, 1995; Ross, 1995; Van der Stede, 2000; Lau & Buckland, 2001), but these types of studies have been referred to in the literature as the reliance on accounting performance measure research stream.

Studies (e.g. Hopwood, 1972; Otley, 1978; Lau & Buckland, 2001; Marginson & Ogden, 2005a; Marginson, 2006) are prominent examples of reliance on accounting performance measure research, but the study of DeCoster and Fertakis (1968) was the first of these studies that structured its investigation using role theory, when an issue raised by Argyris (1952, 1953), namely that of how the interaction of budgeting and

managers with their superiors impacts the budget-induced pressure on managers and their own leadership style towards their subordinates. DeCoster and Fertakis (1968) examined their theoretical predictions and found that pressure caused by budget was related to two types of leadership behaviour, which were initiating structure and consideration. Moreover, they interpreted that the way in which immediate superiors communicated with their staff and their highly exacting requirements concerning budgetary matters were the "closest source of pressure" upon managers.

Some studies (e.g. Hopwood, 1972; Otley, 1978) concentrated on the bivariate relationship between reliance on accounting performance measures and a series of criterion variables that were followed by a series of researches that addressed the issue of whether or not the evaluation styles of superior managers have an effect on the relationship between participation and performance of the subordinate managers, were started by Hopwood (1972). The idea of supervisors' emphasis on budgets to influence the psychological well-being and behaviour of managers was picked up by Hopwood (1972, 1973), who applied role theory to link supervisory styles, tension and dysfunctional behaviours. His study (1972) examined the responses of managers to three types of supervisory styles, in particular to the use of accounting data in performance evaluation, by using a questionnaire survey to collect data from 193 persons in one manufacturing division (cost centres) of a large Chicago-based company. He differentiated between three different supervisory styles, which are the budget-constrained style, the profit-conscious style and the non-accounting style (Hopwood, 1972, p. 160). The results of the study pointed out that the feelings of cost centre managers who are being evaluated based on a Budget Constrained style have a significantly higher level of job related tension than those who are evaluated based on either a Profit Conscious or a Non-accounting style. Due to the imperfect nature of reliance on accounting performance measures, a budget constrained supervisory style particularly causes role ambiguity, which in turn leads to managerial stress, tension and anxiety. Hopwood (1972) further debates that those managers who are attempting to deal with stress and tension leads them to dysfunctional behaviours. His work has motivated a series of further studies to investigative the effects of different supervisory styles. Generally, it is explored how role ambiguity mediates these effects on tension, dysfunctional behaviours and managers' performance (Birnberg et al., 2006, p. 122).

In the accounting literature, the results provide empirical support that budgetary participation has positive effects on job satisfaction (Cherrington & Cherrington, 1973; Milani, 1975; Kenis, 1979; Locke, Schweiger, & Latham, 1986; Cotton et al., 1988). However, some studies indicated that there were positive effects from budget participation on performance (Argyris, 1952; Hofstede, 1968), but other empirical studies have yielded inconsistent results when the relationship between the participation and performance has been investigated. Indeed, some questions have generated more controversy in accounting research (Murray, 1990). In a comprehensive literature review related to accounting and organisational behaviour, Brownell (1982c) stated that the relationship between participation and performance cannot be an unequivocal statement due to the fact that participation sometimes works and at other times it does not.

For example, Cherrington and Cherrington (1973) conducted experimental sessions based on 230 undergraduate students, both male and female, enrolled in an introductory business course, to test the direct effects of budget participation on performance and satisfaction. They found that there were positive effects of budget participation on job satisfaction and performance. Similarly, Milani (1975) tried to examine the direct effects of budget participation on job satisfaction and managerial performance. Building his study on the work of Argyris (1955), he assumed that participation would raise job satisfaction and positively affect performance. Milani's sample was 82 manufacturing foremen who often exhibited better performance if they perceived themselves to participate compared to those foremen who did not participate. The study indicated a significant relationship between budget participation and attitudes, but did not relate consistently to performance and it cannot consider any statistical significance as really providing any "strong" information (quite small). However, the effects of budget participation on managerial performance were sporadic, evident during some periods, but often absent. The research was conducted as a field study and suffered from a lack of control of important variables, which may have an impact on the participants in the study and was also based on one firm, which would not readily compare to other studies. Moreover, the author traded off a high degree of external validity for a low degree of internal validity. Likewise, Kenis (1979) used a questionnaire-based field study to investigate the participation of 169 department managers and supervisors of plants located in the New Jersey/Philadelphia area, about the attitudes and performances

of managers. However, he found an inconsistent relationship between participation and performance.

Contrary to Milani (1975) and Kenis (1979), Chong and Chong (2002) examined budget goal commitment and informational effects of budget participation on performance, by using a structural equation model technique and questionnaire survey method on 79 middle-level managers from manufacturing firms in Australia, and found that the results confirmed that budget participation directly affected performance.

Trying to corroborate Hopwood's supposition (1972), Otley (1978) investigated the effects of supervisory styles on managers who experienced job related tension. The study is based on survey data collected from 41 production unit managers (profit centres) of a single, large organisation and the group of staff in the line hierarchy above them were interviewed. Other data was obtained from the budgetary and other records of the organisation. A subsequent empirical investigation by Otley (1978), who built it on Hopwood's (1972) work, which was studying the effect of leadership evaluation style on organisational effectiveness, but found the results countered Hopwood's findings. The paper found that using budget styles did not have an effect on job, or budget-related tension, nor had a budget-oriented style reduced job ambiguity or ambiguity of evaluation. Contrary to Hopwood, Otley measured the influence that dissimilar performance evaluation styles have, not only on the individual managers, but also on the effectiveness of the overall operations. To explain the conflicting results between the two studies, Otley built his analysis on profit centres which are substantially independent of each other, whereas Hopwood's analysis was conducted on cost centres which are an integrated manufacturing plan. Moreover, it is suggested that budget data is likely to be more appropriate in evaluating the performance of independent units than those of interdependent units (Baumler, 1971; Bruns & Waterhouse, 1975). This might help to explain the differences between Hopwood who found dysfunctional effects for the budget constrained style and Otley who did not.

Marginson and Ogden (2005a) examined the positive role budgets play in the individual's work experiences. The study debated if managers confronted with role ambiguity may respond by becoming positively committed to achieving budgetary targets, since budgets offer a source of structure and certainty. It was conducted by a questionnaire survey of 221 managers based on 'level three', from five of Infotain's

eight strategic business units in UK and showed that using budgets as an antidote to role ambiguity had a powerful effect on the budgeting behaviour of managers.

Moreover, the paper of Marginson (2006) dealt with the psychology of information processing and concentrated on the utilisation of information media for performance evaluation purposes, which was expected to impact the vulnerability of managers to experiencing role ambiguity. The authors used the same sample in their study in (2005a). The findings of the study show support that role ambiguity will decrease as the managers attach increasing importance to information media for the purposes of performance evaluation of low 'richness' (i.e. control reports), but not for high richness (face-to face, telephone).

More recently, Mah'd et al. (2013) examined the influence of budgetary participation on managerial performance in a developing country context (Jordan). They used a questionnaire survey of 77 executives in five private universities as the main method of research and also employed archival documents, observations and reports, in order to achieve the study objective. Using the Mann-Whitney test, the results suggest that the respondents who participate in the budget have better performance than others who do not. By applying further analysis, the study supports previous results which have a value for decision makers of the higher education institution, in addition to the university executives, in a matter of increasing awareness for the importance of budgetary participation.

Studies concerning the effects of budgetary participation on managerial performance are inconsistent; some find positive effects (Cherrington & Cherrington, 1973; Brownell & McInnes, 1986; Chong & Chong, 2002), while others uncover insignificant effects (Milani, 1975; Kenis, 1979). These mixed results have led scholars to conclude that the relationship between budgetary participation and performance is not simply direct and that there might be other variables which act as moderating or interacting factors in this relationship (Hopwood, 1976; Brownell, 1982a; Murray, 1990; Shields & Young, 1993).

3.2.2.2 Moderator and Interacting Relationship Model

According to the inconsistent results of direct relationship models, authors have tried to resolve this contradiction and explain it. They have suggested that there are some variables that work as moderators and/or interacting with other variables, to clarify the relationship between reliance on accounting performance measures and its consequences. Studies adopt several moderator or intervening variables to illustrate their relationships, such as uncertainty (Hirst, 1981; Brownell, 1985), cultural (O'Connor, 1995), behaviour pattern (Fisher, 2001) and participation (Brownell, 1982a, 1983; Dunk, 1989). More specifically, disagreeing results between Hopwood (1972) and Otley (1978) led to a large body of contingency theory research investigating the assumption that the differences in the findings could be clarified by systematic differences in the environment, information system, or individual subordinates.

- **Uncertainty Modelled as a Moderator Variable**

Hirst (1981) suggested that the level of task uncertainty was an important contingent variable perceived by the subordinate. Task uncertainty was associated with the completeness of subordinates' knowledge about cause-and-effect relationships linked to task performance (Thompson, 1967). When the task uncertainty of subordinates is high/ low, they are respectively unsure/sure about the consequences of their actions. For example, Hirst (1981) debated that task uncertainty is especially high in boundary-spanning subunits, such as marketing or research and development departments, due to the fact that these subunits are open to actions taken by other subunits or departments within organisation (i.e., task interdependence) and by outsiders. The increasing task uncertainty leads to increasing loss of the ability of accounting measures to accurately reflect the actions that will achieve organisational goals (Tiessen & Waterhouse, 1983). Reliance on accounting performance measures in high uncertainty environments is unable to tell the whole story, which makes other sources of evaluation information more important. Superiors who are reliance on accounting performance measures might cause dysfunctional behaviour for their subordinates, which in turn lead to poor performance.

In this avenue of research, Hirst (1983) partly replicated the studies of Hopwood (1972) and Otley (1978), by using the situational framework suggested by Hirst (1981) who in

1983 investigated the effect of different uses of reliance on accounting performance measures (in evaluating subordinate performance) on subordinate tension and social withdrawal, in both high and low task uncertainty situations, by applying the questionnaire survey method on 111 line managers representing a wide diversity of functions (i.e. marketing, production, research, administration and distribution) in a large manufacturing firm headquartered in Sydney, Australia. However, the findings did not support that there was a significant three-way interaction between budget emphasis, budgetary participation and task uncertainty, influencing managerial performance. Neither could the study confirm the earlier research finding of Brownell (1981) which was a two-way interaction.

Govindarajan (1984) examined the moderating effects of environmental uncertainty on the relationship between reliance on accounting performance measures and performance. Environmental uncertainty is associated with task uncertainty, but distinct conceptually, as he defined environmental uncertainty as the unpredictable effects on customer outcomes), suppliers of material related to labour and capital, competitors for both markets and resources and regulatory groups. Therefore, when environmental uncertainty is high, reliance on accounting performance measures (incomplete measures) are unable to evaluate managerial performance because managers have less control over outcomes. Govindarajan used the questionnaire survey method to collect data from 58 general managers of business units within multi-business firms in Massachusetts, Connecticut and New York. He found that when environmental uncertainty was high, there was greater reliance on subjective performance measures and reduced reliance on accounting performance measures in high performing business units. This result confirmed that reliance on accounting performance measures fail to assess the quality of a manager's effort, owing to the fact that they are outcome-based performance measures.

However, Brownell (1985) also investigated the moderating effect of environmental uncertainty, but he defined it as two separate dimensions in the environment (the degree of complexity and dynamism). The complexity dimension is linked to the number of elements (e.g. availability of personnel, interdependence with other business units, demands of customers and suppliers etc.) that are essential in decision making, and dynamism referred to the frequency of change in each critical element over time. He

attempted to measure environmental differences between two organisational units, in order to assess their effectiveness in terms of managerial performance and how these units faced different environments by using the control system choices. 61 questionnaires were obtained from the study's responders, who were managers in the marketing and R&D activities of a large multinational electronics and computer business. The findings mentioned that high/low reliance on accounting performance measures was less appropriate for subordinates facing high/low levels of environmental uncertainty.

Imoisili (1989) later tested a model similar to Hirst (1983), by using questionnaires to collect data from102 cost centre managers in three manufacturing companies, to explain the differences in results between Hopwood (1972) and Otley (1978). He examined the relationship between budget attitude (favourable vs. unfavourable, reliance on accounting performance measures), job-related stress and managerial performance. However, that task uncertainty moderated the relationship between reliance on accounting performance measures and any other variables was unconfirmed, but managers who employed a "budget-constrained" supervisory style reported higher levels of job stress and a more favourable attitude toward the budget. Imoisili speculated that sampling bias may confound some of the results. Imoisili failed to clarify the inconsistent results between Hopwood and Otley and concluded that using the contingency approach may not provide adequate explanation for the differences.

The final example in this context is Merchant (1990) who examined the moderating effects of environmental uncertainty on the relationship between reliance on accounting performance measures and the incidence of manipulative behaviours. His definition of environmental uncertainty was consistent with Govindarajan's (1984) and the criterion variables were manipulative behaviour (e.g., revenues and expenses shifting across reporting periods and failure to make needed discretionary expenditures) and short-term decision orientation. Data was collected by interviews and questionnaires from 54 of the lowest level managers in the manufacturing organisation, with profit centre responsibility and who had direct authority over manufacturing. The study showed that there was a positive relationship between reliance on accounting performance measures and manipulative behaviour. Therefore, the results are consistent with earlier empirical evidence. It pointed out that the moderating influences of environmental uncertainty,

superior consideration and business strategy showed weak or insignificant results. To explain the weak results, Merchant stated that they may be due to crude measures and small sample sizes. These findings also suggest that the behavioural influences of financial pressures may be reasonably constant across profit centres within a company.

- **Budgetary Participation Modelled as a Moderator Variable**

Budgetary participation is considered as a control system which may induce several forms and types of dysfunctional behaviour. Scholars have tried resolving inconsistent evidence regarding the relationship between reliance on accounting performance measures and performance. They suggested that there are moderating variables which clarify the relationship between reliance on accounting performance measures and performance. For example, more than three decades ago, reviewing research on participative budgeting, Brownell (1982a) stated that:

> *'Research effort to date tended to focus attention on the more general question of whether participation is effective or not, rather than specifying the conditions under which it is effective. Conflicting results permeate the literature . . . ' (pp. 146-147).*

He classified these conditions into four groups of variables, which are organisational, cultural, interpersonal and individual. In response to the inconsistent results of previous research, several studies have investigated the diversity of moderator-variable, ordinal and disordinal interaction models, to evaluate various conditions and explain the conflicting effects of budgeting relationships.

In the accounting performance measures field of studies, researchers have tried resolving the contradictory evidence in the relationship between reliance on accounting performance measures and performance. They have used budget participation as the moderating variable to clarify the relationship between reliance on accounting performance measures and performance. Some studies provided consistent evidence, for instance (Brownell, 1982a, 1983), that high reliance on accounting performance measures improved performance and job satisfaction when high budget participation accompanied it.

Brownell (1982a) reports the results of a study undertaken in an attempt to reconcile the results of Hopwood and Otley and assumed that directly observable relationships between leadership evaluative style and performance should not be expected, due to the fact that the relationship will be moderated by budgetary participation. Brownell (1982a) investigated leadership evaluative style (reliance on accounting performance measures), budgetary participation and their interaction with both performance and job satisfaction. By using a questionnaire survey on 48 managers drawn from a large San Francisco Bay Area manufacturing company, his findings confirm the assumption, demonstrating that a budget-focused leadership style (reliance on accounting performance measures) was most effective under conditions of high participation, but was ineffective where participation is low. More specifically, when participation is high/low and reliance on accounting performance measures is high/low, the results were positively associated with performance, but inconsistent for job satisfaction.

Moreover, Brownell (1983) also tried shedding light on the inconsistent results of previous research by designing a study to provide evidence not only on the direct effects of leadership style and budgetary participation on performance and job satisfaction, but also on the interactive effects of leadership style and participation. He surveyed 48 middle level cost centre managers involved in manufacturing and distribution functions in a large Australian manufacturing company. However, the study revealed that the most important results were the existence of significant interactive effects of leadership style and participation on both performance and job satisfaction, under certain leadership conditions (a high level of budgetary participation), but at best, no effect on subordinate performance under other conditions.

Dunk's (1989) study was carried out on 26 production managers randomly selected from consumer product manufacturing organisations located in the north of Britain and attempted to resolve, at least partially, the conflict between the Brownell (1982) and the Brownell and Hirst (1986) results by conducting a replication of the Brownell two-way interaction model, examining the impact of budget emphasis on the relationship between participation and performance. The study articulated that high/low participation and high/low reliance on accounting performance measures had a negative relationship with performance. It confirmed Brownell's result of a significant two-way interaction between participation and budget emphasis affecting performance, though it failed to

support Brownell's finding that the interaction positively affects performance. It is proposed that a potential reason for why the results of this study conflict with those of prior research is that their findings were based on non-random sampling.

Using interview and questionnaire survey methods on 100 managers from a large retail drug company with 235 franchised stores in Canada, Aranya (1990) investigated the effects of budget instrumentality and budgetary participation on job satisfaction and performance in a large retail drug company. Despite the fact that the findings of the study mentioned that high participation and high reliance on accounting performance measures lowered performance and satisfaction, rather than increasing them, the type of interaction differs from those found by prior studies (e.g. Brownell, 1982a).

Dunk (1993a), tried to validate Hopwood's (1972) finding, which was that the tension of managers negatively influenced their performance, by employing a research design that paid particular attention to the issues of sampling and variable measurement. The study received 79 mailed valid surveys from managers of manufacturing organisations employing more than 100 people, located in the Sydney, Australia, metropolitan area and listed in the Kompass Australia business directory. The findings of this study suggest that the relationship between job-related tension and performance was negatively significant. The proposition that participation moderated the relationship between job-related tension and performance was not supported.

- **Budgetary Participation and Uncertainty Modelled as Moderator Variables**

To explain the contradictory results in previous studies, researchers have used a wide contingency theory framework by adding both budget participation and uncertainty as the moderating variables to demonstrate the link between reliance on accounting performance measures and its consequences. For instance, Govindarajan (1986) surveyed 77 middle-level management post holders and 53 of their superiors to empirically examine the relationships amongst environmental uncertainty, participation and performance in the budgetary process. The findings so far illustrate that the greater the environmental uncertainty, the greater the positive impact of budget participation on managers' performance and attitudes. However, these findings did not indicate whether budget participation always contributes positively to managers' performance and attitudes.

More importantly, assessing the extent of Brownell (1982a) findings also depends on the level of task uncertainty which was used by Hirst (1983) as the primary independent variable. Brownell and Hirst (1986) surveyed 76 line managers representing a wide variety of functions (i.e., marketing, production, research, administration and distribution) in a large manufacturing company headquartered in Sydney, Australia. They pointed out that the interaction between task uncertainty and budget participation were associated with job-related tension only when task uncertainty was low, but not consistent for performance. One possible explanation is that they used different cross-national samples (one U.S., one Australian). However, there was not a convincing argument for this matter, as the study suggested that any impacts on performance depend on some intervening variable(s).

Mia (1989) examined the interactive effect of participation and job difficulty on managerial performance and work motivation in a budgetary context. This study used the questionnaire survey method to collect data from 76 middle-level managers working in six companies operating in New Zealand. However, participation did positively affect performance, but only for difficult jobs and there were no significant interactions obtained with respect to work motivation.

Finally, due to the conflicting results of Brownell and Hirst (1986) and Brownell (1982a) studies, Brownell and Dunk (1991) sought to reconcile their results related to the role of task uncertainty in the study of budget participation, budget emphasis and managerial performance, by incorporating variations in measurement (sensitive to the chosen measure of task uncertainty) and sampling (procedures employed). They employed a questionnaire survey to collect data from 79 managers at 46 manufacturing companies in Sydney, Australia, and the metropolitan area, employing more than 100 people. The results were that high reliance on accounting performance measures and high budget participation led to optimal performance only in situations of low task difficulty and high performance was obtained when both reliance on accounting performance measures and budget participation were high and combined, regardless of task variability. These results provide strong support for the hypothesis of Brownell and Hirst (1986).

- **Culture Modelled as Moderator Variable**

Another example of research has examined the moderating effect of culture on the relationship between role ambiguity and outcomes (O'Connor, 1995). O'Connor (1995) conducted a study to explore the moderating effect of cultural variables on the relationship between budget participation of 282 middle-level managers and their experienced role ambiguity in 62 manufacturing firms in Singapore, using interviews and a questionnaire survey. The results have shown that the moderating effect of power distance on the relationship between the usefulness of participation in budget setting and performance evaluation was supported.

3.2.2.3 Mediating or Intervening Relationship Model

Many studies have addressed the direct relationship between one or more components of accounting performance measures (e.g. budget participation, standard tightness, performance-based incentives) and performance or other variables (e.g. job-related stress) (Young, 1988; Merchant, 1989; Birnberg et al., 1990a; Young & Lewis, 1995; Shields & Shields, 1998). However, direct (independent or interactive) and indirect models have important theoretical differences and have practical implications, but most of the previous studies have investigated the direct, independent or interactive model, instead of the indirect effect model.

These studies have examined either the independent, direct effects of these components (e.g. bivariate correlation between budgetary participation and performance), or the interactive, direct effects of the components, which means a component interacts with another independent or a moderator variable to affect performance (e.g. interaction of budgetary participation with task uncertainty on performance, or budgetary participation as a moderator between reliance on accounting performance measures and performance). Few studies have investigated whether a control-system component has indirect effects on job satisfaction and performance. This means a model with an intervening variable or variables has the variable(s) mediate the relationship between the independent and dependent variables (role clarity mediating the relationship between budgetary participation and job satisfaction and/or performance). For example, Shields et al. (2000) compared between two types of models (direct and indirect) and found that the indirect model has a significantly better fit to the data than the direct model.

- **Budgetary Participation Modelled as Mediating Variable**

Previous research has found a combination of an evaluative style with high budget emphasis and high participation, have a better relationship with behavioural outcomes (e.g. lower job-related tension) than all other combinations of budget emphasis and participation. However, little research has investigated the theory on why this particular combination of budget emphasis and participation results better affect behavioural outcomes. By using the intervening model, Lau and Buckland (2001) examined the relationship between budget emphasis and job-related tension through budgetary participation, using a questionnaire survey of 120 senior managers from three different functional areas in manufacturing organisations with more than 100 employees in Norway. The results indicate that the direct relationship between budget emphasis and job-related tension was insignificant, but there was a strong indirect effect of budget emphasis on job-related tension through budgetary participation.

- **Role Clarity (Role Ambiguity) Modelled as Mediating Variable**

Collins, Munter, and Finn (1987) used survey-based research on the patterns of gameplay, leadership styles and role stress to identify whether these factors have relationships with the subordinates' attitudes towards accomplishing their budget. Their respondents were 1,021 planning executives and 318 managers from the Planning Executives Institute and the National Management Association respectively. The study found that the game patterns of DEVIOUS, ECONOMIC, INCREMENTAL and TIME were significantly correlated with the attitudes of subordinate managers towards achieving their budgets, particularly when considered in the context of their superior's leadership style and the amount of role stress present. In particular, it found that a manager with a positive budgetary attitude had low role stress and had a superior with a punitive leadership style.

Moreover, the study of Chenhall and Brownell (1988) seeks to explain the effects of participative budgeting on job satisfaction and performance, by depicting role ambiguity as an intervening variable based on the questionnaire surveys of 36 middle-level managers drawn from a large manufacturing company. The results suggest that role ambiguity is an important link in the relationship between budget participation and job satisfaction, as well as performance, but they indicated that participation significantly

had a relationship with job satisfaction, but not with performance. While the study was carried out within a single organisation which limited the generalizability of the findings, it also focussed on a single intervening variable. However, including other variables may add more explanation to the indirect relationship between participation and criteria.

Finally, Chong, Eggleton, and Leong (2006) examined the multiple roles (i.e. cognitive, motivational and value attainment) of budgetary participation and the combined influences of these three roles on the job performance of subordinates. The study assumed that the relationship between participative budgeting and job performance is indirect through three intervening variables, namely, role ambiguity, organisational commitment and job satisfaction. The data were collected from 74 senior-level managers in the Australian financial services sector by a questionnaire survey which was analysed using a path analytic technique. The study found that the participative budgeting indirectly affected subordinates' job performance and satisfaction through role ambiguity.

- **Motivation Modelled as Mediating Variable**

Brownell and McInnes (1986) used a questionnaire to investigate the relationship between budgetary participation and performance through motivation as an intervening variable among 108 middle-level managers from a variety of functional areas in three manufacturing companies. However, the study confirmed that budgetary participation has a positive direct effect on performance, but that the motivation variable did not play any role in this relationship. The study built on a non-random sample which was from three companies; therefore its results may not be generalizable beyond them, or to different managerial levels within the companies. Despite the fact that aspects of the form of the expectancy model have been criticized (e.g. Staw, 1977), the study used this model which has sometimes shown a rather weak relationship to effort and performance (e.g. Ferris, 1977) and that has led to questions being raised about the model's validity in empirical use. Moreover, in spite of these caveats, the results of the study challenge the conventional wisdom concerning the effect of participation on performance through motivation and which has important implications related to the theory and practice of budgetary and requires additional confirmation.

3.2.3 Other Empirical Studies of Role Clarity, Psychological Empowerment and their Consequences

While budgetary participation, reliance on accounting performance measures research and their findings appear to be primarily tailored to managers and managerial role perceptions, several other studies (e.g. Senatra, 1980; Bamber, Snowball, & Tubbs, 1989; Rebele & Michaels, 1990; Gregson, Wendell, & Aono, 1994; Fisher, 2001; Maas & Matějka, 2009) have originated and adopted the role theory and psychological empowerment approaches (e.g. for auditors' jobs, financial accountants and management accountants).

3.2.3.1 Direct Relationship Model

- **Consequences of Role Clarity on Auditors and Accountants**

Senatra (1980) investigated the role ambiguity experienced by senior auditors in a large accounting company, using role theory to develop a framework, including consequences and sources of role ambiguity. By surveying 107 senior auditors in eight offices of one Big Eight public accounting firm, the study found that role ambiguity was significantly related to several adverse consequences. There were also significant relationships between ambiguity and specific measures of the organisational climate of the firm, which were assumed to be potential sources of role stress.

Similarly, Bamber et al. (1989) used role theory to investigate the effects of audit structure on organisational characteristics, which in turn are potential sources of role ambiguity. They surveyed 133 of the office's senior auditors from offices of four Big Eight accounting firms and found that the perceptions of the seniors related to organisational characteristics of their firms and their perceived role stress differed systematically between structured and unstructured firms. Work flow coordination, violations in the chain of command and communication adequacy significantly had a relationship with role ambiguity.

The study by Gregson et al. (1994) attempted to determine whether variables frequently used in the research on role theory (role ambiguity, perceived environmental uncertainty) represent measurements of distinct constructs. The target sample by survey was obtained from 482 staff members in public accounting firms with 10 or more

AICPA (American Institute of Certified Public Accountants) members. The results have shown the construct validity of role ambiguity and support was found for the distinctness of role ambiguity and perceived environmental uncertainty.

A recent study by Ahmad and Taylor (2009) provided evidence of the influence of role ambiguity on internal auditors' commitments to independence. The results via a survey of 101 Malaysian internal auditors reveal that role ambiguity was significantly negative in relation to commitment to independence. The dimensions which have greatest impact on commitment to independence are ambiguity in the exercise of authority by the internal auditor and the time pressure faced by the internal auditor.

- **Consequences of Role Clarity on Job Satisfaction**

Abramis (1994) used formal meta-analytic methods to study the primary relationship link between role ambiguity and job satisfaction. He conducted his meta-analyses based on 39 studies, and found that the results mentioned that role ambiguity has a significant and negative relationship with satisfaction. He also indicated that there is variance in correlations of role ambiguity with its outcome variables across studies, but from his point of view this may be due to the variety of variables which are adopted by these studies.

The antecedents and consequences of role perceptions (e.g. role clarity) have been examined by Hartenian et al. (1994), using path analysis. Particularly, they tried to investigate the relationship between role clarity and job satisfaction using a questionnaire survey on the sample of 253 graduates who had already accepted an offer for full-time work after their graduation and 155 of the same graduates after eight months. The study did not find any relationship between role clarity and job satisfaction. This result is contradictory to previous studies (e.g. Jackson and Schuler, 1985), which assert that there was a positive relationship between role clarity and job satisfaction. This inconsistent result may be due to the generalized job satisfaction measure that the study used.

Koustelios, Theodorakis, and Goulimaris (2004) examined the relationship between role ambiguity and job satisfaction among Greek physical education teachers, and the extent to which role ambiguity predicts job satisfaction. The study was conducted on all

members of the sample of 61 physical education teachers who were employed in the Greek "Sport for all" programs. It showed that physical education teachers reported a high level of role ambiguity, which was a significant predictor of job satisfaction. However, despite the significant relationship found between the variables, the study mentioned that the amount of variance was small. This is due to the fact that the study was based on small sample, leading one to interpret the current findings with caution. The study adopted a very rudimentary model (direct relationship), which is no longer suitable to address relationships between variables in the competitive environment and neglected the role of many other variables that could be interacting or intervening with this relationship.

Mukherjee and Malhotra (2006) study has addressed important aspects of role clarity related to frontline staff, by trying to examine the effects of role clarity and its antecedents and consequences on employee-perceived service quality. Data was collected by a questionnaire survey from a sample of 342 call centre representatives of a major commercial bank in the UK and tested using a structural equation model. However, apart from the relationships which were the effect of feedback on the role clarity, as well as the influence of the latter on job satisfaction that was tested and resulted in a positive relationship, the study neglected to verify the mediating effect of role clarity between both variables.

The Lankau, Carlson and Nielson (2006) study investigated the influence of role ambiguity on job attitude (job satisfaction). Structural equation model was used to test the model with data collected from a sample of 355 protégés by using a questionnaire survey which was mailed to randomly selected graduates of a large western university and a Northeastern university who had earned bachelor's degrees in business management over the last 20 years. The results showed that there was a negative relationship between role ambiguity and job satisfaction.

Similarly, Sakires, Doherty, and Misener (2009) investigated perceptions and correlates of role ambiguity amongst a set of sport administrators in voluntary sport organisations. The study examined the relationship between role ambiguity and job satisfaction based on a sample of 79 paid staff and 143 volunteer board members from provincial voluntary sport organisations, by using an online questionnaire survey. Generally, the result pointed out that greater role clarity was associated with greater satisfaction.

However, a greater level associated with one type of role ambiguity has a significant relationship with lower levels of satisfaction. To justify this correlation the study provided some reasons, which stated that individuals who experienced moderate or high levels of role ambiguity might already have left the organisation, or may be due to a lower tolerance for such perceived ambiguity, or the self-attribution bias related to respondents

Based on these results, it seems that there has been a potential problem related to voluntary sport organisations, as higher levels of role ambiguity were linked to lower levels of job satisfaction. Organisations which have less satisfied members are likely to be less productive (Iaffaldano & Muchinsky, 1985). Despite the knowledge provided by the study, it was limited to a few variables and neglected many other factors which are antecedents of role ambiguity and job satisfaction and that may play an important role in voluntary sport organisations.

Hansen and Høst (2012) study investigated, in addition to how the organisational decision structure influences job satisfaction through the role clarity, the effect of role clarity on job satisfaction. The study utilised a structural equation model and assumed a theoretical model to investigate these relationships by a questionnaire survey of 400 Danish managers from different levels in the public sector and interviews were also conducted with 20 managers from different functions. The results illustrated that role clarity has a positive effect on job satisfaction. Although the study was restricted to the public sector, its sample did not statistically represent the Danish public managers by showing that its data was less representative for the lowest management level, which should be taken into consideration for interpreting and generalising the results.

Given the importance of role clarity on job satisfaction, which is reflected in the increasing productivity of an organisation in which its employees are more satisfied, Allameh, Harooni, Chaleshtari, and Asadi (2013) have examined the relationship between antecedent of role clarity, including feedback, job autonomy, participation in decision-making and supervisor's considerations and its effects on the perceived service quality of front line employees through clarifying the role, commitment and satisfaction of these employees. Based on the path analysis method and a questionnaire survey collected from 132 front line employees in the Keshavarzi Bank of Chaharmahal-e-Bakhtiary province, the study found that role clarity has an important effect on the

employees' perceptions of services quality. However, though the study showed that there was a statistically significant positive relationship between feedback and role clarity and between the latter and job satisfaction, it was restricted to descriptive analysis and did not take a step further to examine whether there was a mediating effect between feedback and job satisfaction through role clarity, or not.

The work of Carbonell and Rodriguez-Escudero (2013) was to investigate the effects of two types of management controls (i.e. output, process and professional), as formal and informal, on the job satisfaction of new product development (NPD) teams. It particularly examines the direct effects of management controls on job satisfaction and indirectly through role ambiguity, as well as the moderating effect of participative-decision making. Data was collected based on a web-based questionnaire from a sample of 197 NPD projects at Spanish firms operating in various manufacturing industries.

Apart from the effects of process control on role ambiguity, the results showed that both output and professional control have direct negative effects on role ambiguity. Contrary to the expectations of the study, results indicate a direct positive relationship between output control and job satisfaction. However, the results revealed that the effects of process control were marginally significantly negative on job satisfaction, but the effect of professional control was positively significant on job satisfaction. Contrary to the negative relationship between role ambiguity and job satisfaction, the latter has a positive direct effect on new product performance. Moreover, the study has found that role ambiguity played a mediating role between both output and professional control and job satisfaction.

For the results related to the relationship between process control and team job satisfaction, which appeared contrary to expectations, this may be because under a process-control setting, reward decisions are likely to be subject to the personal biases of supervisors who typically used subjective evaluation to assess performing tasks of team members. Although the study aims to identify the role ambiguity and job satisfaction for team members in NPD, the data may reflect managers' perceptions of an NPD team's role conflict, role ambiguity and job satisfaction, rather than perceptions of NPD teams themselves, which raises some concerns about the accuracy of the information.

Kim, Egan, and Moon (2014) empirically tested the relationship between managerial coaching behaviour and job performance through role clarity in two public organisations in different countries, by using the structural equation model (SEM). This comparative study collected the data from two samples of 534 and 270 public employees in the United States and South Korean respectively, using a questionnaire survey. The result revealed that role clarity has significant effects on both job satisfaction and performance. However, in regards to the beneficial results provided by this study, it is only limited to public administration and personnel management in public organisations in both countries. Therefore, these points should be taken into account for interpreting and generalising.

- **Consequences of Role Clarity on Performance**

Hartenian et al. (1994) have investigated the effect of role clarity on job performance using path analysis and a questionnaire survey to collect the data from 253 graduates who had already accepted an offer for full-time work after their graduation and another survey on 155 of the same graduates after eight months. The results indicated that high levels of role clarity have increased job performance.

Abramis (1994) has carried out a formal meta-analytic method to examine the effect of role ambiguity on performance. He conducted his meta-analyses based on 39 studies and indicated that the results pointed out that role ambiguity has a significant and negative relationship with performance, but was weak. He also illustrated that there is variance in correlations of role ambiguity with its outcome variables across studies, but it may be due to the variety of variables which are adopted by these studies.

Tubre and Collins (2000) have conducted a meta-analysis of the relationship between role ambiguity and job performance. Out of 128 studies, a total of 74 independent correlations with a total sample size of 11,698 have addressed this relationship and revealed that there was a negative effect of role ambiguity on job performance, with moderating influences due to job type and rating source. The study was only concerned to investigate the direct relationship between role ambiguity and performance, as well as the latter and role conflict. However, it neglected sources of role ambiguity/clarity which are antecedent and the other important relationships, such as interacting and intervening relationships. Whitaker, Dahling, and Levy (2007) have examined the

mediating effect of role clarity on the relationship between feedback seeking from the supervisor and job performance, based on a questionnaire survey of 170 undergraduate students from a large Midwestern university, working at least 20 hours per week and their supervisors. Using structural equation modelling, the study pointed out that role clarity fully mediated the relationship between feedback and job performance. Although the results of this study have helped to answer several recent calls in the feedback-seeking literature, it is restricted because of using a student sample, which limits generalizability. Moreover, the scope of the antecedents related to this study is only limited to feedback-seeking behaviour. However, it ignored other feedback which was provided by other systems within the organisation and also did not address other variables that could mediate this relationship.

The study of Miao and Evans (2007) has examined the mediating of role perceptions (role conflict and role ambiguity) on the cognitive and affective dimensions of intrinsic and extrinsic motivation and behavioural and outcome performance. More specifically, it addressed the relationship between role ambiguity and job performance, using a questionnaire survey to collect data from175 salespeople representing 97 companies and obtained from a leading commercial list broker of 600 sales managers in a major Midwestern state. The result revealed that role ambiguity has a direct negative effect on behavioural performance. In addition, the study indicated that role ambiguity is unavoidable in the boundary-spanning selling environment. To the extent that this role stressor may negatively affect a salesperson's well-being and job performance, sales managers have been advised to use managerial tools, such as empowerment, to enhance a salesperson's role clarity and performance. However, the study concluded that role perceptions (role clarity/ambiguity) were found to be important and strong antecedents for performance, but it suggested using the empowerment variable to increase role clarity of individuals in future studies. Moreover, its sampling is restricted to salespeople in one Midwestern state, which may potentially affect the generalisability of its results.

Gilboa, Shirom, Fried, and Cooper (2008) have conducted a more comprehensive meta-analysis, by including seven stressor variables to examine the relationship between these variables and job performance, which covered all sources of performance ratings: self-rated performance, supervisor-rated performance, objective performance measures (e.g.

sales volume) and general ratings of job performance, as well as the moderating effect between the stressor variables and job performance. The study quantitatively integrated 169 samples (N = 35,265 employees), involving published and unpublished studies that have been used to investigate the relationships. The study revealed that role ambiguity was most strongly negatively related to performance, relative to the other work-related stressors. However, the publication year of a study has moderated the relationship between role ambiguity and performance, but the correlations obtained for published versus unpublished studies were not significantly different. Moreover, the result indicated that studies which used the Rizzo et al. (1970) scale of role ambiguity decreased the magnitude of the correlations of these stressors with performance, relative to other scales. It is recognized that the study is limited to address role stressors, which are part of the category of work demands and it avoided to study the effect of other antecedent variables such as systems, which are part of a broader category of work-related social-psychological roles. The study has focused only on the direct relationships and a few of the interactive relationships, but did not expose variables that act in an intervening role in these relationships, despite their importance.

The study of Kalbers and Cenker (2008) has assumed that there was a negative relationship between role ambiguity and job performance. To examine this relationship, the authors surveyed 334 regional and national auditors from partners at five regional and five national accounting firms, located in and around a large Midwestern city in the USA. Using a questionnaire survey and the structural equation model, the result showed that role ambiguity has a significant negative relationship with job performance. However, it should be considered when interpreting the results that the sample of this study may not be representative of all auditors in public accounting.

In an attempt to identify the relationship between role clarity and employees' performance, a sample of 287 employees at an Indian scientific organisation were selected to collect data from, by Punia (2011), who used a questionnaire survey to measure role clarity, but performance scores were obtained from the records (which records ?). Using the Pearson correlation and regression analysis, the study shows that role clarity was positively associated with performance. Despite the fact that the study is conducted on only a single scientific organisation, it targeted only specific categories of employees in this organisation. This may affect the generalizability of its results.

Similarly, the study of Beris, Sethela, and Mahmood (2011) aimed to investigate the effect of role ambiguity on the job performance of employees. Using 300 questionnaires obtained from employees who are currently working in the service sector SMEs in Malaysia, the result indicated that there was a significant relationship between role ambiguity and the job performance of employees.

Kim et al. (2014) empirically tested the effect of managerial coaching behaviour on job performance through role clarity by using the structural equation model (SEM) technique in two public organisations in different countries. The study collected the data from two samples of 534 and 270 public employees in the United States and South Korean respectively, using a questionnaire survey. The result illustrated that the effect of role clarity was positively significant on job performance. However, the knowledge added by this study is only restricted to public organisations in both countries. Thus, one should be cautious when the results are interpreted and generalised.

- **Consequences of Role Clarity on Psychological Empowerment**

This section concerns the previous literature review of empirical studies that addressed the effects of role clarity on psychological empowerment. In this regard, several researchers (e.g. Spreitzer, 1996; Hall, 2008; De Villiers & Stander, 2011; Mendes & Stander, 2011) have found a positive effect, between these variables.

For example, Spreitzer (1996) described the expected relationships between social structural characteristics at the level of the work unit, by examining the effect of role ambiguity related to middle managers on their feelings of empowerment. The expected relationship of role ambiguity and empowerment was tested by using a questionnaire survey to collect data on a sample of middle managers from diverse units of a Fortune 50 organisation. By applying a multiple regression test, the result showed that role ambiguity has a very strong effect on empowerment.

The study of Wallach and Mueller (2006) was to explore whether and to what extent role ambiguity predicts empowerment among paraprofessionals. A questionnaire survey was used to collect data from 160 paraprofessionals from private human service organisations that provide the "Healthy Start" Programs (111 from a state-wide child abuse prevention program and 49 from the state social welfare agency). Using a

multiple regression test, the finding mentioned that there was a significant negative relationship between empowerment and work stressors (role ambiguity).

Hall (2008) examined the relationship between the dimensions of role clarity (goal clarity and process clarity) and the dimensions of psychological empowerment (meaning, competence, self-determination, and impact). Collecting data by a questionnaire survey of 83 SBU managers at Australian manufacturing companies and using partial least square (PLS), the study pointed out that the relationship between role clarity and psychological empowerment is partially supported which showed that goal clarity was positively related to meaning, impact and competence, while process clarity positively influenced competence, impact and self-determination.

The study of Mendes and Stander (2011) aimed to investigate the impact of role clarity on psychological empowerment, using a questionnaire survey of 179 employees holding various positions, such as managers, specialists, supervisors and administrative staff in South Africa. Using structural equation modelling, the study found that role clarity is positively related to competence, impact and self-determination, with a practically significant, medium effect, whereas it is correlated to meaning with a practically significant, large effect.

De Villiers and Stander (2011) investigated the relationship between role clarity and psychological empowerment in a sample of 278 regional managers, branch managers and sales consultants of a financial institution in the Gauteng region of South Africa. A theoretical model was tested through using structural equation modelling and a path model was tested with SPSS to identify the relationships between the variables. The study found that role clarity, which was an antecedent to psychological empowerment, has a positive effect on it.

- **Consequences of Psychological Empowerment on Job Satisfaction**

The potential relationship between psychological empowerment and job satisfaction has been investigated in the literature by many researchers (Seibert et al., 2011). Apart from those of Laschinger, Finegan, Shamian, and Wilk (2004), most results have indicated that psychological empowerment is positively and significantly correlated with job satisfaction. Accordingly, Laschinger et al. (2004) used a longitudinal study to test a

model linking changes in structural and psychological empowerment to changes in job satisfaction. The study used structural equation modelling on a questionnaire survey of 185 staff nurses who worked in acute-care teaching hospitals in the province of Ontario, Canada. However, the results pointed out that there were direct effects of changing perceived structural empowerment on changing psychological empowerment and job satisfaction, but psychological empowerment did not play a mediating role in the relationship between structural empowerment and job satisfaction due to no association being found between psychological empowerment and job satisfaction. It should be noted that this result is at odds with the findings made by several researchers (e.g Laschinger, Finegan, Shamian, & Wilk, 2001; Seibert et al., 2011).

However, to justify these results, the study argued that longitudinal research would provide a more compelling proof that psychological empowerment leads to job satisfaction, but ignored the other possible reasons which may for example include the existence of collinearity between the dimensions of psychological empowerment, which are often attenuated to the degree of correlation between the mediators (the dimensions of psychological empowerment) and outcome (job satisfaction). This common phenomenon could compromise the significance of particular specific, indirect effects. Moreover, Preacher and Hayes (2008) have argued that "collinearity is not necessarily a problem, but it may lead the investigator to conclude that a variable" (here role clarity) "does not serve as a mediator when in fact it does, or even to conclude that M variable serves as a mediator when it does not"(Preacher & Hayes, 2008, p. 887). It is possible, in any multiple model which has more than one mediator, to find that one variable acts as a mediator, whereas another mediator acts as a suppressor (see MacKinnon, Krull, & Lockwood, 2000), leading to the cancelling out of the indirect effects of both mediators.

Furthermore, the sample size (185) of the study is smaller than recommended for the use of structural equation modelling. However, McQuitty (2004) suggested that it is important to determine the minimum sample size required in order to achieve a desired level of statistical power with a given model, prior to data collection. Several authors (e.g. Hoelter, 1983; Garver & Mentzer, 1999) recommended that a critical sample size is 200. In other words, it is understood that any number above 200 provides sufficient statistical power for data analysis. Seibert, Silver, and Randolph (2004) proposed a work-unit-level construct to examine the influence of the empowerment climate on job

satisfaction through psychological empowerment, based on a questionnaire survey of 301 employees in one division of a Fortune 100 manufacturer of high-technology office and printing equipment and located in the north eastern United States, using hierarchical linear modelling. The study found that the empowerment climate indirectly affected the job satisfaction through psychological empowerment as a mediator.

The relationship between psychological empowerment and job satisfaction was examined by Hechanova, Regina, Alampay, and Franco (2006) in five different service sectors: hotels, food service, banking, call centres and airlines. The study surveyed 954 employees and their supervisors, by using the analysis of covariance (ANOVA) and Pearson correlations to investigate these relationships. The results showed that psychological empowerment has a positive association with job satisfaction. This study has only focussed on the effect of a psychological perspective of employees and its outcomes and has not clarified how to enhance psychological empowerment. However, additional questions come to mind, such as how could organisations empower their employees. There are several ways they could enhance individuals' empowerment, such as providing information to them by an effective system and setting clear goals and objectives. These ways are antecedents to empowerment, which were neglected to be investigated by the study.

In contrast, Meyerson and Kline (2008) tried to clarify whether psychological empowerment as a construct predicts job satisfaction, by using the structure question model and an online questionnaire survey to collect data from a sample of 197 undergraduate university students. However, the results pointed out that the relationship between psychological empowerment and job satisfaction was insignificant. A possible reason for this result is that students may dislike the type of work which they did, regardless of perceptions of capability, resulting in low job satisfaction. The majority of these university students held part-time jobs and may likely have low-skilled, service jobs, as opposed to fulltime employees who may have skilled jobs. Therefore, the students may not have joined their current organisations due to the fact that they liked the job, but simply owing to financial reasons.

Dickson and Lorenz (2009) tried to explore several associations between psychological empowerment and job satisfaction for temporary and part-time nonstandard workers. They collected data from 397 undergraduate students at a regional Midwestern

University, employed in short-term jobs outside their field of study, by using a questionnaire survey. Using OLS regression, the study revealed that two cognitions of psychological empowerment (meaning and impact) have positive effects on job satisfaction.

Similarly, Casey, Saunders, and O'hara (2010) have tried to specify and test the relationships between structural, psychological and critical social empowerment and job satisfaction. In particular, the study has addressed the effect of critical social empowerment on psychological empowerment and job satisfaction by collecting data using a questionnaire survey from a sample of 244 nurses and midwives in Ireland. To test the study hypotheses, regression analysis and the Spearman Rank correlation analysis were used. The findings illustrated that whilst the effects of both structural and critical social empowerment were significantly positive on psychological empowerment and job satisfaction, the critical social empowerment has a stronger effect. Despite the additional knowledge provided by the study, its model was very rudimentary and was based on testing and analysing a simple direct relationship, compared to the complexity of the surrounding environment that assumes overlapping events and relationships.

The study of Gregory, Albritton, and Osmonbekov (2010) has addressed, besides the mediating effect of psychological empowerment on the relationship between person–organisation fit and job satisfaction, the direct relationship between psychological empowerment and job satisfaction, by using an online survey for gathering data from 87 full-time university faculty and staff, with supervisor-rated performance feedback. The result showed that there was a positive relationship between psychological empowerment and job satisfaction. The findings are limited to the academic setting and cannot be generalised to other types of sectors.

Bitmiş and Ergeneli (2011) have investigated the direct and indirect relationships between four dimensions of psychological empowerment and job satisfaction, using a questionnaire survey from 490 investment consultants, who work for non-bank financial intermediaries in Turkey. The results revealed that all dimensions of psychological empowerment have a significant direct relationship with job satisfaction.

Dewettinck and van Ameijde (2011) tried to explore the relationship between leadership empowerment behaviour, employee psychological empowerment and job satisfaction on

a sample of 380 frontline service employees in four Belgian service companies, using a questionnaire survey and structural equation modelling to test these relationships. The paper found a direct, significant and positive relationship between psychological empowerment and job satisfaction. The study findings could not be generalized for any sector, even the service sector, due to the fact that the data was obtained from frontline service employees from four Belgian service companies and therefore more research should be conducted on other employee samples, as well as other business contexts, to check the generalizability of the findings. Increasing employees' feeling of empowerment by their organisations reflects in their being more satisfied with their jobs, but the study neglected role clarity, which is an important antecedent of employee satisfaction to include within the model (Spreitzer, 1995b).

Najafi, Noruzy, Azar, Nazari-Shirkouhi, and Dalvand (2011) aimed to determine the relationship between psychological empowerment and job satisfaction by collecting data from a sample of 378 universities' educational experts, using a questionnaire survey and path analysis model. The result found that psychological empowerment directly and positively influences job satisfaction. Apart from the self-reported nature of the data, the results are limited to the sampling of the study, which might not generalise to other organisations' personnel.

A review was done by Seibert et al. (2011), who addressed 142 studies representing 151 independent samples, including 79 published studies and 63 unpublished dissertations and working papers that had examined the relationships between psychological empowerment and its antecedents and consequences. Job satisfaction was one of PE's consequences, which has been investigated by this review and found that 43 studies with a total sample size of 15,637 examined the relationship between psychological empowerment and job satisfaction. The result revealed that psychological empowerment was strongly related to job satisfaction. Boundary conditions about the effectiveness of psychological empowerment were also examined by this meta-analysis research, which uncovered that the effects of psychological empowerment on job satisfaction tend to be strongest in the service sector. However, the study did not investigate the effectiveness of empowerment interventions in its research framework and has not provided a clear set of variables that practitioners might focus upon if they wish to increase psychological empowerment in their organisation.

- **Consequences of Psychological Empowerment on Performance**

The study of Seibert et al. (2004) has examined the effects of providing information to individuals within organisations (empowerment climate) on individual performance, through the mediating effect of psychological empowerment. The study was based on individual-level data which was collected by a questionnaire survey from 301 employees in one division of a Fortune 100 manufacturer of high-technology office and printing equipment, located in the north eastern United States. Hierarchical linear modelling was used to analyse a cross-level mediation and which showed that the effects of the empowerment climate indirectly affected the individual performance, through psychological empowerment as a mediator. However, the study so far has a serious weakness, which makes it impossible to entirely rule out a risk. Even though the study follows an approach that is not recommended any more to test the mediating relationships, the condition of a mediating effect between the empowerment climate and the individual performance has not been achieved, leading it to turn to another method and state that this precondition is not required and consider that there was a mediating effect between the empowerment climate and the individual performance. Perhaps the most serious disadvantage of this approach which is followed by this study, is that its investigation is based on testing the individual path between variables, to accomplish the mediating relationships and neglects the most important thing, which is testing the indirect effect.

The effect of psychological empowerment on performance has been examined by Hechanova et al. (2006) in five different service sectors: hotels, food service, banking, call centres and airlines by surveying 954 employees and their supervisors, using the analysis of covariance (ANOVA) and Pearson correlations. The results presented a significantly positive relationship between psychological empowerment and performance (Hechanova et al., 2006). Meyerson and Kline (2008) tried to investigate the relationship between psychological empowerment and performance. The study has utilised a structural equation model and an online questionnaire survey for collecting data from 197 undergraduate university students. The findings illustrated that there was a significantly positive relationship between psychological empowerment and performance.

The study of Gregory et al. (2010) has examined, in addition to the effect of person–organisation fit on managerial performance through the mediating effect of psychological empowerment, the direct relationship between psychological empowerment and managerial performance, by using an online questionnaire survey for collecting data from 87 university full-time faculty and staff, with supervisor-rated performance feedback. The study finds that there was a positive relationship between psychological empowerment and managerial performance. The findings are restricted to an academic setting and cannot generalise to other types of sectors.

Tutar, Altinoz, and Cakiroglu (2011) study purposed to investigate the effects of perceived employee empowerment on achievement motivation and employees' performance. The data was gathered from 213 employees of public and private banks operating in Ankara and analysed by applying a structural equation model technique and using a questionnaire survey. The analysis of the research data has revealed that the perceived employee empowerment had a positive influence on the achievement motivation and performance of employees. It has also indicated that employee empowerment is an important predictor variable to achievement in employees' performance. The study covered only employees of public and private banks operating in Ankara and this is a constraint in its generalisability. Moreover, the study did not address the antecedents of employee empowerment and their performance, in order to strengthen the theoretical and empirical findings.

Seibert et al. (2011) who reviewed 142 studies representing 151 independent samples, including 79 published studies and 63 unpublished dissertations and working papers, have addressed the relationships between psychological empowerment and its antecedents and consequences. Performance was one of PE's consequences which have been reviewed by this research and which found that 34 studies with a total sample size of 8,774 examined the relationship between psychological empowerment and performance. The result also provided evidence that psychological empowerment has relatively strong effects on task performance. The effectiveness of psychological empowerment was also examined by this meta-analysis research, which found that the effects of psychological empowerment on performance tend to be stronger in Asia than in North America. However, the study did not address the intervening relationships of psychological empowerment in its research framework and has not clarified variables

that practitioners might concentrate on if they wish to increase psychological empowerment in their organisation.

Chiang and Hsieh (2012) have conducted a study to assess how hotel employees perceive PE's impact on their job performance. The study used a questionnaire survey to collect data from a total of 513 employees of Taiwan hotels. Structural equation modelling was utilised to analyse the data and found that psychological empowerment positively influenced job performance. The findings of this research only apply to Taiwan hotel employees and cannot be extended to other employees from other service industries in Taiwan.

- **Consequences of Job Satisfaction on Performance**

This part deals with the prior literature review of empirical studies related to the relationship of job satisfaction and performance, to test the propositions pertaining to its correlation. In this regard, several researchers (e.g. Herzberg, 1959; Vroom, 1964; Herzberg, 1966; Iaffaldano & Muchinsky, 1985; Organ, 1988) have been attracted to examine and develop a theoretical basis for this relationship for decades. Given the importance of the topic for many organisations, many scholars have also recently been stimulated to research it.

Therefore, amongst much research, Judge, Thoresen, Bono, and Patton (2001) have provided a meta-analysis study examining the relationship between job satisfaction and performance, which includes a qualitative and quantitative review. Their qualitative review concluded that there are seven models that represent the relationship between job satisfaction and performance and which have been addressed by different scholars in previous literature review as follows: (1) job satisfaction causes job performance, (2) job performance causes job satisfaction, (3) job satisfaction and job performance are reciprocally related, (4) the relationship between job satisfaction and job performance is spurious, (5) the relationship between job satisfaction and job performance is moderated by other variables, (6) there is no relationship between job satisfaction and job performance and (7) an alternative conceptualization of job satisfaction and/or job performance. Although some models have obtained more support more than others, there is still a gap in the literature owing to the nature of the studies which have provided inconsistent results and failed to consolidate the components reviewed in the

literature together. Subsequently, researchers have taken a further step by re-examining the proposed models through a two meta-analysis procedures for examining the job satisfaction - job performance relationship, but unfortunately, the results were disappointing due to the limited scope in the prior findings, which hampered them in continuing to achieve their objectives. Therefore, a new meta-analysis was carried out concentrating on the general population of employees, with various professions that were included in many of the original studies and that was concerned with measuring the satisfaction-performance correlation at the individual level and in a natural job setting.

Using a total number of 312 independent samples related to 254 studies, which comprised a total sample size of 54,417, the result pointed out that a mean correlation between the overall job satisfaction and job performance is 0.3, indicating that there was a positively moderate magnitude of correlation between job satisfaction and job performance (Judge et al., 2001). Jones (2006) has also addressed the relationship between job satisfaction and performance, but he has operationalized the latter in terms of task and in-role performance. Using a questionnaire to solicit from a sample of 87 individuals from upper-division undergraduate evening management courses and evening MBA courses at a large Southern California university, the study tried to investigate whether job satisfaction or life satisfaction is a better predictor for job performance. Furthermore, the study showed that adding the life satisfaction factor provided a strong predictor to the combined performance (in-role/task performance), which indicates a higher correlation and more than the correlation between job satisfaction and the combined measure of performance.

Chong et al. (2006) investigated the relationship between job satisfaction and job performance of subordinates in a sample of 74 senior-level managers in the Australian financial services sector, by using a questionnaire survey which was analysed through applying a path analytic technique. The study found that job satisfaction has a significant positive effect on subordinates' job performance. Similarly, Edwards, Bell, Arthur, and Decuir (2008) have examined the relationship between the overall satisfaction, as well as facets of job satisfaction and task and contextual performance. Using a survey tool among a sample of 444 employees in a manufacturing plant located in south-eastern Texas in the United States, the study has assessed the relationship

between both variables based on the questionnaire of the Job Descriptive Index (JDI: Smith, Kendall, & Hulin, 1969) to measure the facets of job satisfaction in terms of pay, promotion, nature of work, supervisor and co-workers. Regarding the performance measures, task performance was measured by adapting the performance appraisal scale developed by Tubré, Arthur, and Bennett (2006), whereas the scale which is developed by Motowidlo and Van Scotter (1994) was used to measure contextual performance.

Despite the fact that the study found that the relationship between overall job satisfaction and task and contextual performance is the same, different results have appeared when the facets of job satisfaction were presented. On one hand, the relationship between satisfaction with supervisor and contextual performance is stronger than with task performance. On the other hand, the relationship between the nature of the work and task performance is stronger than with the contextual performance. In this vein, the findings of the study mention that in order to assess the relationship between job satisfaction and job performance, it is critical to operationalize both concepts for understanding the nature of the relationship accurately. Therefore, the research study takes into account all the facets of job satisfaction and managerial performance when measuring both variables.

Li (2008) study aimed to reveal the relationship between job satisfaction related to individual-level factors and the performance of government employees in China. Many outcomes have been derived from the public service motivation for an organisation to be effective, such as satisfaction and performance, which were investigated by conducting a questionnaire survey that was distributed among 251 MBA students, who were working in Chinese governmental agencies at all levels during their class time and were selected from a variety of universities in 12 provinces of China. Using correlational and multiple regression analyses, the study revealed that there was a significantly positive relationship between job satisfaction and individual performance and the former is a good predictor for the latter.

In addition, Springer (2011) has examined the effects of job motivation and job satisfaction on performance, using a multiple regression technique to analyse the different relationships among the variables. The data collected was based on a questionnaire survey which was randomly distributed to a selected convenience sample of a size equal to 1500 employees working in different banks in the United States.

Based on the Pearson technique, the results have showed that the correlation between job satisfaction and job performance was significantly positive. Moreover, the study has asserted that job satisfaction was a good variable to predict job performance.

An empirical study was conducted by Rehman and Waheed (2011) to examine the influence of job satisfaction on job performance in a public sector organisation in Pakistan. This descriptive-correlation based study used a survey method to collect the data from 568 employees selected to test the relationship between job satisfaction and job performance. The results of this study showed a positive correlation between job satisfaction and job performance. It has emphasized that a strong correlation between job satisfaction and job performance was found and exceeded the findings of the prior studies, which is an indicator that there is a positive and strong effect on employees' satisfaction in relation to job performance as a concluding result from this study.

Based on affective events theory, the study of Carlson, Kacmar, Zivnuska, Ferguson, and Whitten (2011) hypothesized a four-step model of the mediating mechanisms of positive job satisfaction in the relationship between work-family enrichment and job performance. The study examined this model based on two samples using a structural equation model; the samples included 240 full-time employees, were replicated in Study 2, which comprised 189 matched subordinate-supervisor dyads. The results of both samples support the conceptual model and indicate mediation of the enrichment-performance relationship for the work-to-family direction of enrichment. Moreover, the hypothesized assumption which was that job satisfaction has a significant positive effect on job performance was supported.

Kuzey (2012) conducted a study to explore key factors that contribute to job satisfaction among health care workers and to identify the influences of these underlying dimensions of employee satisfaction on organisational performance. The data was collected by a questionnaire survey from a sample of 249 health care workers located in Istanbul, Turkey. Based on correlation analysis, the study found a significant positive correlation between job satisfaction and organisational performance. By applying the Support Vector Machine technique, it indicated that the effect of job satisfaction was significantly positive on organisational performance and considered that job satisfaction factors and their impact on organisational performance are very important in the health care system.

Ikyanyon and Ucho (2013) have investigated the individual and interactive effect of workplace bullying and job satisfaction on job performance among 192 voluntary employees of a federal hospital in Nigeria. Using a questionnaire survey, the study pointed out that there was a significant positive relationship between job satisfaction and job performance. Furthermore, it found that employees who experienced a high level of job satisfaction performed higher than those who experienced low levels of job satisfaction.

3.2.3.2 Moderating Relationship Model

The study of Rebele and Michaels (1990) tried to develop a causal model to investigate antecedents to and outcome of, role stress (role ambiguity), experienced by independent auditors. They surveyed 155 individuals who have at least one year's experience in auditing within four USA Midwestern offices of large international accounting firms. The results generally support environmental uncertainty as antecedent to role ambiguity, whereas job satisfaction, performance and job-related tension were consequences of it. The relationship between role ambiguity and outcome was moderated by the need for achievement and organisational level.

Fisher (2001) extended previous research on the influences of role stress on outcome variables by investigating the moderating effect of the "Type A" behaviour pattern. The data was collected by questionnaire survey on 169 auditors in two of the big public firms in New Zealand and his results confirmed that role ambiguity was significantly negatively associated with job performance and job satisfaction. However, there was no moderating effect of the Type A behaviour pattern on the relationship between role stress and job performance, as well as job satisfaction.

3.2.4 Comparison

The role theory perspective was the dominant approach used by the empirical studies above to investigate the relationships between variables and followed by the contingency approach. Moreover, applying an interactive and moderating relationship model is the prevailing trait in most previous studies reviewed. The majority of the prior studies concentrated on either budgetary participation, or RPMA, to examine their consequence variables. Most studies used a questionnaire survey to collect data.

Additionally, the findings from previous studies related to direct relationship model studies were inconsistent. For instance, some studies (e.g. Cherrington & Cherrington, 1973; Brownell & McInnes, 1986; Chong & Chong, 2002) have found positive relationship between budgetary participation and outcomes (job satisfaction and performance), whereas other studies (Milani, 1975; Kenis, 1979) uncover insignificant relationships. These mixed results led scholars to use the moderation or interaction models to explain the inconsistencies in the previous results.

Although many studies have used uncertainty as a moderating or interacting variable, but it is defined in various forms in these studies. For example, (Hirst, 1981, 1983) and Imoisili (1989) defined it as the completeness of subordinates' knowledge. Govindarajan (1984) and Merchant (1990) conceptualized it as: the unpredictable effects on outcomes of customers, suppliers of material related to labour and capital, competitors for both markets and resources and regulatory groups, whereas Brownell (1985) defined uncertainty as two separate dimensions in the environment (the degree of complexity and dynamism). These studies also applied different models, for instance, Hirst (1981) used a two-way interaction model, while Hirst (1983) has used a three-way interaction model. Due to adopting diverse conceptualizations, for example the uncertainty variable, which led to measuring it differently and applying varied models, these may cause inconsistent results. For instance, Hirst (1983) findings did not support three-way interaction and neither could the study confirm the earlier research finding of Brownell (1981), which was two-way interaction. Govindarajan (1984) showed that uncertainty was unable to evaluate managerial performance because managers have less control over outcomes, whereas the results of Merchant (1990) are consistent with earlier empirical evidence which pointed out that the moderating influences of environmental uncertainty, superior consideration and business strategy showed weak or insignificant results. However Imoisili (1989) failed to clarify the inconsistent results between the previous studies of Hopwood and Otley and concluded that using the contingency approach may not provide adequate explanation for the differences.

Moreover, theories of budgetary participation based on economic, psychological or sociological theories assumed either uncertainty (environmental, task, or task interdependence), or information asymmetry as an antecedent variable for budgetary participation to predict them. In contrast, some studies (e.g. Govindarajan, 1984;

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Brownell & Hirst, 1986; Brownell & McInnes, 1986; Imoisili, 1989) include environmental or task uncertainty, or information asymmetry, as either independent or moderator variables. Such treatment, however, is inconsistent with theory. Furthermore, due to the fact that uncertainty and information asymmetry theoretically are causal antecedents to budgetary participation (i.e. they are correlated with it), to treat them as moderator variables is contradictory to theory, as Govindarajan (1986) did, because with moderator variables, by definition, there are no correlations between these moderators and independent variables. It is not consistent to treat uncertainty and information asymmetry as independent variables, whilst budgetary participation is also an independent variable, as did Dunk (1993a), because they cause it. As previously discussed, it also is inconsistent with theory treating budgetary participation as a moderator variable and uncertainty as an independent variable, as did Brownell and Dunk (1991) and Brownell and Hirst (1986), owing to the fact that uncertainty causes budgetary participation, whilst independent and moderator variables are not supposed to be correlated.

Scholars have tried resolving inconsistent evidence in the relationship between reliance on accounting performance measures and performance by using budgetary participation as a moderator variable. For example, the results of Brownell (1982a) indicated that whether both participation and reliance on accounting performance measures are high, or low, there was a positive relationship with performance, but inconsistent for job satisfaction, while Dunk's (1989) showed a negative relationship with performance. Furthermore, Brownell (1983) mentioned that there was a positive association on both performance and job satisfaction only when budgetary participation was high, whereas Aranya (1990) pointed out that high participation and high reliance on accounting performance measures lowered performance and satisfaction, rather than increasing them.

In the literature on contingency perspectives, there was some confusion about whether its hypotheses reflect differences in `strength' or in `form' (see, e.g. Arnold, 1982, 1984; Stone & Hollenbeck, 1984). *"The common understanding seems to be that contingency hypotheses are of the form type and it is even debated that differences in strength are commonly meaningless"* (Schmidt, 1978, p. 216; Arnold, 1982, pp. 153-154). Thus, there was a problem which existed with respect to the relationships hypothesized and

tested in many budgetary studies. For example, there are five papers used in this review that have either no hypothesis explicitly stated (Brownell & Hirst, 1986; Brownell & Dunk, 1991), or where it is stated in a null form predicting that there is `no interaction' between the measured variables (Brownell, 1982a, 1985; Dunk, 1989).

This leads to raising the question about the meaning of the word `interaction 'in these studies, especially whether the term of interaction is related to strength of the relationship, or to the form of the relationship. Due to the fact that these types of fit are not equivalent for both the theoretical interpretation and the statistical test, null hypotheses are not adequate to describe particular contingency formulations and statistical tests to be used. Clearly, when a writer states that there is an `interaction', this means that the hypothesis has the same shortcomings as described above with the null hypothesis.

Although the dominant model in contingency research is the interacting form, authors' budgetary research has examined hypotheses that seem to express strength interactions. If there is a theory to support these relationships, one of the appropriate statistical analyses is to calculate the z-scores of the correlation coefficients. This analysis is important in using absolute values of the correlation coefficients to find out the difference(s) in predictive power between subgroups. The sign of the value does not contain information about the predictive power. For instance, Merchant (1990) and Govindarajan (1984) test the differences in correlation coefficients, but they do not calculate them, nor particularly mention the `absolute' z-score.

Previous examples showed that there was a weak link between the verbal and statistical format of hypotheses which has been discussed before by Schoonhoven (1981). She has addressed studies in the organisational literature and criticized them because of their lack of clarity when they stated their contingency hypotheses, which influence the obviousness of the statistical test to be used. For example, Govindarajan's (1984) analysis has a problem, which is the substantive content of his contingency hypothesis is incompatible with his theoretical arguments. The hypothesis predicts that the strength of the relationship between environmental uncertainty and evaluation style is affected by organisational effectiveness. The format of statistical analysis is consistent with his hypothesis, because it compares the correlation coefficients related to two sub-groups, but his later interpretations regarding these findings are not. Govindarajan (1984, p.

133) concludes that the relationship between evaluation style and organisational effectiveness is significantly moderated by environmental uncertainty. Thus, his interpretation is unfamiliar, because the correlation analysis of subgroups relies on high and low "effectiveness" subgroups. This shows that the "effectiveness" is the moderator, instead of environmental uncertainty as the theoretically relevant moderator. This also refers to the absence of a match between the theoretical arguments, the formulation of a hypothesis and the interpretation of the statistical analysis of the hypothesis. The conclusion of Govindarajan (1984) related to his moderating effect of environmental uncertainty is obviously unfounded.

In Hirst (1983) study, he tried to find an interaction effect of the form-type based on sub-group regression-analysis. He used standardized regression coefficients in simple linear regression, which equals correlation coefficients. Indeed, the subgroup analysis is a statistical format of subgroup correlation-analysis which is used to test strength and not form. Therefore, the findings of Hirst (1983) based on this latter statistical test seem unfounded.

In some studies (e.g. Brownell, 1982a, 1985; Mia, 1989), the interpretations of the main effects in two-way interactions were invalid. For instance, Brownell (1982a) examined the budget emphasis as moderator on association between budgetary participation and performance. His interpretation of the interaction and both main effects were based on an equation of moderated regression analysis and measured the budgetary participation variable as a "deviation score" from the overall mean (i.e. centred). According to a linear transformation, a score of regression coefficient related to one independent variable directs the coefficient of the other independent variable to be changed. This means that there were changes in the main effect of Budget Emphasis in terms of its coefficient. As a result, the influence of budget emphasis on performance at the average level of budgetary participation was clarified by this coefficient. This interpretation differs from Brownell (1982a, pp. 20-21), who incorrectly interprets the regression coefficient as unconditional on budgetary participation. Moreover, the centring of the variable of budget emphasis was not around its mean, which prevents the possibility of interpreting the coefficient of budgetary participation. Therefore, the conclusion of Brownell related to budgetary participation is unfounded.

Similarly, there are other studies (e.g. Brownell & Hirst, 1986; Imoisili, 1989) that have problems using higher-order interactions. The problem is linked to the interacting relationship model, which is a clear difference between the formulated hypothesis and the statistical test used to investigate it. This makes the conclusions by the scholars debatable. Imoisili (1989, p. 327) hypothesizes that the relationship described by the equation includes a redundant two-way interaction terms $X2 \times X3$, and a redundant three-way interaction terms ($X1 \times X2 \times X3$), which led to incorrectly testing. An answer to the hypothesis was not provided by analysing this equation, due to the fact that Imoisili used an equation whose function omitted to include the interaction effect term ($X2 \times X3$).

This type of relationship model did not resolve contradictory results, which have pushed writers to switch to the mediating or intervening relationship model. Some of the model studies used role stress (Collins et al., 1987), but other studies used role ambiguity, or role clarity, as intervening variables (Chenhall & Brownell, 1988). Collins et al. (1987) have addressed the relationship between the game patterns and attitudes of subordinate managers towards achieving their budgets and found that a manager with a positive budgetary attitude had low role stress, whilst Chenhall and Brownell (1988) were interested in the effects of participative budgeting on job satisfaction and performance, by depicting role ambiguity as intervening. The study considered that role ambiguity is an important link in the relationship between budget participation and both job satisfaction and performance. It clarified that participation was significantly related to job satisfaction, but not to performance.

3.2.5 Limitations of Previous Studies

Several limitations have been identified from the above review of empirical studies as follows:

• Most of the studies on budgetary participation, or RPMA, were conducted in developed countries, mainly in the USA, UK and Australia; whereas there were limited studies in developing countries, such as Turkey and Malaysia.

- Most of the studies concentrated on accounting-based information in studying PMS, except studies by Hopwood (1972) and Otley (1978) which utilised a non-accounting style in addressing PMS.

- Most of the prior studies investigated only a limited number of PMS variables, which are budgetary participation and/or RPMA and their potential effects on outcomes. These previous studies addressed the relationships amongst the variables, either using the direct relationship model or the interacting or moderating relationship model, but little research applied the intervening or mediating relationship model.

- It is difficult to compare many of the above studies which are based on non-random sampling and different characteristics (e.g. Hopwood, 1972; Cherrington & Cherrington, 1973; Milani, 1975; Otley, 1978; Kenis, 1979; Senatra, 1980; Brownell, 1982a, 1983; Govindarajan, 1984; Brownell, 1985; Brownell & Hirst, 1986; Brownell & McInnes, 1986).

- Some studies (e.g. Brownell & Dunk, 1991; Brownell & Hirst, 1986) as mentioned by Hartmanna and Moersb (1999) have unclearly stated their hypotheses, and others (e.g. Brownell, 1982a, 1985; Dunk, 1989) stated them in a null form and even though the studies have explicitly and clearly formulated their hypotheses, they applied inappropriate tests and their interpretations are incorrect.

- As mentioned above, contingency theory has several different approaches which can be used. Many researchers who applied different approaches are not aware of their implications and the difficulties in relating to them (Schoonhoven, 1981; Venkatraman, 1989; Gerdin & Greve, 2004, 2008). For example, the conceptualisations of fit used by different approaches of contingency theory do not appear to be comparable (Drazin & Van de Ven, 1985; Govindarajan, 1988). Thus there is a lack of correspondence between the way in which hypotheses are formulated and examined (Venkatraman, 1989), besides their results which seem to be contradictory or supported may require to be re-explained. In this context Gerdin and Greve (2004, p. 323) point out that:

> *Some researchers claim that their findings are contradictory when this is not necessarily the case, while others incorrectly argue that their results are strongly supported by former studies.*

Additionally, it has been criticised as to how contingency theory has used individual statistical techniques in management accounting research (Hartmann & Moers, 1999; Dunk, 2003; Hartmann & Moers, 2003; Hartmann, 2005; Gerdin, 2005a, 2005b). Gerdin and Greve (2008) have argued that each model of interaction's effects amongst variables that are addressed by management accounting studies requires a specific statistical technique, which implies that some techniques are appropriate to predict general interaction effects, whereas these techniques are not appropriate for specifying a more precise functional interaction form, as for example Hirst (1983) did.

- Few studies adopted the intervening or mediating relationship model, with these studies (e.g. Collins et al., 1987; Chenhall & Brownell, 1988) concentrating only on one independent variable (financial accounting information) and one mediating variable (e.g. role ambiguity), as well as ignoring the effect(s) of other non-financial accounting information and other possible mediating variables, as for example psychological empowerment and individual learning.

- The study using the intervening or mediating relationship model (e.g. Chenhall & Brownell, 1988) was conducted on a single organisation, thus limiting the generalizability of the findings.

- In the Collins et al. (1987) paper, there are either no hypothesis explicitly stated, or they are stated in a null form prediction. For example, they formulated their hypotheses as bearing "no relationship" between the measured variables. According to the causal process of Baron and Kenny (1986), testing a mediating relationship begins, or comes from the basic requirement of there being an existing relationship between the independent and dependent variable. If this hypothesis does not fundamentally assume this relationship, the study cannot continue to test the process causal relationships, due to the absence of the basic requirement. However, in spite of this, Collins et al. managed to prove the intervening relationship as they did not need to formulate hypotheses because this is not reflected in the mediating relationship. They tested the total and other relationships which were found to be statistically significant.

Table 3.1 Participative Budgeting and reliance on accounting performance measures Studies and their Consequent variables

No.	Author(s), year and country	Method(s) of data collection and sample characteristics	Type of the Model	Theoretical framework and variables studied
1	Argyris (1952), USA	Case study four plants/ supervisors and subordinate managers	Direct relationship model	Differentiation economics conditions general leader style, budgetary participation, JRT resentment pressure fear of failure, dysfunctional behaviour, Managerial effectiveness, long-run performance.
2	Hofstede (1968), USA	Questionnaire116,000 employees at IBM Corporation /Interviews/ documents/five firms and six manufacturing plants / supervisors and subordinate managers	Direct relationship model	Role theory Budgetary participation, budget pressure, budget motivation, Job satisfaction Fear of failure job stress dysfunctional behaviour and performance.
3	DeCoster and Fertakis (1968), USA	Interviews/ Questionnaire/31supervisors in companies from the Directory of Washington State Manufacturer. Spearman's Rank Correlation Coefficient	Direct relationship model	Role theory Budget induced pressure, initiating structure and consideration.
4	Hopwood (1972), USA	Interviews/ Questionnaire/193 persons in one manufacturing division of a large Chicago-based company. Mann-Whitney U Test.	Direct relationship model	Role theory The supervisors' style of evaluation, the index of specific cost tension, job related tension
5	Cherrington and Cherrington (1973), USA	The experimental sessions/230 undergraduate students, both male and female, enrolled in an introductory business course. Analyses of Variance	Direct relationship model	Contingency theory Budget participation, performance, satisfaction
6	Milani (1975), USA	Questionnaire/82 foremen Company records were the sources of data concerning an individual foreman's performance A one-tailed t-test. Rank correlation	Direct relationship model	No theory Budget participation, performance, attitude towards job, attitude towards company.
7	Otley (1978), UK	Questionnaire/41 production unit managers of a single, large organisation and the group of staff in the line hierarchy above them were interviewed. Other data obtained from the budgetary and other records of the organisation. Mann-Whitney U-test.	Direct relationship model	Role theory Job-related tension, budget-related tension, trust in superior, ambiguity of job, ambiguity in evaluation, felt fairness of evaluation.

8	Kenis (1979), USA	Questionnaire/169 departmental managers and supervisors of plants located in the New Jersey-Philadelphia area. Stepwise regression.	Direct relationship model	No theory Budgetary participation, budget goal difficulty, budgetary evaluation general, budgetary evaluation-punitive, budgetary feedback, budgetary goal clarity, JS, job involvement, job tension, attitude toward budgets, budgetary performance, cost efficiency and job performance.
9	Senatra (1980), USA	Questionnaire/ 107 senior auditors in eight offices of one Big Eight public accounting firm. Pearson product-moment correlations and multiple regression.	Direct relationship model	Role theory Organisational climate, role conflict, role ambiguity, job-related tension, JS, propensity to leave the organisation.
10	Brownell (1982a), USA	Questionnaire/48 managers drawn from a large San Francisco Bay Area manufacturing company. Multiple regression and Johnson-Neyman technique	Moderating relationship model Budgetary participation	Balance theory and contingency theory Evaluative style, budgetary participation, performance and JS.
11	Brownell (1983), Australia	Questionnaire/48 middle level cost centre managers involved in manufacturing and distribution functions in a large manufacturing company. ANOVA	Moderating relationship model Leadership style and budgetary participation	Contingency theory Leadership style - consideration and initiating structure, budget participation, performance and JS.
12	Govindarajan (1984), USA	Questionnaire/ 58 general managers of business units within multi-business firms in Massachusetts, Connecticut and New York. The Pearson Product-Moment correlation	Moderating model Environmental uncertainty	Performance evaluation style, environmental uncertainty and MP.
13	Brownell (1985) Australia	Questionnaire /61managers drawn from the marketing and *R&D* activities of a large multinational electronics and computer business. ANOVA, chi-square tests and simple regression.	Moderating relationship model Role of accounting information, Budgetary Participation, and functional area	Contingency theory Environment, role of accounting information, budgetary participation, performance.
14	Brownell and Hirst (1986), Australia	Questionnaire/76 line managers representing a wide variety of functions (i.e. marketing, production, research, administration, and distribution) in a large manufacturing company headquartered in Sydney, Australia. Regression and T-test	Moderating relationship model Task uncertainty, budget emphasis and participation	No theory Performance, job-related tension, budgetary participation, task uncertainty.
15	Brownell and McInnes (1986), Australia	Questionnaire/108 middle-level managers from a variety of functional areas in three manufacturing companies. Ordinary least squares.	Mediating relationship model Motivation	Expectancy theory Budgetary participation, motivation, MP.

16	Govindarajan (1986), USA	Questionnaire/ 77 middle-level management positions and 53 of their superiors A multiple regression	Moderating relationship model The variable participation and environmental uncertainty	Contingency theory Performance, performance relative to, budgetary slack, budget usefulness, budget relevance, budget motivation**,** budget attitude, attention, participation, environmental uncertainty.
17	Collins et al. (1987), USA	Questionnaire/ 1,021 planning executives and 318 managers from the Planning Executives Institute and the National Management Association respectively. Stepwise regression/ path analysis	Moderating relationship model Role stress Intervening model The gameplay patterns	Role theory Leadership styles, budget games, role stress, budgetary attitude.
18	Chenhall and Brownell (1988), Australia	Questionnaire/ 36 middle-level managers drawn from a large manufacturing company. Path analysis.	Mediating relationship model Role ambiguity	Role theory Participation, Role Ambiguity, JS, Performance.
19	Bamber et al. (1989), USA	Questionnaire/ 133 of the office's senior auditors from offices of four Big Eight accounting firms. T-test, partial regression	Direct relationship model	Role theory Role conflict, role ambiguity, formalization of rules and procedures, work flow coordination, adequacy of authority, violations in chain of command, communication adequacy, adaptability, task variety, task analysability.
20	Dunk (1989), UK	Questionnaire/26 production managers randomly selected from consumer product manufacturing organisations located in the north of Britain. Regression.	Moderating relationship model Interaction between participation and budget emphasis.	No theory Budgetary participation, managerial performance and budget emphasis.
21	Mia (1989), New Zealand	Questionnaire/76 middle-level managers working in six companies operating in New Zealand. Multiple regression.	Moderating relationship model Participation and job difficulty	Expectancy theory Participation in budgeting, Job difficulty, MP.
22	Imoisili (1989), USA	Questionnaire/102 cost centre managers in three manufacturing companies in Northeastern USA. Multi-variate linear regression.	Moderating model Task uncertainty	Contingency theory Budget evaluation styles, task uncertainty, job stress and MP.
23	Merchant (1990), USA	Interviews /questionnaire/54 lowest level managers in the manufacturing organisation with profit centre responsibility and have direct authority over manufacturing. Spearman rank order correlations	Moderating model Environmental uncertainty	Contingency theory Pressure to meet financial targets, manipulation of performance measures, short- term orientation, environmental uncertainty, Leader consideration and Profit centre strategy.

24	Rebele and Michaels (1990), USA	Questionnaire/155 individuals who have at least one year experience in auditing from four Midwestern offices of large international accounting firms. Path analysis, multiple regression, moderated multiple regression	Moderating model Need for achievement, organisational level	Role theory Boundary spanning activity, perceived environmental uncertainty, role ambiguity, role conflict, JS, job performance, job – related tension, need for achievement, Organisational level.
25	Aranya (1990), Canada	12 interviews and Questionnaire /100 managers from a large retail drug company whose 235 franchised stores were in Canada. Ordinary multiple regression	Moderating relationship model Budget instrumentality, budgetary participation, JS and performance	Task uncertainty theory(implicitly) Budget instrumentality, budgetary participation, JS and performance.
26	Brownell and Dunk (1991), Australia	Questionnaire / 79 managers from 46 manufacturing companies in the Sydney, Australia, metropolitan area employing more than 100 people. Multiple regression	Moderating relationship model Budgetary participation, budget emphasis and task uncertainty	Contingency theory Budgetary participation, task uncertainty, task difficulty, task variability, budget emphasis and MP.
27	Dunk (1993a), Australia	Questionnaire/ 79 managers of manufacturing organisations employing more than 100 people located in the Sydney, Australia, metropolitan area and listed in the Kompass Australia business directory. Moderated Regression	Moderating model Budgetary participation	Role theory Budgetary participation, job-related tension, MP.
28	Gregson et al. (1994), USA	Questionnaire/482 staff members in public accounting firms with 10 or more AICA (American Institute of Certified Public Accountants') members. Correlation, LISREL VI	Direct relationship model	Role theory Role ambiguity, Role Conflict, perceived environmental uncertainty, JS, turnover intentions and self-reported performance evaluations.
29	Hartenian, Hadaway, and Badovick (1994), USA	Questionnaire/ 253 graduates who had already accepted an offer for full-time work after their graduation. Path analysis test.	Mediating relationship model RC, role conflict	Role theory Realism, congruence, RC, role conflict, job performance, JS, job commitment.
30	Abramis (1994)	Meta-analyses / 39 studies, only 18 studies related to role ambiguity. Zero-order correlations.	Direct relationship model	Role ambiguity, JS and performance.
31	O'Connor (1995), Singapore	Questionnaire/282 middle-level managers in 62 manufacturing firms. For each firm, interviews were held with the General Managers/Managing Directors and/or their Directors of Personnel. Moderated regression, multiple linear regression	Moderating model National and organisational culture	Role theory Participation in planning, participation in evaluation, role ambiguity, superior/subordinate relationship, power distance.

32	Spreitzer (1996), USA	Questionnaire/ 393 middle managers from different units of a Fortune 50 organisation. Multiple Regression.	Mediating relationship model PE	Socio-political support, work climate, role ambiguity, access to resources, PE, access to information, managerial effectiveness and innovation.
33	Abernethy and Brownell (1999), Australian	Questionnaire/ Chief Executive Officers in 63 public hospitals. Multiple regression, ANOVA	Moderating relationship Model budget use	Role theory Strategic change, style of budget use, performance.
34	Tubre and Collins (2000)	Meta-analyses / 128 studies. 74 independent correlations with a total sample size of 11,698 related to the relationship between role ambiguity and job performance.	Direct relationship model	Role ambiguity, job performance and role conflict.
35	Lau and Buckland (2001), Norway	Questionnaire/120 heads from three different functional areas in manufacturing organisations with more than 100 employees. A path analytical model	Mediating relationship model Trust and budgetary participation	Role theory Budget emphasis, budgetary participation, trust, job-related tension.
36	Fisher (2001), New Zealand	Questionnaire/169 auditors in two of the big public firms in New Zealand. Moderated Regression	Moderating model Type A behaviour pattern	Role theory Type A behaviour pattern, role ambiguity, role conflict, JS, performance.
37	Judge, Thoresen, Bono, and Patton (2001)	Meta-analysis of 312 samples with a combined *N* of 54,417.	Direct relationship model	JS and job performance.
38	Chong and Chong (2002), Australia	Questionnaire /79 middle-level managers from manufacturing firms in Australia. A structural equation modelling technique.	Direct relationship model	Goal-setting theory Budget participation, budget goal commitment, job-relevant information and job performance.
39	Koustelios, Theodorakis, and Goulimaris (2004), Greece	61 physical education teachers were employed in Greek "Sport for all" programs.	Direct relationship model	Role ambiguity and JS.
40	Laschinger et al. (2004), Canada	Questionnaire/185 staff nurses who worked in acute-care teaching hospitals in the province of Ontario, Canada. A structural equation model	Mediating relationship model PE	Structural empowerment, PE and work satisfaction.
41	Seibert et al. (2004), USA	Questionnaire/301 employees in one division of a Fortune 100 manufacturer of high-technology office and printing equipment located in the north eastern United States. Hierarchical linear modelling	Mediating relationship model PE	Empowerment climate, PE, JS and job performance.

42	Marginson and Ogden (2005a), UK	Questionnaire/ 221managers based on 'level three' from five of Infotain's eight strategic business units. Pearson correlation coefficient, multiple regression	Direct relationship model	Role theory Budgetary commitment, role ambiguity, empowerment, leadership style, superior's expectations, MP.
43	Wallach and Mueller (2006), USA	Questionnaire/160 paraprofessionals from private human service organisations that provide "Healthy Start" Programs (111 from a state-wide child abuse prevention program and 49 from the state social welfare agency). Multiple Regression.	Direct relationship model	PE, role ambiguity, role overload, participation, unit decisions, supervisory relationship, peer support.
44	Marginson (2006), UK	Questionnaire/ 221 managers based on 'level three' from five of Infotain's eight strategic business units. Multiple regressions.	Direct relationship model	Role theory Importance attached to information media, role ambiguity.
45	Chong et al. (2006), Australia	Questionnaire/ senior-level managers from Australian business directory. Pearson correlation test and a path analysis technique.	Mediating relationship Model role ambiguity, organisational commitment, JS	Role theory and Existing theory Participative budgeting, role ambiguity, organisational commitment, JS and job Performance.
46	Mukherjee and Malhotra (2006), UK	Questionnaire/342 call centre representatives of a major commercial bank in the UK.	Mediating relationship model RC	Cognitive theories, role theory Feedback, autonomy, participation, supervisory consideration, team support, RC, organisational commitment, JS, service quality.
47	(Lankau, Carlson, & Nielson, 2006),USA	Questionnaire/355 protégés, randomly selected graduates of a large western university and a northeastern university.	Mediating relationship model Role modelling, role conflict, role ambiguity.	Vocational support, psychosocial support, role modelling, role conflict, role ambiguity, JS and organisational commitment.
48	Hechanova et al. (2006), Philippines	Questionnaire/954 employees and their supervisors in five different service sectors: hotels, food service, banking, call centres and airlines. Analysis of Covariance (ANOVA) and Pearson correlations	Direct relationship model	PE, JS, and job performance.
49	Jones (2006), USA.	Questionnaire/87 individuals who were students enrolled in the MBA program, advanced undergraduate students and "non-traditional" undergraduate students, including returning students and students pursuing certificates in Business Administration at a large Southern California university and their supervisor.	Direct relationship model	JS and job performance, organisational citizenship, life satisfaction.
50	Chong et al. (2006), Australia	Questionnaire/74 senior-level managers in the Australian financial services sector. Path analytic technique.	Direct relationship model	JS and job performance.

51	Whitaker, Dahling, and Levy (2007), USA.	Questionnaire/170 undergraduate students from a large midwestern university working at least 20 hours per week and their supervisors. Structural equation modelling.	Mediating relationship model RC	Supervisor feedback environment, co-worker feedback environment, supervisor effort costs, co-worker effort costs, supervisor feedback seeking behaviour, co-worker feedback seeking behaviour, RC, task performance, contextual performance, job performance and tenure.
52	Miao and Evans (2007), USA.	Questionnaire/175 salespeople representing 97 companies obtained from a leading commercial list broker of 600 sales managers in a major midwestern state. Structural equation modelling.	Mediating relationship model Role conflict, role ambiguity	Challenge orientation, task enjoyment, compensation orientation, recognition orientation, role conflict, role ambiguity, behavioural performance and outcome performance.
53	Gilboa, Shirom, Fried, and Cooper (2008)	Meta-analyses /169 samples (N = 35,265 employees) involving published and unpublished studies. Correlation test.	Direct relationship model and Interacting relationship model	Role ambiguity, role conflict, role overload, job insecurity, work–family conflict, environmental uncertainty, situational constraints and job performance.
54	Kalbers and Cenker (2008) USA	Questionnaire/334 regional and national auditors, from partners at five regional and five national accounting firms, located in and around a large midwestern city in the USA. Structural equation model.	Direct relationship model	Exercised responsibility, experience, autonomy, role ambiguity and job performance.
55	Meyerson and Kline (2008), USA.	Questionnaire/197 undergraduate university students. A structural equation model (LISREL)	Direct relationship model	Transformational/transactional theory, PE, leadership, job performance, JS, affective organisational commitment and turnover intentions.
56	Edwards, Bell, Arthur, and Decuir (2008), USA	Questionnaire/444 employees in a manufacturing plant located in south-eastern Texas in the United States.	Direct relationship model	Overall JS, facet JS, task performance and task performance.
57	Li (2008), China	Questionnaire/251 MBA students who were working in Chinese governmental agencies at all levels during their class time and they were selected from variety of universities in 12 provinces of China. Correlational and multiple regression analyses.	Mediating relationship model JS	Public service motivation, JS, organisation commitment and individual performance.
58	(Sakires, Doherty, & Misener, 2009), Canada	Questionnaire/79 paid staff and 143 volunteer board members from provincial voluntary sport organisations. Multiple regression.	Direct relationship model	Role theory Role Ambiguity, JS, organisational commitment and effort.
59	Dickson and Lorenz (2009) U.S.	Questionnaire/397 undergraduate students at a regional Midwestern University. OLS regression	Direct relationship model	PE and JS.

60	Maas and Matějka (2009), Netherlands	Interviews/Questionnaire/ The study surveyed controllers of decentralized units of large- and medium-sized companies in the Netherlands. The final survey population consists of 134 members from the Controllers Institute (CI) to participate in the study. Standardized regression coefficients test, using LISREL 8.52	Mediating relationship model. Role conflict, role ambiguity.	Role Theory

The emphasis on the functional responsibility of controllers, decision-making support of local management , data misreporting , role conflict, role ambiguity, task analysability, task variability, interdependencies, uncertainty, decentralization. |
| 61 | Ahmad and Taylor (2009), Malaysia | Questionnaire/ The sample was based on 565 in-house internal auditors who have worked in listed companies with at least three years working experience. Hierarchical regression. Multiple regression | Direct relationship model | Role theory

Commitment to independence, role ambiguity, role conflict, guidelines, task, authority, responsibilities, standards, time, inter-role conflict, intra-sender role conflict, personal role conflict. |
| 62 | Casey et al. (2010), Ireland | Questionnaire/244 nurses and midwives in Ireland. Regression analysis and Spearman Rank correlation analysis | Direct relationship model | PE theory

Structural empowerment, PE, critical social empowerment and JS. |
63	Gregory et al. (2010), USA	Questionnaire/87 all full-time faculty and staff employees of a public western US university's business college. Sobel tests	Mediating relationship model PE	Attraction–Selection–Attrition (ASA) theory and theory of work adjustment P-O Fit, PE, JS and in-role performance.
64	Mendes and Stander (2011), South Africa	Questionnaire/179 employees holding various positions, such as managers, specialists, supervisors and administrative staff in South Africa. Structural equation model.	Mediating relationship model PE	Leader-member exchange, RC, PE, engagement and turnover intention.
65	De Villiers and Stander (2011), South Africa	278 regional managers, branch managers and sales consultants of a financial institution in the Gauteng region of South Africa. Structural equation model.	Direct relationship model	Leader empowering behaviour, RC, PE, work engagement and intention to leave.
66	Punia (2011), India	Questionnaire/287 employees at Indian scientific organisation. Pearson correlation and regression analysis.	Direct relationship model	RC, job perception and performance.
67	Beris, Sethela, and Mahmood (2011), Malaysia	Questionnaire/300 employees who are currently working in the service sector SMEs in Malaysia. Pearson Correlation.	Direct relationship model	Role theory Role ambiguity and job performance.
68	Dewettinck and van Ameijde (2011), Belgium	Questionnaire/ 381frontline employees in four service organisations active in people-related services, such as temporary staffing and health insurance. Structural Equation Model.	Mediating relationship model PE	Social cognitive theory

Leadership empowerment behaviour, PE, JS, affective commitment and intention to stay. |

69	Tutar, Altinoz, and Cakiroglu (2011), Turkey	Questionnaire/213 employees of public and private banks operating in Ankara. Structural equation model.	Direct relationship model	Employee empowerment, achievement motive and performance.
70	Bitmiş and Ergeneli (2011), Turkey	Questionnaire/ 490 investment consultants, who work for non-bank financial intermediaries in Turkey. Sobel's test	Mediating relationship model Leader-member exchange	PE, Leader-member exchange and JS.
71	Najafi et al. (2011) , Iran	Questionnaire/378 universities' educational experts participated in the study. Path analysis model LISREL 8/53	Mediating relationship model JS and organisational commitment	Organisational justice, PE, JS, organisational commitment and organisational citizenship behaviour.
72	Seibert et al. (2011),	Meta-analysis /142 studies representing 151 independent samples, including 79 published studies and 63 unpublished dissertations and working papers. Hierarchical linear model.	Direct relationship model	High-performance, managerial practices, socio-political support, leadership, work design characteristics, positive self-evaluation, traits, human capital, gender, PE, JS, organisational commitment, strain, turnover intentions, task performance, organisational citizenship behaviour and innovation.
73	Springer (2011), USA	Questionnaire/1500 employees working in different banks in the United States. A multiple regression and Pearson correlation technique.	Direct relationship model	Job Motivation, JS, job performance.
74	Rehman and Waheed (2011), Pakistan	Questionnaire/568 employees in a public sector organisation in Pakistan. Pearson correlation technique.	Direct relationship model	JS and job performance.
75	Carlson, Kacmar, Zivnuska, Ferguson, and Whitten (2011), USA	Questionnaire/240 full-time employees, which was replicated in Study 2, that comprised 189 matched subordinate-supervisor dyads. Structural equation modelling.	Mediating relationship model Positive mood and JS	Gender, age, tenure, family-to-work enrichment, work-to-family enrichment, positive mood, JS, and job performance.
76	Hansen and Høst (2012), Denmark	Questionnaire/400 Danish managers from different levels in the public sector and 20 interviews. A structural equation model.	Mediating relationship model RC	Decentralized decision-making, RC, Job pressure, Job complexity and JS.
77	Chiang and Hsieh (2012), Taiwan	Questionnaire/513 employees of Taiwan hotels. Structural equation modelling	Mediating relationship model Organisational citizenship behaviour	Perceived organisational support, PE, organisational citizenship behaviour and job performance.

78	Kuzey (2012), Turkey	Questionnaire/249 health care workers located in Istanbul, Turkey. Pearson correlation.	Direct relationship model	JS and performance.
79	Mah'd et al. (2013), Jordan	Questionnaire/77 executives in five private universities as the main method of research and also employed archival documents, observations and reports. Using Mann-Whitney test	Direct relationship model	Budget participation and MP.
80	Allameh, Harooni, Chaleshtari, and Asadi (2013), Iran	Questionnaire/132 front line employees in the Keshavarzi bank of Chaharmahal-e-Bakhtiary province. Path analysis.	Direct relationship model	Work redesign theory and goal theory Feedback, autonomy, participation, supervisor's consideration, RC, JS, organisational commitment and service quality.
81	Carbonell and Rodriguez-Escudero (2013), Spain	Questionnaire/197 NPD projects at Spanish firms operating in various manufacturing industries. Path analysis with AMOS v.19.	Mediating relationship model Role ambiguity, role conflict	Goal theory Output control, process control, professional control, participative decision-making, role ambiguity, role conflict, project complexity, and industry dynamism, pressure for performance, JS and NP performance.
82	Ikyanyon and Ucho (2013), Nigeria	Questionnaire/192 voluntary employees of a federal hospital in Nigeria. Correlation and regression technique.	Direct relationship model	JS, workplace bullying and job performance.
83	Kim, Egan, and Moon (2014) U.S and S. Korea	Questionnaire/534 and 270 of public employees in the United States and South Korean respectively. Structural Equation Model	Mediating relationship model RC	Goal theory Managerial coaching behaviour, RC, satisfaction with work and job performance.

RC= Role Clarity; PE = Psychological Empowerment; MMC = Mental Model Confirmation; MMB = Mental Model Building; JS = Job Satisfaction; MP = Managerial Performance

3.3 Comprehensive PMS and Consequent Variables

The PMS is an increasingly important issue among academicians, practitioners and researchers, where it is still debated as a critical issue. The literature on PMS has clarified that conventional performance measures were insufficient for decision-making, planning and controlling operations in today's rapidly changing and hyper-competitive environment. These types of systems are under serious challenge since their emphasis is on financial measures in order to satisfy the regulatory and accounting reporting requirements. Consequently, to overcome the shortcomings of using a traditional performance measures, management accounting scholars addressed the nature of PMS and their consequences as another line of research; as a result, a superior combination of non-financial and financial performance measures have been introduced.

More recently, organisations have improved their systems to be more comprehensiveness so as to provide managers and employees with information to assist in managing their firm's operations (Malina & Selto, 2001; Fullerton & McWatters, 2002; Lillis, 2002; Ittner, Larcker, & Meyer, 2003; Ullrich & Tuttle, 2004). Previous studies indicate that the more comprehensive PMS contain a more varied set of performance measures which are linked to the strategy of the firm and provide information about parts of the value chain (Nanni et al., 1992; Neely et al., 1995; Malina & Selto, 2001; Chenhall, 2005). Studies of performance measurement addressed the comprehensiveness from three angles: breadth, strategic alignment and cause-and-effect. The studies focus on these three dimensions differently, therefore some of them are dependent on one dimension, others on two dimensions, but none of the accounting studies has explicitly taken into account all three dimensions. Comprehensive PMS are known as techniques which are represented for example by the balanced scorecard (Kaplan & Norton, 1996b), tableau de bord (Epstein & Manzoni, 1998) and performance hierarchies (Lynch & Cross, 1995).

In the empirical accounting literature, several studies investigate the effects of a comprehensive PMS, but they are addressed from different types of models. Some authors focus on direct and interacting relationship models (e.g. Schiff & Hoffman, 1996; Scott & Tiessen, 1999a; Banker, Potter, & Srinivasan, 2000; Hoque & James, 2000) and others on intervening or mediating relationship models (e.g. Burney & Widener, 2007; Hall, 2008; Burkert et al., 2011).

3.3.1 Evaluation Criteria

The aim of this sub-section is to identify the review criteria. In the following subsections, reviewing the direct relationship model and the interacting or moderating relationship model related to comprehensive PMS. Next, the mediating relationship of role clarity, psychological empowerment and individual learning are reviewed. The direct relationships of RC, psychological empowerment, job satisfaction and managerial performance are presented. The sub-sections identify the studies' methods and the model used to describe the direct interactions between variables (i.e. moderation, mediation). A summary of these the criteria can be found in Table 3.2.

3.3.2 Direct Relationship Model of Comprehensive PMS

The authors who use a PMS to evaluate performance, started applying the direct relationship model, but they do not know whether these systems lead to higher performances. When studies deal with the subject of comprehensive PMS, writers looked into comprehensiveness from several angles. Some considered that the system containment on the financial and non-financial metrics is comprehensiveness and others state that the system required strategy alignment to be comprehensiveness, whilst other writers added the cause-and-effect relationships.

The extant accounting literature examines a wide group of issues associated with performance measures, but it does not provide an unequivocal answer about the relationship between comprehensive PMS and performance. Several authors emphasize the benefits of supplementing financial measures with non-financial measures. However, financial measures are described as backward-looking (Johnson & Kaplan, 1987), lack performance measures (Behn & Riley, 1999), are easily manipulated (Rees & Sutcliffe, 1994) and some researchers show that the combinations of financial and non-financial performance measures are proposed to overcome such limitations (e.g., Kaplan and Atkinson, 1998). However some have stated that these measures generate evaluation biases (Lipe & Salterio, 2000; Ittner, Larcker, & Meyer, 2003; Moers, 2005) and are very expensive, complex and troublesome (e.g. Perrin, 1996). Further, anecdotal evidence has revealed that the relationship between comprehensive PMS and performance led to mixed results.

For instance, Schiff and Hoffman (1996) explored the ways in which a group of executives incorporated both financial and non-financial measures in their judging of performance. The study conducted an experiment involving 51 cases of finance and operations executives in a large retail organisation. However, the study has shown that multiple measures were used to evaluate performance, but for evaluating managers the concentration was more on non-financial measures, whereas there was more emphasis on financial measures to evaluate departments. Despite the fact that they addressed comprehensive PMS and their direct impact on managerial performance, their study relied only on one dimension of performance measurement comprehensiveness, which is the breadth dimension and neglected the other two dimensions.

Similarly, the study of Scott and Tiessen (1999a) considers that the combining of financial and non-financial performance measures are comprehensive PMS and examines the direct effect of measurement diversity on performance by using a non-random sample of a questionnaire survey collected from 248 managerial teams in twelve profit sector organisations and 15 non-profit sector organisations. Their results show that multiple measures lead to higher team performance and the effect is stronger when the team members participate in target setting.

In the same context, Banker et al. (2000) used the breadth dimension to express comprehensive PMS and explore the relationship between the system and accounting performance. Through using 72 months of time-series data from 18 hotels managed by a hospitality firm, the results mentioned that non-financial measures are significantly linked to future financial performance and contain additional information not reflected in the past financial measures. Additionally, both non-financial and financial performance measures improved the following implementation of an incentive plan that included non-financial performance measures.

Ittner, Larcker, and Meyer (2003) included two dimensions, which are breadth and strategy alignment, as comprehensiveness of PMS, to investigate the direct relationship between the use of a balanced scorecard and performance drawing upon data collected from 95 branches of a North American retail bank (one firm) and their managers and employees. The study provided contradictory evidence to the two previously mentioned studies by finding a negative relationship between BSC usage and financial performance.

In a similar vein, Davis and Albright (2004) examined the effect of a balanced scorecard, as expressed by the breadth and cause-and-effect dimensions, on financial performance. The quasi-experiment was used to collect data from 9 branches of a banking organisation located in the south-eastern United States. The results showed a statistically significant improvement of financial performance when the balanced scorecard was implemented.

Given that comprehensive PMS is an important part of strategic management accounting systems to provide more information to verity parts of companies, Cadez and Guilding (2008) addressed the relationship between strategic choices, market orientation, company size, strategic management accounting and performance. However, the study considered strategic management accounting as a mediating variable, but it also examined the direct relationship between strategic management accounting and performance. In this study, the authors adopted the structural equation model to test those relationships and the data was collected by interviews and questionnaire survey from a sample of 193 large Slovenian companies based on the Slovenian Chamber of Commerce and Trade. They found that there is a significant positive relationship between strategic management accounting and performance.

More recently, Hammad et al. (2013) have examined the influence of management accounting information on managerial performance within Egyptian hospitals. Data were collected using a questionnaire survey from the managers, or heads of departments, of Egyptian hospitals. 200 questionnaires from heads of departments, or clinical units of 50 selected Egyptian hospitals were obtained. Using the partial least squares (PLS) test, the study found that there is a positive relationship between management accounting information and managerial performance.

Din and Yatim (2013) examined the effect of performance measures on managerial performance in Malaysian local authorities. A structural equation modelling was utilised to examine the direct relationship between variables. The data was collected through a questionnaire survey from 131 head of departments in Malaysian local authorities. The study found that performance measures have a positive direct effect on managerial performance.

3.3.3 Moderating Relationship Model of Comprehensive PMS

Hoque and James (2000) examined the interacting relationship between organisation size, product life-cycle stage, market position and balanced scorecard (BSC) usage on organisational performance. Based on a survey of 66 chief financial controllers from Australian manufacturing companies, they found that a firm's size, product life cycle and market position do not have any significant interaction effect in the relationship between measurement diversity (one dimension - breadth) and performance.

Braam and Nijssen (2004) tried to contribute to the understanding of the effective use of the BSC (measurement-focused-BSC use), which includes the multiple level of use variable and comprehensive measurement use variable to assess how measurement-focused-BSC use affects company performance. Moreover, they also examined measurement-focused-BSC use as a moderating variable on the relationship between strategy-focused-BSC use and performance. A questionnaire survey was used on 41 controllers and/or heads of the financial departments of the company and other data was taken from a database of business-to-business companies in the Netherlands. Although the study pointed out that the direct effects of measurement-focused-BSC use on performance were negative, which was opposite to its assumption, the results found that measurement-focused-BSC use as a moderator is aligned to company strategy and positively impacts the relationship between the strategy and overall company performance.

The role of a third variable in moderating the relationship between strategic PMS and managerial performance has been examined by Burney and Widener (2007) in their large survey of managers in the USA. Their results indicated that the evaluative process, PMS complexity and managerial experience with using PMS information, were reasonable moderators of the relationship between strategic PMS, job-relevant information and role ambiguity. However the study presented strategic PMS only based on two dimensions, namely breadth and strategic alignment, thus missing the cause-and-effect dimension when measuring strategic PMS.

Another study was conducted by Chung et al. (2012), who examined the impact of management accounting systems on managerial performance in general, but they focused on neither PMS nor the same moderating variables used by Burney and

Widener (2007). The Chung et al. (2012) study collected the data by a questionnaire survey of 113 marketing managers and 95 production managers, who were in publicly-listed electronics manufacturing companies in Taiwan, to examine whether functional difference of activities has moderating effects on the relationship between broad scope MAS and role ambiguity, as well as between role ambiguity and the manager's performance relationship. The results pointed out that there was no moderating effect of functional difference on the relationship between role ambiguity and managerial performance.

As mentioned in the previous overview, there are conflicts in existing literature. Given the diverse effects linked to the nature of comprehensive PMS, it is not surprising that the results of studying the direct relationships between the systems and performance were contradictory (e.g. Banker et al., 2000; Ittner, Larcker, & Meyer, 2003). The inconsistency is plausibly identified by disciplinary restraints, simplistic operationalization of concepts in the relationship and ignoring the role of intervening variables' results (Derfuss, 2009). Moreover, some authors stated that these conflicts are at least partially owing to the reliance on different notions of contingency fit in hypothesis tests, particularly moderating, or interacting and mediating types of fit (Hartmann & Moers, 1999; Gerdin & Greve, 2004; Derfuss, 2009). It is worth noting that using such mixed models is problematic, because these models cannot be consistent simultaneously with the theory and reality of organisation. Thus, for the hypotheses and models of prior studies it is difficult to establish integration between their results (Derfuss, 2009).

Other authors emphasized that few studies have examined whether control-system elements (i.e. PMS) have indirect effects on performance (e.g. there are variables that mediate the relationship between the elements and performance, (Shields et al., 2000). In fact, empirical management accounting research on PMS: concentrates on one single paradigm, tends to simply rely on dichotomous variables for capturing the use of various measures and fails to consider behavioural aspects to explain the relationship between PMS and performance (Merchant, Van der Stede, & Zheng, 2003).

3.3.4 Comparison

In the above empirical studies, several theories have been adopted, but role theory is the most widely used perspective. These studies also investigated a variety of relationship models, such as direct and interactive/moderating relationship models. Almost all the prior studies have focused on comprehensive PMS and their consequence variables. The data was collected by questionnaire surveys, which is the dominant approach used and mentioned in the above studies. Most of the studies dealt with measuring the comprehensiveness of the system, relying on different dimensions. Prior research related to direct relationship models between the comprehensive PMS and its outcomes showed contradictory results, which clarified that some studies (e.g. Scott & Tiessen, 1999c; Banker et al., 2000; Davis & Albright, 2004) have indicated positive relationships, while others (e.g. Ittner, Larcker, & Meyer, 2003; Braam & Nijssen, 2004) have negative associations. Moreover, some studies (e.g. Hoque & James, 2000; Braam & Nijssen, 2004; Burney & Widener, 2007; Chung et al., 2012) have tried to fix the contradictory results by examining the interacting relationship model, but their results have been disappointing. The findings were inconsistent and whilst some of them found that there were no interacting effects between its relationships (Hoque & James, 2000; Chung et al., 2012), others, for example Braam and Nijssen (2004), indicated a negative relationship, which were opposite to its assumption.

3.3.5 Limitations of Previous Studies

- Some of previous studies' findings (e.g. Schiff & Hoffman, 1996; Ittner, Larcker, & Meyer, 2003; Davis & Albright, 2004) cannot be generalized because they either concentrate on field study, or on small non-random samples. For example, although Davis and Albright (2004) have adopted field study when they addressed the effectiveness of the BSC on financial measures, they did not take into consideration the differences of BSC in the sample banks which might affect the generalizing of findings.

- The study of Braam and Nijssen (2004) assumed to involve the same variable (measurement-focused-BSC use) in its theoretical framework, as an independent variable and moderator variable, not mentioning that this variable has to be

correlated with the dependent variable (performance), which is inconsistent with the conditions of the moderating test.[1]

- Almost of the reviewed studies adopted just one or two dimensions when they measured the comprehensiveness of the systems. Thus, this research utilised all three dimensions.

- Most of the reviewed studies above focus on one single dependent variable (e.g. managerial performance or job satisfaction), but the present study includes both mentioned variables

3.3.6 Mediating Relationship Model of Comprehensive PMS

Based on the organisational psychology literature, the indirect relationship model presumes that the effects of control systems' components, such as the effects of PMS on performance, are indirect, through the intervening variables of role clarity, psychological empowerment and individual learning (e.g. Vandenbosch & Higgins, 1995; Schäffer & Steiners, 2004; Burney & Widener, 2007; Hall, 2008, 2011).

3.3.6.1 Role clarity as Mediating Variable

Due to the inconsistency of prior studies' results which related to the direct relationship, empirical accounting research has taken into consideration behavioural aspects to explain the relationship between PMS and its outcomes, such as job satisfaction and performance (Merchant et al., 2003). Previous works investigate the determinants predicting the adoption of PMS (e.g. Ittner & Larcker, 2002), the information content of non-financial measures (e.g. Wiersma, 2008), the direct influence of combinations of different measures on performance (Banker et al., 2000) and the effects of multiple measures on a superior's evaluation (e.g. Moers, 2005). Other later studies examine the behaviours experienced by individuals in response to the nature of PMS effects. In psychological literature, there were some studies that sought to clarify the link between PMS and their outcome variables (job satisfaction and performance), by using psychological theories to investigate the relationships between these variables. Some

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[1] The moderation approach assumes that the moderator has "non-significant, bivariate relationships with both the independent and dependent variables" (Shields and Shields, 1998, p. 51).

authors (e.g. Covaleski, Evans, Luft, & Shields, 2003; Kleingeld, Van Tuijl, & Algera, 2004; Covaleski et al., 2007) pointed out that these theories give more complete and valid explanations for the effects of PMS on its outcomes.

For example, the study of Hartenian et al. (1994) tried to point out the relationship between the antecedents and consequences of role clarity, by using path analysis to examine the effect of realism (includes the amount of feedback about individuals which they receive) on role clarity, job satisfaction and performance. A questionnaire survey was used to gather the data from 253 graduates who had already accepted an offer for full-time work after their graduation and 155 of the same graduates after eight months. Despite the fact that the study found that realism has an indirect effect on job performance through role clarity, role clarity did not act this role on the relationship between realism and job satisfaction. Particularly, the results mentioned that high levels of feedback performance have increased role clarity, which in turn affects job performance, but there was no relationship between role clarity and job satisfaction. This result is inconsistent with prior studies (e.g. Jackson and Schuler, 1985) which assert that there is a positive relationship between role clarity and job satisfaction. The contradictory result may be due to the generalized job satisfaction measure which was used by the study. The realism that these workers experienced could be either the result of information received from the work and organisation prior to entry, or the ability of the respondents to adapt to changing circumstances. In any case, these employees have a point of view about their jobs that enable them to adapt to the demands and achieve a balance between the different roles that must be implemented.

Moreover, the paper of Viator (2001) examined the relationship between mentoring (both formal and informal), role ambiguity and perceived environmental uncertainty, as well as job outcomes. The data was collected by a mail survey of 3000 CPAs in large public accounting firms (senior accountants, managers and senior managers) in the USA. In addition to providing the traditional career development and psychosocial support functions, the results indicated that informal mentors offered protégés with information which reduced role ambiguity and clarified their organisational role.

Relying on mediating role stress variables (role ambiguity), Burney and Widener (2007) sought to explain the effect of strategic PMS on managerial performance. Based on a survey study conducted in the USA, they captured the level of strategic PMS as

comprehensive system through two dimensions, which are breadth and strategic alignment. Employing 1,524 individuals who were Institute of Management Accountants members and whose job title of manager or above were selected to collect data by a survey, they pointed out that strategic PMS positively influence performance through job-relevant information and role ambiguity. Managers perceive that when they have strategic PMS closely linked to strategy; they have a higher level of job-relevant information and a lower level of role ambiguity, which in turn is reflected in increasing their performance. The result indicated that role ambiguity fully mediates the relationship between job-relevant information and managers' performance.

Unlike the two previous studies in terms of measuring the comprehensiveness of the system, Hall (2008) stressed that the comprehensiveness should contain three major key elements, which are breadth, alignment with strategy and cause-and-effect relationships, even though he did not explicitly measure the cause and effect relationship in his model. In his study, he investigated the influence of comprehensive PMS on managerial performance through role clarity (focuses on role clarity instead of role ambiguity). 83 strategic business unit (SBU) managers within large Australian manufacturing organisations were surveyed and Hall (2008) concluded that comprehensive PMS is indirectly related to managerial performance through the intervening variable of role clarity. This relationship was fully mediated by role clarity.

The study by Hartmann et al. (2010) examined the effects of superiors' performance evaluation behaviours on work-related attitudes of subordinates on 250 Dutch middle managers from various industries and also analysed the influence of managers on two aspects of reward and compensation controls. The study focused on one dimension (breadth), which is objective and subjective performance measures, when it measured the comprehensiveness of the system. However, most prior studies addressed this dimension as financial and non-financial measures. The study found that there was greater reliance on objective and subjective performance measures when determining subordinates' monetary and non-monetary rewards. It revealed that the use of objective performance measures was positively linked to goal clarity, whereas no relationship was found between the use of subjective performance measures and goal clarity. The result indicated that objective performance measures have a full mediating effect between initiation of structure and evaluation fairness. Although managers seem to rely on

subjective performance measures in performance evaluations, no significant paths are found that link these measures to work-related attitudes. This may be explained by Moers (2005), who found that subjective performance measures are related to performance evaluation bias and they result in more lenient and compressed overall performance ratings, with potential unfavourable influences on goal setting. Another clarification is that supervisors may alter objective performance measures either to compensate for shortages related to the performance measures (economic explanation), or due to the social influences that were caused by the social context in which subjective adjustments occur (behavioural explanation). The study suggested that the interaction between objective and subjective performance measures requires further investigation.

A similar study conducted by Burkert and his colleagues (2011) drew on role theory to examine the effect of PMS on managerial performance and to analyse how role ambiguity mediated this relationship. Despite the fact that the study sought out the effects of PMS, it concentrated only on the controllability principle which stipulates that the accountability of managers should be only for results that are within their control. The study used a questionnaire to collect the data and its sample covered wide aspects of managerial levels in German companies represented by 440 top-level managers and those of lower and middle-level management. Despite the fact that the study confirmed most of the previous findings concerning role ambiguity on this relationship, which was full mediation for lower and middle-level managers, it was insignificant in the group of top-level managers. This is due to the fact that the goal of the study did not include the whole PMS, but was interested to evaluate managers only on components that are under the managers' control. Thus the top-level managers seem to deal with the uncontrollable factors.

Two prior studies (Burney & Widener, 2007; Hall, 2008) addressed the effect(s) of comprehensive PMS, including both financial and nonfinancial performance measures, which have positive relationship with managerial performance through role clarity. It is however unclear whether these findings are related to using financial measures or nonfinancial measures. These prior studies stimulated Lau (2011) to conduct his study, which provided insights to distinguish between the effects arising from nonfinancial measures and those arising from financial measures. Based on a questionnaire survey received from 121 managers or departmental heads in large Australian manufacturing

organisations listed in Jobson's Year Book of Public Companies and using the Sobel test, the results showed that nonfinancial measures, by themselves, have a significant effect on managerial performance through role clarity. The results illustrated that the relationship between non-financial measures and managerial performance was fully mediated by role clarity and also fully mediated between financial measures and managerial performance. More significantly, there was a substantially stronger relationship between nonfinancial measures and role clarity than that through financial measures. Although this study compared between the effects of financial and non-financial performance measures, it adopted the breadth dimension and neglected two other dimensions which are also an integral part of measurement of the system's comprehensiveness. Moreover, the findings of the study related to mediating effects based on the Sobel test, which has been condemned as a result, as this test requires an assumption of normal sampling distribution when it examines the indirect effect (ab), whereas the sampling distribution linked indirect effect (ab) seems to be asymmetric, with non-zero skewness and kurtosis (Bollen & Stine, 1990; Stone & Sobel, 1990; Hayes, 2009).

Another study addressed the impact of comprehensive management accounting systems on managerial performance in general, but did not focus on PMS. The study was conducted by Chung et al. (2012), who examined whether role ambiguity mediates the relationship between broad scope management accounting system and managerial performance, and collected data by a survey from publicly-listed electronics manufacturing companies in Taiwan, based on both113 marketing managers, 95 production managers and their supervisors. Furthermore, it also investigated whether functional difference of activities moderates the relationship between broad scope management accounting system and role ambiguity, and between role ambiguity and manager's performance. The results showed that there was no direct relationship between broad scope management accounting system and managerial performance, but role ambiguity was completely mediated in this relationship, particularly in a marketing-oriented context.

Miao and Evans (2012) examined the combinatory effects of three well-established formal sales control styles on salespersons' performance through role ambiguity as a mediating variable. Drawing on expectancy theory and cognitive evaluation theory, the

study used a questionnaire survey to collect data from 223sales managers on a random name list of 1561 industrial sales managers, which were obtained from a leading list broker in the USA. The study pointed out that the role ambiguity is partially mediated in the relationship between both capability control and activity control and the salesperson's performance. Similarly, Salmon (2013) examined the influences of integrative management accounting information on managerial performance, through role ambiguity as a mediator. Based on information processing theory and role theory, the study tested its hypotheses using a questionnaire survey, from a sample of 108 managers in Australian manufacturing organisations. By adopting ordinary least-squares regression-based path analysis, Salmon found that there was a positive direct link between integrative management accounting information and managerial performance and also an indirect relationship between these two variables through role ambiguity.

3.3.6.2 Psychological Empowerment as Mediating Variable

As mentioned in the previous chapter, theory proposed that psychological empowerment was in part a result of empowering work practices (i.e. enhanced individual responsibility for decision-making) and was also affected by other factors, as well as in turn psychological empowerment leads to behavioural outcomes (e.g. motivation and performance). Therefore, it is assumed that practices of empowerment alone may not be sufficient to impact behaviour, but individuals also require feeling empowered before they engage in performance enhancing work activities (Conger & Kanungo, 1988; Thomas & Velthouse, 1990). In other words there are some elements (i.e. access to information, access to resources) in the overall prediction to promote psychological empowerment, which enhance performance. More specifically, psychological empowerment mediates the relationship between role empowerment and performance.

In this context, Spreitzer (1995a) addressed the relationship of psychological empowerment with antecedent and outcome factors within her original cross-sectional measurement study. She used two samples; the first sample was 393 middle managers from different units of a Fortune 50 organisation and the second sample was composed of lower-level employees from an insurance company. It included 128 employees selected by a stratified random sampling technique. The study found that all four sub-scales had a positive relationship with the antecedents of access to information and three

of the four (except meaning) were related to self-esteem (a personality factor). The relationship between the dimensions and outcomes was less consistent, with only competence and impact which were statistically significantly related in zero-order analyses with performance (e.g. performance standards, overall success) and innovative behaviour, both as rated by subordinates. The study used structural equation modelling which showed a good fit for the effects of the antecedent factors collectively on psychological empowerment as a whole, but a less good fit for the effect of psychological empowerment on effectiveness and innovation (albeit that the paths were statistically significant at $p < 0:001$ for both outcomes).

This initial study of Spreitzer (1995a) did not examine the mediating effects of psychological empowerment on the relationship between antecedent and outcome variables, which is an issue taken up by Spreitzer (1995b) in a second paper. In this later paper, she examined the mediating effects of psychological empowerment on the relationship between the social structural context (e.g. access to strategic information and resources) and behavioural outcomes (i.e. effectiveness). Her study examined this by using a questionnaire survey on a sample of 393 middle managers from different units of a Fortune 50 organisation. Using a series of regression analyses to assess the mediating effect, the results suggest that psychological empowerment mediates the relationship between some elements of workplace social structure and innovativeness, but not effectiveness.

Spreitzer (1996) has continued to use the original sample of managers. She tried to reconsider the same potential antecedents of psychological empowerment as she used in her later study 1995(b) i.e. role ambiguity, access to strategic information and access to resources. In her study (1996), she tried to describe expected relationships between social structural characteristics at the level of the work unit and feelings of empowerment. However, the study found that there was a positive relationship between access to information and empowerment, but role ambiguity was negatively associated to empowerment.

The study of Spreitzer et al. (1997), aimed to identify more rigorously whether the psychological empowerment dimensions differentially predict outcomes of empowerment (effectiveness, work satisfaction and job strain). It considered each sub-scale whilst controlling for the other three. The study addressed each sub-scale while

she and her colleagues controlled the other three sub-scales. The results indicated that whilst the sub-scales collectively predicted outcomes linked to work effectiveness and job satisfaction, no one dimension did so uniquely. Spreitzer et al. (1997) therefore concluded that individuals need to experience each of the empowerment dimensions in order to accomplish all of the hoped for outcomes of empowerment (p. 679). However, this series of Sprietzer's studies have served to illustrate and operationalize the construct of psychological empowerment, and to establish that it is linked to several of the presumed antecedents and outcomes. The work of this series is based on a single sample of managers, which is an important limitation, leaving their generalizability unknown.

Gagné, Senecal, and Koestner (1997) used a questionnaire survey to examine the relationships between job characteristics (task significance, feedback from the job, feedback from agents and autonomy support), psychological empowerment and intrinsic motivation among technical and telemarketing workers. More specifically, the study hypothesized that the various dimensions of empowerment would mediate the relationship between job characteristics, such as feedback and autonomy support, and intrinsic motivation at work. Using a sample of 157 technical and telemarketing employees, the study revealed that different job characteristics predicted different aspects of empowerment, and that aspects of empowerment differentially influenced intrinsic motivation. For example, task significance predicted that only meaning, impact and feedback from the job predicted self-determination. Moreover, autonomy support predicted impact and self-determination. The results further showed that, for two of the dimensions, meaning and self-determination, those experiencing greater psychological empowerment also reported stronger intrinsic motivation. Nevertheless, the third dimension, impact, was unrelated to intrinsic motivation; while the fourth, competence, had a negative relationship. Furthermore, there was also evidence that the psychological empowerment dimension of self-determination mediated the relationship between the job characteristics and the outcome.

More recently, the study of Siegall and Gardner (2000) has investigated the relationship of communication with a supervisor, attitude towards the company, teamwork and concern for performance, with the dimensions of psychological empowerment. Applying regression analysis to data from a questionnaire survey of a sample of 203 lower level manufacturing employees, they found communication with a supervisor to

be associated with experienced meaning, self-determination and impact, and that attitude to the company contributed solely to meaning. Teamwork had no relationship with any dimension of psychological empowerment when the other variables were controlled. Regarding the question of effectiveness, the study also showed that those experiencing more meaning and self-determination showed greater concern for performance. This study suggests the dimensions of psychological empowerment have differential relationships, not only with assumed antecedents, but also with a performance-related outcome.

Liden et al. (2000) have focused particularly on the extent to which the four dimensions of psychological empowerment have mediating effects on the relationship between job characteristics (an aggregate of task identity, task significance and feedback from work) and outcomes (work satisfaction, organisational commitment and job performance). The study used questionnaire survey from a sample of 337 lower-level service company employees. Regression analyses were applied by the study and found that meaning and competence were partially mediating the relationship between job characteristics and satisfaction. The findings related to performance were rather different. Despite the fact that zero-order correlations suggested that all four dimensions of psychological empowerment have a positive relationship with the outcome, regression analysis showed only one dimension, competence, has a relationship with performance when the effects of the other three dimensions were controlled. Furthermore, there was no mediating relationship due to the fact that the job characteristics were unrelated to performance in the first place.

Laschinger et al. (2001) tested an expanded model of Kanter's structural empowerment, which specified the relationships amongst structural empowerment and psychological empowerment, job strain and work satisfaction. The study used a questionnaire survey to test the model in a random sample of 404 Canadian staff nurses. The authors conducted a cross-sectional study and provided evidence that there was a relationship between structural empowerment and individual satisfaction, through the mediating effects of psychological empowerment. Based on this study, Laschinger et al. (2004) have examined psychological empowerment over time. They tested a model linking changes in structural empowerment and psychological empowerment to changes in job satisfaction. Data was collected by a questionnaire survey of 185 randomly selected

staff nurse from the College of Nurses of Ontario registry list. The results indicated that the relationships between structural empowerment (measured as a composite of opportunity, information, support, resources and both formal and informal power), psychological empowerment and outcomes change over time. Particularly, the study showed that as time unfolded, the nurses in their sample indicated that changes in structural empowerment impacted their feelings of psychological empowerment, but while structural empowerment still affected job satisfaction, there was no indirect effect through psychological empowerment.

Seibert et al. (2004) tried to examine the mediating effect of psychological empowerment on the relationship between psychological climate and job satisfaction, as well as individual performance. The study collected the data by a questionnaire survey from 301 employees in one division of a Fortune 100 manufacturer of high-technology office and printing equipment, located in the north eastern United States. However, the result indicated that psychological empowerment fully mediated the relationship between empowerment climate and job satisfaction according to Baron and Kenny (1986), but the mediating effect of psychological empowerment on the relationship between empowerment climate and individual performance was supported in accordance with the perceptions of Kenny, Kashy, and Bolger (1998, p. 260), which means that the study followed two methodologies to test its hypotheses. The criticism of the testing mediation, which relies on more than one methodology, was mentioned by Hayes (2013), who stated that studies have to follow one methodology when they test the mediation.

More recently, Fong and Snape (2015) examined the mediating effect of psychological empowerment on the relationship between empowering leadership providing information and job satisfaction, using a questionnaire survey to collect data from 266 employees and their supervisors from 41 work teams in a division of a large Hong Kong telecommunications corporation. By using the Sobel statistical test, the study found that there was evidence of significant mediation effects of psychological empowerment on the relationship between providing information by empowering leadership and job satisfaction, at both the individual and group levels. Although the study confirmed the existence of the intervening relationship represented in the significant effects of psychological empowerment, this assertion is built on the Sobel test which has been

criticized, or has a major flaw. It requires the assumption that the sampling distribution of the indirect effect is normal, whereas this sampling tends to be asymmetric, with nonzero skewness and kurtosis (Bollen & Stine, 1990; Stone & Sobel, 1990; Hayes, 2009).

Research on the motivational effect has explored the impact of management accounting systems/PMS on intrinsic task motivation, referred to as psychological empowerment. Few studies have addressed the relationship between management accounting systems/PMS and their outcomes (job satisfaction and managerial performance) through psychological empowerment. For instance, Drake, Wong, and Salter (2007) conducted experiment to examine how particular types of performance feedback and performance-based rewards influence performance, through three dimensions of psychological empowerment. The study used a questionnaire survey of 125 undergraduate students who were randomly assigned to one of the six experimental conditions at a large Midwestern university in the USA. The results suggest that there were different effects of feedback and rewards on the dimensions of empowerment for lower-level workers than they were for managers. Namely, performance feedback had a positive relationship with only one dimension and performance-based rewards were negatively related to two out of the three dimensions. Furthermore, overall motivation had an insignificant relationship with two of the three empowerment dimensions. The study has implications associated with techniques that work to increase managers' perceptions of empowerment that may not act at lower organisational levels, and even if successful, the related increase in worker motivation may be insignificant.

Hall (2008) examined how comprehensive PMS affect managerial performance. He suggested that the comprehensive PMS have an indirect effect on managerial performance through the mediating variable of psychological empowerment. The study used a questionnaire survey to collect the data from 83 strategic business unit managers in Australian manufacturing companies. The results pointed out that comprehensive PMS has an indirectly positive relationship on managerial performance through the intervening variable of psychological empowerment. The finding highlights the role of the motivational mechanism in explaining the effect of management accounting systems on managerial performance. Particularly, the results illustrated that comprehensive PMS affect managers' motivation, which, in turn, impact managerial performance.

Hall and Smith (2009) investigated the effect of empowerment as a moderating variable on the relationships between leader–member exchange (LMX) quality and job satisfaction, as well as the job performance of supervisors. The study collected the data by questionnaire survey from two samples; the first was 244 alumni from a private Midwestern university and the second was from 158 full-time employees who required interacting with their supervisors to effectively complete all aspects of their jobs at a state agency. The results provided evidence that in general, empowerment has a moderating effect on the relationships between LMX and job outcomes, but the study illustrated that when empowerment was lacking, the LMX relationship became more vital.

More recently, Mahama and Cheng (2013) have examined whether and how managers' enabling perceptions of their costing systems affect their performance. The study assumed that managers who perceive their costing systems as more enabling will have higher levels of performance, and this relationship occurs through the intensity with which the costing system is used, as well as the level of psychological empowerment experienced by the managers. The writers used a questionnaire survey of 474 middle-level managers from a cross-section of companies listed on the Australian Stock Exchange and analysed the responses using a PLS model. Overall, the results supported the study's assumption and particularly found that there was a positive relationship between managers' enabling perceptions and the intensity with which the costing system is used. The intensity of use has relationships with all four dimensions of PE (meaning, competence, self-determination and impact). Finally, the relationship between the intensity of use and performance was indirectly through the competence dimension of psychological empowerment. Although the study did not explain intervening relationships explicitly and its types or strength (low, medium and strong), it extends prior research on management accounting systems and adds to our understanding of the role managers' perceptions play in improving these systems' effectiveness.

3.3.6.3 Individual Learning as Mediating Variable

Vandenbosch and Higgins (1994) examined whether executive support systems can potentially enhance learning and influence organisational performance. In particular, mental model maintenance/confirmation and building were operationalized by the

research, which investigated the effect of these two types of learning on performance. The study was conducted by the three phases of the research built upon each other. In the first phase a questionnaire survey was used on 73 senior managers who were related to nine companies from various industries, including natural resources, chemicals, banking, utilities and industrial products in Canada. In the second phase, it carried out semi-structured interviews to collect information from five or six executive users in each company, while the final phase was conducted by a questionnaire survey of 327 people from eighteen organisations in six industry groups. In the first phase, the results indicated that the relationship between learning and performance was established and it clarified that MMB was strongly related to perceptions of the influence that the executive support systems had on competitive performance, while mental model maintenance was unrelated. The second phase provided further evidence that there was a relationship between learning and performance. A more detailed investigation has been provided by 36 executives' use of and perceptions about their executive support systems, which gave concrete examples of mental model confirmation and MMB and their relationships to effectiveness and efficiency. It was established that there was a strong link between mental model maintenance and efficiency. Despite the fact that there was a limited number of mental model builders to have hindered the collection of sufficient evidence to establish a link between MMB and effectiveness, anecdotally, the link was supported. The final phase showed that there were strongly, statistically significant relationships between learning and performance, as predicted by the research model. Perceptions of mental model maintenance are linked to perceptions of improvements in organisational efficiency and perceptions of MMB are associated with perceptions of improvements in organisational effectiveness.

The study of Vandenbosch and Higgins (1995) developed a model of the relationships amongst executive support systems, teaming and performance, to describe the influence of executive support systems on perceptions of competitive performance when viewed from a learning perspective. The study also classified learning into two types; namely mental-model maintenance, which is the fit of new information into existing mental models and confirmed them and mental-model building, referring to the change of mental models to accommodate new information. Using a questionnaire survey of 73 senior managers who were related to nine companies from various industries, including natural resources, chemicals, banking, utilities and industrial products in Canada, the

research found that executive support systems use led to mental-model building which has a strong relationship with perceptions of competitive performance, but there was no link between mental-model maintenance and competitive performance. Therefore, it seems that executive support systems can and do enhance executive learning. Nonetheless, companies that embark on developing their systems based on promised gains in competitive performance should proceed cautiously.

A similar study was conducted by the same authors, Vandenbosch and Higgins (1996), to examine a model of the relationship between information acquisition and learning based on a cognitive learning perspective in the executive support systems context. The model used the same types of learning, which are mental model confirmation and building, but it was assumed that information acquisition objectives identified the type of learning. It is suggested that if the system is used to answer specific questions or solve well-defined problems, it helps to fine-tune operations and verify assumptions, which means maintaining current mental models, but if the system is used to scan information to help formulate problems and foster creativity and may be able to challenge fundamental assumptions, this implies building new mental models. Questionnaire surveys of 361 users at 18 organisations and thirty-six interviews with executive support systems users at seven additional organisations in Canada were used to develop scales to measure the constructs of the model, to offer support for its relationships. The results illustrated that the prediction of the model supports that mental model building was more likely linked to scanning than with focused search. Executive support systems have much more relationship with mental model maintenance than they do with mental model building. Without a clear focus on learning, particularly mental model building, the system resulted in business as usual, which is the more likely outcome.

Choe (2004a) empirically investigated and determined specific types of management accounting information, as well as conditions of learning facilitators (the interaction and communication amongst functions, as well as job rotation and experience), to foster effective organisational learning in companies that have high levels of advanced manufacturing technology (AMT). More specifically the study examined the effects of the level of AMT and the amount of management accounting information (i.e. planning and control information and non-financial performance information) on organisational

learning, which in turn is reflected in production performance. There are some of the management literature related to learning is consonant with the concepts of mental model maintenance and mental model building. For example, Argyris and Schon (1978) distinguish between single-loop and double-loop; Senge (2006) divided learning into adaptive (learning to cope) and generative (learning to create), as well as March (1991) who differentiates learning into two types, which are the exploitation of old certainties and the exploration of new possibilities. However, the degree of learning was differently measured by Choe (2004a) who used the degree of change in mental models and the changes in the organisational paradigm as surrogate measures for the degree of learning. A questionnaire survey was used to collect the data from 93 chief production managers, or plant managers, in Korean manufacturing firms. Using the structural equation model, the empirical results indicated that the AMT level has a significant positive relationship with the amount of information provided by management accounting information systems. There were also significant positive relationships among the amount of information, degree of organisational learning and production performance. The findings mentioned that under a high level of AMT, which led to raising a high degree of learning and consequently an increase of performance through a large amount of information, which was provided by MASs (i.e. planning and control information and non-financial performance information) and also that facilitators of learning must be well coordinated (i.e. highly utilized).

Schäffer and Steiners (2004) analysed the relationship between the use of management accounting information, individual learning and organisational performance. They collected the data by using a questionnaire survey of 449 CEOs at German manufacturing companies with 100 to 2,000 employees. The study developed several hypotheses which concerned the relationship between the use of management accounting information, individual learning and organisational performance. It has argued that there were different types of information use (decision-making, monitoring and scanning) that have different influence(s) on the form of learning, which were mental model confirmation and/or MMB. It is further suggested that the use of management accounting information has both directly and indirectly a positive impact on organisational performance, through the aforementioned learning processes (mental model maintenance and mental model building). These hypotheses have been examined by using the structural equation model (LISREL) and the findings pointed out that there

different types of management accounting information use have different effects on the mental model maintenance and mental model building of CEOs, which in turn impact organisational performance.

The study of Capelo and Dias (2009a) aimed to be a contribution to a theoretical model which explains the effectiveness of the learning processes and decision-making from a feedback and mental models' perspective. Managers could achieve long-term success when they have appropriate mental models to be able to improve their capacity for dealing with dynamically complex contexts. It is also explored if mental models have two roles in terms of structure and behaviour under controlled conditions. Under a simulation-based experiment, the study collected the data from 73 subjects in ISCTE (a business graduate school in Lisbon) and at Galp Energia, a Portuguese oil company in Portugal. Based on a simulation experiment, the results showed that there were positive influences between causal diagramming and mental model structure similarity, which in turn had positive influences on mental model behaviour similarity and that the latter positively influences the quality of the decision.

Capelo and Dias (2009b) tried to improve a theoretical model which clarifies the effectiveness of the balanced scorecard perspective, via a system dynamics and feedback learning approach. It is assumed that a better understanding of context has been led by the balanced scorecard, which allowed managers to externalise and update their mental models. The study formulated a diversity of hypotheses about the impact of the balanced scorecard system on mental models and performance and tested them by using a system dynamics model based on a simulation experiment. The data was collected from14 undergraduate students from ISCTE (a business graduate school in Lisbon) and 59 managers in Galp Energia (one of the largest Portuguese oil companies). Three types of parameters: financial indicators, balanced scorecard indicators and balanced scorecard indicators with the aid of a strategy map review, were included in this experiment. Two out of them were confirmed. It was concluded that there was a positive influence of a strategy map review on mental model similarity, which in turn impacts performance.

Gary and Wood (2011) concentrated on the role of managerial cognition which was a source of heterogeneity in company strategies and performance. Differences in decision rules and performance were linked to differences in mental models in a management

simulation. The study was conducted using a computer-based simulation, by collecting the data from 63 MBA students with no previous experience of the management simulation as criteria to participate. The findings indicated that more accurate mental models have led to better decision rules and higher performance. Moreover, decision makers do not require accurate knowledge of the entire business environment, but precise mental models of the main principles are sufficient to accomplish superior performance. There is a fundamental assumption in much of strategic management, which suggests that managers who have a richer understanding about organisational capabilities and the dynamics of industry structure can enhance the performance of their companies. The study has empirical evidence which supported this assumption and illustrated that differences in mental models' assistance clarify ex ante why managers and companies adopt different strategies and accomplish different levels of competitive success.

Hall (2011) investigated whether and how the learning process helps to explain how comprehensive PMS influence individual performance. Despite the fact that previous studies (Burney & Widener, 2007; Hall, 2008; Burney, Henle, & Widener, 2009) concentrated on the important role of particular cognitive and motivational mechanisms, such as role clarity and organisational justice, they do not consider how comprehensive PMS can improve performance by helping individuals to update their mental models and develop learning capabilities. As such, this study examined the influence of comprehensive PMS on two types of managerial (individual level) learning (mental model confirmation and mental model building), which in turn affect managers' performance. The study used a questionnaire survey to collect data from 83 strategic business units (SBU) managers within large Australian manufacturing organisations. Results showed that more comprehensive PMS help to confirm managers' mental models. In contrast, results have shown that more comprehensive PMS can help to build managers' new mental models, but only in specific settings, that is, for managers with a short organisational tenure and/or from a small-sized strategic business unit. Importantly, the findings also illustrated that both MMC and MMB have positive relationships with managers' performance.

3.3.6.4 Comparison

Due to the inconsistent results of direct and interacting relationship models, authors focused on the intervening or mediating relationship models. These models were used to explain the relationship between the provision information by information systems and individual performance through mediating roles of role clarity, psychological empowerment and individual learning.

With regard to role clarity, most of these studies aimed at identifying and examining the relationship between comprehensive PMS and outcome variables, although the adoption of the role theory approach was not explicitly acknowledged in some of these studies. All studies adopted a questionnaire survey as the dominant method to gather research data. Further, comprehensive PMS, role clarity/ role ambiguity and managerial performance were the most frequent factors that have been investigated in the previous studies of role clarity.

The psychological empowerment theory was the dominant approach used by the empirical studies related to psychological empowerment to investigate the relationships between variables. On the other hand, most of the empirical studies reviewed above adopted (Spreitzer, 1995b) perspective to measure psychological empowerment dimensions. Most studies used a questionnaire survey to collect their data. Moreover, the results from most previous studies were consistent. For instance, the importance of access to information and feedback from work are antecedent and have a positive relationship with psychological empowerment, which in turn affects performance (e.g. Spreitzer, 1995a; Spreitzer, 1995b, 1996; Gagné et al., 1997; Liden et al., 2000; Hall, 2008; Mahama & Cheng, 2013).

In individual learning studies, most previous studies adopted, and adapted in some occasions, Vandenbosch and Higgins (1994) instrument to capture individual learning (mental model confirmation and mental model building). Most of these studies aimed at identifying and examining the relationship between the information system and outcome variables, although the adoption of the mental model theory approach was not explicitly acknowledged in some of these studies. Moreover, mental model confirmation, mental model building and performance were the most frequent variables that have been examined in the previous studies. Furthermore, the mediation role of the examined

variables, which were the mental model confirmation and mental model building variable(s), was recognised in a few of these studies. Most of the reviewed studies were based on the direct relationship model. The questionnaire survey, as the quantitative method, was the dominant method employed to gather research data.

3.3.6.5 Limitations of Previous Studies

• Apart from the study by Hall (2008), the other studies reviewed above adopted and tested one single mediating variable (role clarity/role ambiguity), despite the fact that there are other elements that may mediate the relationship between variables in their models that were not included. In this study, four variables are investigated and examined collectively and individually as mediators.

• The above studies adopted the causal step approach (Baron & Kenny, 1986) to test the mediating relationship model, but they did not follow the steps of the approach that start with testing total relationship, which means that if there is significant total relationship a study can continue to examine the other steps, but in most studies reviewed above, however, there is no significant total relationship found, yet the studies continue testing the other steps. Therefore, this is contrary to the causal step approach. This research adopted a modern mediation analysis, as practised in the 21st century.

• Most of the studies concentrate on the full and partial mediating approach to describe the mediating effect, despite the criticism against this approach and none of these studies reviewed above addressed the effect size measures, as is being attempted in the present study.

• Apart from the study of Lau (2011), none of the previous studies compared between the effects of financial and non-financial performance measures on their outcomes, and even though the study of Lau (2011) compared between the two types of measures, it only adopted the breadth dimension to measure the comprehensiveness of the system and neglected the other two dimensions. Moreover, although the study had adopted the causal steps approach of Baron and Kenny (1986), it did not follow the same steps offered by the approach and did not test the first key step of the approach, which is total relationship and also instead of using a regression test, it

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used the correlation test, which does not specify the direction of the relationship. Therefore, this study tried to identify the different effects of both financial and non-financial performance measures and rewards on job satisfaction and managerial performance, on cognitive and motivational variables and on job satisfaction and managerial performance through cognitive and motivational variables.

- There are several methodologies used to examine mediating relationships. However, though some studies (e.g. Spreitzer, 1995b; Gagné et al., 1997) tested the mediating relationship model, they have not shown the method used to test this model.

- Some studies, for example those of (Spreitzer, 1995a, 1995b, 1996), used the same sample to test their models, which affects the generalization results.

- Some studies which have addressed a mediating relationship model, do not have a clear methodology to test the mediation. For example, the causal steps approach requires four steps to test the mediator, starting with testing the main relationship (between the independent and dependent variables) and which must be statistically significant to continue testing the rest of the steps. Although these studies had found that the main relationship was not significant, they tested other steps.

- Lack of accounting studies that are concerned with the mediating effects of the cognitive and motivational mechanisms (i.e. psychological empowerment) between management accounting elements and the outcomes.

- Despite criticism of the descriptive interpretation of mediation (partially full mediation and mediation), the above reviewed studies were based on this interpretation and neglected the quantitative interpretation of the mediating effects (small, medium and large). However, much research has been recommended by for example the National Center for Education Statistics (NCES, 2003), the International Committee of Medical Journal Editors (via the Consolidated Standard of Reporting Trials, (Moher et al., 2010) and the American Educational Research Association (AERA, 2006).

- None of the aforementioned reviewed studies have compared the financial performance measures with non-financial performance measures in relation to managerial performance and job satisfaction through psychological empowerment, as is being attempted in the present study.

- The study conducted by Vandenbosch and Higginsd (2004) indicated that executive support systems are designed to provide top management with high-quality information in a form that is easy to access, easy to use and relevant to decision making. This study tried to examine the potential effects of these mentioned systems on the learning process. It did not include executive support systems in its model and only focused on testing and analysing simple, direct relationships, despite the role of these systems in the learning process and the complexity of the surrounding environment that assumes overlapping events and relationships.

- Some studies (e.g. Hall 2011) that presumed the mediating relationship model, but actually tested the direct and interacting relationship model and incorrectly tried to look for consistency or to contrast the findings with other studies that tested for mediation.

- None of the reviewed studies examined the mediating role of other variables on the relationship between PMS and the outcome variable (e.g. job satisfaction, performance). However, the studies were restricted to limited learning variables. Hence the need to look at a broader set of variables to properly examine these relationships.

The above detailed review of the literature has helped not only in encapsulating the various facets of the current study's research problem but also in designing its theoretical model in the formulation of its hypotheses. Both the theoretical model and the hypotheses are presented and explained in detail in the next chapter.

Table 3.2 Summary of Studies Based on Role Clarity, Psychological Empowerment and Individual Learning

No.	Author(s), year and country	Method(s) of data collection and sample characteristics	Type of the Model	Theoretical framework and variables studied
1	Hartenian et al. (1994), USA	Questionnaires/ 253 graduates who had already accepted an offer for full-time work after their graduation. Path analysis	Mediating relationship model RC, role conflict	Role theory Realism, congruence, RC, role conflict, job performance, JS, job commitment.
2	Vandenbosch and Higgins (1994), Canada	Questionnaire/73 senior managers who are related to nine companies from various industries, including natural resources, chemicals, banking, utilities and industrial products. Partial least squares	Direct relationship model	Mental model maintenance, MMB and performance.
3	Spreitzer (1995a), USA	Questionnaire/ first sample 393 middle managers from different units of a Fortune 50 organisation. A second sample composed of lower-level employees from an insurance company. It included 128 employees selected by a stratified random sampling technique. Hierarchical regression.	Direct relationship model	Locus of control, self-esteem, access to information, reward, PE, social desirability, stability across time, managerial effectiveness and innovation.
4	Spreitzer (1995b), USA	Questionnaire/ 324 middle managers from different units of a Fortune 50 organisation. Structural equation model.	Mediating relationship model PE	Locus of control, self-esteem, access to information, reward, PE, social desirability, stability across time, managerial effectiveness and innovation.
5	Vandenbosch and Higgins (1995), Canada	Questionnaire/73 senior managers who are related to nine companies from various industries, including natural resources, chemicals, banking, utilities and industrial products. Partial least squares.	Direct relationship model	Ease of use, technical quality, information value, analysis capability, self-efficacy, mental model maintenance, MMB and competitive performance.
6	Schiff and Hoffman (1996) USA	Experiment/ 51cases on finance and operations executives in a large retail organisation. MANOVA, T-test, Pearson correlation	Direct relationship model	Use of financial performance measures, non-financial performance measures and performance.
7	Spreitzer (1996), U.S.	Questionnaire/ 393 middle managers from different units of a Fortune 50 organisation. Multiple Regression.	Mediating relationship model PE	Socio-political support, work climate, role ambiguity, access to resources, PE, access to information, , managerial effectiveness, and innovation
8	Spreitzer et al. (1997), USA	Questionnaire/ first sample of 393 middle managers from different units of a Fortune 50 organisation. A second sample composed of lower-level employees from an insurance company. It included 128 employees selected by a stratified random sampling technique. OLS regression	Direct relationship model	PE, managerial effectiveness, JS and job strain.
9	Gagné et al. (1997), Canada	Questionnaire/ 157 technical and telemarketing employees. A path analysis test.	Mediating relationship model PE	Feedback from agent, feedback from job, autonomy support, PE and intrinsic motivation.

10	Scott and Tiessen (1999a), USA	Questionnaires/ 248 managerial teams from the twelve for-profit sector organisations and 15 not-for-profit sector organisations - not random. Path analysis model	Direct relationship model	Organisational theory, economic theory and equity theory. Complexity, the proportion of a respondent's involvement in teams, diversity of team performance measurement, participation, the weight given team performance in setting compensation and team performance.
11	Banker et al. (2000), USA	Using time-series data for 72 months from 18 hotels managed by a hospitality firm. OLS regression, t-statistics	Direct relationship model	No theory Financial performance measures, non-financial performance measures and performance.
12	Hoque and James (2000), Australia	Questionnaires/mailed to 66 chief financial controllers of Australian manufacturing companies. Pearson correlation coefficients, multiple regression and ANOVA	Interacting relationship model	Contingency theory Organisation size, product life-cycle stage, strength of market position, balanced scorecard usage and organisational performance
13	Siegall and Gardner (2000), USA	Questionnaire/ 203 lower level manufacturing employees. a stepwise regression.	Direct relationship model	Communication with supervisor, general relations with company, teamwork, concern for performance.
14	Liden et al. (2000), USA	Questionnaire/ 337 lower-level service company employees. Regression.	Mediating relationship model PE	Job characteristics, leader-member exchange, team-member exchange, PE, work satisfaction, organisational commitment and job performance.
15	Viator (2001), USA	Questionnaires/ 3000 CPAs in large public accounting firms (senior accountants, managers and senior managers). Structural equation model.	Moderating relationship model employee organisational level and gender	Role theory and mentoring theory Role ambiguity, role conflict, perceived environmental uncertainty, job performance, turnover intentions, mentoring functions.
16	Laschinger et al. (2001), Canada	Questionnaire/ 404 Canadian staff nurses. Structural equation modelling	Mediating relationship model PE	Structural empowerment, PE, job strain and work satisfaction.
17	Ittner, Larcker, and Meyer (2003), USA	Archival financial / employee survey data (95 branches in one firm) from the North American retail banking operations of Global Financial Services, a leading international financial services provider. Stepwise regression.	Direct relationship model	Agency theory Use of financial performance measures, non-financial performance measures and performance.
18	Davis and Albright (2004), USA	Quasi-experimental/ 9 branches of a banking organisation located in the southeastern United States. Non- random longitudinal approach. T-tests, nonparametric Wilcoxon tests and ANOVA.	Direct relationship model	The effect of balanced scorecard implementation (use of non-financial performance measures) and financial performance.
19	Braam and Nijssen (2004), Netherlands	Questionnaires/41 controllers and/or heads of the financial departments of the company and other data taken from a database of business-to-business companies. Hierarchical regression.	Interacting relationship model	Implicitly contingency theory Product-Market Dynamics, strategy, level of use, Comprehensive Measurement Use and performance.

20	Laschinger et al. (2004) , Canada	Questionnaire/185 randomly selected staff nurses from the College of Nurses of Ontario registry list. Ordinary least square.	Mediating relationship model PE	Opportunity, information support, resources, formal power, informal power, PE and satisfaction.
21	Seibert et al. (2004), USA	Questionnaire/301 employees in one division of a Fortune 100 manufacturer of high-technology office and printing equipment located in the north eastern United States. ANOVA and Hierarchical regression.	Mediating relationship model PE	PE theory Empowerment climate, PE, work-unit performance, individual performance and JS.
22	Choe (2004a), Korea	Questionnaire/93 chief production managers, or plant managers, from Korean manufacturing firms.	Direct relationship model	Planning and control information, Non-financial performance information, change of shared mental models, organisational change, interaction and communication, job rotation and experience and production performance.
23	Schäffer and Steiners (2004), Germany	Questionnaire/ 449 chief executive officers from German manufacturing companies with 100 to 2,000 employees.	Mediating relationship model	Decision-making, monitoring, scanning, mental model maintenance, MMB, efficiency, effectiveness, adaptiveness and financial performance.
24	Burney and Widener (2007), USA	Questionnaires/1,524 individuals who were Institute of Management Accountants (IMA) members and whose job title were manager or above.	Mediating relationship model. Job-relevant information and role ambiguity Moderating model The evaluation process, the complexity of the Strategic PMS and experience	Role theory Strategic PMS, job-relevant information, role ambiguity, role conflict, manager performance.
25	Drake et al. (2007), USA	Questionnaire/125 students participated in the study and were randomly assigned to one of the six experimental conditions.	Direct relationship model	Self-esteem, feedback, reward, PE, motivation and performance.
26	Hall (2008), Australia	Questionnaires/ 83 strategic business unit (SBU) managers, within large Australian manufacturing organisations. Partial least squares.	Mediating relationship model PE and RC	Role Theory and PE theory Comprehensive PMS, PE, RC, and MP.
27	Cadez and Guilding (2008), Slovenia	Interviews and questionnaires/193 large Slovenian companies from the Slovenian Chamber of Commerce and Trade. Structural equation modelling.	Mediating relationship model Strategic management accounting usage	Contingency theory Strategy type prospector/defender, deliberate strategy formulation, market orientation, company size, accountants' participation in strategic decision making processes, strategic management accounting usage and performance.

28	Hall and Smith (2009), Australia	Questionnaire/490 participants of accountants below partner level working in Australian public accounting firms. Seven firms (one Big 4 firm and six middle-tier firms).	Mediating relationship model Procedural justice, affective organisational commitment, PE	Psychosocial support, career development support, procedural justice, affective organisational commitment, PE, JS and organisational turnover intentions.
29	Capelo and Dias (2009a), Portugal	A simulation-based experiment /73 subjects in ISCTE (a business graduate school in Lisbon) and at Galp Energia, a Portuguese oil company.	Direct relationship model	Level of feedback information, level of systems thinking facilitation, mental model structure similarity, mental model behaviour similarity and performance.
30	Capelo and Dias (2009b), Portugal	14 undergraduate students from ISCTE (a business graduate school in Lisbon) and 59 managers in Galp Energia (one of the largest Portuguese oil companies).	Mediating model Mental model similarity	Level of Balanced Scorecard, level of strategy map, mental model similarity and performance.
31	Hartmann et al. (2010), Netherlands	Questionnaires/250 responsibility centre managers selected across functional areas and positions in the organisational hierarchy, including line and staff managers from eleven organisations and of a single (Dutch) nationality. Partial least squares.	Mediating relationship model use of objective and subjective performance measures	Goal theory Initiating structure leadership style, consideration leadership style, use of objective performance measures, use of subjective performance measures, goal clarity, evaluation fairness, JS.
32	Burkert et al. (2011), German	Questionnaires/ 456 managers of German companies. Structural equation model.	Mediating relationship model. Role ambiguity, role conflict. Moderating model hierarchical level	Role theory Application of the controllability principle, trust, hierarchical level, role ambiguity, role conflict, MP.
33	Lau (2011), Australia	Questionnaires/ Based on a sample of 121 managers or departmental heads in large Australian manufacturing organisations listed in Jobson's Year Book of Public Companies. Sobel test	Mediating relationship model RC	Goal theory and role theory Financial Measures, nonfinancial measures, RC and MP.
34	Hall (2011), Australia	Questionnaire/ 83 strategic business unit (SBU) managers within large Australian manufacturing organisations. Partial least squares.	Moderating model SBU size Organisational tenure	Comprehensive PMS, SBU size, organisational tenure, MMC, MMB and MP.
35	Gary and Wood (2011)	Computer-based simulation / 63 MBA students with no previous experience on the management simulation in order to participate.	Direct relationship model	Performance, mental model accuracy, mental model accuracy of the deep structure.
36	Chung et al. (2012), Taiwan	Questionnaires/ Data were collected from publicly-listed electronics manufacturing companies in Taiwan, based on both113 marketing managers and 95 production managers. Path analysis	Mediating relationship model Role ambiguity Moderating model Production-oriented context Marketing-oriented context	Broad scope management accounting system (MAS), role ambiguity, MP.

37	Miao and Evans (2012), USA	Questionnaires/ 223 sales managers on a random name list of 1561 industrial sales managers within SIC codes 20–39 which were obtained from a leading list broker in the U.S.	Mediating relationship model Role ambiguity	Expectancy theory and cognitive evaluation theory Outcome control, capability control, activity control, salesperson knowledge, salesperson performance, role ambiguity, intrinsic motivation, extrinsic motivation, selling effort.
38	Hammad et al. (2013), Egypt	Questionnaires/ 200 heads of departments or clinical units of 50 selected Egyptian hospitals. Partial least squares test.	Direct relationship model	Contingency theory Organisational structural, perceived environmental uncertainty, MAS information and MP.
39	Din and Yatim (2013), Slovenia	Questionnaires/ 193 large Slovenian companies. A structural equation modelling.	Mediating relationship model The use of PMS	Budget Participation, the use of PMS and MP.
40	Salmon (2013), Australia	Questionnaires/ 108 managers in Australian manufacturing organisations. Ordinary least-squares regression	Mediating relationship model Role ambiguity	Information processing theory and role theory. Integrative management accounting information, role ambiguity and MP.
41	Mahama and Cheng (2013), Australia	Questionnaire/474 managers from a cross-section of companies listed on the Australian Stock Exchange.	Mediating relationship model, Intensity of use and PE	Enabling perceptions of costing systems, intensity of use, PE and task performance.
42	Fong and Snape (2015), Hong Kong	Questionnaire/266 employees and their supervisors from 41 work teams in a division of a large Hong Kong telecommunications corporation. Sobel test	Mediating model PE	Unit-level empowering leadership, individual-level empowering leadership, PE, employee attitudes and behaviours.

Comprehensive PMS = Comprehensive Performance Measurement System; RC= Role Clarity; PE = Psychological Empowerment; MMC = Mental Model Confirmation; MMB = Mental Model Building; JS = Job Satisfaction; MP = Managerial Performance

3.4 Summary and Conclusion

This chapter has offered reviews of two streams of relevant empirical research: one that deals with the relationship between reliance on accounting performance measures and outcome variables paying particular attention to direct, interacting/moderating and intervening/mediating relationship models, the other concerned with the relationship between the comprehensive PMS variable and outcome variables through cognitive and motivational mechanisms (psychological empowerment, role clarity and individual learning).

In reliance on accounting performance measures and budgetary participation relationships, studies were grouped into three categories according to their relationship with the outcomes, and therefore reliance on accounting performance measures was the most popular classification of PMS in the past period. Furthermore, budgetary participation was one of the most important evaluation systems in the prior reviewed studies. In these studies, there were some interacting/moderating variables and intervening/mediating variables have also been investigated.

Similarly, three categories of intervening variable studies were reviewed, including role clarity, psychological empowerment and individual learning. In addition, breadth was the most widely cited dimension, used in comprehensive PMS studies and which neglected the other two dimensions. In these studies, role clarity, psychological empowerment and individual learning were the most mediating variables that have been found in the investigated relationships.

This and the previous chapter have provided detailed reviews of various strands of relevant literature that have helped define the current study's research problem, its objectives and questions and construct its theoretical model. The next chapter will present research hypotheses, philosophy, instruments and methodology.

Chapter 4 Research Methodology

4.1 Introduction

The overall design of this research which was outlined in Chapter One is to examine the relationship between PMS and managerial performance in large and medium-sized manufacturing companies in Libya.

This chapter presents the research theoretical model in detail (Section 4.2), followed by research objectives (Section 4.3), questions (Section 4.4), research hypotheses (Section 4.5) and the research philosophy (Section 4.6). The next four sections present the specific research methods and procedures to collect the research data (Section 4.7), followed by research type (Section 4.8), data collection methods (Section 4.9) and research population and sample (Section 4.10). Section 4.11 then explains in detail the questionnaire construction and pre-testing. This is followed by content and sources of the final version of the questionnaire (Section 4.12), questionnaire administration (Section 4.13), validity and reliability (Section 4.14) and methods used in the data analysis (Section 4.15). Section 4.16 concludes the chapter.

4.2 Research Theoretical Model

Figures 4.1 below depicts the research theoretical model, taking into consideration the model's comprehensive PMS, financial/ non-financial performance measures and reward variables, and in addition to the direct/indirect relationships, the relationship between these variables and its outcomes through cognitive and motivational factors. H1 to H18 refer to the study's research hypotheses (see Section 4.5).

Figure 4.1 Research Theoretical Model
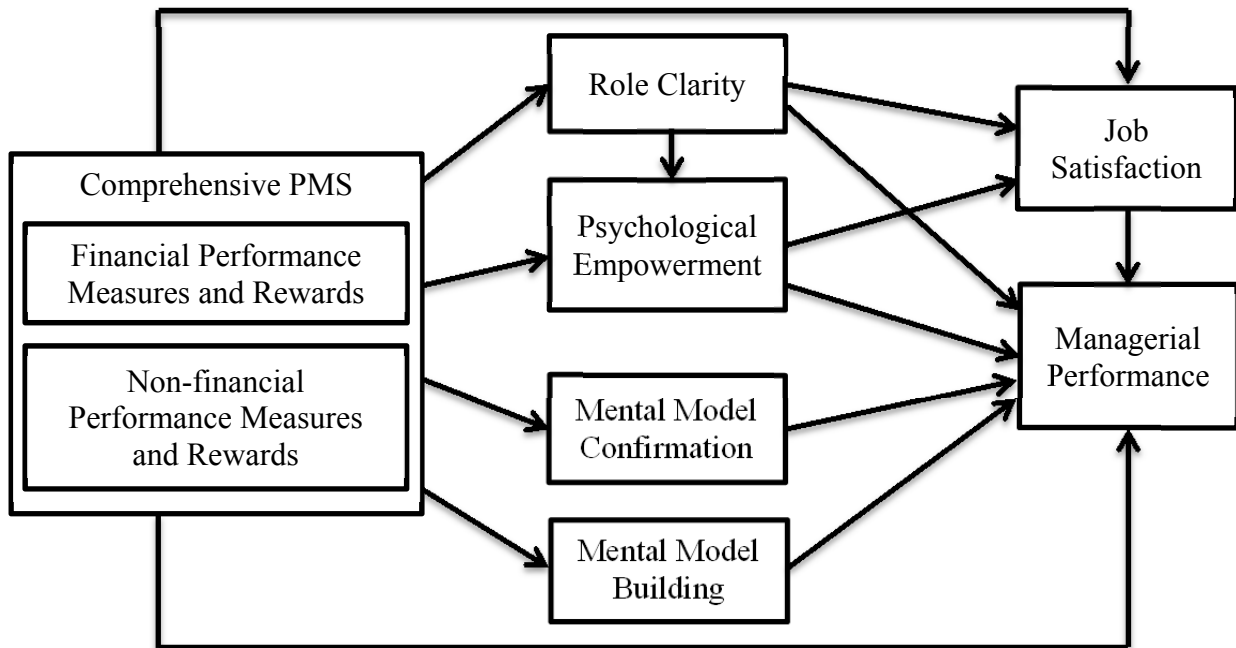
4.3 Research Objectives

As mentioned in Chapter One, the main aim of this research is to investigate the role of cognitive and motivational factors in explaining the relationship between comprehensive PMS and its outcomes (job satisfaction and managerial performance) in large and medium-sized manufacturing companies in Libya.

The study's research objectives were introduced in Chapter One and are reproduced below:

1. To describe the comprehensiveness of PMS, the importance of financial and non-financial performance measures and rewards, levels of role clarity, levels of psychological empowerment and types of individual learning in SBUs at manufacturing companies in Libya.

2. To propose and empirically test a research model by identifying the direct and indirect relationships between comprehensive PMS and individual outcomes, through cognitive and motivational factors in SBUs at manufacturing companies in Libya.

3. To investigate the relationship between role clarity and psychological empowerment in SBUs at manufacturing companies in Libya.

4. To investigate the relationship between job satisfaction and managerial performance in SBUs at manufacturing companies in Libya.

5. To examine the differences between financial and non-financial performance measures and rewards used in terms of direct relationships to the individual outcomes and indirectly through the cognitive and motivational factors in SBUs at manufacturing companies in Libya.

4.4 Research Questions

The research questions which were outlined in Chapter One are presented in full below:

1. What is the comprehensiveness of PMS, the importance of financial and non-financial performance measures and rewards (FPMR and NFPMR) used in SBUs at manufacturing companies in Libya?

2. Are there any direct or indirect relationships between comprehensive PMS and individual outcomes, through cognitive and motivational factors in SBUs at manufacturing companies in Libya?

   (a) Do comprehensive PMS impact job satisfaction in SBUs at manufacturing companies in Libya?

   (b) Do comprehensive PMS impact managerial performance in SBUs at manufacturing companies in Libya?

   (c) Do cognitive and motivational factors (role clarity and psychological empowerment) have mediating effects on the relationship between comprehensive PMS and job satisfaction in SBUs at manufacturing companies in Libya?

   (d) Does role clarity have mediating effects on the relationship between comprehensive PMS and job satisfaction in SBUs at manufacturing companies in Libya?

   (e) Does psychological empowerment have mediating effects on the relationship between comprehensive PMS and job satisfaction in SBUs at manufacturing companies in Libya?

   (f) Do cognitive and motivational factors (role clarity, psychological empowerment, mental model confirmation and mental model building) have mediating effects on the relationship between comprehensive PMS and managerial performance in SBUs at manufacturing companies in Libya?

   (g) Does role clarity have mediating effects on the relationship between comprehensive PMS and managerial performance in SBUs at manufacturing companies in Libya?

   (h) Does psychological empowerment have mediating effects on the relationship between comprehensive PMS and managerial performance in SBUs at manufacturing companies in Libya?

   (i) Does MMC have mediating effects on the relationship between comprehensive PMS and managerial performance in SBUs at manufacturing companies in Libya?

(j) Does MMB have mediating effects on the relationship between comprehensive PMS and managerial performance in SBUs at manufacturing companies in Libya?

3. Does role clarity affect psychological empowerment in SBUs at manufacturing companies in Libya?

4. Does job satisfaction affect managerial performance in SBUs at manufacturing companies in Libya?

5. Are there any differences between using FPMR and NFPMR directly in relation to the job satisfaction and managerial performance and indirectly through cognitive and motivational factors in SBUs at manufacturing companies in Libya?

   (a) Are there any differences between using FPMR and NFPMR in relation to job satisfaction in SBUs at manufacturing companies in Libya?

   (b) Are there any differences between using FPMR and NFPMR in relation to managerial performance in SBUs at manufacturing companies in Libya?

   (c) Are there any differences between the mediation role of role clarity amongst FPMR and NFPMR in relation to job satisfaction in SBUs at manufacturing companies in Libya?

   (d) Are there any differences between the mediation role of role clarity amongst FPMR and NFPMR in relation to job satisfaction in SBUs at manufacturing companies in Libya?

   (e) Are there any differences between the mediation role of psychological empowerment amongst FPMR and NFPMR in relation to job satisfaction?

   (f) Are there any differences between the mediation role of psychological empowerment amongst FPMR and NFPMR in relation to managerial performance in SBUs at manufacturing companies in Libya?

   (g) Are there any differences between the mediation role of MMC amongst FPMR and NFPMR in relation to managerial performance in SBUs at manufacturing companies in Libya?

   (h) Are there any differences between the mediation role of MMB amongst FPMR and NFPMR in relation to managerial performance in SBUs at manufacturing companies in Libya?

4.5 Research Hypotheses

Based on the review of the relevant literature of MAS/PMS (see Chapters Two and Three) and the resulting research objectives and questions, eighteen hypotheses have been formulated for this study. Table 4.1 below summarises the hypotheses into two main groups and several subgroups to link these hypotheses to the research objectives and questions. To substantiate each of the hypotheses, essential components, as discussed in the literature review (see Chapters Two and Three), are provided in the sections below.

Table 4.1 Links between Research Hypotheses, Objectives and Question

Hypotheses groups	Objective(s)	Question(s)
A. Comprehensive PMS Relationships		
1. Direct Relationship of Comprehensive PMS		
Hypothesis 1	2	2, a
Hypothesis 2	2	2, b
2. Mediating Role of Role Clarity		
Hypothesis 3	2	2, c, d
Hypothesis 4	2	2, f, g
3. Mediating Role of Psychological Empowerment		
Hypothesis 5	2	2, c, e
Hypothesis 6	2	2, f, h
4. Direct Relationship between Role Clarity and Psychological Empowerment		
Hypothesis 7	3	3
5. Direct Relationship between Job Satisfaction and Managerial Performance		
Hypothesis 8	4	4
6. Mediating Role of Mental Model Confirmation		
Hypothesis 9	2	2, f, i
7. Mediating Role of Mental Model Building		
Hypothesis 10	2	2, f, j
B. Comparing between Financial/ Non-financial Performance Measures and Rewards' Relationships		
1. Comparing the Direct Effects of Financial/ Non-financial Performance Measures and Rewards on Job Satisfaction and Managerial Performance		
Hypothesis 11	5	5, a
Hypothesis 12	5	5, b
2. Comparing the Indirect Effects of Financial/ Non-financial Performance Measures and Rewards on Job Satisfaction and Managerial Performance through Role Clarity		
Hypothesis 13	5	5, c
Hypothesis 14	5	5, d
3. Comparing the Indirect Effects of Financial/ Non-financial Performance Measures and Rewards on Job Satisfaction and Managerial Performance through Psychological Empowerment		
Hypothesis 15	5	5, e
Hypothesis 16	5	5, f
4. Comparing the Indirect Effects of Financial/ Non-financial Performance Measures and Rewards on Managerial Performance through Mental Model Confirmation		
Hypothesis 17	5	5, g
5. Comparing the Indirect Effects of Financial/ Non-financial Performance Measures and Rewards on Managerial Performance through Mental Model Building		
Hypothesis 18	5	5, h

4.5.1 Comprehensive PMS Relationships:

4.5.1.1 Direct Relationship between Comprehensive PMS and Job Satisfaction

Many studies have addressed the relationship between financial performance measures and job satisfaction and most of them found positive effects of budgetary participation on job satisfaction (Cherrington & Cherrington, 1973; Milani, 1975; Kenis, 1979; Chenhall & Brownell, 1988). For example, Cherrington and Cherrington (1973) conducted an experimental session to examine the direct effects of budget participation on performance and satisfaction. They found that there were positive effects of budget participation on job satisfaction and performance. Milani (1975) also investigated the effects of budget participation on job satisfaction and managerial performance and indicated that there was a positive effect on job satisfaction. However, Chenhall and Brownell (1988) studied the relationship between budget participation and satisfaction by using the intervening relationship model and found both a direct and indirect relationship between budget participation and satisfaction. Lau and Tan (2003) showed that there was a significant positive effect of budget participation on job satisfaction among Singaporean managers. Leach-López, Stammerjohan, and Sang Lee (2009), who investigated the direct effects of budget participation on performance and the indirect effects between budget participation and performance through job satisfaction and job relevant information, were assured that there is direct relationship between budget participation and job satisfaction.

Despite the fact that much research has been done by examining the relationship between financial accounting measures and job satisfaction, few studies have addressed the relationship between comprehensive PMS and job satisfaction. For instance, Hopwood (1972) who included financial and non-financial budgetary in his study, found that the way in which measures were used was important in influencing job satisfaction and behaviour, as are the types of measures (Otley, 1978). Lau and Sholihin (2005) have argued that using multiple financial performance measurements and non-financial measures to evaluate the performance of subordinates can affect job satisfaction positively. Their study showed that both measures increased job satisfaction. Lau, Wong, and Eggleton (2008) examined whether managers' perceptions on the fairness of performance evaluation procedures has affected job satisfaction. They pointed out that procedural fairness in performance evaluation was positively linked to

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job satisfaction. More recently, Sholihin and Pike (2009) replicated Lau et al.'s model to assess the external validity of their findings, by using a very different sample of managers to investigate the potential interaction effects of fairness of performance evaluation procedures and other variables on job satisfaction. They found a strong positive relationship between the fairness of performance evaluation procedures and job satisfaction.

H1 Comprehensive PMS influence Job Satisfaction

4.5.1.2 Direct Relationship between Comprehensive PMS and Managerial Performance

Supporters of comprehensive PMS have debated that these systems can improve performance (Kaplan & Norton, 1996b). This is achieved by concentrating on the efforts to accomplish goals, placing more attention on critical processes, highlighting trade-offs to ensure better decisions and assisting managers to learn about strategies and drivers of performance (Kaplan & Norton, 1996b; Epstein & Manzoni, 1998). Psychological theories suggest that providing managers with goals and comprehensive feedback regarding their performance leads to improvements in their performance, particularly when managers obtain more information about specific goals and particular feedback regarding their efforts and performance, when they will be more motivated and perform better (Ilgen et al., 1979; Locke et al., 1981). Comprehensive PMS can offer feedback on a wide scope of performance measures to improve performance. It also helps decision makers by providing them with relevant information. Linking performance measures to strategy leads to workable measures that managers can concentrate on to enhance performance. Managers can understand cross-functional relationships when measures are integrated across the value chain, which may result in improving problem solving and decision making (Banker et al., 2004). In this context, comprehensive PMS direct decision makers and assist managers to evaluate prior decisions (Malina & Selto, 2001). Kren (1992) debated if relevant information regarding jobs can enhance performance due to the fact that it provides managers with more accurate predictions of their environmental states, which in turn grants a better understanding to managers about decision alternatives and the most effective action. He found that there was a positive relationship between job-relevant information and managerial performance. This suggests that comprehensive PMS provide relevant and specific information for decision making, leading to improved managerial performance. Moreover, Schiff and Hoffman (1996) have shown that comprehensive PMS were used

to evaluate performance. Scott and Tiessen (1999a) have examined the relationship between comprehensive PMS and performance. Their results show that the systems lead to higher performance. More recently, Davis and Albright (2004) examined the effects of comprehensive PMS on performance. The results indicated that when the system is implemented, the performance is improved. Therefore, consistent with the above discussion, this leads to H2:

H2 Comprehensive PMS influence Managerial Performance

4.5.1.3 The Intervening Role of Role Clarity on the Relationship between Comprehensive PMS and Job Satisfaction

Comprehensive PMS can increase goal and process clarity by providing managers with performance information related to strategies and operations of their organisations, to help them better understand their roles and to improve their understanding of the link between drivers and performance and the effect of managers' actions on parts of the value chain.

On the one hand, results of several previous studies (e.g. Burney & Widener, 2007; Hall, 2008; Burkert et al., 2011; Lau, 2011; Chung et al., 2012; Miao & Evans, 2012) confirmed that PMS is positively related to role clarity and negatively with role ambiguity. On the other hand, meta-analyses were conducted by Abramis (1994), who included 39 studies in his research to examine the relationship between role ambiguity and job satisfaction and found that the former is significantly and negatively related to both satisfaction and performance. He stated that the results are consistent with prior research and suggested that role ambiguity is a valid construct in organisational research and is usually associated with lower job satisfaction.

Moreover, Van Sell, Brief, and Schuler (1981) concluded that decreased role clarity has led to lower satisfaction. Fisher and Gitelson (1983) in their meta-analysis mentioned that role clarity has a significantly positive effect on satisfaction. A number of studies in the meta-analysis of Jackson and Schuler (1985) suggested that decreases in role clarity appeared to result in lower job satisfaction and performance. Regarding the effect(s) of financial performance measures on attitudes and behaviour of managers, the view that role ambiguity has a negative and mediated relationship between the measurement system and both performance and job satisfaction is supported by the extant literature. For example, Chenhall and Brownell (1988) investigated the role of cognitive

mechanisms on the relationship between budgetary participation and individuals' job satisfaction and performance. In their study, role ambiguity is used as an important cognitive variable to explain the effects of budgetary participation on both performance and job satisfaction. The authors also pointed out that budgetary participation had a negative relationship with role ambiguity, which in turn is reflected in improving performance and enhanced job satisfaction. It was found that role ambiguity has a full mediating effect on this relationship. Hartenian et al. (1994) found that the amount of feedback which individuals received on their performance (realism) has an indirect effect on job satisfaction through role clarity. Therefore, the thesis also hypothesises this intervening effect:

H3 Role Clarity has a Mediating Effect on the Relationship between Comprehensive PMS and Job Satisfaction

4.5.1.4 The Intervening Role of Psychological Empowerment on the Relationship between Comprehensive PMS and Job Satisfaction

Job satisfaction is usually the feelings owned by people about their jobs (Balzer et al., 1997; Spector, 1997). It is state of emotion that reflects affective responses to the job situation. The job characteristic model of Hackman and Oldham (1980) suggested that critical psychological states affect job satisfaction. Outcome variables were not explicitly included by Thomas and Velthouse (1990) and Conger and Kanungo (1988), who addressed the models of empowerment. Thomas and Tymon (1994) extended these models and assumed that empowerment would lead to higher levels of job satisfaction. They state that since the task assessments, according to the facets of empowerment, generate intrinsic motivation linked to the job, then these facets should have a positive relationship with job satisfaction. Spreitzer et al. (1997) found support that meaning was the strongest predictor of job satisfaction, but impact was unrelated to it. Moreover, self-determination was a significant predictor of job satisfaction only at managerial level. Liden et al. (2000) examined the relationship between job characteristics and job satisfaction through the mediating effects of empowerment. They found that meaning and competence have significant mediating effects on the relationship, but not for self-determination and impact. Seibert et al. (2004) investigated the mediating effect of psychological empowerment on the relationship between psychological climate and job satisfaction. They found evidence that psychological empowerment fully mediated the relationship between empowerment climates and job satisfaction. More recently, Fong

and Snape (2015) examined the mediating effect of psychological empowerment on the relationship between providing information by an empowering leadership and job satisfaction. They also found support that there are significant mediating effects of psychological empowerment on the relationship between empowering leadership (i.e. providing information) and job satisfaction. In keeping with the above discussion, it is hypothesised that:

H4 Psychological Empowerment has a Mediating Effect on the Relationship between Comprehensive PMS and Job Satisfaction

4.5.1.5 The Intervening Role of Role Clarity on the Relationship between Comprehensive PMS and Managerial Performance

Burney and Widener (2007) indicated that RA fully mediates the relationship between job-relevant information and managers' performance. Hall (2008) investigated the influence of comprehensive PMS on managerial performance through role clarity (focuses on role clarity instead of role ambiguity). He found that role clarity plays a fully mediated role in the relationship between comprehensive PMS and managerial performance. Similarly, Burkert and his colleagues (2011) examined the effect of PMS on managerial performance through role ambiguity as a mediator. The study showed that role ambiguity has a full mediating effect on the relationship between PMS and managerial performance.

Lau (2011) has addressed comprehensive PMS and their impact on managerial performance through role clarity. However, he studied the effects of both of two components of systems, which are the financial performance measures and the non-financial performance measures, but he found that the role clarity has a fully mediating effect on the relationships between both components and managerial performance. More recently, Chung et al. (2012) investigated whether role ambiguity mediates the relationship between broad scope management accounting systems and managerial performance. They also showed that role ambiguity completely mediated the relationship between broad scope management accounting systems and managerial performance. Miao and Evans (2012) also found that role ambiguity partially mediated the relationship between control style and performance. Therefore, the hypothesis can be stated as:

H5 Role Clarity has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance

4.5.1.6 The Intervening Role of Psychological Empowerment on the Relationship between Comprehensive PMS and Managerial Performance

Organisational systems are suggested to provide information which may enhance psychological empowerment. From the perspective of feedback theories, performance information can improve psychological empowerment by providing information about task behaviour and performance (Ilgen et al., 1979; Locke et al., 1981; Collins, 1982; Luckett & Eggleton, 1991). Particularly when managers obtain feedback about the results of their operations, their intrinsic task motivation is increased, which in turn influences their performance (Ilgen et al., 1979). In this context, there are some studies (e.g. Ilgen et al., 1979; Locke et al., 1981; Collins, 1982; Spreitzer, 1995a, 1995b, 1996; Gagné et al., 1997; Liden et al., 2000; Seibert et al., 2004) that indicated that there is a relationship between providing information, psychological empowerment and managerial performance. On one hand, some of these studies addressed the direct effects between the variables and found positive relationships between them. For example, Spreitzer (1995a) tried to know the relationship of psychological empowerment with antecedent and outcome factors. She illustrated that all four dimensions had a positive relationship with the antecedents of access to information and three of the four, except meaning, were related to self-esteem. The relationships of both dimensions (competence and impact) are statistically significantly to performance. In her later study, (1996) she used the same potential antecedents of psychological empowerment as before (1995b), but Spreitzer tried to test the relationships between social structural characteristics at the level of the work unit and feelings of empowerment. Her results mentioned a positive relationship between access to information and empowerment.

On the other hand, other studies examined the mediating effect of psychological empowerment on the relationship between providing information and managerial performance. The results of the studies were partially supported. For instance, (Spreitzer, 1995b) examined the mediating effects of psychological empowerment on the relationship between the social structural context (e.g. access to strategic information and resources) and behavioural outcomes (i.e. effectiveness). The results suggest that there is a mediating effect of psychological empowerment on the relationship between some elements of workplace social structure and innovativeness, but not effectiveness. The study of Gagné et al. (1997) assumed that the various

dimensions of empowerment would mediate the relationship between job characteristics, such as feedback and autonomy support, and intrinsic motivation at work. The study found evidence that the psychological empowerment dimension of self-determination mediated the relationship between the job characteristics and the outcome. Liden et al. (2000) have concentrated the extent to which the four dimensions of psychological empowerment have mediating effects on the relationship between job characteristics (an aggregate of task identity, task significance and feedback from work) and outcomes (i.e. job performance). The study pointed out that competence mediated the relationship between job characteristics and performance. Seibert et al. (2004) tried to examine the mediating effect of psychological empowerment on the relationship between psychological climate and individual performance. However, the result indicated that psychological empowerment mediated the relationship between empowerment climate and individual performance.

Research on the impact of management accounting systems/comprehensive PMS on managerial performance, by using the motivational mechanism, has explored the role of psychological empowerment. Few studies though (e.g. Hall, 2008; Mahama & Cheng, 2013) have addressed the relationship between management accounting systems/PMS and managerial performance through psychological empowerment. For example, Hall (2008) examined the effects of comprehensive PMS on managerial performance through psychological empowerment in Australian manufacturing companies. He pointed out that comprehensive PMS have a positive relationship with managerial performance through the intervening variable of psychological empowerment. More recently, Mahama and Cheng (2013) have examined whether and how managers' enabling perceptions of their costing systems affect managerial performance. The study assumed that managers who perceive their costing system as more enabling will have higher levels of performance, and that this relationship occurs through the level of psychological empowerment experienced by the managers. The intensity of use has relationships with all four dimensions of psychological empowerment (meaning, competence, self-determination and impact). Finally, the relationship between the intensity of use and performance was indirectly through the competence dimension of psychological empowerment. These arguments and evidence lead to: H6

H6 Psychological Empowerment has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance

4.5.1.7 Direct Relationship between Role Clarity and Psychological Empowerment

Role clarity is an important antecedent of managers' psychological empowerment. Unless there is a clear sense which managers have about their responsibilities and how to accomplish them, it would be difficult for them to recognise if they have the required skills and abilities to achieve their tasks adequately (i.e. feel empowered). It is assumed that role clarity increases all dimension of psychological empowerment (meaning, competence, self-determination and impact). Spreitzer (1996) debated that if managers understand their roles, the roles can take on personal meaning. Competence is linked by clear task requirements and clear lines of responsibility (Kahn, 1964; Conger & Kanungo, 1988; Gist & Mitchell, 1992). When managers have clear goals and understand how to accomplish them, they can perform their job with adequate skill and therefore feel more competent. Managers who confronted ambiguity in their role expectations are likely to hesitate and not take the initiative because of the ambiguity, and thus experience lower levels of self-determination (Spreitzer et al., 1997). Increasing role clarity enables managers to identify and take actions to complete their tasks, and should raise levels of self-determination. Role ambiguity is likely to make managers think they are helpless, which leads to a reduction in the impact they have in their work area (Spreitzer et al., 1997). In contrast, when managers understand their job roles, they are highly likely to take actions and decisions that impact results in their job area (Sawyer, 1992). Previous research indicated that higher levels of role ambiguity are associated with lower levels of psychological empowerment (Spreitzer, 1996; Smith & Langfield-Smith, 2003). Moreover, Hall (2008) revealed that the relationship between role clarity and psychological empowerment is partially supported. He has pointed out that goal clarity is positively linked to meaning, impact and competence. However process clarity was positively related to competence, impact and self-determination. The discussion above indicates that role clarity has a positive relationship with each dimension of psychological empowerment, which leads to H7:

H7 Role Clarity influences Psychological Empowerment

4.5.1.8 Direct Relationship between Job Satisfaction and Managerial Performance

Previous research points out a modest but positive relationship between job satisfaction and individual performance (Vroom, 1964; Organ, 1977a; Petty, McGee, & Cavender, 1984; Hochwarter, Perrewé, Ferris, & Brymer, 1999). However, the causal order of the

relationship between job satisfaction and individual performance is still uncertain. Some authors (e.g. Schwab & Cummings, 1970) indicated that satisfaction is an antecedent for performance, whereas others (e.g. Lawler & Porter, 1967) debate that performance precedes satisfaction. Thus, is likely to put more effort into, perform more extra-role behaviours, get more social support and valued positions within the organisation, and have more successful interpersonal relationships, which, collectively, should enhance the effectiveness of their work. Therefore, managers who are more satisfied with their jobs are expected to put more effort into and be more interested in their work, which reflects in enhancing performance. This leads to H8:

H8 Job Satisfaction influences Managerial Performance

4.5.1.9 The Intervening Role of Mental Model Confirmation on the Relationship between Comprehensive PMS and Managerial Performance

In the literature review, there are some studies (McKinnon & Bruns, 1992; Chenhall & Morris, 1993; Kaplan & Norton, 1996c; Sprinkle, 2000) which pointed out that managers can use MCS feedback to confirm their mental models, which in turn are reflected in their managerial performance. The study of (McKinnon & Bruns, 1992, p. 206), which addressed using accounting information by managers, found that; "as managers review their success as reported in accounting reports, they are continuously at work, testing and perfecting their mental model of the relationship between activities and success as measured by the management accounting system". By describing the organisational operations more effectively, comprehensive PMS can assist managers in testing and confirming their mental models. If PMS become more comprehensive, they can provide a wealth of empirical observations about the operations of organisation and such observations offer the impetus to testing and confirming the mental models of managers (Chenhall & Morris, 1993). Comprehensive PMS which link measures to strategy and the value chain, also offer a better understanding to managers about their business with confirmation of their mental models (McKinnon & Bruns, 1992). Moreover, Chenhall and Morris (1993) stated that managers who engage in the learning process (i.e. mental model confirmation) are likely perform better and develop higher levels of insight into the operations of organisation, than others who do not. Lant, Milliken, and Batra (1992) argue that learning can increase managers' understanding of connections between the managers' actions and outcomes, which provides the foundation to enhance managerial performance. Research also suggests that managers

can use the comprehensiveness of performance information to verify, confirm and validate their beliefs about cause-and-effect relationships, as an integral part of a company's strategy and plan of action (Luft & Shields, 2001). As the amount of information is increased by comprehensive PMS, this helps managers to test and validate the extent to which their mental model is consistent with the reality of the organisation (Argyris & Schon, 1978; Huber, 1991).

In this context, there some studies that illustrated the relationship between information that has been provided by the system, MMC and performance. For example, Vandenbosch and Higgins (1994) conducted an empirical research program to examine the potential that executive support systems have to foster learning and their impact on performance. The findings supported that mental model confirmation of executive support systems has a positive relationship with performance. Similarly, Vandenbosch and Higgins (1996) investigated the relationship between executive support systems and mental model maintenance. They found that executive support systems have a positive effect on mental model maintenance.

Schäffer and Steiners (2004) examined the relationship between use of management accounting information, individual learning and organisational performance. It is argued that different types of information use (decision-making, monitoring and scanning) influence whether learning takes the form of mental model maintenance and/or mental model building. The findings showed that all types of management accounting information have a positive impact on mental model maintenance, which in turn is positively related to improvements in efficiency. More recently, Hall (2011) tried to know whether and how the process of updating and changing mental models (learning) helps to explain how comprehensive PMS impact managerial performance. He indicated that comprehensive PMS affect mental model confirmation, which in turn has a positive impact on managerial performance.

In summary, as discussed above, when PMS become more comprehensive, they provide more necessary information, feedback and empirical observations, which helps manager to confirm their mental models. This leads to H9:

H9 Mental Model Confirmation has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance

4.5.1.10 The Intervening Role of Mental Model Building on the Relationship between Comprehensive PMS and Managerial Performance

Comprehensive PMS provided more information that is likely to prompt mental model building (e.g. broad range of measures covering important aspects of operations, links between measures and strategy and across the value chain), which may update managers' mental models. In the literature review, there are some empirical studies that suggested that the information provided by systems has a positive effect on mental model building and managerial performance. An example of this is the work of Vandenbosch and Higgins (1994) to investigate the relationship between the mental models of executive support systems and performance. Their results showed that mental model building of executive support systems were positively related to performance. Vandenbosch and Higgins (1995) addressed the relationships amongst the executive support systems, learning and performance. The study found that executive support systems have a strong positive relationship with perceptions of competitive performance through mental model building. Vandenbosch and Higgins (1996) investigated the effect of executive support systems on MMB. The study found that executive support systems have a positive effect on mental model building. The study of Schäffer and Steiners (2004) tested the effects of using management accounting information on individual learning and organisational performance. It found that using management accounting information (decision-making, monitoring and scanning) is positively associated with mental model building, which in turn is positively related to improvements in effectiveness.

Recently, Hall (2011) investigated whether and how comprehensive PMS affect the process of updating and changing mental models, which reflected in improving managerial performance. He showed that comprehensive PMS have a positive effect on mental model building when managers have a short organisational tenure and/or the strategic business unit is small, which in turn has a positive impact on managerial performance. From this discussion, it is likely that the effects of comprehensive PMS on managerial performance are indirect via mental model building. Therefore this leads to H10:

H10 Mental Model Building has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance.

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Figure 4.2 below depict direct, indirect effects of comprehensive PMS and shows research hypotheses from H1 to H10.

Figure 4.2 Direct and Indirect Effects of Comprehensive PMS
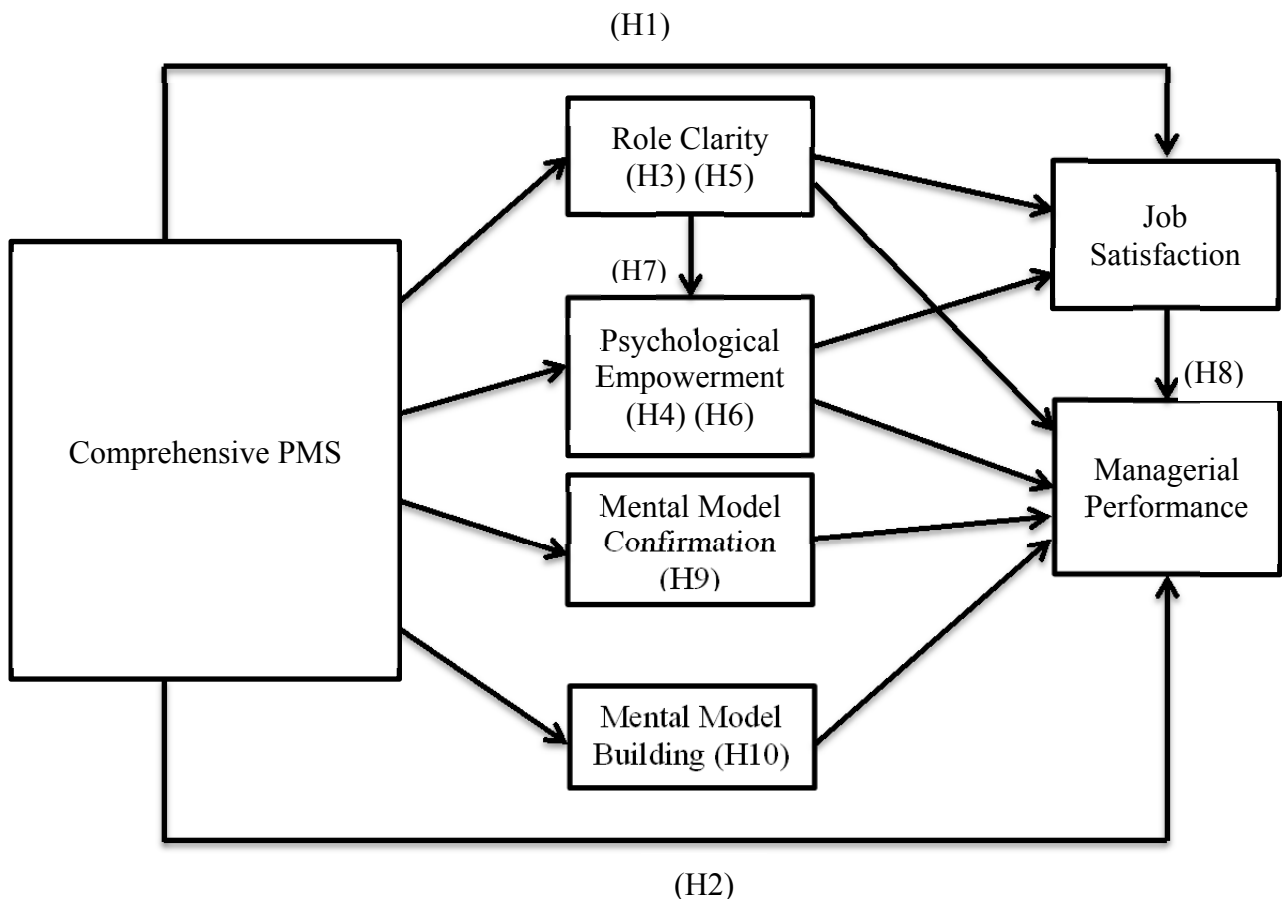
4.5.2 Comparing between Financial and Non-financial Performance Measures and Rewards:

4.5.2.1 Comparing between Financial and Non-financial Performance Measures and Rewards in Relation to Outcome Variables

Organisations use several types of performance measures to evaluate their individuals' performances and are likely to affect their individuals' job satisfaction because the evaluation results will affect their employees' self-esteem, rewards and promotions. Hopwood (1972) suggests that financial measures focus on short-term performance when evaluating managerial performance, which is often concerned with more long-term considerations.

It is argued that using financial measures to evaluate managerial performance would have negative effects on individual job-related tension and job satisfaction, because of the incomplete nature of financial measures. However, Hopwood (1972) found positive effects of financial and non- financial measures on job satisfaction, but the non-financial measures have stronger effects. Moreover, Cherrington and Cherrington (1973) found that there were positive effects of financial measures on job satisfaction and performance. Milani (1975) indicated that financial measures have raised job satisfaction and positively affected performance.

Consequently, multiple non-financial measures are likely to improve individual job satisfaction. Individuals may perform well in indicators such as customer satisfaction, product development and innovation. As such, if managers are evaluated based on these dimensions, they are likely to perceive the performance evaluation as fair and consequently experience satisfaction with the evaluation process. Previous studies' findings also suggest that using multiple non-financial measures to evaluate managerial performance has a significant effect on job satisfaction (e.g. Lau & Sholihin, 2005). Therefore, it is likely that there is a positive relationship between the use of multiple non-financial measures for performance evaluation and employee job satisfaction.

Similarly, Kaplan and Atkinson (1998) noted that when organisations invest in acquiring new capabilities, their success (or failure) may not be motivated in the short run solely by the model of financial measures used. Comprehensive PMS offer the drivers of future financial measures. This suggests that using long-term non-financial measures is likely to somehow generate more positive individual behaviours than those generated by using short-term financial measures.

However, so far, there is little systematic empirical evidence to indicate if and how managers would react to using non-financial measures. It is also unclear that these reactions, if any, are similar to or different from those generated by using more financial measures. Furthermore, organisations which use both financial and non-financial measures to evaluate their managerial performance are required to know the relative importance, or weightings, related to non-financial measures, vis-à-vis financial measures, which may have different effects on managerial behaviours, job satisfaction and managerial performance. For instance, Lau (2011) found that there is a different effect between financial and non-financial performance measures in relation to managerial performance.

In order to ascertain if the weights assigned to financial measures vis-a`-vis non-financial measures have different effects on job satisfaction and managerial performance, the following hypothesis is assumed;

H11 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Job Satisfaction.

H12 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Managerial Performance.

4.5.2.2 Comparing between Financial and Non-financial Performance Measures and Rewards in Relation to Outcome Variables through Cognitive and Motivational Factors

The previous group of hypotheses sought to discover the relationship between comprehensive PMS (the independent variable) and outcome variables, namely job satisfaction and managerial performance. The intervening variable, in general, and the mediating role of role clarity, psychological empowerment and individual learning on the relationship between comprehensive PMS and organisational performance/managerial performance, in particular, has been investigated in the MAS/MCS literature. Researchers in this area have suggested that the relationship between PMS and managerial performance is likely to be indirect through intervening variables. Some variables identified as having such important intervening effects are role clarity, psychological empowerment and individual learning. For example, three recent studies provide empirical evidence in support of this proposition. The study by Burney and Widener (2007) has found that there was a significant relationship between strategic PMS and role clarity (ambiguity), as well as that role clarity is an important intervening variable in this relationship. Hall (2008) similarly found that comprehensive PMS have a positively significant relationship with role clarity (process and goal clarity) and psychological empowerment. He also indicated that role clarity and psychological empowerment fully mediate the relationship between comprehensive PMS and managerial performance. Moreover, Hall (2011) found that comprehensive PMS have a positive effect on individual learning (mental model confirmation and mental model building) and that these mental models have important effects on the relationship between comprehensive PMS and managerial performance.

There is therefore empirical evidence to suggest that the effects of PMS on managerial performance are indirect, through these intervening variables. However, the abovementioned three studies have examined PMS comprising a combination of

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financial and non-financial performance measures. The studies did not isolate and compare the results arising from financial performance measures with those arising from non-financial performance measures.

This leaves some unanswered questions. Firstly, since comprehensive PMS are likely to comprise both financial and non-financial performance measures, are the effects found by the aforementioned three studies derived from using non-financial performance measures, or are they from financial performance measures? Would the use of non-financial performance measures, by themselves, produce the same effects? Would the use of financial performance measures, by themselves, generate the same results? More importantly, what is the relative importance of a non-financial measures vis-à-vis financial measures, in these relationships? In other words, are the results of Burney and Widener (2007) and Hall (2008, 2011) driven mainly by a non-financial performance measures, or mainly by a financial performance measures?

In response partially to these questions, Lau (2011), found that there is a different effect between financial and non-financial performance measures in relation to role clarity and that non-financial performance measures have a stronger effect on role clarity than that of financial performance measures. Furthermore, role clarity has a fully mediating effect on both relationships between financial and non-financial performance measures and managerial performance. However, with this evidence supporting the different effects, there is a need to verify the differing impacts of non-financial performance measures and the financial performance measures in their relationships with this intervening variable role clarity, and with other intervening variables, such as psychological empowerment and individual learning (mental model confirmation and mental model building).

Based on the arguments made and the summary of the relevant literature above, it is assumed that role clarity, psychological empowerment and individual learning (mental model confirmation and mental model building) play mediating roles and that there are different effects between financial and non-financial performance measures and rewards in relation to these intervening variables. Therefore, it is hypothesised that:

H13 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through Role Clarity.

H14 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Role Clarity

H15 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through Psychological Empowerment.

H16 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Psychological Empowerment.

H17 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Mental Model Confirmation.

H18 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Mental Model Building.

Figure 4.3 below depicts the comparison of financial and non-financial performance measures and rewards directly in relation to outcome variables and indirectly through cognitive and motivational factors.

Figure 4.3 Comparing the Effects of Financial/ Non-financial Performance Measures and Rewards on their Consequences
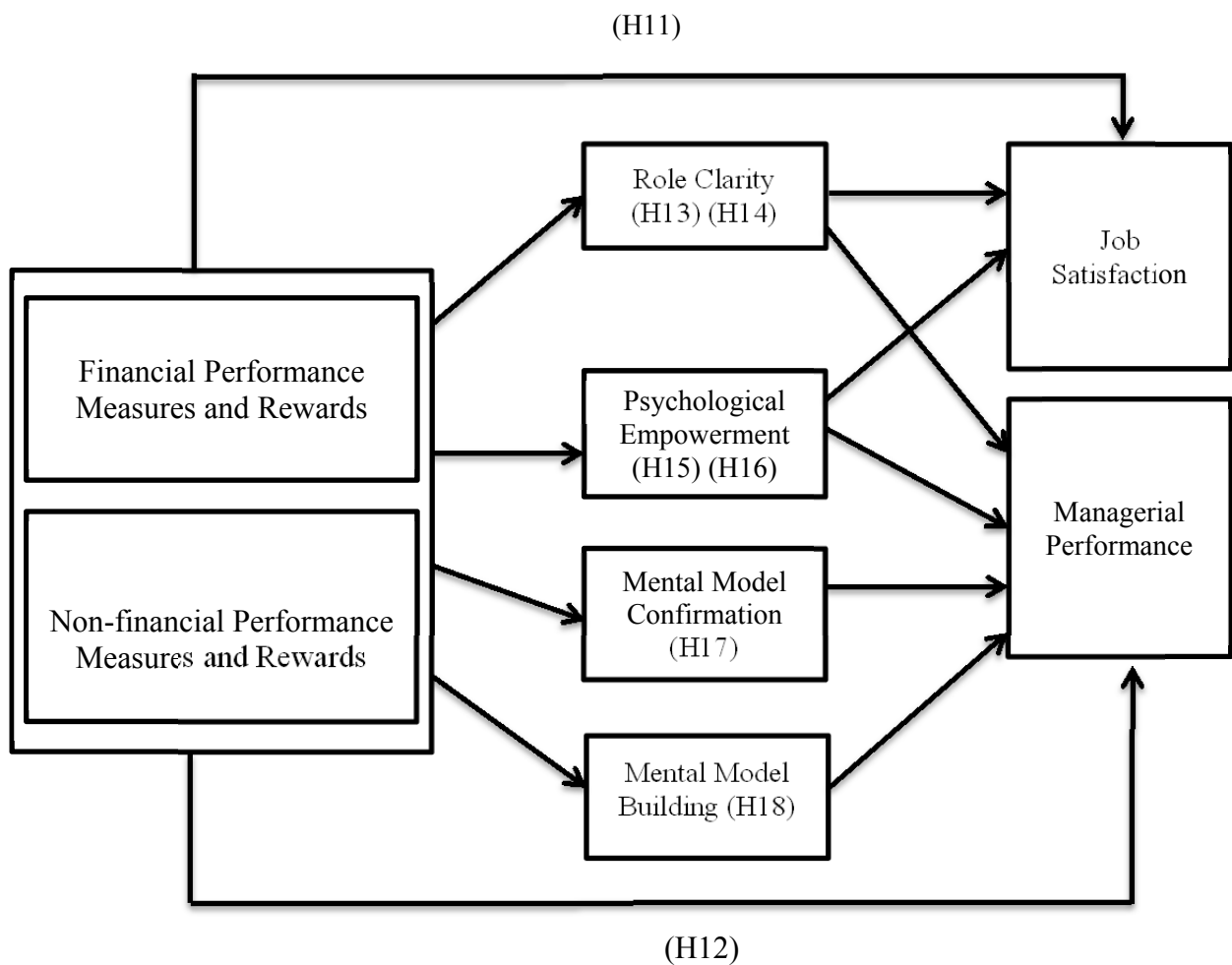
4.6 Research Philosophy

The research approach is defined as the "philosophical framework that guides how scientific research should be conducted" (Collis & Hussey, 2014, p. 43). The research philosophy which is adopted by researchers consists of important assumptions in respect to how they view the world. These assumptions consolidate the research strategy and methods that researchers select as part of that strategy (Creswell, 2014). Furthermore, it is considered that identifying and understanding the research philosophy is a starting point in, and central to, the research design (Easterby-Smith, Thorpe, & Lowe, 2002).

It is of great importance for a researcher to understand the philosophical research issues for at least three reasons (Easterby-Smith, Thorpe, & Jackson, 2008). Firstly, understanding these issues helps in clarifying better designed researches. For instance, it assists researchers to determine which evidence should be collected and from where; it also promotes the ability of researchers to explain or interpret it. Secondly, it puts the researchers in positions, in order that they have the ability to decide whether their designs for researches work or not. Thirdly, in accordance with Easterby-Smith et al. (2008), through understanding the issues, the researchers will be able to select any research design that they are capable of, so it can help the researchers to:

> *"Identify, and even create, designs that may be outside his or her past experience. And it may also suggest how to adapt research designs according to the constraints of different subject or knowledge structures" (p.27).*

Accordingly, there are some researchers (e.g. Easterby-Smith et al., 2008; Saunders, Lewis, & Thornhill, 2012; Collis & Hussey, 2014) who have argued that there are two main philosophies or paradigms, which are positivism and interpretivism (or social constructionism). The concept of positivism was the support paradigm for conducting natural sciences research in earlier times and much of contemporary social sciences research. The philosophy of this concept assumed that social reality is independent of the researcher and is not influenced through the act of investigation, as well as that to measure its properties, objective methods should be used. On the contrary, interpretivism (or social constructionism) is established based on the criticisms of the positivism paradigm, to underpin that the idea of social reality is part of the researchers' minds and is measured by using subjective methods (Easterby-Smith et al., 2008; Collis & Hussey, 2014).

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In the context of the positivism paradigm, the task of the social scientist's research should be to gather facts and measure how certain patterns occur, thus it looks for external reasons and fundamental laws to interpret behaviour, while the task in the interpretivism paradigm is to clarify and recognise the difference in meanings and constructions that individuals place upon their past experience (Easterby-Smith et al., 2002). Moreover, the positivism paradigm is a traditional approach characterized as quantitative, objective and scientific, whilst the qualitative, subjective, humanist and phenomenological approaches are related to the interpretivism paradigm (Collis & Hussey, 2014).

(Collis & Hussey, 2014) have argued that as the assumption of the positivism paradigm is to measure social phenomena, this explicitly implies that the paradigm is more likely to be linked to quantitative methods of analysis. The authors concluded that any type of research where its findings are not derived from statistical analysis of data collected using the quantitative approach, is from the interpretive paradigm. However, while the researchers believe that one of the research forms is correct or better than the other, definitely they would neglect the point that they are better at doing different things. The distinguishing features related to the implications of the two paradigms are shown in Table 4.2 below.

Table 4.2 Implications of the Positivism and Interpretivism Paradigms

	Positivism	Social Constructionism
The observer	Must be independent	is part of what is being observed
Human interest	Should be irrelevant	are the main drivers of Science
Explanations	Must demonstrate causality	aim to increase general understanding of the situation
Research progress through	Hypotheses and deductions	gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	should incorporate stakeholder perspectives
Units of analysis	Should be reduced to simplest terms	may include the complexity of 'whole' situation
Generalisation through	Statistical probability	theoretical abstraction
Sampling requires	Large numbers selected randomly	small numbers of cases chosen for specific reasons

Source: Easterby-Smith et al. (2008, p. 59)

In addition to the prior two paradigms, some authors (e.g. Saunders et al., 2012; Collis & Hussey, 2014; Creswell, 2014) have determined pragmatism as another paradigm. In respect to this paradigm, pragmatists are not confined to following any one system of philosophy when the researchers are involved in carrying out research by using, for example, mixed methods, which leads to stop asking questions associated to reality and laws of nature. Rather than concentrating on which position is better to follow, giving priority to the research problem is the most important, in order to take advantage of all available approaches for comprehending, building knowledge and finding a solution to the problem.

Amaratunga, Baldry, Sarshar, and Newton (2002) have offered a useful summary to illustrate aspects of the strengths and weaknesses relating to the two main research paradigms, which could be useful to guide the researchers to recognise and choose the most suitable methodology and methods for their research projects. These distinctive features are summarised in Table 4.3 below.

Table 4.3 Strengths and Weaknesses of Positivism and Interpretivism

Paradigm	Strengths	Weaknesses
Positivist **(Quantitative)**	▪ They can provide wide coverage of the range of situations. ▪ They can be fast and economical. ▪ Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions.	▪ The methods used tend to be rather inflexible and artificial. ▪ They are not very effective in understanding processes or the significance that people attach to actions. ▪ They are not very helpful in generating theories. ▪ Because they focus on what is, or what has been recently, they make it hard for policy makers to infer what changes and actions should take place in the future.
Phenomenological **(Qualitative)**	▪ Data-gathering methods are seen as natural rather than artificial. ▪ Ability to look at change processes over time. ▪ Ability to understand people's meanings. ▪ Ability to adjust to new issues and ideas as they emerge. ▪ Contribute to theory generation.	▪ Data collection can be tedious and require more resources. ▪ Analysis and interpretation of data may be more difficult. ▪ Harder to control the pace, progress and end-points of the research process. ▪ Policy makers may give low credibility to results from the qualitative approach.

Source: Amaratunga et al. (2002, p. 20)

Saunders et al. (2012) have indicated that the design of a research is identified by the extent to which the researchers are clear about theory at the early starting point of the research, and that they have the ability to use either the deductive or inductive approach. The former approach includes developing a theory and hypothesis and designing a research strategy to test the hypothesis. In contrast, the latter approach involves the researchers putting their attentions to collecting data and developing theory on the basis of results gained from analysing data. Furthermore, both research approaches are related to the different research philosophies or paradigms. While the deductive approach is linked more to positivism, the inductive approach is associated with interpretivism or the phenomenological paradigm.

Saunders et al. (2012) and Creswell (2014) have mentioned that the choice of which paradigm to adopt is influenced by a number of criteria such as the research problem, or the availability of current knowledge about the topic under investigation, which leads to defining a theoretical framework and hypotheses, the objectives of the research, the researchers' personal experiences, and the audiences for whom they inquire to report to. This is more likely to help researchers to follow a deductive approach. They also indicated that for a new research topic into areas where little or no literature exists, it is more suitable to adopt the inductive approach. The authors have pointed out other relevant critical considerations that involve the time available for the research and the extent of accepting risk by the researcher; so referring to the deductive search can be faster to complete and less risky, compared to inductive research.

Consequently, for the design of this research it was decided to adopt a positivistic paradigm. This decision is justified by the following reasons:

- In many areas of business and management research, positivism is still the dominant paradigm. Furthermore, Collis and Hussey (2014) report that the researcher does not have to expend much energy in explaining and justifying the methodology and methods adopted, as long as the positivistic paradigm was acceptable in the research discipline and to the research supervision team.

  - The research topic of this study, which is relatively a literature wealthy topic, and its objectives (see Section 4.2), which seek to identify the extent to which comprehensive PMS are applied in manufacturing companies in Libya and to

examine the relationship between MAS/MCS/ comprehensive PMS and its outcomes through intervening variables (role clarity, psychological empowerment, MMC and MMB), by using psychological theories, role theory, psychological empowerment theory and learning theory. Thus, the positivistic paradigm was considered as appropriate for this research study.

4.7 Research Methodology

One of the most important decisions based on understanding the philosophical issues and after deciding the research paradigm, is to identify the appropriate methodology to reflect the philosophical assumptions of this paradigm (Collis and Hussey, 2009). There are some concepts for which the terms strategies of inquiry, approaches to inquiry and research methodologies are used interchangeably (Creswell, 2014).

Three approaches have been identified by Creswell (2014) that the strategies of inquiry (i.e. methodology) can be derived from. He mentioned that each approach is linked to paradigms and methods of data collection and analysis, with a view to assess the researchers choosing the suitable approach for their research. These are: quantitative, qualitative and the mixed methods approach.

- A quantitative approach is one where the researcher primarily adopts a positivistic paradigm, uses strategies of inquiry such as experiments and surveys collects data by employing predetermined instruments and using closed questions and uses statistical techniques to analyse the data.

- A qualitative approach is one in which the researcher primarily uses interpretivism or the social constructionism philosophy. The investigator within this approach may use different methodologies, such as case studies, ethnography, or grounded theory studies and collects the data through open-ended questions and emerging data, with the intention of developing themes from it.

- A mixed methods approach, where the investigator is based on the pragmatic paradigm, using a combination of strategies of inquiry (quantitative and qualitative paradigms). Therefore, both quantitative information (e.g. instruments) and qualitative information are within the data.

According to the discussion above, and taking into consideration the research paradigm, research questions and objectives, this research study adopted the quantitative approach. Consequently, a survey method was adopted as the research strategy of inquiry which contains a cross-sectional design. Bryman and Bell (2011) and Bryman and Bell (2007, p. 56) pointed out that survey research "comprises a cross-sectional design in relation to which data are collected predominantly by questionnaire or by structured interview on more than one case and at a single point in time, in order to collect a body of quantitative or qualitative data in connection with two or more variables, which are then examined to detect patterns of association".

The rationale behind choosing the questionnaire survey method in this research is fourfold:

• To be consistent with the adopted research paradigm (i.e. the positivistic paradigm) and accomplishing the research objectives in terms of generalisation, perceiving relationships between research variables and carrying out the appropriate test analysis techniques, such as simple and ordinary least squares regression.

• To achieve the research objectives, a potential and large targeted sample was the entire population, which is geographically located in different locations, so it was decided to adopt the questionnaire survey.

• Questionnaire survey is a popularly common method to collect primary data for conducting management and business research (Saunders et al., 2012; Sekaran & Bougie, 2013; Collis & Hussey, 2014; Creswell, 2014).

• Questionnaire survey is a method that has been extensively used in previous research in similar areas of PMS, MCS, MAS and psychological research (e.g. Hartenian et al., 1994; Vandenbosch & Higgins, 1994; Spreitzer, 1995a, 1995b; Schiff & Hoffman, 1996; Spreitzer, 1996; Gagné et al., 1997; Spreitzer et al., 1997; Choe, 2004a; Easterby-Smith et al., 2008; Hall, 2008; Hall & Smith, 2009; Burkert et al., 2011; Hall, 2011; Lau, 2011; Chung et al., 2012; Mahama & Cheng, 2013).

4.8 Research Type

Selecting a particular research paradigm leads researchers to carry out a specific research, which includes a series of rational decision-making options, such as issues linked to the purpose of the study design, the type of investigation, the study setting, the analysis' unit and time horizon (Sekaran & Bougie, 2013). Nevertheless, there are a number of different categorizations of research types existing, with no simple categorization of research designs comprehensively defining and concerning all variations (Blumberg, Cooper, & Schindler, 2014).

It has been widely expressed in the literature that research could be classified according to the purpose of the research, as argued by Collis and Hussey (2014), who described it as: exploratory, descriptive, explanatory or analytical/explanatory research. Exploratory research is carried out when few or no earlier research studies have been found that could help the researcher refer to information regarding the research problem. The main aim of this type of research is to seek for patterns, ideas or hypotheses, rather than testing or conforming hypotheses. Conducting descriptive research is for describing a particular problem or issue as it exists, by discovering and obtaining information on its characteristics. Therefore, data collected is often quantitative for this type of studies (Sekaran & Bougie, 2013). Analytical or explanatory research is considered the developed stage of the descriptive research and it goes beyond merely describing characterises, to analyse and explain why or how the phenomena are happening. The aim of this research is discovering and measuring causal relationships among phenomena in order to understand them.

It is well known that predictive research takes the explanatory research a step forward via forecasting the probability of similarities in situations happening somewhere else. The predictive research aims to generalise from the analysis by predicting certain phenomena, which are based on the assumption and general relationships and it provides answers to how, why and where questions to present events, as well as similar ones in the future (Collis & Hussey, 2014).

Based on the aim and objectives of the research, this research can be classified as descriptive and explanatory. Specifically, Objective one, which identifies to what extent comprehensiveness of PMS and the importance of financial and non-financial

performance measurement and reward systems, can be classified as descriptive. Objective two, which seeks to examine the relationship between comprehensive PMS and the role of cognitive as well as motivational variables in relation to outcome variables, can be classified as an analytical or explanatory part. Objective three, which endeavours to examine the relationship between role clarity and psychological empowerment, can be classified as an analytical or explanatory part. Objective four, which tries to investigate the relationship between job satisfaction and managerial performance, can be classified as an analytical or explanatory part. Objective five comparing between financial and non-financial performance measurement and reward systems and the role of cognitive as well as motivational variables in relation to outcome variables, can be classified as an analytical or explanatory part.

In the same context, some authors (e.g. Saunders et al., 2012; Sekaran & Bougie, 2013; Blumberg et al., 2014; Collis & Hussey, 2014) have suggested two different types of research in terms of time horizons, involving cross-sectional and longitudinal studies. The former allows a researcher to collect data once, which provides a snapshot of the research phenomena at a point in time, whereas longitudinal studies are conducted across a period of time and the data is collected at two or more different points in time. In this respect, the present research study can be classified as cross-sectional, as the required data is gathered at a point in time.

Moreover, Sekaran and Bougie (2013) argued that studies might be classified into causal or correlational according to the type of investigation. Causal study is carried out when the researcher attempts to define one or more variable (s) causing the problem. In other words, it deals with cause-and-effect relationships, whereas correlational research is concerned with identifying the important variables linked to the problem. Consistent with the research objectives, this research study can be classified as a correlational and causal investigation.

4.9 Data Collection Methods

As previously mentioned in this chapter, the positivistic paradigm was selected to cater for the research objectives and therefore the questionnaire survey method is used as the main vehicle to collect data.

Generally, in a research, two main sources can be used to obtain data, which are primary or secondary sources. Primary data is collected by the researcher from original sources to achieve the research objectives, including experiments, questionnaire surveys, interviews or focus groups. Secondary data are gathered from existing sources and can be found in various sources, including publications, databases and internal records. Moreover, the survey methodology is associated with the positivistic paradigm. It is designed for collecting primary or secondary data from a sample, which can be statistically analysed and its results generalised to a population. Collis and Hussey (2014) have mentioned that there are several methods that can be used for collecting survey data in positivistic research, such as questionnaires and interviews.

A questionnaire refers to a set of questions, which are circumspectly designed and tested for a particular group of participants, to obtain reliable responses (Sekaran & Bougie, 2013; Collis & Hussey, 2014).There are different types of questionnaires which can be found regarding to how they are distributed, involving; the post/mail questionnaire, telephone questionnaire, online questionnaire and self-administered questionnaire, but each type has its strengths and weaknesses (see for e.g. Oppenheim, 2000; Sekaran & Bougie, 2013; Collis & Hussey, 2014). Due to the nature of the research population, namely large and medium-sized manufacturing companies operating in Libya, it is considered that the self-administered questionnaire was the appropriate tool to achieve the research objectives. The participants received the self-administered questionnaire from a member of the research team, or the researcher, who explained the purpose of the investigation, and then the respondents were left alone to fill in and complete the questionnaire (Oppenheim, 2000; Sekaran & Bougie, 2013).

A self-administered questionnaire has some main advantages, which include; targeting very precisely the most appropriate sample, ensuring the high response rate, collecting the completed questionnaires within a short period, clarifying any ambiguous questions on the spot, often saving cost and time and reducing researcher bias (Oppenheim, 2000; Bryman & Bell, 2011; Sekaran & Bougie, 2013; Collis & Hussey, 2014). Furthermore, Sekaran and Bougie (2013) have indicated that adopting the self-administered questionnaire offers a great opportunity for the researcher to introduce the research topic and motivates the respondents to give their answers honestly. In addition to the previous

advantages of a self-administered questionnaire mentioned above, this type was chosen due to the following reasons:

- The postal service in Libya is not reliable, which may cause risks leading to a low response rate and consume time, so relying on this service and a postal questionnaire is unadvisable.

- It is very difficult to find updated, or even correct, personal contact details (e.g. email, telephone number) related to the target respondents in the manufacturing companies in Libya, which hinders using email or telephone questionnaires.

- The research questionnaire is designed for collecting comprehensive data and subsequently it is quite long, therefore, if it was administered by post, email or telephone, it would have been neglected and the response rate would have be zero or very low.

Collis and Hussey (2014) concluded that there are several essential decisions which the researchers should consider before distributing their research questionnaire, including: sample/population size, question design (i.e. type, wording, presentation), questionnaire design, wording of the covering letter, piloting the questionnaire, distribution method, methods of data analysis and tests of reliability and validity. All of these important issues are discussed next.

4.10 Research Population and Sample

The population of this research study is defined as all large and medium-sized manufacturing companies in Libya. The justifications for selecting these companies are as follows:

- The research population is restricted to large and medium-sized manufacturing companies only (an independent company or a strategic business unit SBU/divisions/ within a large company), and excluded small companies. The SBUs are independent organisations or divisions of larger organisations. The rationale for this is that large and medium-sized companies tend to have a well-designed management accounting system in general and PMS in particular and they are more likely to have developed sophisticated PMS due to a greater availability of resources and a greater need for more comprehensive systems (Chenhall, 2003). Whereas small companies are

expected to rely on informal systems and not have sophisticated systems (Tsang, 1997; Malmi, 1999; Szychta, 2002; Chenhall, 2005; Henri, 2006; López, Peón, & Ordás, 2006; Lopez, 2007; Rompho & Siengthai, 2012).

- Restricting it to the manufacturing sector in this research population is due to the fact that there are differences between manufacturing and non-manufacturing companies in designing/adopting their MAS/PMS (Fisher, 1995; Drury, 2012). Thus, it is difficult to either design a suitable questionnaire for both manufacturing and non-manufacturing companies, or to design a separate questionnaire for each one (manufacturing and non-manufacturing companies). In addition, similarities in features among manufacturing companies, compared to non-manufacturing ones, make it easier to design one questionnaire. Additionally, there are shared or common features among manufacturing companies, compared to non-manufacturing ones, which make it easier to design one questionnaire.

The sample of this research is all cases in the study population. However, there is no readily available database of complete and accurate conditions for the population. Therefore, the researcher has to develop their own sampling frame (Saunders et al., 2012). In order to get the sampling, the researcher visited the Libyan Export Promotion Centre (LEPC) based in the capital Tripoli and the Industrial Register Office (IRO) in Misrata, to obtain a list index of the names and addresses of manufacturing companies in Libya. Two different lists were obtained. The first list from the LEPC encompasses 450 names of manufacturing and non-manufacturing companies and their addresses. In this list, there are only 199 manufacturing companies, of which 56 are large and 57 medium-sized. All the large companies were active, thus considered suitable for the study, but only 51 of the medium-sized were included, due to the fact that others listed had already been liquidated. The IRO provided another list of 349 manufacturing companies. However, most of the 349 companies were small sized, which left only 13 large and 34 medium to complete the study sample. As the list was also insufficient with regard to company details and addresses, only 11 large and 13 medium-sized companies were considered suitable.

After carefully taking into account the repeated names in the lists, the initial sampling frame was prepared, which included 115 companies (64 large and 51 medium-sized) located in four different geographical parts of the country, as shown in Table 4.4.

Table 4.4: Population and Sampling Frame

Source	Total number	Company size	Total number by size	Companies suitable for the study	Final useable sample
Libyan Export Promotion Centre	Manufacturing 199	Large	56	56	56
		Medium	57	51	38
		Small	86	-	-
	Non-manufacturing 251	-	-	-	-
Industrial Register Office	349	Large	13	11	8
		Medium	34	13	13
		Small	302	-	-
Total				131	115*

* between them the 115 have a total of 190 SBUs

Using the prepared list as the initial sampling frame, the companies were contacted in order to obtain more knowledge about their strategic business units (SBUs). A total of 190 SBUs were identified, most of them divisions of larger companies, and few single entity companies.

According to Sekaran and Bougie (2013), a sample is defined as a subgroup of the population and they indicated that the size of the population itself is one of the factors that affect decisions on size of sample. This would imply that the researchers, in some instances, have to use a 100% sample to avoid bias and appropriately represent the issues when the population is relatively small. Due to the low number of large and medium-sized manufacturing companies working in Libya, the research target sample is therefore the entire population.

The strategic business unit manager, division/subsidiary manager and general managers were the target respondents for this research. The reasons for choosing these respondents are that they are in a managerial position and should be knowledgeable enough to complete the questionnaire and provide accurate information and they also have access to PMS, as well as to capture the influences of comprehensive PMS on middle-management perceptions.

4.11 Questionnaire Construction and Pre-testing

A number of writers (e.g. Saunders et al., 2012; Sekaran & Bougie, 2013) have argued that the most widely used technique that has been used to collect data for research is the questionnaire. They pointed out that designing a questionnaire is very important in order

to ensure that it could be used to collect the precise data required to answer the research questions and meet the research objectives, as it is not possible to go back to the respondents and collect additional information using another questionnaire.

Collis and Hussey (2014) mentioned that when the study follows a positivistic paradigm, the researchers should be identifying and clarifying any concepts which they use and how they conceptualise them. Hence, to meet the purpose of this study, a theoretical framework was built on the basis of achieving the objectives of the research and linked to the questions of the survey questionnaire.

Furthermore, designing a questionnaire has an impact on the response rate and the validity, as well as the reliability, of the data being gathered. This effect could be positively enhanced by designing every question carefully, good questionnaire layout, clear explanation of the questionnaire's aim, pre-testing and its carefully planned and implemented administration (Saunders et al., 2012). More detailed description is provided in the next subsections.

4.11.1 Construct Definitions

As indicated in Chapter One, this study investigates the relationship between comprehensive PMS and managerial performance through cognitive and motivational mechanisms in addition to comparing between the effect of both financial and non-financial performance measures and rewards on managerial performance directly and indirectly through the mentioned mechanisms in manufacturing companies in Libya. As summarised in Table 4.5, all variables, including independents, mediators and dependents were measured through managers' choices using 7-Likert Scale, which made them continuous variables.

Table 4.5 Variables Conceptualisation and Operationalisation

Variables	Type	Definition
Managerial Performance	Dependent	Factors related to individual members of the organisation in managerial activities that include planning, investigating, coordinating, evaluating, supervising, staffing, negotiating and representing.
Job Satisfaction	Dependent/ Independent	Factors related to attitude of individuals towards or about a job as a whole rather than investigating its separate facets, including activity, independence, variety, social status, supervision-human relations, supervision-technical, moral values, security, social service, authority, ability utilization, company policies, compensation, advancement, responsibility, creativity, working, co-workers, recognition and achievement.
Role Clarity	Dependent/ Independent/ Mediator	Factors related to two dimensions which include goal clarity and process clarity and define as the extent to which individuals know what are expected of them for adequate performance of their job tasks and responsibilities.
Psychological Empowerment	Dependent/ Independent/ Mediator	The common set of dimensions which define the psychological experience of empowerment in the workplace includes a sense of meaning, competence, self-determination and impact.
Mental Model Confirmation	Dependent/ Independent/ Mediator	Factors address the way in which managers' mental model of their business unit are confirmed and maintained.
Mental Model Building	Dependent/ Independent/ Mediator	Factors address the way in which managers' mental model of their business unit are questioned and developed.
Comprehensive PMS	Independent	Factors link to a set of measures indicate a high degree of comprehensiveness that provides a certain breadth, reflects strategy, and yields information about cause-and-effect relationships.
Financial Performance Measures and rewards	Independent	Factors related to financial performance measures for evaluation purposes (based on financial numbers according to pre-set goals and targets) and monetary rewards.
Non-financial Performance Measures and rewards	Independent	Factors related to non-financial performance measures for evaluation purposes (based on quantitative numbers according to pre-set goals and targets and boss's personal and subjective appraisal) and non-monetary rewards.

4.11.2 Question Design, Wording and Layout

Several drafts of the questionnaire have been cogitated on towards the construction and pre-testing, in order to reach an acceptable final version. In addition, several recommendations on designing a questionnaire survey have been offered by a number of authors (e.g. Dillman, 1978; Oppenheim, 2000; De Vaus, 2001; Easterby-Smith et al., 2002; Saunders et al., 2012; Aaker, Kumar, Leone, & Day, 2013; Sekaran & Bougie, 2013; Collis & Hussey, 2014), that were adopted wherever possible. The following are examples of different procedures adopted to guide the questionnaire

construction in this research, with regard to general rules of designing questions, choice of wording and layout:

• The questionnaire purpose was explained to all target participants.

• Leading, double negative, ambiguous, loaded, double-barrelled, insensitive, or embarrassing questions were avoided.

• Language used in the questionnaire was meaningful, simple and unambiguous, in order to make it understandable to all participants.

• Each question's length was kept as short as possible, in a way that did not affect its content and meaning.

• To ensure consistency, clear instructions were given throughout the questionnaire to guide response. The respondent was directed in a logical sequence when answering the questionnaire, starting from general to more specific questions, without making major shifts or gaps

• Questions were grouped in each section on the basis of similarity in the content. For example, all questions associated with general information were grouped under section A, while questions related to PMS were grouped under section C.

• Finally, in order to increase response, care was taken to have a well presented questionnaire as a professionally printed double-sided booklet.

4.11.3 Question Types and Formats

In regard to constructing the questionnaire, there are two types of questions that have been commonly used, which are the open-ended and closed types. The open question does not have any kind of listed choices, but allows the respondents to answer in their own words, which means that the answers have to be recorded in full by the respondents, whereas the closed types have alternative choices which are provided to the respondents to choose between (Oppenheim, 2000; Collis & Hussey, 2014). It has been argued that the choice of open or closed questions is identified by several factors. According to van der Velde, Jansen, and Anderson (2004), this choice could be linked to the nature of the research's aim. Researchers who adopt exploratory research generally use open questions in order to gather as much information as possible, whereas adopting analytical or explanatory research often leads to utilising closed questions. Collis and Hussey (2014) pointed out that the type of questions used in the research is related with, and influenced by, the paradigm. Therefore they suggested

using open-ended question in the interpretivism paradigm, while the closed questions are commonly used with the positivistic approach.

Additionally, selecting the type of question could be identified through the content of the question, type of participants, their motivation to participate and the administration method (De Vaus, 2001). With a questionnaire that is described as long and comprehensiveness, it is recommended using the close-ended question type, which make it easier and quicker to be answered and coded (De Vaus, 2014).

Owing to the comprehensive nature related to this research questionnaire and its length to be consistently in accord with the research type and paradigm adopted, the closed-ended type was used to construct the questionnaire, as the main type. This is consistent with Mangione (1995), who recommended using open questions where short and specific answers are required, or there are large possible answers related to questions, which make it impractical to put each of them in a check box for response.

For achieving the research objectives, four types of closed questions were used, involving rating questions, category questions, list questions and quantity questions. According to Saunders et al. (2012), category questions are designed to fit one category only. To collect data about behaviour or attributes, these questions are helpful. This type was used in Questions A2, A3, A5 and B4. Moreover, list questions were used to provide the respondents with list questions in which they can choose from. They were used in Questions A1, A4, A5, B1, B2 and B3. The quantity questions type is where the respondent gives a number to answer the question. These questions tend to be useful to collect behaviour or attribute data. They were used in Questions A2, A3, B3 and B4.

In this questionnaire, the main type of closed questions used was rating questions, which are on a Likert-scale form. This type of question is often used for collecting opinion data and researchers frequently utilise them in questionnaires as they are easier and quicker to answer, not much is space needed or writing required and they provide more options for statistical tests (Mangione, 1995; Oppenheim, 2000; Collis & Hussey, 2014).

There are many versions of the Likert-scale, but the most commonly used are the four-, five-, six- or seven-point rating scales (Saunders et al., 2012). Different scales are

suggested to suit different purposes. In this regard, it is suggested by Kervin (1999) that the length of the scale should be seven or eight points or shorter, as a long length scale could take much effort from the respondents to answer (quoted in Saunders et al., 2012) and quoted in Saunders et al., 2007, p. 372).

Though, Elmore and Beggs (1975) pointed out that the quality of the five-point scale is just as good as any, and that increasing it from five to seven, or nine points, would not affect the reliability rating. However, it is stated that: *"the advantages of the 7- 9 - point scales are a better approximation of a normal response curve and extraction of more variability among respondents"* (Cooper & Schindler, 2011, p. 301). In addition, many reviewed studies (e.g. Spreitzer, 1995a, 1995b, 1996; Vandenbosch & Higgins, 1996; Gagné et al., 1997; Liden et al., 2000; Choe, 2004a; Burney & Widener, 2007; Drake et al., 2007; Hall, 2008; Hall & Smith, 2009; Burkert et al., 2011; Hall, 2011; Lau, 2011; Mahama & Cheng, 2013; Fong & Snape, 2015) related to this research have used a seven-point scale. Furthermore, following the recommendations of Numally (1978) for developing survey instruments, a seven-point Likert scale was used to ensure statistical variability amongst survey responses for the constructs. Therefore, this type of question was used within the questionnaire to measure some of the main research variables in Questions B5, C1, C2, C3, D1, D2, D3, D4, E1, E2 F1, F2, G and H.

4.11.4 Questionnaire Pre-testing

Although the process of the preparation and construction of the questionnaire took a considerable and appreciable concerted effort in stages and underwent numerous revisions with the supervision team before a final draft was produced, it was nonetheless fundamental to pilot the final draft to establish whether further improvements were required before distributing the questionnaire. It is recommended to pilot the questionnaire on a small number of participants before distributing it, so as to ensure that there is neither difficulty to answer questions, nor problems faced by the respondents, such as in the wording and measurement (Sekaran & Bougie, 2013). Moreover, Saunders et al. (2012) have stated that when researchers pilot the questionnaire, they obtain initial assessment about the content validity and the likely reliability of their data they will collect. In the context of pre-testing the questionnaire, some authors (e.g. Oppenheim, 2000; Saunders et al., 2012; Collis & Hussey, 2014; De Vaus, 2014) mentioned that it may involve friends, colleagues, an expert or group of

experts and people of different opinions, in order to obtain different views, insights and ideas. Therefore, to reach the final version of the questionnaire, a number of pre-testing stages have been done. These stages are discussed next.

For the first stage of pretesting, the finalised version was sent to nine PhD students, who are researching their doctoral projects in several subjects associated to business at different universities in the UK, including the University of Huddersfield Business School. Their feedback received provided some useful suggestions regarding the wording of questions, presentation, clarity and the formatting of the questionnaire.

The second stage of pre-testing was carried out with three academic staff who have an interest in management accounting and hold PhDs in accountancy from British universities. All of them work as lecturers in accountancy at different Libyan educational institutions. Two of these academics work in two different branches at the Academy of Graduate Studies, one in Misrata, the other in Tripoli, whereas the third lecturer works at the Omar El-Mukhtar University-Tubruq branch. They offered useful comments about the design, drafting and the contents that were taken into account when the questionnaire was re-drafted.

In the third stage of pre-testing, a meeting was held with middle-level manager at the largest manufacturing company in Libya. The purpose of the meeting was to gain feedback from persons similar to the respondents who are targeted by the research, for any ambiguous instructions, questions, and wording, for knowing the time required to complete the whole questionnaire and for the evaluation of participants' ability to answer the various aspects in the questionnaire.

The fourth stage of pre-testing involved handing the questionnaire to six companies which the researcher had targeted and located in the western region and collected all of them within seven days. The aim of this stage was to ensure that the questionnaire did not have problems before the real distribution. By taking into account all the suggestions as aforementioned, there were a few modifications which were made before producing a revised final draft.

4.11.5 Questionnaire Translation

The questionnaire was initially constructed and produced based on the English language, that is neither the official language nor widely spoken at companies in Libya. Therefore, it was decided to translate the final version of the questionnaire (see Appendix A) into the Arabic language (see Appendix B), in order for it to be clear and easy for respondents to answer it. For accuracy and for clarifying the content of the translated questionnaire, it was tested through independent evaluation by bilingual speakers. Four final drafts of both English and Arabic versions were sent to four academics working at different universities in Libya. The academics have an interest in management accounting and hold PhDs in accountancy from British universities. Both the final English and Arabic versions of the questionnaire were also sent to an expert translator at the same Libyan university, in order to ensure that the translated questionnaire is consistent with the original English version. A final check was made by an Arabic language expert to check the grammar and spelling of the Arabic version of the questionnaire before printing and distributing it to the target companies in Libya.

4.12 Content and Sources of the Final Version of the Questionnaire

The final version of the questionnaire consisted of seven A4 pages, including the covering letter page and the final page was left blank to be used by the respondents for any additional comments. The questionnaire is arranged into six sections. Each section is described in detail as follows. In addition, the relationship between the questionnaire items and objectives, as well as the research questions, is summarised and shown in Table 4.5.

Table 4.6 Links between Research Questionnaire Items, Objectives and Questions

Questionnaire section	QN	NI	Scale and type	Purpose and usage	RO	RQ
A: General information about the responses	A1	3	Multiple choice	It is customary practice in most questionnaire surveys	-	-
	A2	1	Quantity			
	A3	1	Quantity			
	A4	6	Multiple choice			
	A5	5				
	A6	2				
B: General	B1	9				

	QN	NI		Description	RO	RQ
information about the companies	B2	6				
	B3	6				
	B4	2	Quantity			
	B5	14	1-7 Likert			
C: PMS	C1	12	1-7 Likert	Measurement of comprehensiveness of PMS, used for hypotheses H1, H2, H3, H4, H5, H6, H9, H10	1 2	1 2
	C2	5	1-7 Likert	Measurement of NFPMR, used for hypotheses H11, H12, H13, 14, H15, H16, H17, H18	1 5	1 5
	C3	4	1-7 Likert	Measurement of FPMR, used for hypotheses H11, H12, H13, 14, H15, H16, H17, H18	1 5	1 5
D: PE	D1	3	1-7 Likert	Measurement of the degree of meaning, used for hypotheses H5, H6, H7, H15, H16	1 2 3 5	2 3 5
	D2	3	1-7 Likert	Measurement of the degree of competence, used for hypotheses H5, H6, H7, H15, H16	1 2 3 5	2 3 5
	D3	3	1-7 Likert	Measurement of the degree of self-determination, used for hypotheses H5, H6, H7, H15, H16	1 2 3 5	1 2 3 5
	D4	3	1-7 Likert	Measurement of the degree of impact used for hypotheses H5, H6, H7, H15, H16	1 2 3 5	2 3 5
E: RC	E1	5	1-7 Likert	Measurement of goal clarity, used for hypotheses H3, H4, H7, H13, H14	1 2 3 5	2 3 5
	E2	5	1-7 Likert	Measurement of process clarity, used for hypotheses H3, H4, H7, H13, H14	1 2 3 5	2 3 5
F: Learning	F1	5	1-7 Likert	Measurement of MMC, used for hypotheses H9, H17	1 2 5	2 5
	F2	5	1-7 Likert	Measurement of MMB, used for hypotheses H10, H18	1 2 5	2 5
G: JS	G	6	1-7 Likert	Measurement of the degree of satisfaction, used for hypotheses H1, H3, H5, H8, H11, H13	2 4 5	2 4 5
H: MP	H	8	1-7 Likert	Measurement of MP, used for hypotheses H2, H4, H6, H8 H9, H10, H12, H14, H16, H17, H18	2 4 5	2 4 5

QN: Question number; NI: Number of items; RO: Research objective; RQ: Research question; H: Hypothesis; NFPMR: Non-financial performance measures and rewards; FPMR: Financial performance measures and rewards

• **Section A: Respondents' General Information**

This section was designed to collect information about the participants regarding their job titles and positions, their levels of qualification and their experience in their current job and with the current company.

• **Section B: Companies' General Information**

This section is to gather general information about companies, such as: main industrial sector, companies' age in the current sector, type of ownership, number of employees in the division/subsidiary or strategic business unit and the degree of authority delegated to middle/ operational managers.

Question B5 was designed to measure the degree of decentralisation in the decisions of SBU managers. This question was based on the instruments developed by Hage and Aiken (1967), Pugh, Hickson, Hinings, and Turner (1968), Inkson, Pugh, and Hickson (1970) and Gordon and Narayanan (1984) and was commonly used in the prior studies (e.g. Dewar, Whetten, & Boje, 1980; Merchant, 1981; Chenhall & Morris, 1986; Soobaroyen & Poorundersing, 2008). The respondents were asked to indicate, on a seven point scale rating from 1 (never delegated) to 7 (always delegated), the extent to which decisions are delegated to middle/operational managers by top management in their companies.

• **Section C: Characteristics of PMS and Rewards**

This section was sought to collect information about the comprehensiveness of PMS and the importance of using both financial and non-financial performance measures and rewards in the sampled SBUs at manufacturing companies in Libya. It was divided into three questions.

Question C1 was designed to gather information about the extent of the comprehensiveness of PMS, by asking the respondents to indicate to what extent each of the statements that followed applies to the PMS of their business unit, on a seven-point scale rating from 1 (not at all) to 7 (to a great extent).

Question C2 was aimed at identifying the importance of using non-financial performance measures and rewards to the respondents' supervisor, which was provided by respondents for evaluating and rewarding their performance. The respondents

indicate the degree of importance of 5 items in relation to their supervisor, on a seven point scale rating from 1 (Not important) to 7 (Very important).

Question C3 was sought to determine the importance of using financial performance measures and rewards to the respondents' supervisor, which was provided by respondents for evaluating and rewarding their performance. The respondents indicate the degree of importance of 5 items in relation to their supervisor, on a seven point scale rating from 1 (Not important) to 7 (Very important).

Both these instruments in Questions C2 and C3 were developed based on the literature review, using articles (e.g. Hirst, 1981, 1983; Harrison, 1992; Lau, 2011) and some items were adopted from prior studies, such as that of (Hartmann et al., 2010).

• **Section D: Psychological Empowerment**

This section aimed at collecting information on psychological empowerment, which consists of four dimensions, including meaning, self-determination, competence and impact. This instrument was adopted from Hall (2008), who based it on Spreitzer (1995b) who had developed a 12-item instrument to measure the dimensions mentioned above, with three for each. Respondents were asked by this instrument to indicate the extent to which a variety of factors related to each of the dimensions is evident in their jobs, using a seven-point scale rating from 1 (Strongly disagree) to 7 (Strongly agree). Spreitzer's (1995b) measure of psychological empowerment has been widely used in prior research (e.g. Fulford & Enz, 1995; Gagné et al., 1997; Spreitzer et al., 1997; Corsun & Enz, 1999; Koberg, Boss, Senjem, & Goodman, 1999; Liden et al., 2000; Siegall & Gardner, 2000; Laschinger et al., 2001, 2004; Seibert et al., 2004; Drake et al., 2007; Hall, 2008; Hall & Smith, 2009; Mahama & Cheng, 2013; Fong & Snape, 2015).

• **Section E: Role Clarity**

This section is designed to collect information on both dimensions of role clarity, namely goal clarity and process clarity. This instrument was adopted from Hall (2008), who established it on Ilgen and Hollenbeck (1991) work, which argued that research should explicitly define the aspects of role clarity under examination. It suggested the clarity of expectations about the goals and objectives of a job role and the clarity of the behaviours required for fulfilling a job role. There were some authors (e.g. Sawyer,

1992; Beard, 1999; Hall, 2008) who offered support for the discriminant, convergent, and construct validity of the goal clarity and process clarity scales.

Question E asked respondents to indicate the extent to which they were certain or uncertain about aspects of their current jobs in both dimensions, which are 5 items for goal clarity and 5 items for process clarity and using a seven-point scale rating from 1 (Very uncertain) to 7 (Very certain).

• **Section F: Individual Learning**

This section aimed to collect information about the respondents' learning which was measured using two dimensions, including the five-item scale for MMC and another five-item scale for MMB.

Question F was adopted and adapted from Hall (2011) and Vandenbosch and Higgins (1996). The question sought to measure the degree of the confirming and updating of mental models of the respondents by asking them to indicate the extent to which they agreed or disagreed with each statement, using a seven-point Likert scale rating from 1 (Strongly disagree) to 7 (Strongly agree).

• **Section G: Job Satisfaction**

This section sought to collect information about the job satisfaction of respondents and was measured by using the short-form of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England, & Lofquist, 1967). The MSQ was selected from several facet-specific measures for the following reasons. First, Dunham, Smith, and Blackburn (1977) pointed out that it offered the highest convergent validity of the measures they evaluated. Second, the MSQ is the most comprehensive of the facet-specific measures of job satisfaction, including 20 job facets. Third, Scarpello and Campbell (1983) adjudged the MSQ to have had more success than the other scales which they examined, in predicting overall job satisfaction from satisfaction with the facets of the job. This measure has been supported for its reliability and validity (Weiss et al., 1967) and has been widely and consistently used in the applied psychology field (see for example Butler, 1983; Pulakos & Schmitt, 1983), as well as managerial accounting research (e.g. Brownell, 1981, 1982a, 1982c; Harrison, 1992, 1993; Leach-López, Stammerjohan, & McNair, 2007; Leach-López, Stammerjohan, & Rigsby,

2008). The study also used the modified rating categories advocated by Weiss et al. (1967).

Question G asked respondents to indicate the extent to which they are dissatisfied or satisfied with twenty statements about their jobs, by using a seven-point scale rating from 1 (Very dissatisfied) to 7 (Very satisfied).

• **Section H: Managerial Performance**

This section aimed at collecting information on the respondents' performance and was measured using the eight-item scale developed by Mahoney, Jerdee, and Carroll (1965). It consists of eight dimensions of managerial performance; planning, investigating, coordinating, evaluating, supervising, staffing, negotiating and representing.

Question H asks respondents to rate their performance based on self-rating, by using a seven-point scale rating from 1 (Well below average) to 7 (Well above average). This instrument remains the dominant method of obtaining data related to self-rated managerial performance in management accounting research (Brownell, 1985; Kren, 1992; Gul & Chia, 1994; Chong, 1996; Chong & Chong, 2002; Burney & Widener, 2007; Hall, 2008; Burkert et al., 2011; Hall, 2011; Lau, 2011; Chung et al., 2012).

At the end of the questionnaire the respondents were asked to add any additional information and comments, or suggestions related to the issues covered in this questionnaire, by using the last page or a separate sheet. Finally, they were appreciated and thanked for being participants in completing the questionnaire and invited to provide contact details if they are keen and have the ability to be interviewed later.

4.13 Questionnaire Administration

In order to maximise the survey response rate, a number of procedures recommended by many authors (e.g. Dillman, 1978; Oppenheim, 2000; Saunders et al., 2012) have been followed. According to their suggestions, the following steps have been applied in this research, which includes pre-testing the research questionnaire (see sub-section 4.15.3), distributing the questionnaire personally (see Section 4.12), and a covering letter accompanying the questionnaire (see Appendix A). Saunders et al. (2012) and De Vaus (2014) have recommended that there are some features that should be contained in the

covering letter in order for it to be adequate. Therefore, the covering letter contained the following features:

- The letter content displays The University of Huddersfield's official logo at the top.
- It contains a summary about the research title, aim and its importance to the target respondents.
- Respondents were reassured that their information which they provide would be treated as strictly confidential and used only for the purposes of the research study.
- Contact details of the researcher were provided for any queries.

Finally, four supporting copies of letters were provided with the questionnaire. The first supporting letter was from the University of Huddersfield, UK, where the research project was developed. The second letter was from the Libyan Cultural Affairs Bureau in London, the financial sponsors of the study. The third was from the Scholarships Office in Libya, the official sponsor of scholarship students abroad and the fourth was from the Zliten Local Council in Libya. These letters assisted and encouraged all companies to participate in and contribute to this research study.

Once the final draft of the questionnaire was produced, it was personally distributed on 19th June 2013. Each target participant was delivered a package, which included a covering letter, the questionnaire and the supporting letters. When questionnaires were distributed by hand, the researcher explained the objectives, the framework and the relevant issues, giving the participants an outline of the research, hoping that would motivate the participants to give complete and honest answers and then asking them to read all the questions in the questionnaire in order to clarify any ambiguous questions or need any require it. Finally, before the researcher left any participant to complete the questionnaire, they were asked to give a certain time for gathering the completed questionnaires. Furthermore, participants were encouraged to contact the researcher at any time whilst they completed the questionnaire if there were any questions, and by using the researcher's contact details which are shown in the cover letter. The researcher conducted some telephone calls to remind the participants about completing the questionnaire before coming to hand it back and if it was not completed yet, they were given a chance to complete it and hand it in another time.

The process of distributing and collecting the questionnaires continued during the period June-August 2013 and resulted in the delivery of 190 questionnaires by hand and gathering the 135 questionnaires that were returned. A total of 17 questionnaires were not returned, with the main reasons given for non-completion being lack of time, work pressure and company policy. A total of 13 questionnaires were not usable, thus yielding an 80.26% response rate (see Table 4.6 below).

Table 4.7 Analysis of the Questionnaire Response Rate

Type of distribution	Personally distributed
Population size (SBU managers)	190
Ineligible, company not operating[2]	-38
Refusals/company policy/staff busy	-17
Total questionnaire returned	135
Unusable questionnaire/Partially < 50% filled	13
Total questionnaires returned	122
Usable Response Rate	80.26%

The usable response rate is calculated as follows:

Response rate =

$$\frac{\text{number of completed and returned questionnaires}}{\text{Number of respondents in sample} - (\text{The non-eligible and non-reachable respondents})}$$

Response rate = 122 / (190 – 38) = 80.26%

In most academic studies, a response rate between 30-50 per cent for self-administered questionnaires is considered acceptable. However, this ratio can vary depending on cultural aspects (Baruch, 1999; Saunders et al., 2012). Therefore, the response rate obtained for this research study is considered to be very satisfactory.

4.14 Validity and Reliability

It is acknowledged that a crucial part of any good research is to assess the goodness of the developed instrument for ensuring that this instrument is accurately measuring the concept that it sets out to measure and not something else (Baruch, 1999; Saunders et

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[2] Some of the targeted companies were not, or only partially operating, owing to Government policy on companies for the re-evaluation procedures.

al., 2012). In other words, the measurement of variables in any research, especially one related to a positivistic paradigm, must be valid. This requires that the data collected should be representative of the true picture of what is being studied. Measuring the variables must be reliable, which means that if the research were to be repeated, the same results should be obtained. Assessing the goodness related to the measurement of variables is concerned with assessing the validity and reliability of the instrument. Thus, in a positivistic research, these two issues are vital (Collis & Hussey, 2014).

4.14.1 Validity

Validity refers to whether the research results accurately represent what is really happening in the case that has been addressed. In other words, it is a test of how well the measurement instrument is developed when it used to measure the concept of intent (Saunders et al., 2012; Sekaran & Bougie, 2013; Collis & Hussey, 2014). According to research literature, validity has two major forms, which are external and internal validity. External validity refers to generalising the results of research across persons, settings and times (Blumberg et al., 2014). To obtain external validity in a research study, its sample must be valid and this can be achieved through a well-designed sample that truly represents the features of the population. Attaining this requires firstly, the sample must be accurate which means the degree of bias is absent from it, and secondly, the precision of the sample, which refers to how closely the sample represents the population. According to the literature review, there is a type of standard deviation measurement, which is standard error of estimate that can be used to measure precision; with the smaller the standard error of estimate, the higher is the precision of the sample. The ideal sample design is reflected in producing a small standard error of estimate (Blumberg et al., 2014).

As clarified above in Section 4.9, the sample of this research targeted the entire population. The high response rate achieved, which indicates the representation of the sample to the population, therefore establishes external validity. Furthermore, variables of this research model have a standard error of estimate of less than 1. Consequently, it can be concluded from the above that it is possible to generalise the findings of this study to the entire population.

Moreover, there is an issue that may affect the findings generalisation, which is related to the non-response bias. To generalise the survey's results, it is recommended to conduct non-response bias tests. However, many authors (e.g. Govindarajan, 1984; Govindarajan & Gupta, 1985; Chong, 1998; Jermias & Gani, 2004) have stated that non-response bias is not problematic if the response rate is particularly high. Since this research has a high response rate (80%), it is considered that the non-response bias test was not necessary.

Additionally, the internal validity deals with the ability of the research instrument for measuring what it is designed to measure (Blumberg et al., 2014). In this regard, there are three common types related to validity tests, which are usually used to test the goodness of measures, including content, criterion and construct validity. Both content and construct validity are frequently mentioned in the literature to assess the research instrument. Content validity assesses the degree of the measured concept, to ensure that it is covered by an adequate and representative set of items; with the higher the representation of the scale items for the concept being measured, the greater the content validity (Sekaran & Bougie, 2013). Assessing content validity can be difficult since it is a matter of judgement and can therefore be achieved through; first, a well-defined topic and careful item selection, which are often different and unique for each research, and second, by using a panel of judges to evaluate the goodness of an instrument in meeting the standards (Sekaran & Bougie, 2013; Collis & Hussey, 2014).

To meet requirements of the content validity, a studious review of previous literature was undertaken for defining the topic and clarifying the items and scales used in the instrument. In addition, the overall items and scales used in the questionnaire of this study were adopted from relevant prior studies (see Section 4.16). Suggestions and information were obtained from the literature and pre-testing of the instrument was incorporated into this research. Therefore, it was concluded that the content validity was established for this research.

Construct validity identifies how well the findings obtained from the measurement fit with the theories around which the test was designed (Sekaran & Bougie, 2010, p. 160). This validity can be achieved through pre-testing the questionnaire which used a number of pre-testing stages to ensure enhanced construct validity, as mentioned earlier in this research study.

- **Controlling Response Bias**

Response bias occurs when respondents answer survey questions in a way they believe that a researcher wants them to. It is also defined as "a systematic tendency to respond to a range of questionnaire items on some basis other than the specific item content" (Paulhus, 1991, p. 17). For instance, a respondent may choose or mark the option which is most socially desirable or most extreme. Also a question's wording or layout can cause response bias. It is possible that social desirability contributes to an instrument's validity, but is usually not testable if controlling social desirability is actually built into the scale (Paulhus, 1981). Although a response bias cannot be completely eliminated, there are some steps or advice that can be followed at least to minimize bias and collect more precise data.

➢ Clear language: when researchers design their survey, they must make sure that they understand their audience and the language that the audience uses and comprehends. In this regard, the researcher needs to pay more attention when the questionnaire is designed in terms of simplifying language that audiences understand. They also need to avoid technical jargon that might be above the audience's understanding. The researcher also needs to double check that the respondents understand what the questionnaire is trying to convey to them by Pre-testing the surveys on a sample audience as mentioned in Section (4.114).

➢ Framing a question is another issue for gathering precise data. The researcher took into account framing the questions correctly and he was aware of these types of biases while he was wording the questions.

➢ Offer enough options: adding more options to the scale is another key point. The researcher used a seven-point Likert scale rather than a three or five-point Likert scale to offer more options to respondents thus reducing respondent bias.

➢ Demand reduction is a wide-ranging form of control which includes maximising confidentiality and anonymity. It is very important to remind respondents that the feedback is useful only if responses are honest. They must also assure anonymity and confidentiality to respondents. This strategy leads to lower susceptibility to socially desirable answers. In the covering letter, the researcher reassured respondents that their responses would be treated as strictly confidential, and only used for the

purposes of this research study. They were also informed that answers would not be disclosed to third parties under any circumstances.

➢ Other response biases-for example, pattern responding. There are other response biases, one of which for example is pattern responding or positive response bias. This is where respondents simply mark their responses in a sequential pattern. (e.g., 1, 2, 3, 4, 5, 6, 7 1, 2, 3, 4, 5, 6, 7 etc., or all 4's or 6's for example). However, computer programs have been developed by some researchers to recognise this type of bias, but it is suggested that the best method to recognise this phenomenon is the human eye. To control this type of bias, when the questionnaires were individually collected and checked, one must look at them to ensure there is nothing to suggest a certain pattern in respondents' answers and that answers appear miscellaneous.

4.14.2 Reliability

The reliability of a measure indicates whether a developed instrument, in measuring its target construct using different items over time, is stable and consistent (Sekaran & Bougie, 2013). Reliability is therefore referred to as consistency and is concerned with the robustness of the questionnaire, particularly whether or not it produces consistent results at different times and under different circumstances. Hence, according to Easterby-Smith et al. (2002) and Saunders et al. (2012), reliability is a matter of stability.

There are three different forms which are commonly used in order to assess the reliability of an instrument, namely test re-test, internal consistency and parallel (alternative) form. One of the most popular forms to assess reliability is Cronbach's alpha, which determines the internal consistency or average correlation of items in a survey instrument, for gauging its reliability (Bryman & Bell, 2011; Saunders et al., 2012; Sekaran & Bougie, 2013). Therefore, Cronbach's alpha was used in this study to determine the overall reliability of the measurement scale for each construct. The internal consistency is concerned with whether or not a scale, which was built by the items, tends to measure the same concept (Bryman & Bell, 2011). The higher the coefficient scores the more reliable the measuring instrument. In this regard, it is recommended that the acceptable score of an alpha is not less than 0.70 (Hair, 2011).

Table 4.8 Reliability Test Results

Variables	Question(s)	No. of items	Cronbach alpha
Decision Making Autonomy	B5	14	0.933
Comprehensive PMS	C1	12	0.938
Financial Performance Measures and Rewards	C2	4	0.892
Non-financial Performance Measures and Rewards	C3	5	0.817
Role Clarity	E1 and E2	10	0.951
Goal Clarity	E1	5	0.910
Process Clarity	E2	5	0.960
Psychological Empowerment	D1 to D4	12	0.956
Meaning	D1	3	0.863
Competence	D2	3	0.964
Self-determination	D3	3	0.958
Impact	D4	3	0.917
Mental Model Confirmation	F1	5	0.860
Mental Model Building	F2	5	0.930
Job Satisfaction	G	20	0.964
Managerial Performance	H	8	0.907

It can be concluded, as shown above in Table (4.7), that the Cronbach alpha results of all variables (questions) were measured by scaled items (more than two) and have passed the test and that the achieved values have exceeded the minimum recommended value for assessing reliability.

4.15 Methods used in Data Analysis

In the context of analysing data, it is acknowledged that there are two main groups of inferential tests used, parametric or non-parametric. The former is utilised when the data is normally distributed and measured on interval or ratio scales (i.e. metric), whereas the latter is concerned with nominal data (i.e. non-metric). However, the data collected for this study is analysed by using parametric tests which are consistent with previous management accounting studies and there are some statistical tools (e.g. Process) that do not require that the data be normally distributed. Therefore, Chapter Six displays the results of all the assumptions of the parametric test used, which were met. Moreover, to achieve the objectives of the research, some statistical techniques were used to analyse the data and followed.

4.15.1 Descriptive Statistics

Descriptive statistics, such as frequency and means, aims to achieve descriptive objectives by describing the status of using PMSs within manufacturing companies in Libya and investigating SBU managers' perceptions of the relationship between PMSs and their outcomes as well. The means were statistically calculated and used to rank the importance of each item within its sub- and main group, where it is possible, as presented in the next chapter (Chapter Five). Characteristics of respondents and responding SBUs within target companies were described by using frequencies, means, percentages and graphs.

4.15.2 Correlation and Regression

Correlation is a technique which is used to examine an association between two or more quantitative, continuous variables and shows the overall strength of the association (Pallant, 2007; Field, 2013). Despite the offered benefits of using this type of analysis, variables cannot be distinguished between independent and dependent. According to correlation analysis, which variable causes the other is unknown.

On the other hand, regression analysis is used to identify the influence of independent variables on a dependent variable. In this vein, it is argued that the most widely used technique to analyse data and for measuring linear relationships between at least two variables, is regression analysis, which could be utilised in a simple form where a single independent variable is used for predicting a single dependent variable, or could be multiple, looking at the effect of at least two independent variables on the dependent variable (Hair, Celsi, Money, Samouel, & Page, 2011). Multiple regression is used when a model seeks to determine the impact of several independent variables on a dependent variable simultaneously and to provide information about how much of the variance in the dependent variable is explained by the independent variables in the relationships.

Furthermore, in this research, both correlation and regression analysis are used to examine the relationships between the variables which are measured with interval data (i.e. metric). Correlation analysis is applied to inspect the strength of correlation between the intervening variables, which are dimensions of role clarity, psychological

empowerment and individual learning. In contrast, simple regression is utilised to examine the potential influence of comprehensive PMS on the outcome variables (job satisfaction and managerial performance), the effect of role clarity on psychological empowerment, the impact of job satisfaction on managerial performance and the influence of performance measures and rewards on outcome variables (job satisfaction and managerial performance), as stated in the research hypotheses H1, H2, H7, H8, H11 and H12 respectively (see Chapter Six).

In addition, mediation regression is used to investigate the role of cognitive and motivational variables as mediators on the relationship between PMS and outcome variables. In order to proceed and examine this mediating effect (see Chapters Six and Seven), Hayes's (2013) macro (Process) was downloaded and integrated with the SPSS 22 package and used to estimate the indirect effect in multiple-mediation, followed by simple mediation to obtain the effect size measure. A full description related to this technique and its output interpretation is provided and discussed later in Chapters Six and Chapter Seven.

4.15.3 Factor Analysis

Factor analysis is a multivariate statistical technique, exploring the underlying correlations among a large number of variables (e.g. test items, questionnaire response), for summarising and combining them into a much smaller number of variables or factors. Achieving the purpose of this technique, studies have adopted one of two methods, either principal components analysis, or common factor analysis, which is also known as exploratory factor analysis (Hair et al., 2011). Principal components analysis is used to reduce the original set of variables to a smaller set of combined variables. On the other hand, common factor analysis is adopted when the aim is to identify and classify the underlying common dimensions in the original variables (Hair et al., 2011).

Despite the fact that there has been a considerable discussion over which method is the more suitable, empirical research usually reports similar results and solutions when both methods are applied to the same problem (Hair, Tatham, Anderson, & Black, 2010; Field, 2013). According to (Field, 2013) and Hair et al. (2011), who have argued that there are differences between both methods, common factor analysis appears largely difficult for non-statisticians to conceptualise and calculate it, and in addition, they also

indicated that the principal components analysis is the most commonly used method in business research. For these reasons, this research adopted the principal components analysis (hereafter referred as factor analysis) and used it to define the dimensions of PMS (see Chapter Five).

4.16 Summary

To accomplish the research objectives, the positivistic approach was adopted using a survey method. All large and medium-sized manufacturing companies in Libya were surveyed to collect quantitative data by using a questionnaire, achieving a high response rate. Validity and reliability were established by applying relevant tests and finally, types of statistical tests to analyse the data of this research were selected, presented and clarified.

The next chapter presents a descriptive analysis of the results that relate to the first objective of this research, regarding PMS in terms of current use and types.

Chapter 5 Descriptive Analysis of PMS Comprehensiveness and Types

5.1 Introduction

The chapter introduces the descriptive statistics based on general information related to the respondents, responding companies and the characteristics of the used PMS, in terms of their design, implementation and comprehensiveness. The descriptive statistics in this chapter are mainly related to the study's first research objective which was outlined in Chapter One and is presented in more detail below:

1- To describe the comprehensiveness of PMS, the importance of financial and non-financial performance measures and rewards (FPMR and NFPMR), levels of role clarity, levels of psychological empowerment and types of individual learning (Mental Model Confirmation and Building) in SBUs at manufacturing companies in Libya.

- To identify the comprehensiveness of PMS in SBUs at large and medium-sized manufacturing companies in Libya.

- To identify the importance of FPMR and NFPMR used in these SBUs.

- To identify to what the extent is the role clarity of SBU managers in these companies.

- To identify the level of psychological empowerment in SBUs at the companies.

- To identify the level of managers' MMC and MMB in SBUs at these companies.

This chapter is organised as follows: general information about respondents and the responding companies is provided in Sections 5.2 and 5.3. Section 5.4 presents the SBUs' PMS, followed by in Section 5.5 the level of role clarity perceived by the managers and in Section 5.6 by the level of psychological empowerment about the respondents. The managerial level of learning in both its subdivisions, namely MMC and MMB, is presented in Section 5.7, the present level of managers' job satisfaction follows in Section 5.8 and managerial performance in Section 5.9. Section 5.10 concludes the chapter.

5.2 General Information about the Respondents

Section A of the survey questionnaire was used to collect general information about the job titles of the respondents, their experiences in current jobs and with the current companies and details related to their academic and professional qualifications.

Due to the nature of the information required by this research, respondents who are experienced or have much knowledge about PMS in their companies (e.g. SBU managers) were targeted to participate in the questionnaire survey. Hence, no effort was spared to ensure that SBU managers and division/subsidiary managers participated in the survey. As shown in Table 5.1 almost all of the respondents work as SBU managers (98.4%) in their companies, as chief executives in independent companies and divisions' managers of larger companies. Most (84.4%) have been working for their current firms for more than 5 years and many (57.3%) have experience in their current positions for more than 5 years. More than half of the respondents hold a bachelor's degree and 23.8% have a postgraduate qualification (e.g. MA/MSc), while only 2.5% have a Ph.D.

Table 5.1 General Information about the Respondents

	Frequency	Percentage	Cumulative
Job title and position			
Division/Subsidiary Manager	64	52.5	52.5
Strategic Business Unit Manager	56	45.5	98.4
Other	2	1.6	100.0
Total	**122**	**100.0**	
Experience in the current job			
Less than 5 years	52	42.6	42.6
5 years - less than10 years	37	30.3	73.0
10 years - less than 15 years	11	9.0	82.0
15 years and more	22	18.0	100.0
Total	**122**	**100.0**	
Experience with the current company			
Less than 5 years	19	15.6	15.6
5 years - less than10 years	36	29.5	45.1
10 years - less than 15 years	30	24.6	69.7
15 years and more	37	30.3	100.0
Total	**122**	**100.0**	
Highest qualification			
High School	12	9.8	9.8
BA/BSc	67	54.9	64.8
MA/MSc	29	23.8	88.5
PhD	3	2.5	91.9
Professional Qualifications	6	4.9	95.9
Other	5	4.1	100.0
Total	**122**	**100.0**	

It may be concluded from the above information related to characteristics of the respondents that they are generally knowledgeable and also relatively highly experienced with regards to how long they have been working in the current companies and particularly in their current positions. Therefore, it is considered that these respondents are appropriate for providing relevant information in terms of their PMS, cognition and motivation, as well as managerial performance.

5.3 General Information about the Responding SBUs

In Section B of the questionnaire, respondents were asked to provide information about the characteristics of their companies. Tables 5.2 to 5.5 and Figure 5.1 summarise these characteristics in terms of industrial sector, ownership, number of employees in the SBU, age of the company and the extent of decision making autonomy.

Table 5.2 SBU Main Industrial Sector

Industrial sector	Frequency	Percentage
Food	30	24.6
Furniture and Paper	11	9.0
Cement and Building Materials	20	16.4
Chemical	5	4.1
Oil and Gas	6	4.9
Electronics and Electrical	13	10.7
Metal	14	11.5
Textile	12	9.8
Other	11	9.0
Total	122	100.0

Table 5.2, shows that there are a wide range of manufacturing sectors which are distributed according to the sectors, namely, the food making sector constitutes a quarter (24.6%) of the sample, followed by cement and building materials (16.4%), metal (11.5%) and sectors such as furniture and paper, electronics and electrical and textile, collectively representing about a third (29.5%) of the sample.

The ownership type is illustrated in Table 5.3, showing that 41% from responding companies are private, whilst 34.4% of them are state-owned. Despite the fact that few steps have been taken by the Libyan government to move towards a free economy (Leftesi, 2008), the number of state-owned companies is still quite high. It is worth

noting that some of the companies work together with a foreign partner as joint ventures which may enhance and improve the effectiveness of the management accounting system, particularly the PMS, in the future.

Table 5.3 SBU by Company Ownership Type

	Frequency	Percentage
State-owned company	42	34.4%
Private company	50	41.0%
Joint venture (State and a foreign partner)	7	5.7%
Joint venture (State and local private)	8	6.6%
Joint venture (Local private and foreign)	11	9.0%
Other	4	3.3%
Total	**122**	**100%**

Figure 5.1 shows that 92.6% of the respondents indicated that their companies have been operating for over 6 years and 26.2 % of the companies have been operating for more than 26 years. Moreover, while the SBUs that employed between 100 and 199 employees are 38.5%, the SBUs which have 500 or more are 9%, as shown in Table 5.4.

Figure 5.1 Age Distribution of Companies

Figure 5.1 Age Distribution of Companies
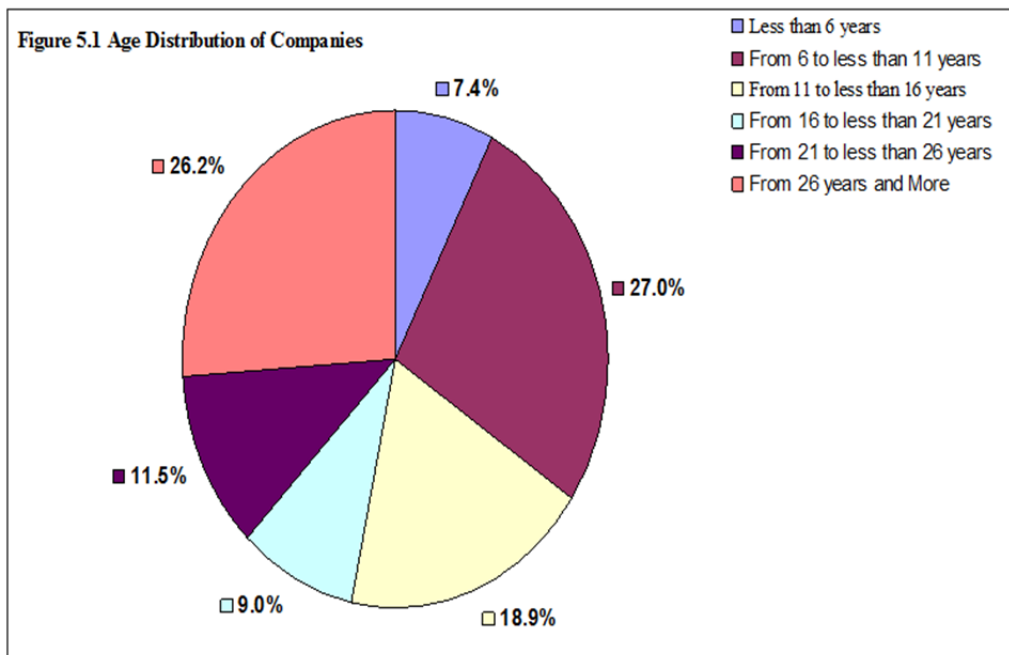
Table 5.4 SBU Size: Number of Employees

	Frequency	Percentage	Cumulative Percentage
100 - 199	47	38.5	38.5
200 - 299	31	25.4	63.9
300 - 399	19	15.6	79.5
400 - 499	14	11.5	91.0
More than 500	11	9.0	100.0
Total	122	100.0	

In Question B6 the respondents were asked about the internal operating environment of their companies to indicate the extent to which decisions are delegated to middle/operational managers by top management in their companies, on a seven point scale, from 1= Never delegated to 7 = Always delegated.

Table 5.5 shows the perceptions of managers regarding decision making autonomy. It is indicated that the overall mean of delegated decisions to managers is on average 4.05.

Table 5.5 Decision Making Autonomy in the Companies

	Rank	Mean
Decisions to introduce new products.	11	3.70
Decisions to improve existing products.	6	4.07
Decisions to terminate active products.	8	3.87
Product pricing decisions.	7	3.90
Decisions on major changes to processes (e.g. introduction of new manufacturing technology).	4	4.38
Decisions related to developing existing markets.	10	3.73
Decisions related to entering new markets.	12	3.68
Personnel policy decisions (appointment\training\promotion\dismissal).	3	4.62
Capital investment decisions.	9	3.74
Budgeting decisions.	5	4.20
Working capital decisions (e.g. cash balances, overdraft, payments to suppliers and payments by customers).	13	3.40
Long-term financing decisions.	14	3.26
Raw materials sourcing decisions.	1	5.07
Transfer pricing decisions.	2	5.02
Overall mean		4.05

It also demonstrates that there are differences in delegating several decisions, while the decisions related to raw materials sourcing decisions and transfer pricing decisions are slightly more delegated with 5.07 and 5.02 scores respectively. Long-term financing are the least delegated decisions with a 3.26 score.

From the above table, it is clear that the delegation of authority within the sample companies differs from one decision to another, although most of the authority related to delegate decisions slightly increases or decreases on the average. These results are consistent with the argument that firms design their decision-making autonomy around their PMS, indicating the close link between decision making autonomy and comprehensive PMS, which may provide support and possible explanation for the above results (Micheli & Manzoni, 2010). Specifically, the descriptive statistics related to the aspects of the decision making process investigated in this research (Table 5.6), indicate that the sampled companies can be described as having relatively moderate decision making autonomy (mean = 4.05), and this is reflected in the design and adoption of the comprehensiveness PMS and its types (see Sections 5.4.1 and 5.4.2).

5.4 The SBU's PMS

In order to identify the PMS used in SBUs at large and mid-sized industrial companies in Libya, Question C1 assesses the comprehensiveness of the PMS, and both C2 and C3 identify the types of performance measures and rewards used, in terms of financial and non-financial, for evaluating job satisfaction and managerial performance. The following two sub-sections discuss and summarise the findings related to these questions.

5.4.1 The Comprehensiveness of SBU's PMS

In Question C1, 12 items were utilised to find out the extent of their application regarding the comprehensiveness of the PMS being used by SBU managers at the sampled companies. The respondents were asked to indicate to what extent each of the statements in this construct applies to their business unit's PMS, using a seven point scale (from 1 = not at all to 7 = to a great extent).

As can be seen from Table 5.6, a new scale has been developed to capture the comprehensive of the PMS construct. The scale comprises twelve items. Five items (*) describe the extent to which the PMS provides a diversity of performance information relating to the important parts of the SBU's operations: Four items (**) relate to the extent of integration of measures with strategy and across the value chain, Two items (***) relate to the extent to which the PMS provides quantitative information to capture cause-and-effect relationships between activities within the business unit, One item (****) relates to the extent of the well-designed PMS contributing to the comprehensiveness of the system.

Table 5.6 The Comprehensive PMS

PMS Items	Rank	Mean
The PMS provides a broad range of performance information about different areas of the business unit.*	12	4.78
The PMS is produced in a fully documented form, which provides a record for evaluating performance.**	11	4.81
The PMS provides a diverse set of measures related to the key performance areas of the business unit.*	10	4.89
The PMS provides consistent and mutually reinforcing links between the current operating performance of the business unit and the company's long term strategies.**	6	5.07
The PMS provides information on different dimensions of the business unit's performance.*	7	5.02
The PMS links together the activities of the business unit to the achievement of the goals and objectives of the company.**	2	5.12
The PMS provides a variety of information about important aspects of the business unit's operations.*	9	4.93
The PMS captures cause-effect relationships between activities in the business unit. ***	8	4.94
The PMS shows the activities and results in my business unit are connected. ***	5	5.09
The PMS shows how the activities of the business unit affect the activities of other units within the company. **	4	5.09
The PMS provides a range of measures that cover the critical areas of the business unit's operations, in line with business strategy.*	1	5.13
The comprehensiveness of the PMS is aided by well-designed performance systems. ****	3	5.09
Overall mean		**5.00**

Furthermore, data presented in Table 5.6 show that all provided items in relation to the comprehensive PMS have a mean score of above 4.00. On the one hand, managers of SBUs considered that "The PMS provides a range of measures that cover the critical areas of the business unit's operations in line with business strategy" is the most

important determinant of the comprehensiveness of the PMS, with a mean score of 5.13. This may be due to the fact that the strategic fit of performance measures seems to support managers by focusing on the most strategically relevant information for learning, thus mitigating complexity (Chenhall, 2005), as well as the experimental evidence of Farrell, Kadous, and Towry (2008) who mentioned that providing managers with strategic performance indicators reduces their task complexity simply by reducing their set of strategic choices.

On the other hand, unexpectedly, providing a broad range of performance information about different areas of the business unit has a lower mean with 4.78 and ranked 12th. However, it is still higher than the average. Given the importance of cause-and-effect relationships related to performance measures, which resulted in mean scores around 5.00, that indicate that these results emphasize the importance of causal business modelling for individual and organizational learning. This is consistent with the argument of Kelly (2007) and extends experimental findings showing that providing managers with cause-and-effect relationships improves performance, even independently of their accuracy (Kelly, 2010).

In conclusion, the slightly high overall mean score of all items (5.00) indicates the importance of these items in determining the comprehensiveness of the PMS in large and mid-sized manufacturing companies in Libya. Due to the fact that the scales of the comprehensive PMS and both types of performance measures and rewards used in this study have been adapted from previous research, several tests (e.g. an exploratory factor analysis and Cronbach alpha) have been performed to examine psychometric properties of the comprehensive PMS and both types of performance measures and rewards, prior to including them in the measurement model.

As previously mentioned in Chapter Four, factor analysis was used to find out whether the above items represent one factor, which is the comprehensive PMS, for identifying and understanding the dimensions of the PMS's effectiveness and in addition, to determine the number of factors that the items of both types of performance measures and rewards could represent. This procedure is conducted with the purpose of avoiding biased responses in relation to these variables (i.e. a direct question may result in highly unrepresentative scores). Thus, it is recommended by some authors (e.g. Hair, Anderson, Tatham, & Black, 1998; Hair, Babin, Money, & Samouel, 2003; Tabachnick

& Fidell, 2012; Field, 2013) that critical principles should be taken into consideration by performing factor analysis as follows:

- The statistical score related to the Kaiser-Meyer-Olkin of Sampling Adequacy (KMO) should be greater than 0.5 and the Bartlett's Test of Sphericity should be significant (the value of the test at p = 0.05 or less).

- The Kaiser Criterion is used for selecting factors that have an eigenvalue greater than 1 and also using a Scree Plot.

- Deciding how many factors to be retained and choosing factors that should explain together at least 60% of the total variance.

- It is considered that factor loadings that have absolute values greater than .5 are important and should be displayed.

These values of each item, as mentioned above, are relatively important to represent factors. Therefore, the more the absolute value of items loading, the more easily to interpret and name the factor. In other words, the ultimate goal is to obtain a set of factors that are easy to interpret and theoretically meaningful. However, if the factors do not make sense and become meaningless, it should stop factoring (Aaker et al., 2013). The results of conducting factor analysis are shown below.

Table 5.7 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.898
Bartlett's Test of Sphericity	Approx. Chi-Square	1821.211
	df	210
	Sig.	.000

Evidently, Table 5.7, shows that the KMO value is 0.898, which is greater than the minimum requirement and therefore is considered as a good value (Field, 2013). Furthermore, Bartlett's Test of Sphericity is highly significant at the level of .05 (p < .001). Hence, using factor analysis for the study's data is appropriate.

As can be seen from Table 5.8 below, the results show the total variance explained by each component and indicate that three factors have Eigenvalues that are greater than 1, explaining about 67 % of that variance. It is obvious that the first factor explains about 44% of total variance. Moreover, the Scree Plot (Figure 5.2) illustrates that three of

those factors explain most of the variability, due to the fact that the line starts to straighten after factor 3 which means the remaining factor explains a very small proportion of the variability and is likely unimportant. Takes into account the naming of the factors extracted, the total variance explained by all factors and by each factor and the factors that have Eigenvalues of more than 1, therefore the first three factors were selected (highlighted in Table 5.8), as they explain about 67 % of the total variance and could be logically named. In this context, one of these factors is related to the comprehensive PMS and the others represent two types of performance measures and rewards.

Table 5.8 Total Variance explained by each Factor

Component (factor)	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	9.284	44.212	44.212
2	2.583	12.302	56.514
3	2.107	10.035	66.550
4	0.992	4.725	71.275
5	0.772	3.680	74.955
6	0.647	3.082	78.037
7	0.605	2.885	80.922
8	0.543	2.585	83.507
9	0.492	2.343	85.850
10	0.431	2.051	87.901
11	0.361	1.721	89.622
12	0.321	1.530	91.152
13	0.288	1.370	92.522
14	0.270	1.285	93.807
15	0.253	1.207	95.014
16	0.220	1.046	96.059
17	0.199	.949	97.009
18	0.182	.865	97.874
19	0.169	.805	98.679
20	0.151	.720	99.399
21	0.126	.601	100.000

Figure 5.2 Scree Plot for PMS Dimensions

Scree Plot
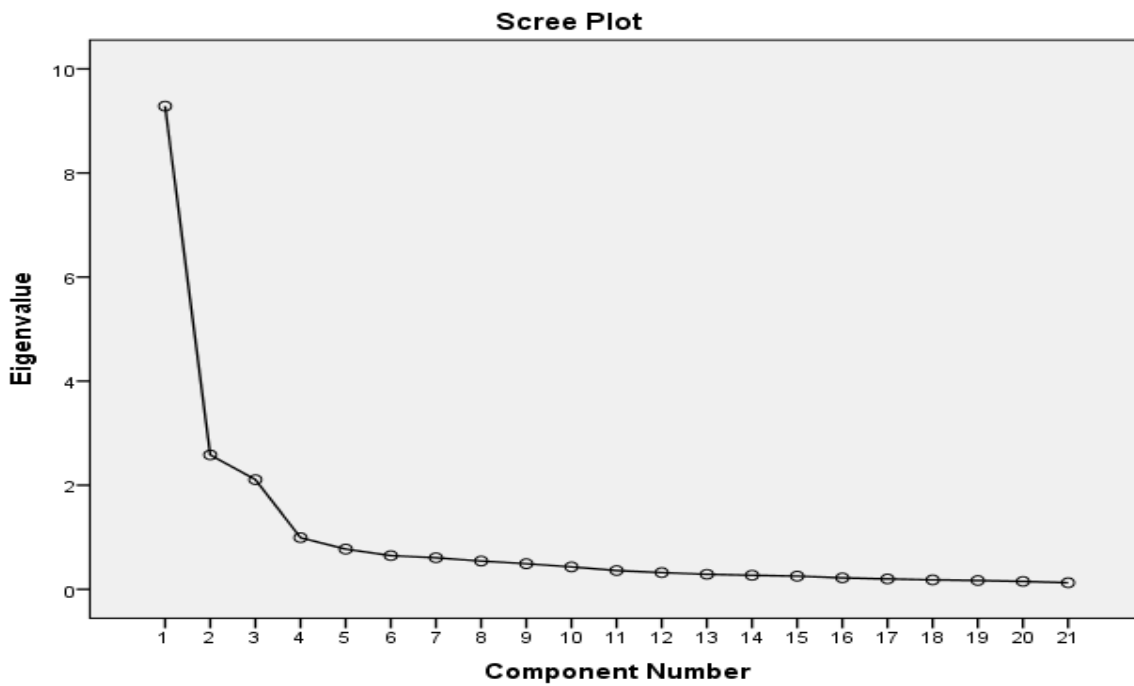
Table 5.9 Rotated Component Matrix

Items	Component
	1
The PMS provides a diverse set of measures related to the key performance areas of the business unit.	.849
The PMS provides a variety of information about important aspects of the business unit's operations.	.849
The PMS captures cause-effect relationships between activities in the business unit.	.828
The PMS provides consistent and mutually reinforcing links between the current operating performance of the business unit and the company's long term strategies.	.822
The PMS shows the activities and results in my business unit are connected.	.754
The PMS is produced in a fully documented form, which provides a record for evaluating performance.	.750
The PMS provides information on different dimensions of the business unit's performance.	.747
The comprehensiveness of the PMS is aided by well-designed performance systems.	.731
The PMS provides a range of measures that cover the critical areas of the business unit's operations in line with business strategy.	.702
The PMS shows how the activities of the business unit affect the activities of other units within the company.	.693
The PMS provides a broad range of performance information about different areas of the business unit.	.684
The PMS links together the activities of the business unit to the achievement of the goals and objectives of the company.	.645

As Table 5.9 shows, the most strongly loaded items on the first factor are listed first and ordered with reference to their correlated size with the factor, and then the same thing

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happens in order with the second factor and third factor, as seen in Table 5.11 below. In addition, the results of an exploratory factor analysis show that the twelve-item scale is unidimensional, with each item loading on the single factor above 0.50.

5.4.2 Types of SBU's PMS

In Questions C2 and C3, nine items were utilised, regarding the types of PMS and rewards being used by the sampled respondents. The respondents were asked to indicate how important is each of the following items to their superior in evaluating and rewarding their performance, on a seven point scale (from 1 = not important to 7 = very important).

Table 5.10 Types of PMS

PMS type and Items	*Rank G**	*Mean*	*Rank I***
• **Financial**			
Evaluating me on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, cost prices, expenditures, profits, financial budgets).	3	4.69	3
Rewarding me financially on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).	1	4.77	1
Rewarding me financially on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, expenditures, profits).	2	4.71	2
Rewarding me financially based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).	4	4.62	4
Mean of the group		4.70	
• **Non-financial**			
Evaluating me on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).	3	4.51	7
Evaluating my performance based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).	1	4.60	5
Rewarding me non-financially on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).	5	4.44	9
Rewarding me non-financially on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, expenditures, profits).	4	4.51	8
Rewarding me non-financially based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).	2	4.57	6
Mean of the group		4.53	
Overall mean of the PMS types		4.62	

G*= rank within the group; I**=overall rank within the two groups

Table 5.10 summarises the level of importance attached by superior SBU manages to two types of PMS and rewards. The responses show that the overall mean for both types is slightly higher than the average, with a mean of 4.62, but to compare between both means of the types, the financial one has a slightly higher mean than that of the non-financial one, with means of 4.70 and 4.53 respectively. Although the responses show that the items of both types are close in rank, they put more emphasis on the financial one and its items are ranked, in terms of means, as the following order of importance: "Rewarding me financially on my performance expressed in quantitative numbers, according to pre-set goals and targets" and "Rewarding me financially on my performance expressed in financial numbers, according to pre-set goals and targets". Results show that the majority of respondents consider these measures as of the highest importance for their superior, with means 4.77 and 4.71 respectively and they indicated that: "Rewarding me non-financially on my performance expressed in financial numbers, according to pre-set goals and targets" and "Rewarding me non-financially on my performance expressed in quantitative numbers, according to preset goals and targets " are considered as the lowest of importance of measures, though which are still above the average with means of 4.51 and 4.44 respectively. This is consistent with the findings of Lau (2011). It is also indicated that the more precise financial measures are relative to non-financial measures, the lower the extent of delegation and the more verifiable the higher the extent of delegation (Abernethy, Bouwens, & Van Lent, 2004). These results are consistent with the moderate level of authority delegation in the sampled SBUs at companies. In the Libyan context, Amhalhal's, results (2013) indicated that Libyan companies used a mixture of performance measures, including a set of financial and non-financial measures. The results in this thesis are broadly similar to his findings.

To conclude, large and medium-sized manufacturing companies in Libya tend to be in favour of both types of performance measures (financial performance measures and rewards and non-financial performance measures and rewards), as the overall mean scores of both types were 4.70 and 4.62 respectively.

Despite the fact that the multi-item scale related to the types of performance measures and rewards were subject to an exploratory factor analysis, the previous results of factor analysis produced three factors with an eigenvalue greater than 1 as shown in Table 5.8. Two of these factors are financial and non-financial performance measures and rewards,

which include all items related to them as one factor. Financial performance measures and reward consists of four items and the other, non-financial performance measures and reward, involves five items. Moreover, according to Table 5.11, all items have a loading above 0.5, implying that the nine items are representative of two constructs for the types of PMS (financial and non-financial performance measures and rewards).

Table 5.11 Rotated Component Matrix

Items	Component	
	1	2
Rewarding me financially based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).	.892	
Rewarding me financially on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).	.854	
Rewarding me financially on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, expenditures, profits).	.852	
Evaluating me on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, cost prices, expenditures, profits, financial budgets).	.752	
Evaluating my performance based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).		.920
Rewarding me non-financially based on my boss's personal and subjective appraisal (e.g. how my boss 'sees' me at work, my boss's opinions about my commitment, motivation and effort at work).		.872
Rewarding me non-financially on my performance expressed in financial numbers, according to pre-set goals and targets (e.g. costs, expenditures, profits).		.857
Rewarding me non-financially on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).		.838
Evaluating me on my performance expressed in quantitative numbers, according to pre-set goals and targets (e.g. indicators, production numbers and budgetary numbers).		.718

5.5 Role Clarity of SBU Managers

Data shown in Table 5.12 and section E in the questionnaire mentioned that there are ten items that represent the role clarity scale. In this vein, the respondents were asked to indicate to what extent they are certain or uncertain about aspects of their current job, using the 7-point scale (from 1 = very uncertain to 7 = very certain). However, the overall mean of the role clarity scale is high with a mean of 5.09, and there is a slight

difference between both subscales which implies that goal clarity has a higher mean than that of the process clarity, with means of 5.43 and 4.80 respectively. In other words, for the goal clarity scale, the items' means ranged from 5.54 to 5.19, with an average across items of 5.43 on a 7-point scale, whereas the process clarity items had means ranging from 4.87 to 4.66, with a mean across items of 4.76, which was lower than the goal clarity scale. In addition, when comparing respondents' answers, items of role clarity captured the first five rankings while the process clarity items came in the last five rankings.

Table 5.12 Role Clarity Level

Dimensions of Role Clarity and Items	Rank G*	Mean	Rank I**
• Goal Clarity			
My duties and responsibilities.	2	5.48	2
The goals and objectives of my job.	1	5.54	1
How my work relates to the overall objectives of my business unit.	3	5.47	3
The expected results of my work.	4	5.47	4
What aspects of my work will lead to positive evaluations.	5	5.19	5
Mean of the group		5.43	
• Process Clarity			
How to divide my time among the tasks required of my job.	3	4.75	8
How to schedule my work day.	5	4.66	9
How to determine the appropriate procedures for each work task.	1	4.87	7
The procedures I use to do my job are correct and proper.	2	4.84	10
Knowing the best way to perform all my work tasks.	4	4.68	6
Mean of the group		4.76	
Overall mean of Role Clarity		5.09	

G*= rank within the group; I**=overall rank within the two groups

It can be seen from Table 5.12 that all role clarity indicator items are more than average, which means that most of these indicators in the surveyed SBUs are relatively high. Equally, this means that the indicators that relate to goal clarity are higher than those that assess process clarity, as it was found that 5 indicators out of the 10 items that relate to goal clarity capture the first ranks. As the study deals with role clarity levels, it can be safely concluded that SBU managers at the manufacturing companies in Libya have moderately clear roles. However, the managers' goal clarity is slightly higher than that of their process clarity. These results are consistent with the findings of (Hall, 2008)

5.6 Psychological Empowerment of SBU Managers

Table 5.13 below shows the overall mean of psychological empowerment and for each dimension. From Question D, twelve items were used to determine the level of

psychological empowerment, which includes four dimensions in the sampled respondents. The respondents were asked to indicate to what extent do SBU managers agree or disagree with each listed item in the construct, on a seven point scale (from 1 = strongly disagree to 7 = strongly agree). A low rating in any dimension of psychological empowerment will lower the overall mean of it. Therefore, high ratings in all dimensions are required to ensure a high level of empowerment (Lee & Koh, 2001). According to Brancato (2006), the dimensions of psychological empowerment and the strategies related to this concept should be understood by individuals. Hancer and George (2003) have argued that the administration should investigate all dimensions and be ready to take the required actions to increase the level of employee agreement towards the dimensions and increase the level of psychological empowerment experienced by employees.

Table 5.13 Psychological Empowerment Level

Dimensions of Psychological Empowerment and Items	Rank G*	Mean	Rank I**
• **Meaning**			
The work I do is very important to me.	1	5.45	1
My job activities are meaningful to me.	2	5.44	2
The work I do is meaningful to me.	3	5.41	3
Mean of the group		5.43	
• **Competence**			
I am confident about my ability to do my job.	2	4.69	8
I am self-assured about my capabilities to perform my work activities.	1	4.73	7
I have mastered the skills necessary for my job.	3	4.56	9
Mean of the group		4.66	
• **Self-determination**			
I have significant autonomy in determining how I do my job.	3	4.19	12
I can decide on my own how to go about doing my work.	1	4.28	10
I have considerable opportunity for independence and freedom in how I do my job.	2	4.22	11
Mean of the group		4.23	
• **Impact**			
My impact on what happens in my work area is large.	1	5.14	4
I have a great deal of control over what happens in my work area.	2	5.07	5
I have significant influence over what happens in my work area.	3	5.07	6
Mean of the group		5.09	
Overall mean of PMS types		4.85	

G*= rank within the group; I**=overall rank within the four groups

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As shown above, for overall psychological empowerment the mean is 4.85, whilst for individual dimensions; the Meaning dimension scores the highest with a mean of 5.43, followed by Impact (5.09), Competence (4.66) and Self-determination (4.23).

Meaning and Impact received the highest evaluation compared to other dimensions of psychological empowerment. This shows that managers of SBUs feel that their job and work is meaningful and important to them and do really feel that they can influence their work outcome. They might feel that their work can affect the overall goal achievement and do really believe that he/she can influence the strategic output, management and operation in the workplace. This is consistent with the argument of Micheli and Manzoni (2010) who indicated that performance information affects intrinsic motivation and empowerment, since 'more comprehensive PMS can make SBU managers believe that their jobs are more meaningful by helping them to determine how their work fits within the broader scope of the organisation' (Hall, 2008). These aspects, in turn, have been found to have a positive impact on performance.

For the Competence dimension, it shows that it is higher than Self-determination with an overall mean of 4.66 and managers of SBUs feel that they are competent and have the capacity and skills to perform their jobs. However, comparatively, the respondents evaluated these constructs and considered the lowest level is Self-determination, which is in the middle as an important factor owing to the fact that it is about taking initiative and feeling competent and responsible about work. Based on the overall mean score one can observe that the SBU managers have a slightly high level of psychological empowerment.

5.7 Learning (Mental Model Confirmation and Building) of SBU Managers

To identify the levels of individual learning acquired in SBUs of manufacturing companies in Libya, the respondents were asked in Questions F1 and F2 to indicate to what extent they agree or disagree for each dimension of managerial learning, which are mental model confirmation and mental model building (from 1 = strongly disagree to 7 = strongly agree). Table 5.14 presents the mean score of each item, the mean score of each dimension, the overall mean score of individual learning, the rank of each item amongst the group and the rank of each item amongst all items.

As can be seen from Table 5.14, respondents pointed out that all items of the mental model confirmation dimension seem to be high, as their mean scores were ranged between 5.07 and 5.28, with a mean group of 5.19. The respondents agree that all five items are ranked first for the mental model confirmation dimension and none of the items has an overall mean less than 5, as is shown. In contrast, the items of mental model building took the last position comparing between both dimensions and their mean scores were ranged between 4.56 and 4.76, with a mean group of 4.64. However, though this dimension is slightly high and above the average, none of these items has reached an overall mean of 5, which implies that it is less than the mental model confirmation level.

Table 5.14 Individual Learning

Dimensions of Individual Learning and Items	Rank G*	Mean	Rank I**
• **Mental Model Confirmation**			
My beliefs about the operations of my business unit are regularly confirmed.	2	5.22	2
My beliefs about the operations of my business unit are regularly supported.	1	5.28	1
My views about the operating situation of my business unit are often maintained.	4	5.13	4
My views about the operating situation of my business unit are often validated.	5	5.07	5
I regularly verify my assumptions about the operations of my business unit.	3	5.21	3
Mean of the group		5.19	
• **Mental Model Building**			
I regularly challenge my assumptions about the way my business unit operates.	1	4.76	6
I regularly question my assumptions about the way my business unit operates.	5	4.56	10
I often think creatively about the operations of my business unit.	3	4.62	8
I often change and re-orient my thinking about the way my business unit operates.	4	4.61	9
I continually broaden and expand my outlook of my business unit.	2	4.67	7
Mean of the group		4.64	
Overall mean of individual learning types		4.96	

G*= rank within the group; I**=overall rank within the two groups

To sum up, managers of SBUs at large and medium-sized manufacturing companies in Libya attach a considerable amount of agreement to both dimensions of individual learning, with a mean score of 4.96. However the emphasis appears to be slightly more on the mental model confirmation than that of the mental model building dimension.

5.8 Job Satisfaction of SBU Managers

Job satisfaction was measured by the short-form of the Minnesota Satisfaction Questionnaire (MSQ) which contains 20 job facets, including; activity, independence, variety, social status, supervision-human relations, supervision-technical, moral values, security, social service, authority, ability, company policies, compensation, advancement, responsibility, creativity, working conditions, co-workers, recognition and achievement. In Question G, these 20 items were utilised to determine the level of job satisfaction for the sampled respondents. Participants were asked to indicate, their degree of satisfaction with each aspect of their job, as listed on the 7-point scale (from 1 = very dissatisfied to 7 = very satisfied).

Table 5.15 Job Satisfaction

job satisfaction Items	Rank	Mean
Activity. Being able to keep busy all the time.	12	4.85
Independence. The chance to work alone on the job.	20	4.63
Variety. The chance to do different things from time to time.	6	4.91
Social status. The chance to be "somebody" in the community.	3	4.98
Supervision-human relations. The way my boss handles his/her employees.	11	4.87
Supervision-technical. The competence of my supervisor in making decisions.	16	4.75
Moral values. Being able to do things that don't go against my conscience.	4	4.98
Security. The way my job provides for steady employment.	14	4.79
Social service. The chance to do things for other people.	1	5.04
Authority. The chance to tell people what to do.	13	4.84
Ability utilization. The chance to do something that makes use of my abilities.	10	4.89
Company policies. The way company policies are put into practice.	18	4.67
Compensation. My pay and the amount of work I do.	19	4.67
Advancement. The chances for advancement in this job.	7	4.90
Responsibility. The freedom to use my own judgment.	2	5.00
Creativity. The chance to try my own methods of doing the job.	9	4.89
Working conditions. The working conditions.	17	4.71
Co-workers. The way the employees in my unit get along with each other.	15	4.76
Recognition. The praise I get for doing a good job.	8	4.90
Achievement. The feeling of accomplishment I get from the job.	5	4.97
Overall mean		**4.85**

As presented in Table 5.15, managers of SBUs indicated that they are slightly highly satisfied with their job, as shown by the overall mean of job satisfaction which is 4.85. However, comparatively, the respondents considered that "Social service" has the highest level of job satisfaction, whereas "Independence" has the lowest level with means of 5.04 and 4.63 respectively. This illustrates that there is a convergence in terms of respondents' satisfaction about aspects of their jobs.

5.9 Managerial Performance

Finally, in Question H, the eight-dimension scale developed by Mahoney (1963) was used to measure the managerial performance of the sampled respondents. This scale measures eight performance dimensions: planning, investigating, coordinating, evaluating, supervising, staffing, negotiating and representing. The respondents were asked to indicate what they think of their performance on the eight-dimensions, using the 7-point scale (from 1 = well below average to 7 = well above average).

Table 5.16 Managerial Performance

Managerial Performance Items	Rank	Mean
Planning: determining goals, policies and courses of action, such as work scheduling, budgeting and programming.	8	4.93
Investigating: collecting and preparing of information, usually in the form of records, reports and accounts (measuring output, record keeping and job analysis).	6	5.00
Coordinating: exchanging information with people in the company other than my subordinates, in order to relate and adjust procedures, policies and programs.	5	5.12
Evaluating: assessment and appraisal of proposals, or of reported/ observed performance (e.g. employee appraisals, judging financial performance and product inspection).	2	5.24
Supervising: directing, leading and developing your subordinates.	1	5.25
Staffing: maintaining the work force of your responsibility area (e.g. selecting and promoting your subordinates).	4	5.16
Negotiating: purchasing, selling, or contracting for products or services (e.g. contracting suppliers, collective bargaining).	7	4.97
Representing: advancing the general interests of my company through speeches, consultations, or contacts with individuals or groups outside the company.	3	5.19
Overall mean		5.11

As mentioned above in Table 5.16, the overall mean for managerial performance is relatively high with a mean of 5.11. To compare between the dimensions of managers' performance, supervising has the highest scoring mean, while planning is perceived as the lowest level with scores of 5.25 and 4.93 respectively.

5.10 Summary and Conclusion

The data presented in this chapter concentrates on decision making autonomy and the effectiveness of a company's PMS, namely, comprehensiveness and the types of PMS, as well as the role clarity, psychological empowerment, individual learning, job satisfaction and performance of SBU managers in large and medium-sized manufacturing companies operating in Libya.

With reference to creating autonomy in the companies, it is indicated that the overall mean of delegated decisions to managers is average, but it seems that raw materials sourcing and transfer pricing are the most delegated decisions, while entering new markets and long-term financing are the least delegated decisions, with an overall mean less than the average.

Furthermore, for the effectiveness of a company's PMS, factor analysis resulted in three factors, including one related to the comprehensiveness of the PMS and two linked to types of PMS. The comprehensiveness of a PMS was measured through three angles, including breadth, alignment with strategy and the existence of cause-and-effect relationships, which showed that there were relatively comprehensive systems in the sample. Regarding the importance of using financial and non-financial performance measures as well as rewards, SBU managers have attached importance to both types, but with slightly more emphasis on the financial types.

According to the role clarity however, in general, managers have clear roles in their SBUs, but they are much more certain about their goals and objectives than the certainty about their process. For the psychological empowerment level, the sample of managers showed that they are quite highly empowered, but these managers have a higher level of meaning and impact, which implies that they feel that their job and work is very important and meaningful, as well as that they can influence their work outcome.

Moreover, the level of the individual learning which has been acquired by SBU managers is comparatively high, but is higher for MMC than MMB. In relation to job satisfaction, the sampled managers are slightly highly satisfied with their jobs, whereas they perceptibly have more satisfaction from their compensation. Finally, the performance of SBU managers was apparently high for all dimensions, although a higher performance is derived from supervising and evaluating.

The next two chapters present in detail all the statistical analysis carried out to test the study's research hypotheses and discusses the results obtained in the light of the literature reviewed.

Chapter 6 The Mediating Role of Cognitive and Motivational Variables in the Relationship between Comprehensive PMS and Managerial Performance

6.1 Introduction

The purpose of this chapter is to gain a better understanding of the relationship between the comprehensive PMS and individual outcomes by presenting and discussing the results obtained from the first group of hypotheses. Ten hypotheses within this group were devoted to achieve three research objectives, which are:

- To propose and empirically test a research model identifying the direct and indirect relationships between the comprehensive PMS and individual outcomes, through cognitive and motivational factors, in manufacturing companies in Libya.

- To investigate the relationship between role clarity and psychological empowerment in manufacturing companies in Libya.

- To identify the relationship between job satisfaction and managerial performance in manufacturing companies in Libya.

This chapter is organised into ten sections as follows: Sections 6.2 and 6.3 provide research variables' measurements and descriptive statistics of the research variables respectively. In the next Section, linear regression analysis of continuous variables and checking the tests' assumptions are presented. The Fifth Section is divided into four sub-sections to test direct relationships using simple regression tests: these subsections introduce the findings of the direct relationships between the comprehensive PMS, job satisfaction and managerial performance; the association between role clarity and psychological empowerment as well as the relationship between job satisfaction and managerial performance respectively. The Sixth Section introduces mediation analysis, including existing approaches and types of mediation models. The Intervening Effects and Effect Size Measures are Classified and presented in Section Seven. The Eighth Section provides statistical assessment of mediation and the results of the mediating effect of cognitive and motivational variables on the relationships between the comprehensive PMS and outcome variables (job satisfaction and managerial performance) at multiple-mediations. The results of individual simple mediation related

to each cognitive and motivational variable and their sub-dimensions are provided in Section Nine. Finally, the summary and conclusion are presented in Section Ten.

6.2 Research Variable Measurements

The study's eighteen hypotheses, as stated in Chapter Four (Section 4.4), were formulated and prearranged into two sub-groups. The first group consists of ten hypotheses (H1-H10). Four of them (H1, H2, H7 and H8) are concerned with testing the direct relationships as mentioned above. The other six hypotheses deal with the potential influence of a third variable as mediator (i.e. cognitive and motivational factors) in the relationships between the comprehensive PMS, job satisfaction and managerial performance. Simple regression tests were used to examine hypotheses H1, H2, H7 and H8 and ordinary least squares tests were used to investigate the rest of this group of hypotheses.

The second group of hypotheses (H11-H18) attempts to identify the different effects of financial and nonfinancial performance measures and rewards directly on outcome variables and indirectly through cognitive and motivational factors. Simple regression tests were used to examine hypotheses H11 and H12 and ordinary least squares tests were used to investigate the rest of this group of hypotheses. When applying the mediation regression test, the mediator is treated first as a dependent variable, and secondly as an independent variable. Thus, the role clarity, psychological empowerment, mental model confirmation and building are the dependent variables with respect to the comprehensive PMS variable, and the independent variables in relation to work outcome.

Initially, several items on a seven-point scale were used to measure the rest of the variables, namely: the comprehensive PMS (Question C1 with 12 items), role clarity (Question E1 with 5 items and E2 with 5 items), psychological empowerment (Question D1 with 3 items, D2 with 3 items, D3 with 3 items and D4 with 3 items), mental model confirmation (Question F1 with 5 items), mental model building (Question F2 with 5 items), job satisfaction (Question G with 20 items) and managerial performance (Question H with 8 items).

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All hypotheses in this group were tested based on one overall mean construct for each variable, followed by applying the same test, but with more details to identify the relationships between variables based on their sub-constructs, if any, such as role clarity represented by goal clarity (GC) and process clarity (PC), as well as by psychological empowerment, which consists of meaning (ME), competence (COM), self-determination (SED) and impact (IMP).

The second group, which will be dealt in Chapter Seven, takes the mediating relationships examined in the first group into more detail, by comparing the potential influence of two types of PMS and rewards on the outcome variables through the same third variable, as mediators (i.e. cognitive and motivational variables). Particularly, this group of hypotheses is devoted to examining the potential influence of the role clarity, psychological empowerment, mental model confirmation and mental model building on the relationship(s) between both financial and non-financial performance measures and reward variables (independents) and work outcome (dependent). The second group of hypotheses which is interested in addressing the differences between the types of PMS and rewards in its relationship(s) with its outcome variables, will be presented in the next chapter (Chapter Seven).

Simple linear regression is used to examine the relationships between independent and dependent variables due to the metric nature of these variables, as pointed out in a previous chapter (4.15.2) and is considered appropriate to investigate the variable(s) that might influence the JS and the MP. More details were presented in Chapter Four regarding the number of items and questions used, as well as the Cronbach Alphas for the investigated variables. The following two sections provide the descriptive statistics of the variables and check the assumptions of tests that were used to investigate the research hypotheses, respectively.

6.3 Descriptive Statistics of the Research Variables

Descriptive Statistics, such of the minimum, maximum, mean and standard deviation of the research variables, are provided in Table 6.1.

Table 6.1 Descriptive Statistics of the Research Variables

Research Variable	Min	Max	Mean	S.D
CPMS	2.58	7.00	5.00	0.88
FPMR	2.00	7.00	4.70	1.20
NFPMR	1.80	7.00	4.53	1.08
RC	2.20	6.80	5.09	1.21
GC	3.00	7.00	5.43	1.04
PC	1.00	7.00	4.76	1.55
PE	1.92	7.00	4.85	1.34
ME	3.00	7.00	5.43	1.10
COM	1.00	7.00	4.66	1.75
SED	1.00	7.00	4.23	1.79
IMP	1.33	7.00	5.09	1.41
MMC	2.60	6.80	5.19	0.96
MMB	2.00	7.00	4.64	1.30
JS	2.00	6.45	4.85	1.14
MP	2.63	6.75	5.11	1.02

CPMS = Comprehensive Performance Measurement Systems; FPMR = Financial Performance Measures and Reward; NFPMR = Non-Financial Performance Measures and Reward; RC= Role Clarity; GC = Goal Clarity; PC = Process Clarity; PE = Psychological Empowerment; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact; MMC = Mental Model Confirmation; MMB = Mental Model Building; JS = Job satisfaction; MP = Managerial Performance

6.4 Linear Regression Analysis of Continuous Variables

As discussed in Chapter Four, (Section 4.15.2), the simple linear regression test was utilized in this study to investigate the influence of the CPMS on JS and MP variables. Simple linear regression was used to test the direct relationship between an independent variable and a set of dependent variables, but also the basis of an individual relationship between each of two variables as one independent and one dependent variable (i.e. RC with PE), or one sub-independent variable with one sub-dependent variable (i.e. GC with ME). To conduct this test, there are several important steps related to using the test's analysis, such as investigating data for outlying values and checking their assumptions. These steps are discussed in the following sections.

6.4.1 Variables Entered and Number of Cases Required.

As mentioned above, only four hypotheses in this first group were tested by applying the simple linear regression test. In addition, two hypotheses of the second group are examined by the simple linear regression test to provide more details about the

differences between two independent variables in their effects on dependent variables. With regard to the desired cases required for using the regression test, Hair et al. (2010) recommended that cases which should be entered into the regression model for each independent variable at least are between 10 and 20 cases. In this study there were enough cases for each variable entered into the model, because every model used in this study did not exceed the two variables and the number of the cases is 122.

6.4.2 Choice of Regression Type

Simple linear regression and mediated regression were chosen here for several reasons. For simple linear regression, one reason is that this study aims to look at the influence of one variable (Comprehensive PMS) on one outcome variable in every time (JS and MP), the effect of the RC variable on the PE variable and the impact of JS on the MP variable. In other words, six hypotheses (four in Chapter Six and four in Chapter Seven) of the model's assumptions were tested individually, because it is composed of one independent variable and one dependent variable, which means to examine the individual relationship(s) between two individual variables, apart from their relationships with other variables. The second reason is to avoid collinearity between some dimensions of variables (e.g. PE dimensions). Therefore, the study tests PE as one overall mean of an independent variable and every single dimension with its relationship to other variables, by using the simple linear regression test.

Mediated regression was selected in particular because this research assumed that the relationship between the independent and dependent variables may be mediated by a third variable, i.e. it was determined by the review of previous research that cognitive and motivational variables may account for all or some of the relationships between the independent and dependent variables. This type of regression is presented later in this chapter with more details (6.6 – 6.9).

6.4.3 Examining Data for Outlying and Influential Values

Outliers' cases are an important issue in examining data and should be taken into consideration before conducting any statistical test, in order to accurately generalize and interpret the results of the regression model. Regarding this issue, the standardized residuals were investigated to check whether there is any case that falls above ± 2.5,

which are approximately 5% of outliers that are expected to lie beyond these values according to normal distribution theory (Seo, 2006; Field, 2013). Casewise Diagnostics provided the descriptive analysis which was used to assess this issue and it was found that all cases fell inside the range of the allowable limits as shown in Appendix C.

6.4.4 Checking of Regression Assumptions

It has been suggested that there are some assumptions which must be met in respect of interpreting and generalizing the results of the regression model accurately. One of these assumptions is that all the independent variables type (predictor variables) must be quantitative (measured as a continuous scale, such as interval or ratio), or categorical (with two categories), and similarly for the dependent variables to be quantitative, continuous and unbounded. In this study, the independent and dependent variables were measured using a 7-point Likert scale, which has been commonly treated as approximately interval in regression analysis (Field, 2013).

In this context, several other assumptions needed to be met in order to obtain accurate results when conducting regression tests, which are normality, linearity and homoscedasticity. These assumptions are very important for liner regressions and have to be checked. The predictions' errors that are normally distributed around each and every predicted dependent variable score, are referred to as the normality assumption (Tabachnick & Fidell, 2012). One of these methods is histograms, which could graphically illustrate it (a bell-shaped curve) and the P-P Plot, examine normality.

Appendix D shows that the distribution of all variables are convincing as normal, as shown in the histogram and P-P Plot. Skewness and Kurtosis are used as other methods to check normality statistically, which have shown that normal distribution is confirmed within the range of -1 to +1 and -3 to +3 respectively (Hair et al., 2011). Table 6.2 indicates that both values of Skewness and Kurtosis for each variable fall within the accepted range, confirming the normality assumption. The assumption of linearity assumes that the association between a dependent variable and an independent variable is linear and its scatterplots would show linearity by being rectangular scatterplots, rather than a curved one. If a linear model is used to predict non-linear relationships, the generalizability of the study's results and the accuracy of the prediction in the model would be limited (Field, 2009).

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Table 6.2 Normality Statistical Tests of the Research Variables

Variables	Skewness	Kurtosis
CPMS	- 0.172	- 0.431
FPMR	- 0.415	- 0.692
NFPMR	0.123	- 0.160
RC	- 0.767	- 0.424
GC	- 0.493	- 0.457
PC	- 0.653	- 0.648
PE	- 0.528	- 0.674
ME	- 0.339	- 0.727
COM	- 0.367	-1.126
SED	- 0.328	-1.117
IMP	- 0.789	-0.074
MMC	- 0.777	0.417
MMB	- 0.201	- 1.050
JS	- 0.908	- 0.079
MP	- 0.497	- 0.532

CPMS = Comprehensive Performance Measurement Systems; FPMR = Financial Performance Measures and Rewards; NFPMR= Non-financial Performance Measures and Rewards; RC= Role Clarity; GC = Goal clarity; PC = Process clarity; PE= Psychological Empowerment; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact; MMC= Mental Model Confirmation; MMB= Mental Model Building; JS = Job Satisfaction; MP= Managerial Performance.

Homoscedasticity refers to the assumption that the variance of errors is equal across all levels of the independent variables (Hair, Tatham, Anderson, & Black, 2006). Accordingly, the residuals across all levels of the independent variables should have equal variance (homoscedasticity), which would be shown by residuals in the scatterplots. If variances are very unequal, this means that there is evidence of the existence of the heteroscedasticity and the scatterplots will be funnel shaped rather than rectangular (Field, 2013). Scatterplots are used to examine standardized residuals which are shown by standardized predicted values and used to verify the assumptions of homoscedasticity.

It is suggested that scatterplots of standardized residuals are examined by standardized predicted values, which are commonly used to test the assumptions of linearity and homoscedasticity (Tabachnick & Fidell, 2012). As shown in Appendix E, the large majority of the scatterplots show no clear evidence for non-linear curvature in the relationship between the independent and dependent variables, and no obvious evidence of the existence of heteroscedasticity. It could be pointed out here that there were some deviations in the scatterplots, for example the financial as well as the non-financial performance measures and rewards. However, it should not discount the fact that regression is reasonably robust anyway (Howell, 2012).

6.5 Data Analysis of the Direct Relationships between Research Variables (Comprehensive PMS, RC, PE, JS and MP)

This section presents the results of the simple linear regression tests related to the direct relationships in the first group of hypotheses, to achieve the second, third and fourth objectives of the study. Thus, hypotheses H1, H2, H7 and H8 were directed toward the second, third and fourth research aims respectively. As mentioned above, this study aims to investigate the influence of the comprehensive PMS on the JS and MP variables; the impact of RC on the PE; the effect of JS on MP. Therefore, several hypotheses were formulated to examine the direct relationships between those variables and divided into four sub-sections, which are 6.5.1, 6.5.2, 6.5.3 and 6.5.4 as follows:

6.5.1 Direct Relationship between the Comprehensive PMS and JS.

H1 Comprehensive PMS influence Job Satisfaction

Results related to testing hypothesis H1 indicate that the comprehensive PMS has a statistically significant influence on the JS of the SBU managers (see Table 6.3, F value = 27.2768, p = .000). The value of R^2 for this variable is 0.1852, which means that the comprehensive PMS explain 18.52% of the variance in JS. In addition, the B value is .5597, which indicates a positive influence of the comprehensive PMS on JS. Therefore, H1 is fully accepted.

Table 6.3 Influence of Comprehensive PMS on Job Satisfaction

Variable	H	R^2	F	B	S.E	Beta	t	Sig.	LLCI	ULCI
CPMS → JS	H1	.1852	27.2768	.5597	.1072	.430	5.2227	.0000	.3475	.7719

CPMS = Comprehensive Performance Measurement Systems, JS = Job Satisfaction

In general, the results support the findings reported by previous MAS/PMS literature, theoretical as well as empirical, about the influence of the CPMS on JS, indicating the positive relationship between them (e.g. Hopwood, 1972; Cherrington & Cherrington, 1973; Milani, 1975; Otley, 1978; Kenis, 1979; Chenhall & Brownell, 1988; Lau & Tan, 2003; Lau & Sholihin, 2005; Leach-López et al., 2009; Sholihin & Pike, 2009). However, some studies (Cherrington & Cherrington, 1973; Milani, 1975; Kenis, 1979; Chenhall & Brownell, 1988; Lau & Tan, 2003) have found a positive significant relationship of financial accounting measures on JS, with other recent studies (e.g. Lau & Sholihin, 2005; Sholihin & Pike, 2009) that mentioned that CPMSs using multiple

performance measurements of financial and non-financial measures, have also shown positive effects on JS.

6.5.2 Direct Relationship between the Comprehensive PMS and MP.

H2 Comprehensive PMS Influences Managerial Performance

A simple linear regression test was conducted for this hypothesis and the results indicate that comprehensive PMS have a significant influence on MP. As shown in Table 6.4, the model is significant at the .01 level and the F value is 30.1273. The CPMS is positively predicting the MP with a *B* value of .5249 (t = 5.489). Additionally, the independent variable can explain about 20 % (R^2) of the variance in the dependent variable. Hence, H2 is fully accepted.

Table 6.4 Influence of Comprehensive PMS on Managerial Performance

Variables	H	R^2	F	B	S.E	Beta	t	Sig.	LLCI	ULCI
CPMS → MP	H2	.2007	30.1273	.5249	.0956	.449	5.489	.0000	.3356	.7143

CPMS = Comprehensive Performance Measurement Systems, MP = Managerial Performance

The results support the findings of previous studies which have shown that management accounting information usage has a positive influence on organisational and managerial performance (Cadez & Guilding, 2008; Hammad et al., 2013). Chenhall (2003) has pointed out that organisations with more information have facilitated managers to take more effective decisions, which in turn have led to enhancing their performance. A positive relationship between using management accounting information and performance has been confirmed in many prior empirical studies. For example, Abernethy and Guthrie (1994) have provided evidence that better performance was associated with using a broad scope of information. Meanwhile, Mia and Chenhall (1994) have indicated that there was higher performance when a higher, broad scope of management accounting information was used for marketing activities.

The findings of this study are consistent with the argument of Burkert et al. (2011) who found that the effects of control systems have significantly positive influences on MP and also confirmed the result of Burney and Widener (2007) who indicated that there is a positive relationship between the PMS and MP.

The above finding, related to the comprehensive PMS, is also consistent with some earlier studies which were conducted by several authors, such as Scott and Tiessen (1999e), Shields et al. (2000), Salmon (2013), Din and Yatim (2013) and Ho, Wu, and Wu

(2014), who indicated that companies with a diverse set of measures provide managers with more information to help them make the appropriate decisions and which in turn positively influence their performance.

Conversely, the results of some previous studies (Hall, 2008; Chung et al., 2012) are inconsistent with the findings of this hypothesis. However, these studies asserted that there is an indirect relationship through a mediating variable, which means that there is a total relationship between the two variables under the terms of the mediation, according to the causal steps approach, which is applied by the aforementioned studies. In this regard, the results of these studies is not logical and in accordance with the causal steps approach, which requires a main relationship between independent and dependent variables to be in existence for the completion of the analysis. The authors completed the analysis, but the main relationship has not been achieved or does not exist, which is violation of the mediating terms related to Baron and Kenny (1986), who stressed to stop the mediation test in the absence of a/the main relationship (total effect).

6.5.3 Direct Relationship between Role Clarity and Psychological Empowerment

H7 Role Clarity Influences Psychological Empowerment

The statistics relating to hypothesis H7 revealed (see Table 6.5) that RC as an overall mean variable has a positive influence on PE as overall mean constructs with an F value = 409.648, p < .001. The value of R^2 for this variable is 0.773, which implies that RC explains 77.3% of the variance in PE. In addition, the beta value is 0.879, which indicates a positive influence of RC on PE.

In more details, GC and PC which are components of RC, have a significant positive influence on the four dimensions of PE, including ME, COM, SED and IMP. For the relations between GC and these dimensions, the standardized coefficients (betas) are 0.787 (t-value = 13.969), 0.712 (t-value = 11.093), 0.627 (t-value = 8.822) and 0.719 (t-value = 11.334), as well as the F values which are 195.132, 123.056, 77.820 and 128.466 and which can explain 61.9%, 50.6%, 39.3% and 51.7% (R^2) of the variance in PE (ME, COM, SED and IMP) respectively. In respect to the relationships between PC and those dimensions, the standardized coefficients have shown that betas are 0.616 (t-value = 8.561), 0.803 (t-value = 14.761), 0.821 (t-value = 15.742) and 0.707 (t-value = 10.858), with the values of F as 73.297, 217.897, 247.811and 119.592, as well as ratios

of R^2 as 37.9%, 64.5%, 67.4% and 49.9%, which imply that the variance in the dimensions of PE can be explained by PC respectively. Thus, the findings of the regression model indicated that hypothesis H7, which predicts a direct relationship between RC and PE, was supported at the 0.001 significance level. The study found strong empirical support for hypothesis H7. Therefore, hypothesis H7 is accepted.

Regarding the results of this hypothesis as mentioned below in Table 6.5, RC positively has associated with managers' empowerment in the strategic business units. Higher levels of RC are associated with the increased PE of managers. This is in agreement with Wellins, Byham, and Wilson (1991) findings that linked PE to a sense of ownership and control over tasks (roles). Empowerment of managers and the energy that comes with feelings of ownership are necessary pre-requisites for continuous improvement. Managers who tend to have control over their work and work context, have the competence to perform their work. Thus, empowerment could be conceived as a positive additive function of perceived control, competence and goal internalization.

Table 6.5 Influence of Role Clarity on Psychological Empowerment

Variable	H	R^2	F	B	S.E	Beta	t	Sig.
RC→ PE		**.773**	**409.648**	**.971**	**.048**	**.879**	**20.240**	**.000**
GC→ ME		.619	195.132	.836	.060	.787	13.969	.000
GC→ COM		.506	123.056	1.197	.108	.712	11.093	.000
GC→ SED		.393	77.820	1.084	.123	.627	8.822	.000
GC→ IMP	H7	.517	128.466	.976	.086	.719	11.334	.000
PC→ ME		.379	73.297	.439	.051	.616	8.561	.000
PC→ COM		.645	217.897	.906	.061	.803	14.761	.000
PC→ SED		.674	247.811	.952	.060	.821	15.742	.000
PC→ IMP		.499	119.592	.644	.059	.707	10.936	.000

RC = Role Clarity, GC = Goal Clarity, PC = Process Clarity, PE = Psychological Empowerment, ME = Meaning, COM = Competence, SED = Self-determination, IMP = Impact.

RC has statistically significant, positive correlations with ME, COM, SED and IMP. This suggests that increased RC results in an increased sense of purpose, or personal connection to work (ME). Furthermore, increased RC causes managers to believe that they have the skills and ability which are necessary to perform their work well (COM), and have a sense of control in selecting activities that make sense and are able to act in ways that seem appropriate (SED), as well as a belief that they possess the ability to

influence outcomes at their work (IMP). The dimensions of the PE construct, namely ME, COM, SED and IMP, are positively correlated with RC.

The results of the simple regression analysis indicated that PE was predicted by RC. Thus when sharing information and authority delegated between managers and their supervisor, managers know and understand exactly what is expected of them and will experience more ME. When managers assert accountability for results, self-directed and participative decision making, they possess SED and are able to fulfil the right choices while being able to respond to the demands of the situations they find themselves in. Similarly, when the expectations and goals of work tasks are clearly defined, managers experience a greater sense of SED, by employing work-related actions that he or she deems appropriate.

Moreover, the managers believe that they have the ability to perform functions with the required level of skill and COM when their roles are clarified (Bandura, 1997), which leads to starting new ideas and persistence in the face of barriers. When managers experience role requirements with less clarity, their sense of impact on results within the work environment is decreased. More specifically and referring to the above results, the dimensions of RC have positive effects on the dimensions of PE. This is consistent with previous studies which have shown the dimensions of RC as antecedents of the PE dimensions (Spreitzer, 1995b; Hall, 2008).

These results are consistent with those presented by (e.g. Spreitzer, 1996; Hall, 2008; De Villiers & Stander, 2011; Mendes & Stander, 2011), who have found positive effect, between RC and PE. For example, in the USA, Spreitzer (1996) found that there was strong effect of role ambiguity related to middle managers on their feelings of empowerment. Similarly, Wallach and Mueller (2006) found a significant negative relationship between empowerment and work stressors (role ambiguity). Moreover, the study of Mendes and Stander (2011) which related to emerging economy, found that role clarity was positively associated with competence, impact, self-determination with practically significant, medium effect whereas it is correlated to meaning with practically significant, large effect. These results are also consistent with those presented by De Villiers and Stander (2011) who conducted their study in less developed country. The results of these studies are consistent in both the developed and developing countries.

6.5.4 Direct Relationship between Job Satisfaction and Managerial Performance.

H8 Job Satisfaction influences Managerial Performance

Results related to testing hypothesis H8 show that JS of the SBU managers has a statistically significant influence on MP (see Table 6.6, F value = 240.829, p < .001). The value of R^2 for the variable is 0.667, which means that JS explains 66.7% of the variance in MP. In addition, the beta value is 0.817, which indicates a high positive influence of JS on MP. Therefore, H8 is accepted.

Table 6.6 Influence of Job Satisfaction on Managerial Performance

Variables	H	R^2	F	B	S.E	Beta	t	Sig.
JS → MP	H8	0.667	240.829	0. 736	0. 047	0. 817	15.519	.000

JS = Job satisfaction, MP = Managerial Performance.

Previous research demonstrated that there was a positive relationship between JS and individual performance (Vroom, 1964; Organ, 1977c; Petty et al., 1984; Hochwarter et al., 1999; Hayati & Caniago, 2012; Peng, 2014). Therefore, more satisfied managers with their jobs are likely to put forth more effort in their work, which leads to improvements in their performance. However, there is still uncertainty about the causal order of the relationship between the JS and performance. Thus, some researchers debate that satisfaction is an antecedent for performance (e.g. Schwab & Cummings, 1970), whereas other researchers debate that performance is an antecedent for satisfaction (e.g. Lawler & Porter, 1967). Recently, theoretical research models point out that happy and satisfied individuals are likely to put forth more effort, perform more extra-role behaviours, gain more social support and valued positions in the organisation and be more successful in interpersonal relationships, which collectively should enhance the effectiveness of their work (Staw, Sutton, & Pelled, 1994; Wright & Staw, 1999). The result of this research is consistent with recent studies which have shown JS as an antecedent of an individual performance and has a positive influence on MP. For example, Edwards, Bell, Arthur Jr, and Decuir (2008) found that overall satisfaction has a statistically significant positive influence on performance. Springer (2011) suggested that managers who applied managerial strategies to increase JS are likely to improve employees' job performances. Chen and Liu (2012) found that JS has a positive effect on work performance in Taiwan. The study of Aftab and Idrees (2012), applied to managers in a middle level of the banking sector, found there was a positive influence

of JS on job performance. Iqbal, Latif, and Naseer (2012) also demonstrated that JS positively influenced performance.

6.6 Mediation Analysis

The following sections take the analysis of the previous two direct relationships between the comprehensive PMS and both JS and MP to a more complex level, by examining the potential influence of a third variable, mediator, on those relationships. More specifically, they aim to test the mediating role of the cognitive and motivational variables on the relationships between the comprehensive PMS (independent variable) and the managerial outcomes, such as JS and MP (dependent variables).

The next section begins with a brief description of the existing approaches for testing for mediation and describing Hayes' (2013) macro, which is applied in this research study in order to clarify the macro's output matrix. Next, the mediating hypotheses are examined in the multiple mediation level (parallel mediators) between the comprehensive PMS and JS in the aggregate level for RC and PE, then the investigation of the multiple mediation of RC, PE , MMC and MMB on the relationship between the comprehensive PMS and MP and this is followed by a detailed analysis of the individual level of the cognitive and motivational variables, in order to identify which dimensions of RC (i.e. GC and PC) and PE (i.e. ME, COM, SED and IMP) contributed to the overall intervening effect. The results of these analyses, with effect size measures, are presented and discussed. The final section presents the summary and conclusions.

6.6.1 Overview of Existing Approaches for Testing for Mediation

More than a dozen methods have been proposed to test hypotheses about mediation. MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) have determined and compared 14 methods of testing for mediation effects. They concluded by classifying these methods into three general frameworks as follows: (1) the causal steps approach, (2) differences in coefficients and (3) products of coefficients.

6.6.1.1 Causal Steps Approach

The causal steps approach refers to a series of conditions or rules for inferring mediation, which differ somewhat across developers. MacKinnon et al. (2002) have stated that there has been low Type 1 error rates and low statistical power found in this

approach to detect mediation effects for small and moderate effect sizes, as well as for large effect sizes with samples of fewer than 100. The causal steps approach is considered to be the most commonly used method to measure an intervening relationship. It has two sub-approaches which are the Baron and Kenny (1986) approach and the James and Brett (1984) approach. For the causal steps strategy, popularized by Baron and Kenny (1986), an investigator estimates the paths of the model using OLS regression or SEM, to assess the extent to which several criteria are met. In other words, any intervening relationship model which has three variables, namely, the X independent variable, M mediating variable and Y dependent variable. To achieve M as a mediator according to the causal steps strategy, there are four conditions that must be met, which are; the first condition is X significantly accounts for variability in Y called (Path C), the second is X significantly accounts for variability in M called (Path a), the third is M significantly accounts for variability in Y called (Path b), and the fourth condition is when M is entered in a model and controlling for X simultaneously, called (Path Ć). If the effect of X on Y decreases, but is still statistically significant, the relationship for a mediator is called partial mediation, whereas if the effect of X on Y statistically becomes non-significant, it is called full or complete mediation.

Despite the fact that it is a commonly widely used approach, it has been under heavy criticism for several reasons (Hayes, 2009). Just to name one, some authors (e.g. MacKinnon et al., 2002; MacKinnon, Fairchild, & Fritz, 2007; Hayes, 2009) have argued that this approach has low statistical power. This means that if the independent variable effect on the dependent variable occurred partially through the mediator, of all the different methods available, the causal steps approach is actually the least likely for detecting that effect (Hayes, 2009).

The most contentious issues related to Baron and Kenny (1986) approach focus on the individual paths a, b, c and c′ when testing a mediation model and their recommendation for testing and analysing the fourth condition. In this regard, Kenny et al. (1998) have noted that the latter condition will be satisfied when the first and third conditions are satisfied and the signs of the effects are consistent with the proposed mediation process. These conditions essentially require paths a, b and c to be significant and c′ to be smaller than c by a nontrivial amount. However, it has been argued that a significant

total effect of X on Y (quantified as c) is not necessary for mediation to occur (MacKinnon, 1994, 2000; MacKinnon et al., 2000; Shrout & Bolger, 2002).

A serious weakness with Baron and Kenny (1986) approach however, is that they have recommended testing for the fourth condition, which is to compare the sizes of the regression coefficients before (byx) and after the mediator is included in the analysis (byx.m) and to use the Sobel (1982) test for testing the significance of the change in the coefficient because of introducing the mediator. Despite the fact that the widely adopted recommendation is to interpret a change in the significance of the regression coefficient as full and partial mediation, which is problematic owing to the fact that inferences of mediation are made without any assessment of the statistical significance of the mediation effect (*ab*) (MacKinnon et al., 2002).

Regarding the approach of James and Brett (1984) who identified similar conditions to those offered by Baron and Kenny (1986) for the bivariate relationships between the independent variable and the mediator and the mediator and the dependent variable, but the second and third conditions of Baron and Kenny (1986) approach are the first and second conditions in the James and Brett (1984) approach. The third condition of the James and Brett (1984) approach requires that the independent and dependent variables are no longer related when the mediator is controlled, which is similar to the fourth condition of Baron and Kenny (1986). However, to satisfy this condition, different evidence is required by James and Brett (1984). They recommend that once the first and second conditions are met, inferences of mediation require that the independent variable explains no additional variance in the dependent variable over that already explained by the mediator (i.e. R^2 y.mx is not significantly greater than R^2 y.m). This rule of evidence has faced the same problem which is recommended by Baron and Kenny (1986) about changes in regression coefficients, in that the inference of mediation is not based on a statistical test of the indirect effect. In this context, it has explicitly been noted that there is no analogue to test for the indirect effect in an ordinary least squares regression (James & Brett, 1984, P. 319). Moreover, even when Baron and Kenny (1986) recommended using the Sobel test for testing the fourth step, the result of this test related to an indirect effect is judged by the normal distribution, which occurs only in large samples.

Furthermore, the fourth condition of James and Brett indicates that the mediator should add uniquely to the prediction of the dependent variable in its relationship with the independent variable (i.e. R^2 y.mx is significantly greater than R^2 y.x), although it is absolutely unclear whether they intended to require this as a condition for mediation.

6.6.1.2 Differences in Coefficients Approach

This approach involves statistically comparing the coefficients of the relationship between an independent and dependent variable before and after accounting for the role of an expected mediator (see Clogg, Petkova, & Shihadeh, 1992; Freedman & Schatzkin, 1992; Olkin & Finn, 1995; MacKinnon et al., 2002).

The approach provides estimates of the standard error and assessment of the statistical significance of the mediation effect. However, MacKinnon and his colleagues (2002) have stated that this approach offers a more formal statistical test of mediation than that offered by the causal steps processes outlined above, but they stressed that there have several potential weaknesses with its equations which are seen as only pseudo-direct tests of mediation, not nearly as accurate as the product of coefficient tests detailed in the next section. Inaccuracies are derived when the equations are used to compare the relationship between the independent variable and dependent variable, instead of a direct test of the mediating relationship itself. It has been argued that the difference in coefficients approach is the least used in the social sciences and each formula in this approach has been created for comparing a specific type of statistic (e.g. simple correlation, partial correlation, regression coefficient). Therefore, its equations cannot be generalised to the broad testing of mediation across different types of analyses.

6.6.1.3 The Product of Coefficients Approach

The approach offers estimates of the standard error and assessment of the statistical significance of the mediation effect. In this approach, the equations calculate the product of the paths which lead from the independent variable to the potential mediating variable and from the latter to the dependent variable, dividing this product by its standard error, and then compare it to the normal distribution. It is also algebraically equivalent to tests of the change in the regression coefficient following the introduction of the mediator (i.e. byx - byx.m) (MacKinnon, Warsi, & Dwyer, 1995), which is the

reason that Baron and Kenny (1986) suggested the Sobel test as a possible test of the fourth condition in their causal steps approach.

With respect to the standard error however, Aroian (1947), Goodman (1960) and Sobel (1982) have offered three traditional products of coefficients formulas, which slightly differ in their estimation of the standard error, but MacKinnon and colleagues have more recently provided a series of clear products of coefficients equations for assessing potential mediation (MacKinnon, Lockwood, & Hoffman, 1998). Their alternatives have been introduced due to the fact that there is low statistical power related to the traditional products of coefficients equations, because the products of the path estimates are not normally distributed.

Although, in general, a hypothesis of mediation is being supported based on the significance of the p value (i.e. 0.01 and 0.05), which is computed in reference to the standard normal distribution, methodologists have argued that using the standard normal distribution to derive a p value for the indirect effect (ab) is normally distributed only in large samples.

Given the unique advantages related to the products of coefficients approach, this study follows this approach. However, to overcome the disadvantages related to the normal distribution when a P value is estimated, the latest software (Process) produced by Hayes in (2013) is used, which in addition to estimating the P value, it offers a bootstrap method to overcome non-normal distribution in small and moderate samples.

6.6.2 Hayes' (2013) Macro (The Process Test)

As mentioned in Chapter Four (Subsection 4.15.2), the intervening variable model (i.e. mediation with effect size measures, instead of concentrating on full or partial mediation) is examined using (Hayes, 2013) macro (PROCESS).

PROCESS is a macro which describes Mediation, Moderation and Conditional Process Analysis and uses ordinary least squares, or the logistic regression-based path analytical framework, in order to estimate direct and indirect effects in simple and multiple mediating models. PROCESS extends what the existing macros (e.g. SOBEL, INDIRECT, MODMED, MODPROBE and MEDTHREE) can do by largely expanding

the number and complexity of models that can be placed together to estimate the conditional process model, which consists of for example, moderated mediation models with multiple mediators, multiple moderators of individual paths, interactive effects of moderators on individual paths and models with dichotomous outcomes.

The Process Test has verity of information including estimation of the P value, offering a bootstrap method to overcome non-normal distribution in small and moderate samples. Moreover, the Process provides more information about direct, indirect and total effect, as well as produces a variety of methods related to effect size measures which have not been found in many other types of software. Thus, the interpretation of the macro's outcome requires clarifying some key aspects before conducting the tests. The outcomes of the macro consist of the following parts:

- **Bootstrapping**

This part of the outcome is related to a non-parametric approach that produces a test which does not require a large sample size, but it can be used for a small size sample. In addition, it is preferred over the Normal theory-based Sobel test for inference about indirect effects, due to the unrealistic assumption the Sobel tests make about the shape of the sampling distribution of the indirect effect (Preacher & Hayes, 2004; Hayes, 2009, 2013).

The outputs of the Process generate a bootstrap estimate of the indirect effect *ab*, an estimated standard error (SE) and from 90% to 99% bias-corrected bootstrap confidence intervals for all indirect effects. The macro has more choice for confidence intervals, but by default it generates percentile-based bootstrap confidence intervals rather than bias-corrected confidence intervals.

The idea of bootstrapping is based on K random resampling of the data n, where n is the original sample size and K is the number of the samples which is taken from the original sample size to compute the indirect effect *ab* in each K sample (Preacher & Hayes, 2004). In order to determine whether the indirect effect is statistically significant at p < .05, the values of both the lower limit and upper limit of 95% confidence intervals (LL 95 CI - UL 95 CI) must be both positive or both negative, which means that the value of zero '0' is not in this confidence level (i.e. does not exist between the lower and upper

limits values). Moreover, since bootstrapping is based on random resampling of the data, the values of bootstrap confidence intervals and standard errors which are provided by the macro are slightly different each time it runs, but the more bootstrap samples are requested, the less variation will be obtained between runs.

In conformity with (Hayes, 2009, 2013), bootstrapping is one of the more valid and powerful methods to test the effects of intervening variables (mediation effects and indirect effects) in simulation studies, apart from having the best control of Type I errors. Moreover, the default number of bootstrap samples which is provided by the macro is 1000, but some authors (e.g. Hayes, 2013; Valeri & VanderWeele, 2013) recommended at least 5000. Despite the fact that bootstrapping has been increasingly used recently, it is sometimes presented as a supportive method to the causal steps approach when testing a mediation relationship.

6.6.3 Types of Mediation Models

According to the literature review, there are generally two types of mediator models, including simple mediation and multiple mediation. Multiple mediation models also have two forms, which are a serial multiple-mediator model (the mediators are connected together in a causal chain) and a parallel multiple-mediator model.

6.6.3.1 The Simple Mediation Model

The conceptualization of mediation analysis as a statistical method to calculate an effect may in part be owing to the dissemination of a popular approach, which is dominated by mediation analysis and has become deeply rooted in how scientists think, but is no longer recommended. On the surface, the existence of a relationship between X and Y seems to be a reasonable precondition of trying to explain the underlying effect of X on Y, but it has been a growing recognition over the last few years that such thinking is misguided. As Bollen (1989) stated *"lack of correlation does not disprove causation and correlation is neither a necessary nor a sufficient condition of causality"* (p. 52). This appears to be inconsistent with the conventional wisdom regarding the conditions of the causal steps approach. Therefore, many scholars of mediation analysis (e.g. Shrout & Bolger, 2002; MacKinnon, 2008; Cerin & MacKinnon, 2009; Hayes, 2009; Zhao, Lynch, & Chen, 2010; Rucker, Preacher, Tormala, & Petty, 2011) have now

followed the perspective of Bollen. Therefore, the first precondition of the causal steps approach, which assumes evidence for a simple relationship between X and Y, no longer is included in practice for 21st century mediation analysis.

It is the most rudimentary mediation model that can be estimated and no doubt it is the simplest form of mediation models which are used by scientists to study the influence of X on Y in real processes. Nonetheless, it is important to understand this model deeply due to the fact that it is routinely used to estimate and interpret the empirical social and psychological (e.g. Alter & Balcetis, 2011; Righetti & Finkenauer, 2011), cognitive (e.g. Debeer, Hermans, & Raes, 2009), clinical health (e.g. Leonard & Rasmussen, 2011; Ruby, Dunn, Perrino, Gillis, & Viel, 2011), political (e.g. Duncan & Stewart, 2007; Wohl & Branscombe, 2009), medical (e.g. Goodall & Slater, 2010; Shrum, Lee, Burroughs, & Rindfleisch, 2011) and business literatures (e.g. Brown & Baer, 2011; Patrick & Hagtvedt, 2011), among many other fields.

The conceptual diagram of the simple mediation model, as shown in Figure 6.1, includes two consequent variables M and Y, as well as two antecedent variables X and M, with X causally affecting Y and M and M causally impacting Y. A simple mediation model is any causal mechanism which has at least one independent variable X that affects an independent variable Y, through a single intervening variable M. In this model, two pathways can be distinguished and which proposes that a specific variable X can influence variable Y. One path is from the X variable directly to the Y variable without passing through M and is called the direct effect of X to Y. The other path is from the X variable to the Y variable and is called the indirect effect of X on Y through M. The indirect effect represents how the dependent variable Y is influenced by the independent variable X, through a causal sequence in which X influences the intervening variable M, which in turn influences Y.

- **Estimation of the Direct, Indirect and Total Effect of X**

This side of the study is interested in addressing the direct, indirect and total effects which have been known as the Bollen (1989) perspective. This perspective does not require the existence of the total effect between the independent and dependent variables as an essential precondition.

To estimate the relationships in a simple mediation model, two linear models are required, one for each consequent variable (M and Y).

$$M = i_1 + a X + e_m \qquad (1)$$

$$Y = i_2 + \acute{C} X + bM + e_Y \qquad (2)$$

Where i_1 and i_2 are regression intercepts, e_m and e_Y are errors in the estimation of M and Y, respectively, and b and $\acute{C}$ are the regression coefficients given to the antecedent variables in the model in the estimation of the consequents. The coefficients can be estimated by carrying out two OLS regressions using SPSS and other statistical packages, such as a structural equation model with LISREL, AMOS, Mplus, or EQS, or using PROCESS.

➢ **Direct Effect of X on Y**

As shown in Figure 6.1 the first path a, refers to the regression of the mediating variable (M) on the independent variable (X). The second step relates to the regression of the dependent variable (Y) on the mediating variable (M), while controlling for the effect of X, as seen in path b in the same Figure. Finally, path C′ is the regression of the dependent variable (Y) on the independent variable (X), while controlling for the effect of the intervening variable (M). The direct effect (C′) quantifies the estimated difference in the dependent variable (Y) between two cases that vary by one unit on the independent variable (X), that is independent of the intervening variable effect (M) on the dependent variable (Y). The interpretation of the direct effect is that two cases that vary by one unit on the independent variable (X), but are equal on the intervening variable (M), are estimated to vary by C′ units on the independent variable (X). Figure 6.1 shows this step, which is recognised as the direct effect.

Figure 6.1 Simple Mediation Model
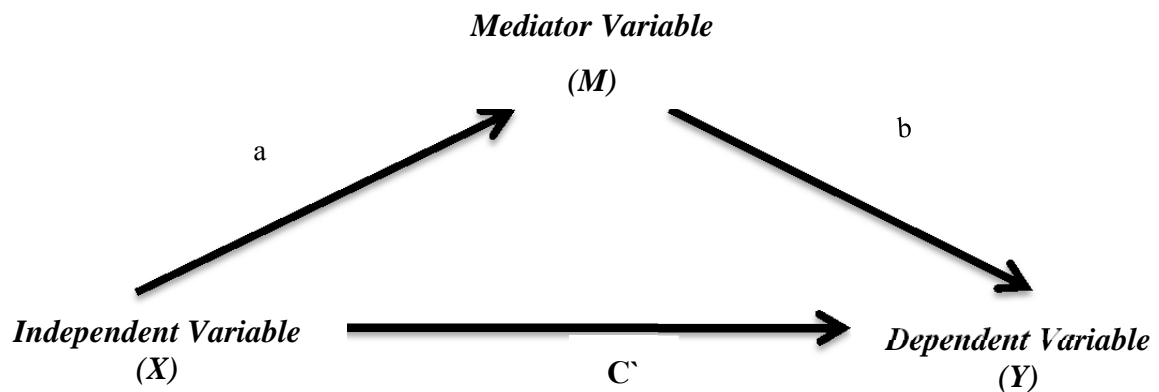
- ➤ **Indirect Effect of X on Y**

It is worthwhile to explain what *a* and *b* estimate before introducing the indirect effect definition. In simple mediation models, *a* quantifies how much two cases that vary by one unit on the independent variable (*X*) are estimated to vary on the intervening variable (*M*), with the sign identifying whether the case higher on the independent variable (*X*) is estimated to be higher (+) or lower (-) on the intervening variable (*M*). The *b* coefficient has an interpretation analogous to *C′*, except with the intervening variable (*M*) as the antecedent. Two cases that vary by one unit on the *M* variable, but that are equal on the *X* variable, are estimated to vary by *b* units on the *Y* variable. As with *a* and *C′*, the sign of *b* identifies whether the case higher on the *M* variable is estimated as higher (+) or lower (-) on the *Y* variable.

The indirect effect of the independent variable X on the dependent variable Y through the intervening variable M, is the Product of a and b. This implies that the indirect effect is $a * b = ab$. This effect tells that two cases that vary by one unit on the independent variable X are estimated to vary by *ab* units on the dependent variable Y, as a result of the effect of the independent variable X on the intervening variable M, which in turn, influences the dependent variable Y. It is acknowledged that if a and b are positive or negative, the indirect effect is positive (implying the case higher on variable X is estimated to be higher on variable Y), whereas if either a or b, but not both, is negative, the indirect effect would be negative (implying the case higher on variable X is estimated to be lower on variable Y).

> ➢ **Total Effect of X on Y**

The direct and indirect effects perfectly partition how differences in X map on to differences in Y, the so-called total effect of X, denoted here as C. The total effect of the independent variable (X) on the dependent variable (Y) is equal to the sum of the direct and indirect effects of the independent variable (X), which means C = C′ + *ab*. This relationship can also be written as *ab* = C - C′, which offers another definition of the indirect effect. The total effect C (the sum of the direct and indirect effects) quantifies how much two cases that vary by one unit on the independent variable X are estimated to vary on the dependent variable Y. Figure 6.2 is representing path c.

Figure 6.2 The Total Effect

Independent Variable (X) $\xrightarrow{\quad C \quad}$ *Dependent Variable (Y)*

6.6.3.2 Parallel Multiple-Mediator Model

In a parallel multiple mediator model, the independent variable X is modeled to affect the dependent variable Y directly and indirectly through two or more intervening variables as mediators, with the condition that there is no causality influences between any mediator and another, which does not mean that the mediators are presumed to be independent because they are likely to be correlated in most situations.

As can be seen in figure 6.3, a parallel multiple mediator model with K mediators has K+1 consequent variables (one for each of the K mediators M and one for the outcome variable Y) and so requires K+1 equations to estimate all the effects of X on Y. these equations are:

$$Mi = i_{Mi} + a_i X + em_i \qquad \text{for all } i = 1 \text{ to } k \qquad (3)$$

$$Y = i_Y + \acute{C}X + \sum_{i=1}^{k} b_i M_i + e_Y \qquad (4)$$

From these equations, a_i estimates the effect of X on M_i, b_i estimates the effect of M_i on Y controlling for X and the other $K - 1M$ variables, and $\acute{C}$ estimates the effect of X on Y holding all KM variables constant.

Figure 6.3 Parallel Multiple Mediator Model
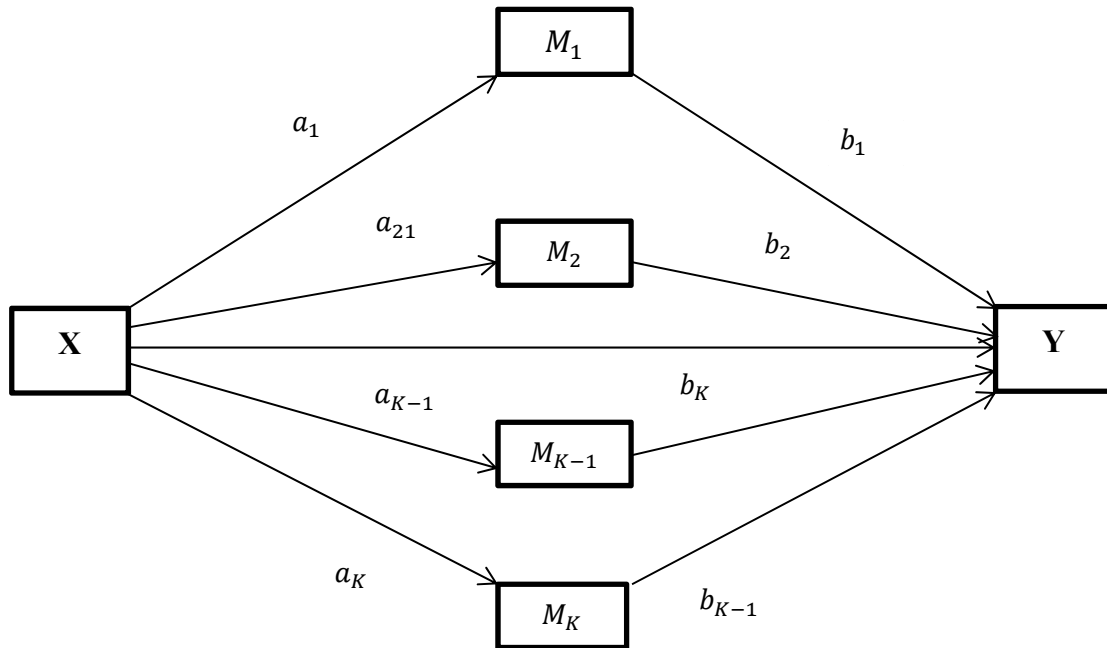
Consider a parallel multiple mediator model with four proposed mediators, like the model which is presented in this study, with $K = 4$ mediators, so five equations are required:

$$M1 = i_{M1} + a_1 X + em_1 \tag{5}$$

$$M2 = i_{M2} + a_2 X + em_2 \tag{6}$$

$$M3 = i_{M3} + a_3 X + em_3 \tag{7}$$

$$M4 = i_{M4} + a_4 X + em_4 \tag{8}$$

$$Y = i_Y + \acute{C}X + b_1 M_1 + b_2 M_2 + b_3 M_3 + b_4 M_4 + e_Y \tag{9}$$

In equations 5-8 , a_1, a_2, a_3 and a_4 quantify the amount by which two cases that vary by one unit on X are estimated to differ on $M1$, $M2$, $M3$ and $M4$, respectively. In equation 9, b1 estimates the amount by which two cases that differ by a unit on $M1$ differ on Y, holding $M2$, $M3$, $M4$ and X constant. Similarly, b_2 estimates the amount by which two cases that differ by a unit on $M2$ differ on Y, holding $M1$, $M3$, $M4$ and X

constant, and so on for the other bs. For Ć, which estimates the amount by which two cases that differ by one unit on X differ on Y, it holds $M1, M2, M3$ and $M4$ constant.

- **Direct and Indirect Effects in a Parallel Multiple Mediator Model**

In this model, X is modeled to exert its effect on Y through $K + 1$ paths. One path is direct, from X to Y, without passing through any of the proposed mediators; the other K paths are indirect, each through a single mediator. According to this model, the indirect effects are referred to as specific indirect effects. Therefore, a model with K mediators has K specific indirect effects, one through M_1 ($X \rightarrow M_1 \rightarrow Y$), one through M_2 ($X \rightarrow M_2 \rightarrow Y$) and so on up through M_k ($X \rightarrow M_K \rightarrow Y$).

As in a simple mediation model, the indirect effect of X on Y through a given mediator M_i is quantified as the product of paths linking X to Y through M_i. In this model, only two paths link X to Y through M_i. The first path is the effect of X on M_i and the other path is from M_i to Y. The regression coefficients corresponding to these paths, when multiplied together, yield the specific indirect effect of X on Y through M_i. Therefore, in the four-mediator parallel multiple mediator model, for example, the specific indirect effect of X on Y through M_1 is $a_1 b_1$, the specific indirect effect of X on Y through M_2 is $a_2 b_2$, the specific indirect effect of X on Y through M_3 is $a_3 b_3$ and the specific indirect effect of X on Y through M_4 is $a_4 b_4$.

A specific indirect effect is interpreted just as in the simple mediation model. Thus, the specific indirect effect of X on Y through M_i is the estimated amount by which two cases that differ by a unit on X are estimated to differ on Y as a result of the effect of X on M_i, which in turn influences Y, holding all other mediators constant.

The total indirect effect in the model is the sum of the specific indirect effects of X on Y through all mediators in the model. Therefore, to calculate the total indirect effect in a model with K mediation is as follows:

$$\text{Total indirect effect of X on Y} = \sum_{i=1}^{k} a_i b_i \qquad (10)$$

The total indirect effect for a parallel multiple mediator consisting of four mediators is $a_1 b_1 + a_2 b_2 + a_3 b_3 + a_4 b_4$.

The direct effect of X quantifies how much two cases that differ by a unit on X are estimated to differ on Y, independent of all mediators. As in the simple mediation model, the sum of the direct and indirect effect is the total effect of X, as can be seen in the equation below:

$$C = \acute{C} + \sum_{i=1}^{k} a_i b_i \qquad (11)$$

The total effect of X is called C, which can also be estimated from regressing Y on X alone. Moreover, in the four multiple mediators' model the total effect is $C = \acute{C} + a_1 b_1 + a_2 b_2 + a_3 b_3 + a_4 b_4$. As also can be calculated the total indirect effect, which is equal to the difference between the total and the direct effects of X:

$$C - \acute{C} = \sum_{i=1}^{k} a_i b_i \qquad (12)$$

6.7 Classifying the Intervening Effects and Effect Size Measures

In the next sections which are related to RC and PE as mediating variables, their results and discussions will be presented at first on an aggregate level and then followed by addressing the mediating effect for each dimension of these variables, which include GC and PC for RC, as well as ME, COM, SED and IMP for PE in order to shed light on the individual intervening effect of the six mentioned dimensions and to compare their effect sizes.

According to Mathieu and Taylor (2006) there are two types of intervening effect, which are the indirect and the mediating effect and they stated that it is worthwhile to illustrate these effects to draw the right conclusions. They have assured that some pre-conditions are required to know the types of effects (indirect or mediating effect), before making any final decision when interpreting the results. Mathieu and Taylor (2006) argued that when there are significant total effects between the X variable and Y

variable, as well as both path a and b are significant, the mediating effect must be found by the M variable, but if the total effect is insignificant, the indirect effect must be found. However, some authors (Collins, Graham, & Flaherty, 1998; MacKinnon, 2000; Hayes, 2013) have mentioned that a pre-condition of the total effect to be significant is not required. More specifically, MacKinnon (2000, p. 141) has pointed out that:

> *"A mediator is a variable that accounts for all or part of the relation between a predictor and an outcome because the mediator is intermediate in the causal pathway from the independent variable to the dependent variable. The mediation effect is also called the indirect effect because it represents the independent variable effect on the dependent variable through a mediating variable. Mediating variables are sometimes called intervening variables because they are intermediate between the independent and dependent variable."*

In the causal steps approach, studies expressed the mediation form in terms of full/complete/perfect, or partial. However, these previous descriptions are the most popular way to express effect size for mediation (Mathieu & Taylor, 2006), but they have several weaknesses of interpretation (e.g. informal descriptors, meaninglessness, affected by the sample size and highly imprecise), let alone, at least in psychology, complete mediation is expected to be rare owing to the prevalence of multiple mediators (Preacher & Kelley, 2011).

As for the mediating effects, instead of addressing full or partial mediation and in order to avoid the shortcomings caused by existing methods (the descriptive interpretation of the results of testing mediators) (Preacher & Kelley, 2011), the research will present the analysis of intervening variables by reporting the effect sizes as quantitative values, which are small (.01), medium (.09) and large (.25), as defined by (Cohen, 1988). In this respect, on one hand the research satisfies the suggestion of (Preacher & Kelley, 2011) who state that at a minimum, the estimated value of k^2, the ratio of the obtained indirect effect to the maximum possible indirect effect, should be reported in mediating and indirect analysis due to the fact that it provides several benefits, such as be standardized, on an interpretable metric (0 to 1), be insensitive to sample size and with bootstrap methods. On the other hand, the research also follows the recommendations of previous studies, such as the National Center for Education Statistic (NCES, 2003), the American Educational Research Association (AERA, 2006) and the International Committee of

Medical Journal Editors (via the Consolidated Standard of Reporting Trials [CONSORT; Hartmann et al., 2010), in terms of reporting more different types of effect size measures, which are available in Appendix F and for possible use in meta-analysis in future studies.

In conclusion, the reasonable rationale for using Hayes' (2013) macro is the suitability for small sample sizes, which is inappropriate for the structural equation modelling (SEM) approach that deals with large samples only. Furthermore, the macro has a powerful procedure, being simple to interpret the results and provides much information related to effect size measures and which is helpful to reach the final decision and draw conclusions (Hayes, 2013). This information is not available in some previous macros, such as the Sobel Test.

6.8 The Intervening Roles of Cognitive and Motivational Variables on the Relationship between the Comprehensive PMS and Outcome Variables

The mediation results have been obtained based on a questionnaire survey from the sample of 122 SBU managers working in manufacturing companies in Libya. The research examines the mediation relationships at the individual level of analysis, where the data was obtained from the sample of SBU managers. The research design was cogitated to achieve the objectives of the present research and to test four mediation relationships. Each hypothesis of mediation has been set based on each proposed outcome, as mentioned in the literature review. The study used the parallel multiple mediation analysis which has the ability to detect total and specific indirect (mediating) effects. In the absence of a full indirect effect therefore, specific indirect effects have been presented between the antecedent and outcome variables.

6.8.1 Statistical Assessment of Mediation

It could be argued that assessing regression paths is a very important procedure due to the fact that this step identifies which combinations of variables actually provide empirical evidence of a statistical indirect effect (mediation). Analysis by Process (macro) provides information about the estimation of individual paths and total, as well as specific indirect effects amongst the variables. These two paths together represent the indirect effect which can prove the existence of the intervening effect (the mediation pathway) (Sobel, 1982; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008). Process also offers asymmetric confidence intervals for the product of these

paths which are further assessment for evidence of mediation, as suggested by many authors (e.g. MacKinnon, 2008; Tofighi & MacKinnon, 2011; Hayes, 2013). In this case, the mediation relationship is statistically significant if the confidence interval excludes zero.

There is no general agreement on what estimation is best to represent effect sizes among statistical mediation analyses and this area is still under refinement (MacKinnon, 2008; Fairchild, MacKinnon, Taborga, & Taylor, 2009; Preacher & Kelley, 2011).

In this vein, two mediation models were tested to examine the indirect effects of the CPMS on JS and MP through cognitive and motivational variables.

6.8.2 Analysing the Multiple Mediation Model of Role Clarity and Psychological Empowerment on the Relationship between the Comprehensive PMS and Job Satisfaction

Model I, which is illustrated in Figure 6.4, hypothesizes that the comprehensive PMS would be a significant predictor of JS when RC and PE were entered into the model as mediators. The hypotheses of this model are as shown below:

H3 Role Clarity has a Mediating Effect on the Relationship between the Comprehensive PMS and Job Satisfaction.

H4 Psychological Empowerment has a Mediating Effect on the Relationship between the Comprehensive PMS and Job Satisfaction.

In the parallel multiple mediation model analysis, RC and PE were simultaneously tested as intervening variables between the comprehensive PMS and JS. The path coefficients in the model were estimated through the OLS regression, using the Process SPSS macro with bootstrapping procedures (Hayes, 2013) and evaluated whether there was evidence for statistically significant relationships or not. In this model, four paths are estimated and evaluated, then quantifying the product of paths linking the comprehensive PMS to JS through RC and PE. Two paths link the comprehensive PMS to JS through RC ($a_1 b_1$) and two others link the comprehensive PMS with JS through PE ($a_2 b_2$). Every two paths after evaluation were used to quantify the product of paths in which they are multiplied to obtain the specific indirect effect for each mediator.

Figure 6.4 Model I: Parallel Multiple Mediators Model of RC and PE
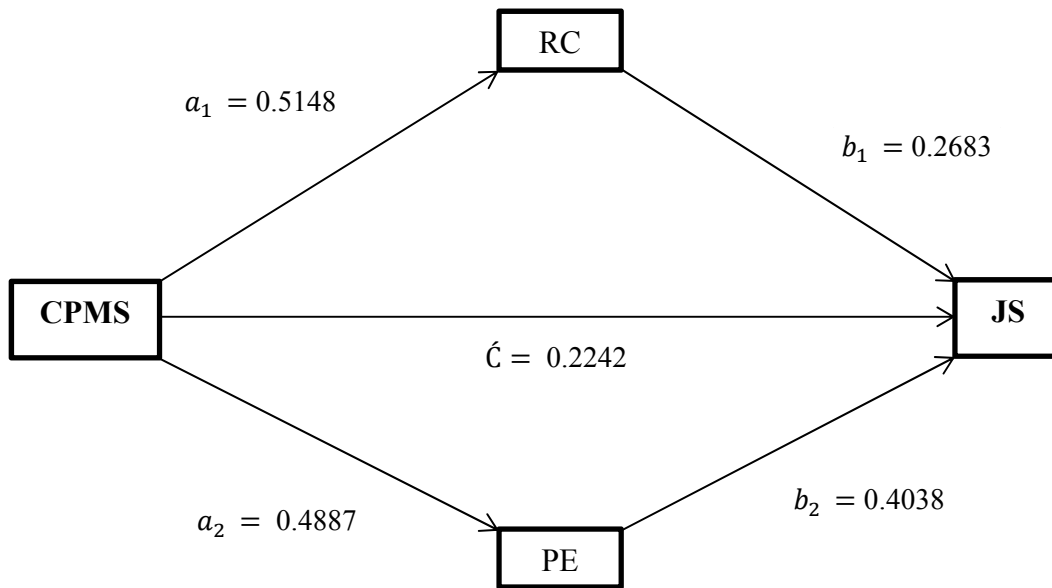
As can be seen in Table 6.**7**, both paths of RC (a_1 and b_1) and PE (a_2 and b_2) demonstrated statistical significance for both components of the two mediations' pathways, yielding the total indirect effect through both mediators equalled $ab = 0.3355$, indicating that both mediators have significant positive relationships between the comprehensive PMS and JS, as a result of excluding zero in the confidence interval based on 5000 bootstrap samples (95% CI = .1530 − .5219). Controlling for the other mediator, the results illustrated that the specific indirect effect ($a_1 b_1$) of the comprehensive PMS on JS through RC was statistically positively significant ($a_1 b_1 = 0.1381$, 95% CI = .0306 − .3022), as well as for the specific indirect effect ($a_2 b_2$) of the comprehensive PMS on JS through PE ($a_2 b_2$ = .1973, 95% CI = .0807 − .3781). Likewise, the direct effect of the comprehensive PMS on JS, controlling for both mediators RC and PE, is significantly different from zero at the level of the 95% confidence interval (JS * comprehensive PMS RC and PE; Ć = .2242, $p < .01$, .0761 - .3723). Moreover, the results revealed that the relationship of the comprehensive PMS with JS yields a significant positive total effect (c = .5597, p < .001, with 95% CI = .3475 - .7719).

Table 6.7 Results of the Mediating Effect of RC and PE on the Relationship between CPMS and JS

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
RC								
P. a_1 (CPMS→RC)	.1383	19.2593	.5148	.1173	4.3885	.0000	.2825	.7471
P. a_2 (CPMS→PE)	.1022	13.6610	.4887	.1322	3.6961	.0003	.2269	.7504
P. b_1 (RC→JS)	.6639	77.6920	.2638	.1075	2.4954	.0140	.0554	.4813
P. b_2 (PE→JS)			.4038	.0954	4.2318	.0000	.2148	.5927
P. Ć (CPMS→JS)			.2242	.0748	2.9985	.0033	.0761	.3723
P. c (CPMS →JS)	.1852	27.2768	.5597	.1072	5.2227	.0000	.3475	.7719
total In. "ab"	-	-	**.3355**	.0947	-	-	.1530	.5219
Specific In. $a_1 b_1$	-	-	**.1381**	.0682	-	-	.0306	.3022
Specific In. $a_2 b_2$	-	-	**.1973**	.0743	-	-	.0807	.3781

P: Path; CPMS = Comprehensive Performance Measurement Systems; RC= Role Clarity; PE= Psychological Empowerment; JS = Job Satisfaction; *In*. = Indirect Effect.

From the above results, it can be stated that the criteria of the mediating effect of RC and PE are met in simultaneous testing. In other words, the RC and PE have a large total indirect effect size on the relationship between the comprehensive PMS and the JS (β = 0.3355, 95% CI = .1530 – .5219). Therefore, the research hypotheses H3 and H4 are supported. These hypotheses have not previously been studied. However, as the comprehensive PMS is part of the management control system, the RC hypothesis agreed with the study of Carbonell and Rodriguez-Escudero (2013), who found that RC mediated the relationship between the management control system and JS and confirms the findings of Chenhall and Brownell (1988) that role ambiguity has a mediating effect on the relationship between budgeting participation and JS. The findings of the current study suggest that SBU managers, who have more information provided by more comprehensive PMS to understand what they are expected to do in their role, are more satisfied in that role.

The PE hypothesis is consistent with several studies (Laschinger et al., 2001; Seibert et al., 2004; Gregory et al., 2010) which indicated that providing information was indirectly affecting JS through PE as a mediator. This corresponds with the comprehensive PMS that provides a large amount of operational and strategic information, leading to the enhanced PE of SBU managers (mediating effect), which in turn is reflected in increasing their JS.

6.8.3 Analysing the Multiple Mediation Model of Role Clarity, Psychological Empowerment, Mental Model Confirmation and Mental Model Building in Relation to the Comprehensive PMS and Managerial Performance

Model II, which is depicted in Figure 6.5 hypothesizes that RC, PE, MMC and MMB have mediating effects on the relationship between the comprehensive PMS and MP. The hypotheses of this model are shown below:

H5 Role Clarity has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

H6 Psychological Empowerment has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

H9 Mental Model Confirmation has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

H10 Mental Model Building has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

To test this model, eight paths were required to be estimated and evaluated. First, identify all paths whether statistically significant or not. Second, calculate the specific indirect effects which are linking the comprehensive PMS with MP by every single mediator and whether they are statistically significant. Third, quantify whether the product of all paths that are linking the comprehensive PMS to MP, through RC, PE, MMC and MMB, expressing the total indirect effect, which is the sum of the specific indirect effects, is statistically significant. The coefficient for each single path $(a_1, a_2, a_3, a_4, b_1, b_2, b_3, b_4)$ was estimated. Apart from b_1, all other paths were statistically significant. The results which were obtained (see Table 6.8) from the Process, calculating the specific indirect effects for each mediator, as follow; RC $(a_1 * b_1)$, PE $(a_2 * b_2)$, MMC $(a_3 * b_3)$ and $(a_4 * b_4)$, as well as the total indirect effect for all mediators $- (a_1 * b_1) + (a_2 * b_2) + (a_3, * b_3) + (a_4 * b_4)$ simultaneously, indicated the statistical significance for the total indirect effect due to its confidence interval did not include zero ($ab = .2905$, 95% CI $= .1427 - .4526$).

Unstandardized regression paths describing the two separate mediation pathways related to the four parallel multiple mediations, which count four pairs of paths, are involved in Table 6.8. Of the four pairs of mediating paths, three mediators demonstrated statistical significance across both pairs of paths that make up the two mediation pathways. The paths of these mediators (PE, MMC and MMB), with unstandardized regression paths, were: PE through the comprehensive PMS and MP ($a_2 = .4887$ & $b_2 = .2420$), MMC

through the comprehensive PMS and MP ($a_3 = .3558$ & $b_3 = .4237$) and MMB through the comprehensive PMS and MP($a_4 = .5851$ & $b_4 = .1507$).

Coefficients of these individual paths and products of unstandardized coefficients (specific indirect effects) related to all three of the previously identified mediators had confidence intervals that did not include zero, which confirmed that PE, MMC and MMB are mediating the relationship between the comprehensive PMS and MP simultaneously; Product coefficient of PE ($a_2 * b_2 = .1183$, 95% CI = .0111 − .2972), Product coefficient of MMC ($a_3 * b_3 = .1508$, 95% CI = .0627 − .3043) and Product coefficient of MMB ($a_4 * b_4 = .0882$, 95% CI = .0181 − .1954).

Figure 6.5 Model I: Parallel Multiple Mediators Model of RC, PE, MMC and MMB
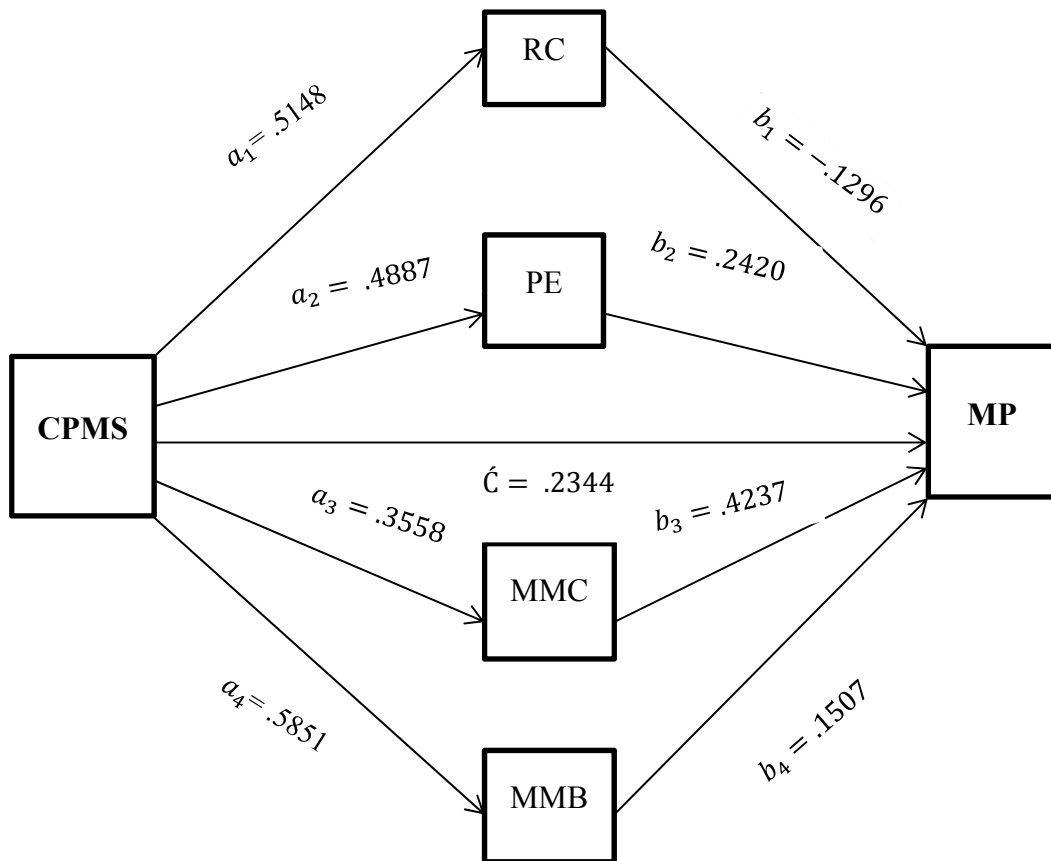
Table 6.8 Results of the Mediating Effect of RC, PE, MMC, and MMB

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
RC								
P. a_1 (CPMS→RC)	.1383	19.2593	.5148	.1173	4.3885	.0000	.2825	.7471
P. a_2 (CPMS→PE)	.1022	13.6610	.4887	.1322	3.6961	.0003	.2269	.7504
P. a_3 (CPMS→MMC)	.1066	14.3193	.3558	.0940	3.7841	.0002	.1696	.5420
P. a_4 (CPMS→MMB)	.1554	22.0748	.5851	.1245	4.6984	.0000	.3385	.8317
P. b_1 (RC→MP)			-.1296	.1246	-1.0395	.3007	-.3765	.1173
P. b_2 (PE→MP)			.2420	.0989	2.4474	.0159	.0462	.4379
P. b_3 (MMC →MP)	.5829	32.4275	.4237	.1068	3.9671	.0001	.2122	.6352
P. b_4 (MMB →MP)			.1507	.0678	2.2244	.0281	.0165	.2849
P. Ć (CPMS→MP)			.2344	.0776	3.0218	.0031	.0808	.3881
P. c (CPMS →MP)	.2007	30.1273	.5249	.0956	5.4888	.0000	.3356	.7143
total In. "ab"	-	-	**.2905**	.0784	-	-	.1427	.4526
Specific In. $a_1 b_1$	-	-	**-.0667**	.0788	-	-	-.2538	.0673
Specific In. $a_2 b_2$	-	-	**.1183**	.0685	-	-	.0111	.2972
Specific In. $a_3 b_3$	-	-	**.1508**	.0586	-	-	.0627	.3043
Specific In. $a_4 b_4$	-	-	**.0882**	.0440	-	-	.0181	.1954

P. = Path; CPMS = Comprehensive Performance Measurement Systems; RC= Role Clarity; PE= Psychological Empowerment; JS= Job Satisfaction; MMC= Mental Model Confirmation; MMB= Mental Model Building; MP = Managerial Performance; *In*. = Indirect Effect.

From the above results, it can be stated that the criteria of the mediation effect of PE, MMC and MMB are met. In other words, PE, MMC and MMB have simultaneous mediation effects on the relationship between the comprehensive PMS and MP. Therefore, the research hypotheses H6, H9 and H10 are supported.

These results illustrate that the directions of the indirect paths through PE, MMC and MMB are consistent with the interpretation; more comprehensive PMS leads to SBU managers feeling more psychologically empowered, confirm and update their mental models, which in turn leads to greater MP. However, the indirect path through RC is negative in direction (called a suppressor). Therefore, indirect paths with opposite directions have cancelled each other out, resulting in an insignificant specific indirect relationship.

Preacher and Hayes (2008) stated that a specific indirect effect does not represent the ability of a given mediator (i.e. RC) to mediate the effect of X (the comprehensive PMS) on Y (MP), but it represents the ability of RC to mediate the effect controlling for all

other mediators (PE, MMC and MMB). Therefore, a specific indirect effect related to RC represents RC's unique ability to mediate the comprehensive PMS -MP relationship. Generally, but not necessarily, indirect effects will be attenuated, to the extent that the mediators (RC, PE, MMC and MMB) are correlated, which is simply an indication of the common phenomenon of collinearity, or redundancy among predictors (mediators including RC, PE, MMC and MMB are predictors of MP). However, authors (e.g. Preacher & Hayes, 2008) have argued that collinearity is not necessarily a problem, but it may lead the investigator to conclude that M (RC) does not serve as a mediator when in fact it does, or even to conclude that M serves as a mediator when it does not.

6.9 Single Mediator Models of Role Clarity, Psychological Empowerment, Mental Model Confirmation and Mental Model Building

As RC identified above failed to be established as the mediator in the multiple-mediator model, the mediated effect of this individual variable for the dependent variable was subsequently tested in a single mediator model to compare with the alternative multiple-mediator model. In this case, the study follows the recommendations of Preacher and Hayes (2008) who suggest that for investigating multiple mediation, two parts should be taken into consideration; testing the total indirect effect to identify whether the set of mediators transmits the effect of X to Y; and investigating hypotheses regarding individual mediators in the context of a multiple mediator model, which means testing the specific indirect effect related to each putative mediator. Moreover, Spencer, Adams, and Yapa (2013) considered that this step is necessary, as the single mediator model will reveal whether the variable is a significant mediator on its own and whether its effect has been accounted for by other potential mediators which render it insignificant in the multiple-mediator model.

6.9.1 The Role of Role Clarity on the Relationship between the Comprehensive PMS and Job Satisfaction

H3 Role Clarity has a Mediating Effect on the Relationship between the Comprehensive PMS and Job Satisfaction.

The Process test related to hypothesis H3 has three regression models which examined the contribution of the comprehensive PMS and the magnitude of RC on aspects of JS (as shown in Table 6.9). The effect of the comprehensive PMS on RC yields a significant positive effect of path *a*, which is excluding zero by the 95% confidence interval based

on 5000 bootstrap samples that ranged from .2825 to .7471, with B value = .5148, R^2 = .1383, t = 4.3885, P = .0000 and showed that 13.83% of variance in RC is explained by the comprehensive PMS. Path *b* which is the effect of RC on JS while controlling for the comprehensive PMS, has shown positive significant influence, with B = .6618, R^2 = .6129, t = 11.4659, p = .0000 and 95% CI that ranged from .5475 to .7761. The test indicated that the indirect effect of the comprehensive PMS on JS through RC (i.e. ab) is different from zero by the 95% confidence interval based on 5000 bootstrap samples CI that ranged from .1607 to .5275, with a point estimate of .3407. In addition, the direct effect of the comprehensive PMS on JS while controlling for RC is significantly different from zero at the level of 95% confidence interval; C` = .2190, p < .01 with bootstrap samples CI ranged from .0607 to .3772. Both paths (*b* and *c*`) explained 61.29% of variance in JS by RC (Path *b*) and the comprehensive PMS (Path *C*`) reported on in the mediational model. The findings also indicated that the influence of the comprehensive PMS on JS, as seen in path *c*, is a significant total effect, (B = .5597, R^2 = .1852, t = 5.2227, P = .0000, 95% CI = .3475, .7719), which indicate that the comprehensive PMS explained 18.52% of the variance in JS.

The results of the bootstrapping mediation analyses revealed that the estimated effects for the purposed mediational relationship between the comprehensive PMS and JS through RC identified as a large effect size with K^2 = .2963, 95% CI = .1457, .4248.

In more detail, the results indicate that both dimensions of RC (GC and PC) had a mediating effects on the relationship between the comprehensive PMS and JS (see paths a, b and c`). To demonstrate this, on the one hand the indirect effect of the comprehensive PMS on JS through the GC dimension (*ab*) is different from zero by 95% confidence interval based on 5000 bootstrap samples ranged from .2001 to .5113, with a point estimate of .3407, as well as both paths (a and b) having positive significant effects (with a point estimate of .5013 and 95% CI ranged from .3074 to .6952 for path a) and R^2 = .1793 which explained about 18% of the variance in GC by the comprehensive PMS. For path b, it is also significant, (with a point estimate of .6960 and 95% CI ranged from .5426 to .8493 and R^2 = .5147) and which explained 51.47 % of the variance in JS by both GC and the comprehensive PMS. On the other hand, the PC dimension has a significant effect on the relationship between the comprehensive PMS and JS, which is also different from zero by 95% confidence interval based on 5000

bootstrap samples (ranged from .0819 to .4385, with a point estimate of .2582) and both paths (a and b) of PC have positive significant effects (with a point estimate of .5283 and 95% CI ranged from .2241 to .8325 for path a and $R^2 = .0897$), which explained about 9 % of the variance in PC by the comprehensive PMS. In respect to path b related to PC, the results indicate a significant effect (with a point estimate of .4888 and 95% CI ranged from .3985 to .5791 and $R^2 = .5855$), which explained 58.55 % of the variance in JS by both the comprehensive PMS and PC.

In short, given the significance of all four paths of the two dimensions, both of the dimensions have a mediating effect, but they have been classified as a large effect size through GC ($\kappa^2 = .2850$, 95% CI ranged from .2001 to .5113), while there is a medium effect size through PC ($\kappa^2 = .2258$, 95% CI ranged from .0724 to .3589).

Table 6.9 Results of the Mediating Effect of RC on the Relationship between CPMS and JS

• *product coefficient approach*	*R²*	*F*	*B*	*S.E.*	*t*	*Sig.*	*LLCI*	*ULCI*
RC								
P. a (CPMS→RC)	.1383	19.2593	.5148	.1173	4.3885	.0000	.2825	.7471
P. b (RC→JS)			.6618	.0577	11.4659	.0000	.5475	.7761
P. Ć (CPMS→JS)	.6129	94.1993	.2190	.0799	2.7402	.0071	.0607	.3772
P. c (CPMS →JS)	.1852	27.2768	.5597	.1072	5.2227	.0000	.3475	.7719
Indirect effect "ab"			**.3407**	.0926			.1607	.5275
Kappa-squared			**.2963**	.0698			.1457	.4248
Goal clarity								
P. a(CPMS→GC)	.1793	26.2119	.5013	.0979	5.1197	.0000	.3074	.6952
P. b (GC→JS)	.5147	63.1058	.6960	.0774	8.9887	.0000	.5426	.8493
P. Ć (CPMS→JS)			.2108	.0917	2.2994	.0232	.0293	.3923
Indirect effect "ab"			**.3489**	.0792			.2001	.5113
Kappa-squared			**.2850**	.0567			.1690	.3924
Process clarity								
P. a (CPMS→PC)	.0897	11.8204	.5283	.1537	3.4381	.0008	.2241	.8325
P. b (PC→JS)	.5855	84.0552	.4888	.0456	10.7208	.0000	.3985	.5791
P. Ć (CPMS→JS)			.3014	.0804	3.7472	.0003	.1421	.4607
Indirect effect "ab"			**.2582**	.0915			.0819	.4385
Kappa-squared			**.2258**	.0721			.0724	.3589

P. = Path; CPMS = Comprehensive Performance Measurement Systems; RC= Role Clarity; JS= Job Satisfaction; GC = Goal Clarity; PC = Process Clarity.

Figure 6.6 the Role of RC on the Relationship between Comprehensive PMS and JS

The Mediating Effect
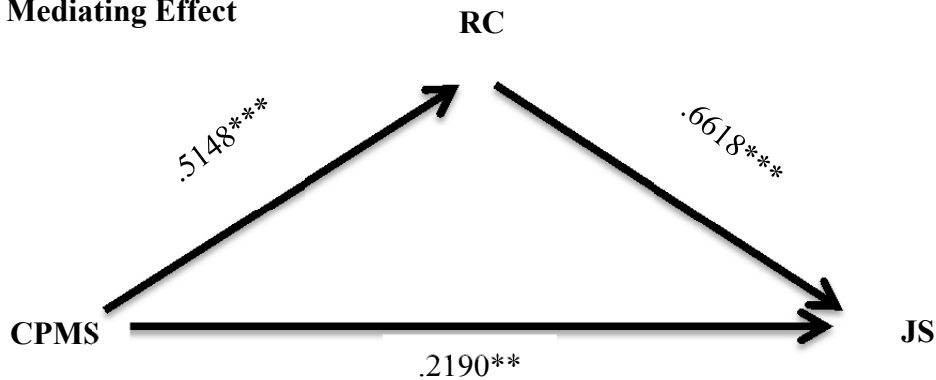
RC

.5148***

.6618***

CPMS

.2190**

JS

*** Significant at the level of .001
** Significant at the level of .01

The Total Effect

.5597*

CPMS → *JS*

*** Significant at the level of .001

The above results illustrated that the criteria of the mediation effect are met. In other words, the RC at an aggregate level has a mediating effect on the relationship between the comprehensive PMS and JS with a large-effect size, which resulted from both its dimensions, but is mostly driven from the GC dimension with a large-effect size and is followed by the PC dimension with a medium-effect size. Therefore, the research hypothesis H3 is supported.

The findings of this study indicate that the comprehensive PMS has an important impact on increasing RC, which helps managers to clarify their work roles by increasing both GC and PC. The comprehensive PMS appears to play an important role to direct the attention of SBU managers to the goal-relevant activities. This system helps managers by providing effective feedback and role-related information, which is reflected in higher RC by improving managers' understanding of the goals and objectives of their work roles (Hall, 2008). Moreover, such a system clarifies the linkages between

business operations and strategy to achieve results which increases the likelihood of RC. High RC leads to greater satisfaction of managers in their jobs.

As far as this researcher is aware, none of previous researches have particularly addressed the relationship between the performance measurement system as a comprehensive system and JS through RC. However, some prior studies have examined the effect of role ambiguity on the relationship between management systems and JS. For example, Chenhall and Brownell (1988) found that accounting performance measurement (budgetary participation) had a positive effect on JS through role ambiguity (less clarity), while Carbonell and Rodriguez-Escudero (2013) have addressed the effects of three types of management controls, including output control, process control and professional control on JS, through role ambiguity and found that apart from process control, both of the other types have significant effects on JS through role ambiguity.

As accounting performance measures are part of the comprehensive PMS which is a component from a management control system, the results of the mediational effect related to RC presented in this study are consistent with the findings reported by Chenhall and Brownell (1988), as well as Carbonell and Rodriguez-Escudero (2013). However, these studies found that role ambiguity (less clarity) has a mediating effect on the relationship between the management system and JS, but both of the studies did not mention the strength of effect size measures, which indicated that most effect size derived from GC in this study.

6.9.2 The Role of Psychological Empowerment on the Relationship between the Comprehensive PMS and Job Satisfaction

H4 Psychological Empowerment has a Mediating Effect on the Relationship between the Comprehensive PMS and Job Satisfaction.

The results obtained from testing H4, as shown in Table 6.10 and Figure 6.7, indicate that the indirect effect of the comprehensive PMS on JS through the PE (i.e. *ab*) is different from zero with a 95% confidence interval (95% CI ranged from .1221 to .4818, with a point estimate of .2979), as is the path from the comprehensive PMS to PE (CPMS $\rightarrow$ PE), a path with a point estimate of .4887, 95% CI ranged from .2269 to .7504 and R^2 = .1022, can explain 10.22% of the variance in JS by the comprehensive

PMS, and the path from PE to JS while controlling for the comprehensive PMS (PE $\rightarrow$ JS, b path with a point estimate of .6097, 95% CI ranged from .5127 to .7066). Additionally, the direct effect of the comprehensive PMS on JS (CPMS $\rightarrow$ JS, path C`), while controlling for PE, is statistically significant at the 95% CI ranged from .1136 to .4100, with a point estimate of .2618 and R^2 = .6462), which explain 64.62% of the variance in JS by PE while controlling for the comprehensive PMS and by the comprehensive PMS while controlling for PE. In addition, the total relationship between the comprehensive PMS and JS (CPMS $\rightarrow$ JS, path C) is statistically significant at the 95% CI ranged from .3475 to .7719, with a point estimate of .5597 and R^2 = .1852, which indicates that the value of R^2 can explain 18.52% of the variance in JS by the comprehensive PMS.

Moreover, the results also illustrate that the estimated effect of PE as a mediator on the relationship between the comprehensive PMS and JS is classified as a large effect size (with (κ^2 = .2672, 95% CI = .1159, .4013).

As considering that PE, which consists of four dimensions (ME, COM, SED and IMP) that mediate the relationship between the comprehensive PMS and JS, a set of tests was conducted in detail, so as to determine the impact of these mediating dimensions on the relationship between the comprehensive PMS and JS and to specify the strength of the effect size for each dimension on that relationship (CPMS $\rightarrow$ JS). As can be seen in Table 6.10, the bootstrapping indirect effect of the comprehensive PMS on the JS through the ME, COM, SED and IMP dimensions, revealed a bias corrected confidence interval excluding zero at the .05 level (*ab* = .3106, .1887, .1982 and .2537, as well as *CI* = .1656, .4767; .0399, .3428; .0543, .3587; .0797, .4279 respectively).

These results point out that all the dimensions have mediating roles on the relationship between the comprehensive PMS and JS, as mentioned below.

In respect to the ME dimension, it is indicated that both paths (a and b) are significant with points estimates of .4888 and .6355 respectively, and 95% CI ranged from .2794 to .6982 for the former, as well as 95% CI ranged from .4923 to .7788 for the latter. However, path a shows R^2 = .1511 which implies that about 15% of the variance of ME is explained by the comprehensive PMS, while the R^2 relates to path b and path C` (direct relationship) is .5057, implying that the R^2 value explained 50.57% of the variance in JS by both ME, while controlling for the effects of the comprehensive PMS

and by the comprehensive PMS, while controlling for the effects of ME. It is also that there is a significant direct relationship, as path Ć (CPMS→JS) results illustrate the values of 95% CI excluding zero ranged from .0689 to .4292, with a point estimate of .2490.

In relation to the COM dimension, its paths (a and b) are also statistically significant due to the fact that the values of 95% CI not including zero and which are ranged from .1285 to .8274 for path a and ranged from .3187 to .4774 for path b, with points estimates of .4779 and .3949 respectively. The value of R^2 relating to path a is .0576, whereas path b is .5298, which indicates that 5.76% of the variance in COM is explained by the comprehensive PMS. However, about 53% of the variance in JS is explained by both path b, controlling for the effect of the comprehensive PMS and path c` (direct relationship), while controlling for the effect of COM. The direct relationship (CPMS→JS) is also significant due to the fact that the values of 95% CI excluding zero ranged from .2042 to .5377, with a point estimate of .3710.

According to results of the SED, both paths (a and b) of this dimension have significant effect as the values of 95% CI excluding zero ranged from.1391 to .8568 and ranged from .3187 to .4774, with points estimates of .4980 and .3980 respectively. The findings mention that R^2 is .0592; implying that about 6% of the variance in SED is explained by the comprehensive PMS, while R^2 for path b and path c` (direct relationship) is.5544. This $R^2$ explained 55.44% of the variance in JS by both path b, controlling for the effect of the comprehensive PMS and path c` (direct relationship), while controlling for the effect of SED. In addition, a significant positive direct relationship (CPMS→JS) is found, as the values of 95% CI not including zero ranged from .1990 to .5239, with a point estimate of .3615.

In the context of the results related to the IMP dimension, both paths (a and b) are significant with points estimates of .4878 and .5201, as the values of 95% CI not including zero ranged from .2109 to .7647 and ranged from .4180 to .6222 respectively. It is also shown that R^2 is .0920, indicating that about 9% of the variance in IMP is explained by the comprehensive PMS, while about 56% of the variance in JS is explained by both path b, controlling for the effect of the comprehensive PMS and path C` (direct relationship), while controlling for the effect of IMP, as R^2 = .5606. Moreover, there is a

significantly positive direct relationship (CPMS→JS), as the values of 95% CI excluding zero ranged from .1418 to .4702, with a point estimate of .3060.

Table 6.10 Results of the Mediating Effect of PE on the Relationship between CPMS and JS

• *product coefficient approach*	R^2	*F*	*B*	*S.E.*	*t*	*Sig.*	*LLCI*	*ULCI*
PE								
P. a (CPMS→PE)	.1022	13.6610	.4887	.1322	3.6961	.0003	.2269	.7504
P. b (PE→ JS)	.6462	108.6520	.6097	.0490	12.4506	.0000	.5127	.7066
P .Ć (CPMS→JS)			.2618	.0748	3.4975	.0007	.1136	.4100
P. c (CPMS→JS)	.1852	27.2768	.5597	.1072	5.2227	.0000	.3475	.7719
Indirect effect "ab"			**.2979**	.0915			.1221	.4818
Kappa-squared			**.2672**	.0725			.1159	.4013
ME								
P. a(CPMS→ME)	.1511	21.3607	.4888	.1058	4.6218	.0000	.2794	.6982
P. b (ME →JS)	.5057	60.8771	.6355	.0723	8.7843	.0000	.4923	.7788
P. Ć (CPMS→JS)			.2490	.0910	2.7377	.0071	.0689	.4292
Indirect effect "ab"			**.3106**	.0784			.1656	.4767
Kappa-squared			**.2564**	.0571			.1418	.3652
Competence								
P .a (CPMS→COM)	.0576	7.3336	.4779	.1765	2.7081	.0078	.1285	.8274
P. b (COM →JS)	.5298	67.0398	.3949	.0423	9.3385	.0000	.3111	.4786
P. Ć (CPMS→JS)			.3710	.0842	4.4051	.0000	.2042	.5377
Indirect effect "ab"			**.1887**	.0780			.0399	.3428
Kappa-squared			**.1630**	.0623			.0361	.2788
Self-determination								
P. a (CPMS→SED)	.0592	7.5495	.4980	.1812	2.7476	.0069	.1391	.8568
P. b (SED →JS)	.5544	74.0353	.3980	.0401	9.9301	.0000	.3187	.4774
P. Ć (CPMS→JS)			.3615	.0820	4.4058	.0000	.1990	.5239
Indirect effect "ab"			**.1982**	.0775			.0543	.3587
Kappa-squared			**.1727**	.0626			.0492	.2992
Impact								
P. a (CPMS→IMP)	.0920	12.1656	.4878	.1399	3.4879	.0007	.2109	.7647
P. b (Imp →JS)	.5606	75.9107	.5201	.0516	10.0828	.0000	.4180	.6222
P .Ć (CPMS→JS)			.3060	.0829	3.6894	.0003	.1418	.4702
Indirect effect "ab"			**.2537**	.0888			.0797	.4279
Kappa-squared			**.2193**	.0709			.0693	.3500

P. = Path; CPMS = Comprehensive Performance Measurement Systems; PE= Psychological Empowerment; JS= Job Satisfaction; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact.

Figure 6.7 The Role of RC on the Relationship between CPMS and JS

The Mediating Effect
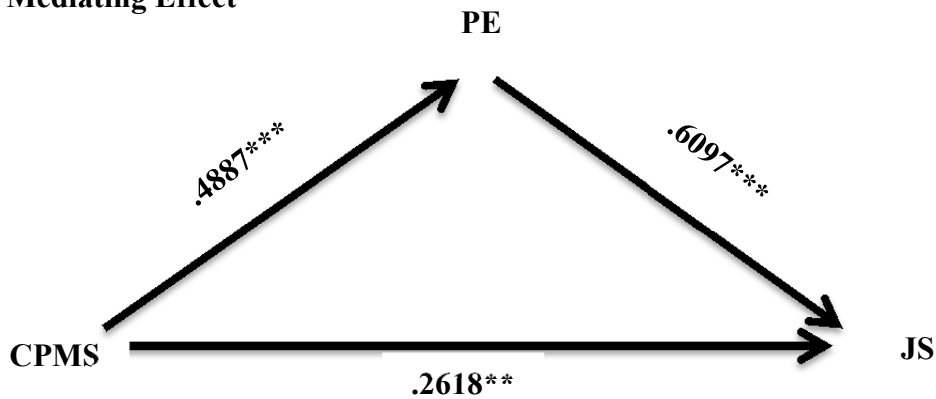
*** Significant at the level of .001
** Significant at the level of .01

The Total Effect

*** Significant at the level of .001

The above results suggest that the dimensions of PE, which are ME, COM, SED and IMP have mediating effects on the relationship between the comprehensive PMS and JS. However, the aggregated mediating effect of PE on the relationship between the comprehensive PMS and JS was driven by all four PE dimensions, but there were different effect sizes involved which mostly derived from ME with its large-effect size (K^2 = .2564, *CI* = .1418, .3652), followed by a medium-effect size for IMP (with K^2 = .2193,CI = .0693, .3500), next SED (with K^2 = .1727,CI = .0492, .2992) and finally from COM (with K^2 = .1630,CI = .0361, .2788).

Based on the above findings, the mediational conditions of PE and its four dimensions were all met. These were due to the results of indirect effects which were different from zero at $p < .05$. In this context, PE and its dimensions mediate the influence of the comprehensive PMS on the JS. Thus, the research hypothesis H4 is supported.

As far as this researcher knows, there is no research particularly based on the effect of the comprehensive PMS on the JS through PE. However, the current literature in general has limited empirical evidence on the mediating effect of PE in providing information and access to strategic information - JS relationship, but specifically for the mediating effect of PE on the comprehensive PMS - JS relationship, it is limited and piecemeal.

On the one hand, the results of this study agree with the emerging literature (e.g. Liden et al., 2000; Laschinger et al., 2001; Seibert et al., 2004; Fong & Snape, 2014) which have examined the mediating effect of PE on the relationship between providing information and access to strategic information and JS and confirmed this relationship. On the other hand, it was mentioned that access to strategic information was identified as an important antecedent of PE (Spreitzer, 1995a, 1995b, 1996). Moreover, according to prior studies (e.g. Spreitzer et al., 1997; Hechanova et al., 2006; Dickson & Lorenz, 2009; Hall & Smith, 2009; Casey et al., 2010) it was concluded that empowered individuals would have a higher level of motivation and JS. Furthermore, the findings of this study are consistent with the argument of Hall (2008) who stated that positive effects of the comprehensive PMS on PE are owing to the more complete and richer information about operations provided by the system; in addition, such a system is an important antecedent of PE.

In short, the results of the study indicate that the comprehensive PMS, through its effects on PE, improve individual outcomes. Thus, the findings are consistent with previous theoretical and empirical research, which accentuates the mediating roles of cognitive and motivational mechanisms in elucidating the relationship between management control systems and work outcomes (Ilgen et al., 1979; Chenhall & Brownell, 1988; Bonner & Sprinkle, 2002; Hall, 2008). This suggests that research investigating the individual performance effects of performance information (and management control systems in general) should involve, where theoretically justified, psychological variables that can assist to clarify the relationship between performance information and work outcomes. In particular, the results indicate that the comprehensive PMS affect the cognitive and motivational roles of managers, which in turn impact on managerial outcomes. This study contributes to previous research which examined the direct and indirect-effects of management control system components on work outcomes (Shields et al., 2000).

6.9.3 The Role of Role Clarity on the Relationship between the Comprehensive PMS and Managerial Performance

H5 Role Clarity has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

The results of investigating H5, shown in Table 6.11 and Figure 6.8, indicate that all paths relating to the mediating role of RC are statistically significant at the .001 level. Particularly, the indirect effect of the comprehensive PMS on MP through the RC (i.e. *ab*) does not include zero with a 95% confidence interval ranged from .1181 to .3894, with a point estimate of .2390 and a medium effect size with a point estimate of .2175 with a 95% confidence interval excluding zero ranged from .1096 to .3377. As are the paths from the comprehensive PMS to RC, (*a Path,* CPMS →RC; *B* = .5148, *t* = 5.4888, *P* = .0000, and 95% *CI* ranged from .2825 to .7471 and R^2 = 1383), which explain 13.83% of the variance in RC by the comprehensive PMS. For *b Path* (RC→ MP), which is also significant (with *B* = .4643, *t* = 7.5582, *P* = .0000, and 95% *CI* = .3427, .5860). The direct effect of the comprehensive PMS on MP while controlling for RC, *C` Path* (CPMS →MP) is statistically significant (as *B* = .2859, *t* = 3.3620, p = .0010, with 95% *CI* ranged from .1175 to .4543). Moreover*,* both paths (*b and C`*) have 50.6720 *of the F* value, as well as .4599 of the R^2 value. The R^2 explained about 46% of the variance in MP by RC while controlling for the effects of the comprehensive PMS and the direct effect of the comprehensive PMS while controlling for RC.

The results also mentioned that the total effect of the comprehensive PMS on MP is significant (CPMS→MP; B = .5249, R^2 = .2007, F value = 30.1273, t = 5.4888, P = .0000 and 95% CI ranged from .3356 to .7143), which indicates that about 20% of the variance in MP is explained by the comprehensive PMS.

In more detail, RC which consists of two dimensions (GC and PC), mediates the relationship between the comprehensive PMS and MP and a set of tests have been conducted in detail to determine the influence of these mediating dimensions on the effect of the comprehensive PMS on MP and to specify the strength of the effect size for each dimension on that relationship (CPMS→MP). As mentioned in Table 6.11, the bootstrapping indirect effect of the comprehensive PMS on the MP through the GC and PC dimensions, pointed out a bias corrected confidence interval excluding zero at the .05 level (ab = .2833 and .1647, as well as CI = .1650, .4272, .0559, .3052 respectively).

As are the paths: (i) from the comprehensive PMS to GC (path a; B = .5013, R^2 = .1793, F value = 26.2109, t value = 5.1197, p = .0000, CI = .3074, .6952), and PC (path a; B = .5283, R^2 = .0897, F value = 11.8204, t value = 3.4381, p = .0008, CI = .2241, .8325); (ii) from GC (path b; B = .5650, t value = 7.7369, p = .0000, CI = .4204, .7096), and PC (path b; B = .3118, t value = 6.3133, p = .0000, CI = .2140, .4095) to MP while controlling for the comprehensive PMS effect; and (iii) from the comprehensive PMS to MP with the presence, and controlling for the effects, of GC (path c`; B = .2417, t value = 2.7950, p = .0061, CI = .0705, .4129) and PC (path c`; B = .3602, t value = 4.1350, p = .0001, CI = .1877, .5327). Furthermore, both paths (b and C`) for the two dimensions have 52.3822 and 39.8701 of the F values, as well as .4682 and .4012 of the R^2 values respectively. The R^2 values explained about 47% and 40% of the variance in MP (by GC and PC) while controlling for the effects of the comprehensive PMS and the direct effect of the comprehensive PMS while controlling for GC and PC.

Table 6.11 Results of the Mediating Effect of RC on the Relationship between CPMS and MP

•product coefficient approach	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
RC								
P. a(CPMS→RC)	.1383	19.2593	.5148	.1173	5.4888	.000	.2825	.7471
P. b (RC→ MP)	.4599	50.6720	.4643	.0614	7.5582	.000	.3427	.5860
P.Ć (CPMS→MP)			.2859	.0850	3.3620	.001	.1175	.4543
P. c(CPMS→MP)	.2007	30.1273	.5249	.0956	5.4888	.000	.3356	.7143
Indirect effect "ab"			**.2390**	.0679			.1181	.3894
Kappa-squared			**.2175**	.0575			.1096	.3370
Goal clarity								
P. a(CPMS→GC)	.1793	26.2109	.5013	.0979	5.1197	.000	.3074	.6952
P. b (GC→MP)	.4682	52.3822	.5650	.0730	7.7369	.000	.4204	.7096
P.Ć(CPMS→MP)			.2417	.0865	2.7950	.006	.0705	.4129
Indirect effect			**.2833**	.0672			.1605	.4272
Kappa-squared			**.2531**	.0573			.1417	.3702
Process clarity								
P. a (CPMS→PC)	.0897	11.8204	.5283	.1537	3.4381	.000	.2241	.8325
P. b (PC→MP)	.4012	39.8701	.3118	.0494	6.3133	.000	.2140	.4095
P.Ć (CPMS→MP)			.3602	.0871	4.1350	.000	.1877	.5327
Indirect effect			**.1647**	.0617			.0559	.3052
Kappa-squared			**.1513**	.0534			.0507	.2634

P: Path; CPMS = comprehensive performance measurement systems; RC= Role Clarity; MP = managerial performance; GC = Goal Clarity; PC = Process Clarity.
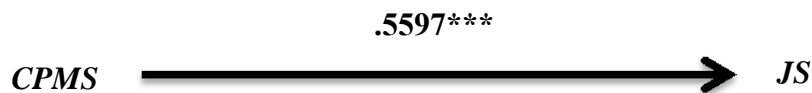
Figure 6.8 The Role of RC on the Relationship between CPMS and MP

The Mediating Effect
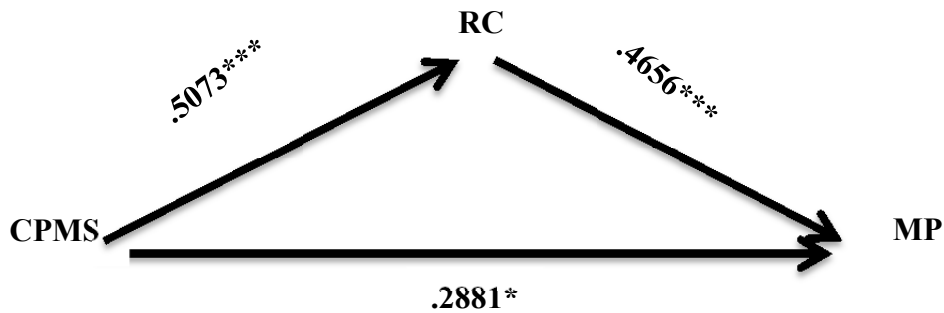
*** Significant at the level of .001
** Significant at the level of .01

The Total Effect
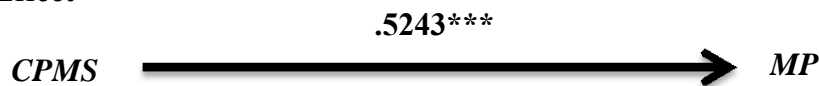
*** Significant at the level of .001

Moreover, the results provide that the RC and its dimensions, including GC and PC, have mediating effects on the relationship between the comprehensive PMS and MP. However, the aggregated mediating effect of RC on the mentioned relationship was driven by both of the two RC dimensions, but there were different effect sizes, which were mostly derived by GC with a large-effect size (K^2 = .2531, *CI* = .1417, .3702), followed by a medium-effect size by PC (with K^2 = .1513, CI = .0507, .2634).

Based on the above results, the conditions of the mediating role for RC and its dimensions are all met and this is due to the indirect effect results related to RC and its dimensions, which are different from zero at $p < .05$. In this regard, the RC mediates the influence of the comprehensive PMS on the MP. Thus, the research hypothesis H5 is accepted.

According to role ambiguity which is defined as "uncertainty about what an occupant of a particular office is supposed to do" (Katz & Kahn, 1978, p. 206), this means that increased information is required to overcome the uncertainty (Marginson et al., 2014). The findings suggested that RC is increased by using the comprehensive PMS, which is

an efficacious source of information to counteract role ambiguity (and therefore increase RC). The empirical findings of this study are consistent with the results of other studies (Burkert et al., 2011; Chung et al., 2012; Miao & Evans, 2012; Salmon, 2013) which have addressed the mediating effect role ambiguity (less clarity) has on the relationship between the management accounting system and performance, as well as being consistent with (Burney & Widener, 2007; Hall, 2008) which found that the comprehensive PMS has an influence on MP through RC. Moreover, the findings confirmed Hall's argument (2008), which indicated that positive effects are due to the more complete and richer operations and the strategic information which is provided by the comprehensive PMS. Such a system helped to clarify manager's job roles by increasing GC and PC and indicated that the system, through the directional function of feedback, could help in improving managers' understanding of the goals and objectives of their job roles and with the most appropriate behaviours to fulfil their job roles. This reinforces the view that the system can communicate organisational priorities and performance information between managers (Spreitzer, 1996). The findings point out that the comprehensive PMS directly and positively affects MP, whilst at the same time there is an indirect link between the comprehensive PMS and performance, via RC. That is, the availability of a useful comprehensive PMS reduces role ambiguity and increases RC, because managers have access to additional information which clarifies the effective role behaviours necessary for the job, which in turn favourably affects performance. The theoretical implication of the research findings was that the consideration of RC as a mediator, which is built as a more sophisticated model, this could better explain the relationship between the comprehensive PMS and MP, as shown in above results (i.e. 47% of the variance in MP). The empirical findings also provided practical implications that the benefits of the comprehensive PMS for improving MP appeared only when managers' RC could be increased.

Despite of the fact that the results of this study are consistent with the existing literature, they also extend the contributions of previous studies (e.g. Hall, 2008; Salmon, 2013) by providing the effect size measures, which are shown in this study as a medium effect size through RC as whole, a large effect size through GC and a medium effect size through PC, because no prior studies took into consideration to measure the indirect effect size in a quantitative way, as they only offered qualitative descriptions as full and partial mediation.

6.9.4 The Role of Psychological Empowerment on the Relationship between the Comprehensive PMS and Managerial Performance

H6 Psychological Empowerment has a Mediating Effect on the Relationship between the Comprehensive PMS and Managerial Performance.

The mediating regression test is used to analyse and determine the results related to H6, as shown in Table 6.12 and Figure 6.9 and to articulate that the indirect effect of the comprehensive PMS on MP through PE (i.e. *ab*) revealed a bias corrected confidence interval based on 5000 bootstrap samples excluding zero at 95% CI ranged from .0942 to .3565, with a point estimate of .2127, as is the path from the comprehensive PMS to PE (CPMS →PE): a path; B = .4887, 95% CI ranged from .2269 to .7504, and R^2 = .1022, which indicates that 10.22% of the variance in PE is explained by the comprehensive PMS, as well as the path from PE to MP while controlling for the comprehensive PMS (PE → MP), b path; B = .4353, 95% CI ranged from .3304 to .5402. Additionally, the direct effect of the comprehensive PMS on MP (CPMS → MP) c` path, while controlling for PE, is statistically significant at 95% CI ranged from .1519 to .4725, with a point estimate of .3122. The value of R^2 is .4901, implying that about 49% of the variance in JS can be explained by both PE, controlling for the effect of the comprehensive PMS (path b) and the comprehensive PMS while controlling for the effect of PE (path C`). Moreover, the results also illustrate that the estimated effect of PE as a mediator on the relationship between the comprehensive PMS and MP is classified as a medium effect size through PE (with K^2 = .1984, 95% CI = .0883, .3162). The results also demonstrated that the total relationship of the comprehensive PMS on MP (CPMS→ MP) path C, is statistically significant at the 95% CI ranged from .3356 to .7143, with a point estimate of .5249 and R^2 = .2012, which implies that the value of R^2 can explain 20.12% of the variance in MP by the comprehensive PMS.

Due to the mediating effect of PE which includes four dimensions (ME, COM, SED and IMP) on the relationship between the comprehensive PMS and MP, a set of tests were conducted in detail to show the contribution of every dimension in this relationship, besides identifying the variation in the strength of effect for each dimension on the relationship (CPMS → MP). As shown in Table 6.12, the bootstrapping estimation of the indirect effect confidence is conducted to test the relationship between the comprehensive PMS and the MP, through the ME, COM, SED and IMP dimensions.

Table 6.12 Results of the Mediating Effect of PE in the Relationship between CPMS and MP

• *product coefficient approach*	R^2	F	B	S.E	t	Sig.	LLCI	ULCI
PE								
P. a (CPMS→PE)	.1022	13.661	.4887	.1322	3.6961	.0003	.2269	.7504
P. b (PE→MP)	.4901	57.196	.4353	.0530	8.2193	.0000	.3304	.5402
P. Ć (CPMS→MP)		5	.3122	.0810	3.8569	.0002	.1519	.4725
P. c (CPMS→MP)	.2007	30.127	.5249	.0956	5.4888	.0000	.3356	.7143
Indirect effect "ab"			**.2127**	.0662			.0942	.3565
Kappa-squared			**.1984**	.0582			.0815	.3117
ME								
P. a (CPMS→ME)	.1511	21.360	.4888	.1058	4.6218	.0000	.2794	.6982
P. b (ME→MP)	.5122	62.482	.5646	.0648	8.7182	.0000	.4364	.6928
P. Ć (CPMS→MP)		5	.2490	.0814	3.0578	.0028	.0878	.4102
Indirect effect "ab"			**.2760**	.0674			.1547	.4191
Kappa-squared			**.2536**	.0575			.1447	.3673
Competence								
P. a (CPMS→COM)	.0576	7.3336	.4779	.1765	2.7081	.0078	.1285	.8274
P. b(COM→MP)	.4125	41.783	.2790	.0426	6.5510	.0000	.1947	.3633
P. Ć (CPMS→MP)		4	.3916	.0848	4.6173	.0000	.2237	.5595
Indirect effect "ab"			**.1333**	.0576			.0243	.2541
Kappa-squared			**.1245**	.0513			.0217	.2271
Self-determination								
P. a (CPMS→SED)	.0592	7.5495	.4980	.1812	2.7476	.0069	.1391	.8568
P. b (SED→MP)	.3609	33.601	.2363	.0433	5.4622	.0000	.1506	.3219
P. Ć (CPMS→MP)		1	.4073	.0885	4.6003	.0000	.2320	.5826
Indirect effect "ab"			**.1177**	.0505			.0320	.2360
Kappa-squared			**.1091**	.0447			.0384	.2058
Impact								
P. a (CPMS→IMP)	.0920	12.165	.4878	.1399	3.4879	.0007	.2109	.7647
P. b (IMP→MP)	.4634	51.378	.3920	.0514	7.6326	.0000	.2903	.4937
P. Ć (CPMS→MP)		9	.3337	.0826	4.0409	.0001	.1702	.4972
Indirect effect "ab"			**.1912**	.0678			.0715	.3382
Kappa-squared			**.1778**	.0601			.0649	.3020

P: Path; CPMS = comprehensive performance measurement systems; PE= psychological empowerment; MP = managerial performance; ME = meaning; COM = competence; SED = self-determination; IMP = Impact.

In respect to the ME dimension, it is indicated that there is a significant indirect effect of the comprehensive PMS on MP through this dimension, as a bias corrected confidence interval excluding zero at the 95% CI ranged from .1547 to .4191, with a point estimate of *ab* = .2760, and both paths of the dimension (a and b) are significant with a point estimate of .4888 which relates to path *a* and a point estimate of .5646 for path *b* and

both points are not including zero at the 95% CI ranged from .2794 to .6982 and ranged from .4364 to .6928 respectively. However, R^2 for path *a* pointed out that 15.11% of the variance in MP is explained by the comprehensive PMS, whereas 51.22% of the variance in MP is explained by PE while controlling for the comprehensive PMS and explained by the comprehensive PMS while controlling for PE. Moreover, the results show that there is a significant direct relationship between the comprehensive PMS and MP, as the 95% CI is not zero ranged from .0878 to .4102, with a point estimate of .2490.

According to results of the COM dimension, both paths (a and b) of this dimension have a significant effect, as the values of 95% CI are excluding zero ranged from .1285 to .8274 and ranged from .1947 to .3633, with points estimates of .4779 and .2790 respectively. The finding referring to R^2 (related to path a) is .0576, implying that 5.76% of the variance in COM is explained by the comprehensive PMS, while R^2 for path b and path c` (direct relationship) is .4125. This $R^2$ can explain 41.25% of the variance in MP by both COM (path b), while controlling for the effect of the comprehensive PMS and by the comprehensive PMS (path c`, direct relationship), while controlling for the effect of COM. In addition, a significant positive direct relationship (CPMS→MP) is found, as the values of 95% CI are not including zero ranged from .2237 to .5595, with a point estimate of .3916.

With regard to the SED dimension, its two paths (a and b) are also statistically significant owing to the fact that the values of 95% CI are excluding zero which are ranged from .1391 to .8568 for path a and ranged from .1506 to .3219 for path b, with points estimates of .4980 and .2363 respectively. The value of R^2 related to path a is .0592, whereas path b is .3609, which indicated that 5.92% of the variance in SED is explained by the comprehensive PMS, though about 36% of the variance in MP is explained by both SED, while controlling for the effect of the comprehensive PMS (path b) and by the comprehensive PMS, while controlling for the effect of SED (path c` direct relationship). The direct relationship (CPM→MP) is also significant as the values of 95% CI are excluding zero ranged from .2320 to .5826, with a point estimate of .4073.

According to the results of testing the IMP dimension, it is indicated that both paths (*a* and *b*) are significant with points estimates of .4878 and .3920 respectively, and 95% CI is not including zero, and ranged from .2109 to .7647 for the former, as well as 95% CI ranged from .2903 to .4937 for the latter. However, path a shows $R^2 = .0920$, which

implies that about 9% of the variance in Impact is explained by the comprehensive PMS, while the R^2 related to path b and path c` (direct relationship) is .4634, implying that the R^2 value explained 46.34% of the variance in MP by both Impact, while controlling for the effects of the comprehensive PMS and by the comprehensive PMS, while controlling for the effects of IMP. It is also mentioned that there is a significant direct relationship, as path Ć (CPM→MP) results illustrate that the values of 95% CI are excluding zero ranged from .1702 to .4972, with a point estimate of .3337.

As mentioned above, the results indicated that the dimensions of PE, which are ME, COM, SED and IMP have mediating effects on the relationship between the comprehensive PMS and MP. Despite the fact that the aggregated mediating effect of PE on the relationship between the comprehensive PMS and MP was obtained by all four PE dimensions, with the large-effect size only gained from the ME (with K^2 = .2536, 95% CI is excluding zero ranged from .1447 to .3673), trailed by the IMP with a medium-effect size (K^2 = .1778, 95% CI ranged from .0649 to .3020), followed by the COM (with K^2 = .1245, 95% CI ranged from .0217 to .2271) and finally from the SED (with K^2 = .1091, 95% CI ranged from .0384 to .2058).

Figure 6.9 The Role of RC on the Relationship between comprehensive PMS and MP

The Mediating Effect
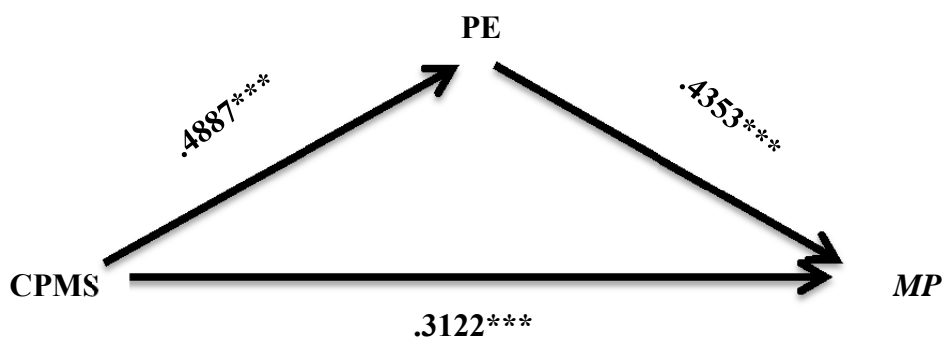
*** Significant at the level of .001

The Total Effect
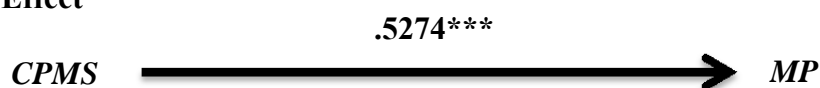
*** Significant at the level of .001

Based on the results mentioned above, the mediational conditions of the PE and its dimensions are all met, and these are owing to the indirect effect result excluding zero at the $p < .05$. In this respect, the PE and its dimensions have mediated the influence of the comprehensive PMS on the MP. Therefore, the research hypothesis H6 is supported.

These results propose that the comprehensive PMS can serve an important function which increases intrinsic task motivation by raising all four dimensions of PE (ME, COM, SED and IMP). This shows that such a system, through the motivational function of feedback, can help improve the intrinsic task motivation of managers. As pointed out in some previous studies (e.g. Spreitzer, 1995a; Spreitzer, 1995b, 1996) access to and providing strategic information are important antecedents of PE. On the one hand, the results of this study confirmed the argument of these previous studies that the comprehensive PMS as an essential resource of information is antecedent to and has played a positive psychological role on, the work experiences of managers. On the other hand, the findings are consistent with several other studies (e.g. Seibert et al., 2004; Hechanova et al., 2006; Meyerson & Kline, 2008; Gregory et al., 2010; Seibert et al., 2011; Tutar et al., 2011; Chiang & Hsieh, 2012) which have asserted that PE has a significant positive effect on performance. The results also point out that the comprehensive PMS as part of a management control system is an important antecedent for the dimensions of PE and is directly, as well as indirectly, associated with MP. Moreover, the findings confirmed the results of Hall (2008) who found that PE has a mediating effect on the relationship between the comprehensive PMS and MP.

In short, the results of the study pointed out that MP is improved by the comprehensive PMS through its effects on PE. Thus, these results confirmed prior theoretical and empirical research, which asserts the mediating roles of cognitive and motivational mechanisms in demonstrating the relationship between management control systems and work performance (Ilgen et al., 1979; Chenhall & Brownell, 1988; Bonner & Sprinkle, 2002). This suggests that research examining the managers' performance and effects of performance information (and management control systems in general), should include, where theoretically justified, psychological variables that can help to explain the relationship between performance information and work performance.

6.9.5 The Role of Mental Model Confirmation on the Relationship between the Comprehensive PMS and Managerial Performance

H9 Mental Model Confirmation has a Mediating Effect on the Relationship between the comprehensive PMS and Managerial Performance.

The results of testing hypothesis H9, as shown in Table 6.13 and Figure 6.10, point out that the indirect effect related to the influence of the comprehensive PMS on the MP through the MMC (i.e. *ab*) revealed that a bias corrected confidence interval excluding zero, at the 95% confidence interval ranged from .1129 to .3695, with a point estimate of .2282, as is the path from the comprehensive PMS to MMC (CPMS →MMC), a path; B = .3558, 95% CI excluding zero ranged from .1696 to .5420 and R^2 = .1066, which implies that 10.66% of the variance in MMC is explained by the comprehensive PMS, and the path from MMC to MP while controlling for the comprehensive PMS (MMC → MP), b path is significant with a point estimate of .6414, as 95% CI excluding zero ranged from .4981 to .7847.

Table 6.13 Results of the Mediating Effect of MMC on the Relationship between CPMS and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a (CPMS→MMC)	.1066	14.3193	.3558	.0940	3.784	.0002	.1696	.5420
P. b (MMC→MP)	.5185	64.0816	.6414	.0724	8.863	.0000	.4981	.7847
P. Ć (CPMS→MP)			.2967	.0789	3.762	.0003	.1406	.4529
P. c (CPMS→MP)	.2007	30.1273	.5249	.0956	5.488	.0000	.3356	.7143
Indirect effect "ab"			**.2282**	.0657			.1142	.3747
Kappa-squared			**.2144**	.0566			.1044	.3258

P. = Path; CPMS = Comprehensive Performance Measurement Systems; MMC = Mental Model Confirmation; MP = Managerial Performance.

Figure 6.10 The Role of MMC on the Relationship between comprehensive PMS and MP

The Mediating Effect

.3558***   .6414***

CPMS   .2967***   MP

*** Significant at the level of .001

The Total Effect

.5249***
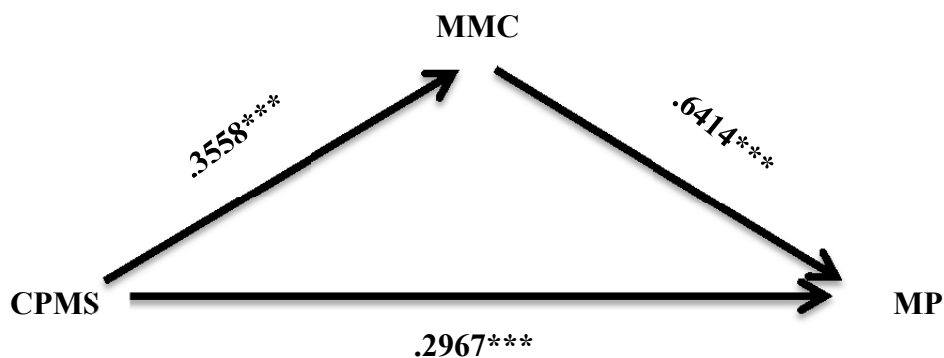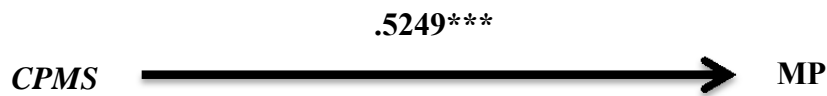
CPMS ——————————————————▶ **MP**

*** Significant at the level of .001

In addition, the direct effect of the comprehensive PMS is statistically significant on the MP, while controlling for MMC (CPMS → MP), c` path, at the 95% CI excluding zero ranged from .1406 to .4529, with a point estimate of .2967. The value of the R^2 is .5185 which is shared to explain about 52 % of the variance in MP by both MMC, while controlling for the comprehensive PMS and by the comprehensive PMS, while controlling for MMC. Furthermore, there is a statistically significant total relationship between the comprehensive PMS and MP (CPM→MP, c path) at the 95% CI excluding zero ranged from .3356 to .7143, with a point estimate of .5249 and R^2 = .2007, which indicates that about 20% of the variance in MP is explained by the comprehensive PMS.

Moreover, the results also demonstrated that the estimated effect of MMC as a mediating role on the relationship between the comprehensive PMS and MP was classified as a medium-sized indirect effect of MMC (κ2 = .2144, 95% CI ranged from .1044 to .3258).

This hypothesis investigated the relationship between the comprehensive PMS, MMC and MP. The results demonstrate that engaging managers in learning processes related to MMC could be supported by a more comprehensive PMS. The findings pointed out that a more comprehensive PMS, which more effectively describes the operations of the business, offered managers the required information and the necessary feedback to verify and confirm their mental models of business operations. This result is consistent with the argument of previous studies (e.g. Vandenbosch & Higgins, 1996) which indicated that more information is a strong predictor of MMC, which in turn affects individual performance. Results related to MMC and MP indicates that the MMC has a strong positive influence on MP. This is consistent with the benefits that flow from increased MMC (March, 1991; Vandenbosch & Higgins, 1995; Hall, 2011).

6.9.6 The Role of Mental Model Building on the Relationship between the Comprehensive PMS and Managerial Performance

H10 Mental Model Building has a Mediating Effect on the Relationship between the comprehensive PMS and the MP.

The results related to test hypothesis H10, as shown in Table 6.14 and Figure 6.11, illustrate that the indirect effect of the comprehensive PMS on MP through the MMB (i.e. *ab*) is different from zero with the 95% confidence interval ranged from .1326 to .3787, with a point estimate of .2398. As is the path from the comprehensive PMS to MMB (CPMS →MMB, a path that is significant due to the fact that at the 95% confidence interval excluding zero, 95% CI ranged from .3385 to .8317, with a point estimate of .5851 and R^2 = .1554, which indicate that 15.54% of the variance in MMB is explained by the comprehensive PMS and the path from MMB to MP (MMB →MP, b path), while controlling for the comprehensive PMS, is also significant, as the 95% confidence intervals not including zero, which ranged from .2919 to .5277, with a point estimate of .4098.

Moreover, the direct effect between the comprehensive PMS and the MP, while controlling for the MMB (CPM→MP, c` path) is statistically significant as the 95% confidence intervals not including zero, ranged from .1102 to .4602, with a point estimate of .2852 and R^2 = .4283, which explained about 43% of the variance in MP by MMB, while controlling for the comprehensive PMS and by the comprehensive PMS, while controlling for MMB. The results also clarify that the estimated effect of MMB as a mediator on the relationship between the comprehensive PMS and the MP classified as a medium effect size (as K^2 = .2145, 95% CI ranged from .1197 to .3282). The total effect of the comprehensive PMS on MP (CPMS →MP, c path) is statistically significant at the 95% CI ranged from .3356 to .7143, with a point estimate of .5249 and R^2 = .2007, which points out that about 20% of the variance in MP is explained by the comprehensive PMS, as mentioned in the previous section.

Table 6.14 Results of the Mediating Effect of MMB on the Relationship between CPMS and MP

• *product coefficient approach*	R²	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a(CPMS→MMB)	.1554	22.0748	.5851	.1245	4.698	.0000	.3385	.8317
P. b (MMB→MP)	.4283	44.5718	.4098	.0595	6.882	.0000	.2919	.5277
P. Ć (CPM→MP)			.2852	.0884	3.226	.0016	.1102	.4602
P. c (CPM→MP)	.2007	30.1273	.5249	.0956	5.488	.0000	.3356	.7143
Indirect effect "ab"			**.2398**	.0625			.1326	.3787
Kappa-squared			**.2145**	.0531			.1175	.3271

P: Path; CPMS = Comprehensive Performance Measurement Systems; MMC = Mental Model Confirmation; MP = Managerial Performance.

Figure 6.11 The Role of MMB on the Relationship between Comprehensive PMS and MP
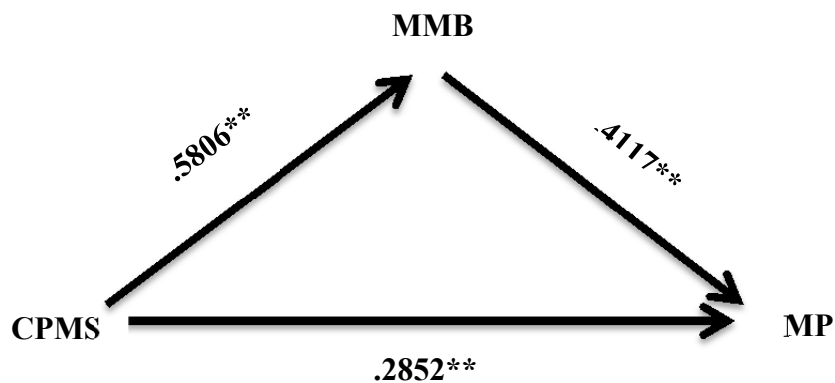
The Mediating Effect

*** Significant at the level of .001
** Significant at the level of .01

The Total Effect

*** Significant at the level of .001

The findings related to the mediating role of MMB point out that a more comprehensive PMS can help to update the mental model of managers, which in turn reflects in enhancing their MP. The finding assist in promoting our understanding of the tension between those who argue that the comprehensive PMS as formal systems hinder innovation and new ways of thinking (e.g. Hedberg & Jönsson, 1978; Preston, 1986; Staw & Boettger, 1990; Hall, 2011) and those who argue that the system can generate double-loop learning (Kaplan & Norton, 1996a). This result confirmed the argument of

prior studies (e.g. Vandenbosch & Higgins, 1996), which pointed out that a more amount of information has a strong positive impact on MMB, which in turn affects individual performance. Results related to MMB and MP demonstrated that this MMB strongly and positively impacts MP. This is consistent with the benefits that flow from increased MMB, such as greater flexibility, innovation and creativity (March, 1991; Vandenbosch & Higgins, 1995).

It is difficult to form a direct comparison with studies in the literature review as in this thesis a mediation model is being used and other studies for example Hall (2011) has used and tested a moderation model. However, partial comparisons are easier to make as some of the criteria used in the results are the same. In this regard, Hall's results showed that both confirming and building mental models of managers have positive relationships with managerial performance and also a more comprehensive PMS has positive effect on mental model confirmation of managers. The results in this thesis concur with those findings. However, the relationship between comprehensive PMS and managers' mental model building was positively significant only when managers have a short organizational tenure and/or the size of strategic business unit is small.

6.10 Summary and Conclusion

In summary, this chapter has presented the findings from testing the direct and indirect relationships between the comprehensive PMS and its outcomes, such as JS and MP. The results of the study pointed out that the comprehensive PMS, through its effects on RC and PE, improves JS simultaneously. Moreover, apart from RC, all other intervening variables (PE, MMC and MMB) have mediating effects on the relationship between the comprehensive PMS and MP simultaneously.

 However, testing the mediating effects for all the intervening variables (RC, PE, MMC and MMB) individually revealed that they have a mediating effect on the relationships between the comprehensive PMS and both JS and MP. The results indicated that the relationship between the comprehensive PMS and JS are mediated by RC (with a large effect size) and its dimensions GC (with a large effect size) and PC (with a medium effect size). However, when they have a mediating effect on the relationship between the comprehensive PMS and MP, RC and PC, it has showed a medium effect size, but GC has a large effect size. The findings related to PE and its dimensions (ME, COM,

SED and IMP) as mediators between the comprehensive PMS and JS, show that PE and the IMP dimension have large effect sizes, but the other dimensions; ME, COM and SED have medium effect sizes. Despite its mediating effects on the relationship between the comprehensive PMS and MP, apart from the ME dimension with a large effect size, the PE and its other dimensions have medium effect sizes. In the context of individual learning, both the dimensions MMC and MMB have mediating effects on the relationship between the comprehensive PMS and the MP, with medium effect sizes.

Based on these results therefore, the findings confirm earlier theoretical and empirical research, which highlights the mediating roles of cognitive and motivational mechanisms in clarifying the relationships between the comprehensive PMS and MP, as well as JS (Ilgen et al., 1979; Collins, 1982; Chenhall & Brownell, 1988; Luckett & Eggleton, 1991; Burney & Widener, 2007; Hall, 2008, 2011; Carbonell & Rodriguez-Escudero, 2013).

Chapter 7 Financial and Non-financial Performance Measures and Rewards in Relation to their Outcomes through Cognitive and Motivational Factors

7.1 Introduction

This part of the study concentrates on the process by which using financial and non-financial performance measures and rewards (FPMR and NFPMR) as performance evaluation criteria affect managers' behaviours, including roles, empowerment, learning, satisfaction and performance. It also attempts to evaluate the comparison of FPMR with NFPMR in their relations to individual outcomes directly and indirectly through the cognitive and motivational variables.

More specifically, this chapter is concerned with the second group which involves several hypotheses that are looking for the differences in the strength of total, direct and indirect impacts between FPMR and NFPMR on the individual outcomes of job satisfaction (JS) and managerial performance (MP) through cognitive and motivational variables. For comparing the relative strength of the various relationships, unstandardized path coefficients are used. This group of hypotheses is related to research objective five, which is:

- To examine the differences between FPMR and NFPMR used, in direct relationship to the individual outcomes and indirectly through the cognitive and motivational variables in SBUs at manufacturing companies in Libya.

7.2 Data Analysis Related to Different Influences of FPMR and NFPMR on the Individual Outcomes

The aim of this section is to test the different effects of FPMR and NFPMR in their relations to JS and MP. It consists of two sub-sections which present the results of simple regression tests related to testing H11 and H12.

7.2.1 The Difference of the FPMR and NFPMR' Effects on Job Satisfaction

H11 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Job Satisfaction.

The simple regression results provided in Table 7.1 show that there are statistically significant influences of both FPMR and NFPMR on JS (with B = .4114, p =.0000, t-values = 5.2567 and B = .4821, p =.0000, t-values = 5.6534 respectively). Moreover, FPMR have explained 18.71% of the variance in JS while NFPMR have explained 21.03% of the variance in the same dependent variable (JS), as R^2 indicates .1871 and .2103 respectively. Although both systems have significant influences on JS, NFPMR has 17% more impact on overall JS than that of the financial ones. The coefficients showed that there were slight differences between FPMR and NFPMR in their power of total effects (see Table 7.1). Therefore, hypothesis H11 is supported.

Table 7.1 The Effects of FPMR and NFPMR on JS

Variable	H	R^2	F	B	S.E	Beta	t	Sig.
FPMR→JS	H11	.1872	27.6326	**.4114**	.0783	.4326	5.2567	.0000
NFPMR→JS		.2103	31.9609	**.4822**	.0853	.4586	5.6534	.0000

FPMR = Financial Performance Measures and Rewards; NFPMR = Non-Financial Performance Measures and Rewards; JS = Job Satisfaction

These findings are consistent with those of previous studies which reported differences between FPMR and NFPMR in relation to their effects on JS (e.g. Lau & Sholihin, 2005; Tan & Lau, 2012). For example, Tan and Lau (2012) found that the results for the FPMR are similar to those of the NFPMR, but with a stronger impact of the latter on JS. It is also mentioned that individuals are sensitive to their performance evaluations comprising the type of the performance measures, such as using financial or non-financial measures (Kaplan, 1984; Lipe & Salterio, 2000; Banker et al., 2004; Libby, Salterio, & Webb, 2004). Anthony and Govindarajan (1995) argued that the criteria used in the evaluation process are likely to have a significant effect on individuals' attitudes towards their jobs. However, the results contradict Hopwood's (1972) argument that financial measures emphasising short-term performance would have negative effects on employees' job-related tension and job satisfaction, because of the incomplete nature of financial measures. Moreover, he argued that when individuals are evaluated on dimensions they consider unimportant, they are likely to be dissatisfied with their job due to the fact that they are likely to experience conflict, tension and anxiety. Nonetheless, companies in this study use multiple financial and non-financial measures which improve the job satisfaction of SBU managers when they are evaluated. Furthermore, the results are consistent with Lau and Sholihin (2005) who suggest that

non-financial measures for evaluating individuals' performances have a significant effect on their job satisfaction.

7.2.2 Data Analysis Related to the Influence Power of FPMR and NFPMR on MP

H12 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Managerial Performance.

The results of the simple regression tests are presented in Table 7.2, which indicated that the effects of FPMR and NFPMR were significantly positive on MP. The path coefficient for the relationship between FPMR and MP is only .2581, while the path coefficient for the effect of NFPMR on MP is .3265, which is 27 % more than that of NFPMR. Moreover, R^2 indicates about 9% of the variance in MP is explained by FPMR, whereas 11.88% of the variance in MP is explained by NFPMR. Hypothesis H12 is therefore supported.

Table 7.2 The Effects of FPMR and NFPMR on MP

Variable	H	R^2	F	B	S.E	Beta	t	Sig.
FPMR→MP	H12	.0907	11.9750	**.2581**	.0746	.3012	3.4605	.0007
NFPMR→MP		.1188	16.1710	**.3265**	.0812	**.3446**	4.0213	.0001

FPMR = Financial Performance Measures and Rewards; NFPMR = Non-Financial Performance Measures and Rewards; MP = Managerial Performance

The above results are consistent with the findings of Lau (2011) who indicated that non-financial performance measurement systems used by an organisation to evaluate its managers' performance have more impact on managerial performance than that of financial performance measurement systems. However, the results contradict Hopwood's (1972) argument on one part that financial measures emphasise short-term performance and have a negative impact on managerial performance, which required long-term considerations. Nevertheless, in this study, firms have used both types of systems to evaluate their managers and found that both measures have a positive effect on managerial performance and that NFPMR has more effect on managers' performances than that of FPMR. This is consistent with the other part of his argument that managerial performance required long-term considerations based on multiple non-financial measures, which are likely to improve managerial performance as he stated.

7.3 Influence of Financial and Non-Financial Performance Measures and Rewards on Job Satisfaction and Managerial Performance through Role Clarity

The aim of this section is to test the differences between the influence power of FPMR and NFPMR on job satisfaction (JS) and managerial performance (MP) through role clarity (RC). The section consists of sub-section, presenting the results of mediational regression tests related to testing H13 and H14 which are directed toward the fifth research aim.

7.3.1 The Difference of the FPMR and NFPMR Effects on JS through the RC

H13 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through Role Clarity.

Despite the fact that the results shown in Tables 7.3 and 7.4 that there are statistically significant influences of both FPMR and NFPMR on RC as bootstrap samples not including zero at the 95% CI ranged from .2325 to .5686, with a point estimate of .4005 and bootstrap samples also excluding zero at the 95% CI ranged from .3259 to .6867, with a point estimate of .5063 respectively, it is mentioned that NFPMR has about 26% more impact on overall RC than that of FPMR. By comparing the direct effects of both systems (FPMR and NFPMR), the results indicate that these systems have positive significant effects on JS, as bootstrap samples not including zero at the 95% CI ranged from .0279 to .2632, with a point estimate of .1456 and bootstrap samples also excluding zero at the 95% CI ranged from .0129 to .2821, with a point estimate of .1475, respectively.

In view of the indirect influence, both systems (FPMR and NFPMR) have significant positive relationships with JS through RC, as bootstrap samples excluding zero at the 95% CI ranged from .1472 to .4077, with a point estimate of .2659 for FPMR on JS through RC, as well as bootstrap samples excluding zero at the 95% CI ranged from .1993 to .4947, with a point estimate of .3347 for NFPMR on JS through RC. However, both systems have large effect sizes on JS through RC, but NFPMR has a larger effect size that that of FPMR, as pointed out by K^2, which indicates that K^2 related to FPMR is significant, due to the fact that bootstrap samples excluding zero at the 95% CI ranged from .1793 to .4393, with a point estimate of .3129, whereas K^2 for NFPMR is larger

and also significant, due to the fact that bootstrap samples excluding zero at the 95% CI ranged from .2150 to .4704, with a point estimate of .3465.

More specifically, when more detailed tests were conducted about the effects of both FPMR and NFPMR on both components of RC (GC and PC), the result indicated that both systems have significant effects on both of the dimensions of RC. For GC (FPMR on GC), bootstrap samples excluding zero at 95% CI ranged from .1681 to .4598, with a point estimate of .3139, and for NFPMR on GC, the bootstrap samples also excluding zero at 95% CI ranged from .2379 to .5530, with a point estimate of .3955, with the values of R^2 as .1315 and .1707, indicating that 13.15% of the variance in GC is explained by FPMR, whereas about 17% of the variance in GC is explained by NFPMR.

For the result related to PC, the effects of both FPMR and NFPMR on PC are significant, as bootstrap samples for FPMR on PC excluding zero at the 95% CI ranged from .2712 to .7030, with a point estimate of .4871, as well as bootstrap samples for NFPMR on PC not including zero at the 95% CI ranged from .3847 to .8495, with a point estimate of .6171. However, NFPMR has a greater influence on both GC and PC than that of FPMR. On the one hand, the results illustrated that NFPMR have 26 % and 27 % more effect on both GC and PC respectively than that of FPMR. On the other hand, it was revealed that both FPMR and NFPMR have more influence on PC than that of GC, with more impact from NFPMR on PC in their direct relationship.

The results also mentioned that both systems (FPMR and NFPMR) have positive direct effects on JS, while controlling for both dimensions of RC (GC and PC), as bootstrap samples for FPMR on JS, while controlling for GC excluding zero at the 95% CI ranged from .0679 to .3219, with a point estimate of .4871, bootstrap samples for FPMR on JS, while controlling for PC not including zero at the 95% CI ranged from .0501 to .2960, with a point estimate of .1731. Whilst bootstrap samples for NFPMR on JS, while controlling for GC are different from zero at the 95% CI ranged from .0695 to .3577, with a point estimate of .2136, and likewise, bootstrap samples for NFPMR on JS, while controlling for PC excluding zero at the 95% CI ranged from .0431 to .3235, with a point estimate of .1833. Although both measures have a significant direct impact on JS, while controlling for the previous mentioned dimensions, NFPMR have a greater impact

than that of FPMR through GC, likewise, NFPMR have more impact through PC compared to FPMR.

Regarding the indirect effects of both systems (FPMR and NFPMR) on JS through both components of RC (GC and PC), the results indicated that both systems have significant positive indirect effects on JS through both GC and PC. To illustrate this, the significant effects due to the fact that at the 95% confidence interval based on 5000 bootstrap samples (related to the four pairs paths between both systems and both dimensions of RC) are different from zero, which including for FPMR on JS through GC, is significant at the 95% CI ranged from .1037 to .3478, with a point estimate of .2165, whilst for NFPMR on JS through GC is significant at the 95% CI ranged from .1475 to .4119, with a point estimate of .2686. In addition, FPMR on JS through PC is significant at the 95% CI ranged from .1320 to .3720, with a point estimate of .2384, and NFPMR on JS through PC is significant at the 95% CI ranged from .1750 to .4463, with a point estimate of .2989.

Nevertheless, all the indirect effects of both systems on JS through both dimensions (GC and PC) are significant with large effect sizes, except the effect of FPMR on JS through GC, indicating a medium effect size. The results point out that NFPMR have more indirect effect on JS through GC than that of FPMR, as K^2 related to the indirect effect of FPMR is .2489 at the 95% IC ranged from .1254 to .3650, while K^2 related to the indirect effect of NFPMR is .2742 at the 95% IC ranged from .1487 to .3962. Moreover, the findings revealed that NFPMR have more indirect impact on JS through PC than that of FPMR, as K^2 related to the indirect effect of FPMR is .2766 at the 95% IC ranged from .1563 to .4001, whereas K^2 related to the indirect effect of NFPMR is .3066 at the 95% IC is ranged from .1875 to .4184. However, both systems have more effect on JS through PC than that of GC.

In short, given the significant effects of all paths and the significant products of coefficients for *ab*s related to overall RC, and for both GC and PC dimensions, all of RC and its two dimensions (GC and PC) are found to play mediating roles on the relationship between both FPMR and NFPMR and JS ,with more effect of NFPMR on JS through GC and PC than that of FPMR, as well as more effect of NFPMR through PC than that through GC. The results also demonstrate that the effect sizes of both FPMR and NFPMR on JS through overall RC, are large, but individually, they indicate

that NFPMR have a large effect size on JS through GC, whereas they demonstrate a medium effect size for the relationship between FPMR and JS through GC. Additionally, the effect sizes of both systems on JS through PC are large. However, the effect size of NFPMR is larger than that of FPMR. Therefore, there are different effects between FPMR and NFPMR in relation to JS through RC and its dimensions, which lead to acceptance of hypothesis H13.

Table 7.3 Results of the Mediating Effect of RC on the Relationship between FPMR and JS

• *product coefficient approach*	R^2	*F*	*B*	*S.E*	*t*	*Sig.*	*LLCI*	*ULCI*
Role clarity								
P. a (FPMR →RC)	.1566	22.2746	.4005	.0849	4.7196	.000	.2325	.5686
P. b (RC→JS)	.6082	92.3693	.6638	.0587	11.308	.000	.5475	.7800
P. Ć (FPMR →JS)			.1456	.0594	2.4500	.015	.0279	.2632
P. c (FPMR →JS)	.1872	27.6326	.4114	.0783	5.2567	.000	.2565	.5664
Indirect effect "ab"			**.2659**	.0660			.1472	.4077
Kappa-squared			**.3129**	.0660			.1793	.4393
Goal clarity								
P. a (FPMR →GC)	.1315	18.1670	.3139	.0737	4.2623	.000	.1681	.4598
P. b (GC→JS)	.5296	66.9937	.6897	.0741	9.3078	.000	.5430	.8364
P. Ć (FPMR →JS)			.1949	.0642	3.0378	.002	.0679	.3219
Indirect effect "ab"			**.2165**	.0618			.1044	.3442
Kappa-squared			**.2489**	.0617			.1254	.3650
Process clarity								
P. a (FPMR →PC)	.1426	19.9535	.4871	.1090	4.4669	.000	.2712	.7030
P. b (PC→JS)	.5650	77.2863	.4893	.0481	10.167	.000	.3940	.5847
P. Ć (FPMR →JS)			.1731	.0621	2.7871	.006	.0501	.2960
Indirect effect "ab"			**.2384**	.0612			.1323	.3729
Kappa-squared			**.2766**	.0616			.1563	.4001

P= Path; FPMR = Financial Performance Measures and Rewards; RC= Role Clarity; JS= Job Satisfaction; GC = Goal Clarity; PC = Process Clarity

Table 7.4 Results of the Mediating Effect of RC on the Relationship between NFPMR and JS

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
Role clarity								
P. a (NFPMR →RC)	.2047	30.8770	.5063	.0911	5.5567	.0000	.3259	.6867
P. b (RC→JS)	.6041	90.7936	.6610	.0608	10.879	.0000	.5407	.7814
P. Ć (NFPMR →JS)			.1475	.0680	2.1692	.0321	.0129	.2821
P. c (NFPMR →JS)	.2103	31.9609	.4822	.0853	5.6534	.0000	.3133	.6510
Indirect effect "ab"			**.3347**	.0747			.1993	.4947
Kappa-squared			**.3465**	.0645			.2150	.4704
Goal clarity								
P. a (NFPMR→GC)	.1707	24.7017	.3955	.0796	4.9701	.0000	.2379	.5530
P. b (GC→JS)	.5274	66.3902	.6791	.0760	8.9345	.0000	.5286	.8297
P. Ć (NFPMR →JS)			.2136	.0728	2.9354	.0040	.0695	.3577
Indirect effect "ab"			**.2686**	.0706			.1431	.4233
Kappa-squared			**.2742**	.0630			.1487	.3962
Process clarity								
P. a (NFPMR →PC)	.1872	27.6345	.6171	.1174	5.2569	.0000	.3847	.8495
P. b (PC→JS)	.5613	76.1328	.4844	.0496	9.7577	.0000	.3861	.5827
P. Ć (NFPMR →JS)			.1833	.0708	2.5882	.0108	.0431	.3235
Indirect effect "ab"			**.2989**	.0689			.1754	.4457
Kappa-squared			**.3066**	.0597			.1875	.4184

P= Path; NFPMR = Non-financial Performance Measures and Rewards; RC= Role Clarity; JS= Job Satisfaction; GC = Goal Clarity; PC = Process Clarity

It is difficult to form a direct comparison with studies in the literature review as in this thesis a new model is being used for the first time. However, partial comparisons are easier to make as some of the criteria used in the results are the same. The findings above are consistent with the argument that non-financial measures are commonly less closely linked to the annual financial reporting cycle than that of financial measures (Lau, 2011). Therefore, their time horizon may involve less pressure and fewer constraints from accounting standards and regulation. With fewer restrictions to the time condition for reporting, both short-run and long-run measures are possible to be developed to suit the situations. Moreover, if there are fewer restrictions for requirements on objectivity and monetary outcomes, a variety of measures are possible to be widely used. In addition, the characteristic of non-financial performance measures is using nonmonetary expressions, which allows them to have a stronger influence on managers' RC than that of financial measures, in many ways. One of these ways is that these measures are free from the constraint of a monetary expression which can be

expressed in different ways (e.g. customer perspective, customer satisfaction rate, customer retention rates, number of customer complaints etc.). The existence of a diversity of measurements can provide the possibility of a much broader evaluation of the performance of managers and which are not provided by financial metrics. Therefore, it is easier, more complete, more accurate and more relevant to individuals to use non-financial measures for their performance evaluations (Lau, 2011).

The results of this study have important theoretical and practical implications. These findings highlight the importance of clarifying the roles of managers in the workplace, especially with regard to NFPMR of managers. Companies should ensure that their PMSs are designed to provide individuals with information about their goals and objectives so as to enhance favourable individuals' behaviours. Individual performance evaluations affect the intrinsic values of the individuals, such as their self-esteem and self-confidence (Kaplan & Atkinson, 1998; Lau & Moser, 2008).

These findings agreed with those of previous studies which reported that the behavioural effects of non-financial measures are different from those of financial measures (e.g. Lau & Sholihin, 2005; Lau, 2011). For instance, Lau (2011) found that non-financial measures have a stronger influence on RC than financial measures, due to the fact that both categories of measures have considerably different characteristics. These characteristics have different effects on individuals' RC.

7.3.2 The Difference of the FPMR and NFPMR Effects on Managerial Performance through Role Clarity

H14 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Role Clarity

The results of the statistical test related to H14 (see Tables 7.5 and 7.6) indicated that there are statistically significant direct influences of both FPMR and NFPMR on RC, as mentioned above in section 7.4.1. For the indirect effects of both FPMR and NFPMR on MP through RC (i.e. *ab*s), it is mentioned that these indirect effects are also statistically significant as a result of excluding zero in the confidence interval based on 5000 bootstrap samples (95% CI ranged from .1075 to .3188), with a point estimate of .2091 and (95% CI ranged from .1433 to .3997) with a point estimate of .2604 respectively. Nevertheless, both systems have significant indirect effects with large effect sizes on MP through RC. However, NFPMR has larger effect sizes than that of FPMR, indicated

when NFPMR has $K^2 = .2772$ at the 95% CI ranged from .1546 to .4006, compared to FPMR which has $K^2 = .2538$ at the 95% CI ranged from .1381 to .3673.

As a more detailed test was carried out for the direct relationship between both FPMR and NFPMR on both components of RC (GC and PC), the result indicated that both systems have significant effects on both GC and PC, but NFPMR have a greater influence on both GC and PC than that of FPMR, with more impact on PC than that of GC, as mentioned in the section above (see 7.4.1).

In the context of the indirect effects, more detailed tests were carried out to examine the relationships between both systems (FPMR and NFPMR) and MP through both components of RC (GC and PC). The findings demonstrated that both systems (FPMR and NFPMR) have significant positive indirect effects on MP through GC and PC. However, apart from the effect of NFPMR on MP through GC, which indicated a large effect size, all the other relationships appeared to be medium effect size.

To clarify this, the indirect effects (*ab*s) of both FPMR and NFPMR on MP through both dimensions of RC (GC, and PC) are all significant, as the 95% confidence interval based on 5000 bootstrap samples is different from zero. The results mentioned that the effect of FPMR on MP through GC is significantly positive, with a point estimate of .1964, as the 95% CI ranged from .0929 to .3037. Likewise, the effect of NFPMR on MP through GC is also significantly positive, with a point estimate of .2435, CI ranged from .1292 to .3786. Similarly, the effect of FPMR on MP through PC is significantly positive with a point estimate of .1689, as the 95% CI ranged from .0854 to .2730, as well as the effect of NFPMR on MP through PC, which is significantly positive with a point estimate of .2079, as the 95% CI ranged from .1108 to .3304.

However, though all indirect effects of both systems on MP through both GC and PC are significant; the results revealed that there are different effects sizes related to their relationships. Apart from the effect size of NFPMR on MP through GC, indicating a large effect size as $K^2 = .2671$ and the 95% CI ranged from .1477 to .3905, the other effect sizes were medium due to $K^2 = .2445$, as the 95% CI ranged from .1272 to .3625 (FPMR on MP through GC), $K^2 = .2172$, as the 95% CI ranged from .1187 to .3274 (NFPMR on MP through PC) and $K^2 = .1998$, as the 95% CI ranged from .1076 to .3103 (FPMR on MP through PC).

To sum up, due to the significant effects of all paths and their products of coefficients (*ab*s), RC and its dimensions (GC and PC) are found to play mediating roles on the relationships between both FPMR and NFPMR and MP, with more effect of NFPMR on MP through overall RC, GC and PC than that of FPMR, as well as more effect of NFPMR through overall RC and specifically through GC (large effect size) than that through PC. Therefore, there are different effects between FPMR and NFPMR in relation to MP through RC and its dimensions, which lead to accepting hypothesis H14.

Table 7.5 Results of the Mediating Effect of RC on the Relationship between FPMR and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
Role clarity								
P. a (FPMR→MP)	.156	22.274	.4005	.0849	4.71	.0000	.2325	.5686
P. b (RC→MP)	.4114	41.587	.5219	.0648	8.05	.0000	.3936	.6503
P. Ć (FPMR →MP)		9	.0491	.0656	.747	.4562	-.0809	.1790
P. c (FPMR→MP)	.090	11.975	.2581	.0746	3.46	.0007	.1104	.4058
Indirect effect "ab"			**.2091**	.0541			.1075	.3188
Kappa-squared			**.2538**	.0586			.1381	.3673
Goal clarity								
P. a (FPMR →GC)	.131	18.167	.3139	.0737	4.26	.0000	.1681	.4598
P. b (GC→MP)	.4378	46.330	.6256	.0730	8.57	.0000	.4811	.7701
P. Ć (FPMR →MP)		9	.0617	.0632	.976	.3309	-.0634	.1868
Indirect effect "ab"			**.1964**	.0538			.0929	.3037
Kappa-squared			**.2445**	.0594			.1272	.3625
Process clarity								
P. a (FPMR →PC)	.142	19.953	.4871	.1090	4.46	.0000	.2712	.7030
P. b (PC→MP)	.3245	28.580	.3468	.0540	6.41	.0000	.2398	.4538
P. Ć (FPMR →MP)		8	.0892	.0697	1.27	.2033	-.0489	.2272
Indirect effect "ab"			**.1689**	.0480			.0854	.2730
Kappa-squared			**.1998**	.0516			.1076	.3103

P: Path; **FPMR** = Financial Performance Measures and Rewards; RC= Role clarity; GC = goal clarity; PC = process clarity; MP = Managerial Performance.

These findings are consistent with those of previous studies which reported that the behavioural effects of non-financial measures are different from those of financial measures (e.g. Lau & Sholihin, 2005; Lau, 2011). For instance, Lau (2011) found that non-financial measures have a stronger influence on RC than financial measures, due to the fact that both categories of measures have considerably different characteristics. These characteristics have different effects on individuals' RC. The annual financial

reporting cycle has been generally less closely tied to non-financial measures compared to financial measures. Therefore, there is less pressure on the time horizon which means fewer constraints from accounting standards and regulations. If there are less stringent requirements on time of reporting, both short-run and long-run measures are possible to be developed to suit the situations. Moreover, if objective and monetary outcomes are less stringently required, a variety of measures is possible to be wider used. In addition, the characteristic of non-financial performance measures is using nonmonetary expressions, which allows them to have a stronger influence on managers' RC than financial measures in many ways. One of these ways is that these measures are free from the constraint of a monetary expression which can be expressed in different ways (e.g. customer perspective, customer satisfaction rate, customer retention rates, number of customer complaints etc.). The existence of diverse measurements can provide the possibility of a much broader way to evaluate the performance of managers which are not provided by financial metrics. Therefore, it is easier, more complete, more accurate and more relevant to individuals to use non-financial measures for their performance evaluations (Lau, 2011).

Table 7.6 Results of the Mediating Effect of RC on the Relationship between NFPMR and MP

• *product coefficient approach*	R^2	*F*	*B*	*S.E.*	*t*	*Sig.*	*LLCI*	*ULCI*
Role clarity								
P. a (NFPMR→MP)	.2047	30.877	.5063	.0911	5.5567	.0000	.3259	.6867
P. b (RC→MP)	.4125	41.7767	.5144	.0667	7.7136	.0000	.3824	.6465
P. Ć (NFPMR→MP)			.0660	.0746	.8845	.3782	-.0818	.2138
P. c (NFPMR→MP)	.1188	16.171	.3265	.0812	4.0213	.0001	.1657	.4872
Indirect effect "ab"			**.2604**	.0655			.1433	.3997
Kappa-squared			**.2772**	.0630			.1546	.4006
Goal clarity								
P. a (FPMR→GC)	.1707	24.701	.3955	.0796	4.9701	.0000	.2379	.5530
P. b (GC→MP)	.4396	46.6822	.6156	.0746	8.2550	.0000	.4680	.7633
P. Ć (NFPMR→MP)			.0830	.0714	1.1625	.2474	-.0584	.2243
Indirect effect "ab"			**.2435**	.0634			.1292	.3786
Kappa-squared			**.2671**	.0628			.1477	.3905
Process clarity								
P. a (NFPMR→PC)	.1872	27.6345	.6171	.1174	5.2569	.0000	.3847	.8495
P. b (PC→MP)	.3279	29.0316	.3369	.0554	6.0857	.0000	.2273	.4466
P. Ć (NFPMR→MP)			.1185	.0790	1.5012	.1360	-.0378	.2749
Indirect effect "ab"			**.2079**	.0558			.1108	.3304
Kappa-squared			**.2172**	.0533			.1187	.3274

P= Path; NFPMR = Non-financial Performance Measures and Rewards; RC= Role Clarity; MP = Managerial Performance; GC = Goal Clarity; PC = Process Clarity

They are also consistent with goal theory which assumes that conscious goals and intentions direct human actions and that the existence of goals and performance criteria decreases ambiguity, reduces the misinterpretation of criteria and expectation, which leads to increased RC. Locke and Latham (1991, p. 240) have argued that RC and harmony is assumed to be enhanced by the setting of goals. They also mention that the individual's attention and relevant behaviours or outcomes are directed by goals, which also influence how information is processed. Goals influence arousal through regulating the intensity of the individual's effort related to achieving the task, and they impact its duration by leading individuals to persevere in their actions until they reach the goal. Apart from intensity and duration of effort, it must direct individuals to some activities related to goals and away from goal-irrelevant activities. Locke and Latham (1991, pp. 86, 92) have stated that the stored knowledge and skills which individuals owned should be activated as relevant to the task. Therefore, superiors who have tied great importance to performance measures (irrespective of whether financial or non-financial measures) offer clearer signals to direct their subordinates on what is expected from them than those of superiors who do not inform their subordinates about how they would be evaluated.

7.4 Influence of the FPMR and NFPMR Effects on Job Satisfaction (JS) and Managerial Performance (MP) through Psychological Empowerment (PE)

The aim of this section is to test the differences between the influence power of FPMR and NFPMR on JS and MP through PE. The section consists of a sub-section presenting the results of mediational regression tests related to testing H15 and H16 and which are directed towards the fifth research aim.

7.4.1 The Difference of the FPMR and NFPMR Effects on JS through the PE

H15 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through the Psychological Empowerment.

As shown in Tables **7.7** and **7.8**, the statistical results indicate that the direct effects of FPMR and NFPMR on PE and its dimensions, including ME, COM, SED and IMP are positively significant. The results, as shown in Table **7.7,** have revealed that FPMR has a significant direct effect on PE, at a confidence interval based on 5000 bootstrap samples that are different from zero and the 95% IC ranged from .2699 to .6390, with a

point estimate of .4544. The findings also pointed out that FPMR has a significant direct relationship on all PE dimensions at a confidence interval based on 5000 bootstrap samples excluding zero, indicating that FPMR → Mean at the 95% IC ranged from .0833 to .4038, with a point estimate of .2436, the FPMR → COM at the 95% IC ranged from .2996 to .7880, with a point estimate of .5438, the FPMR → SED at the 95% IC ranged from .4471 to .9277, with a point estimate of .6874 and the FPMR → IMP at the 95% IC ranged from .1412 to .5475, with a point estimate of .3443. Likewise, Table 7.8 points out that the direct relationship of NFPMR on PE and it dimensions are also significant at a confidence interval based on 5000 bootstrap samples not including zero, yielding NFPMR → PE at the 95% IC ranged from .4310 to .8166, with a point estimate of .6238, the NFPMR → ME at the 95% IC ranged from .2848 to .6144, with a point estimate of .4496, the NFPMR → COM at the 95% IC ranged from .6117 to 1.1042, with a point estimate of .8579, the NFPMR → SED at the 95% IC ranged from .5168 to 1.0443, with a point estimate of .7806 and the NFPMR → IMP at the 95% IC ranged from .1858 to .6318, with a point estimate of .4088. According to the results above, it is clear that the NFPMR has 37%, 85 %, 58 % and 19 % more effects on PE and its dimensions comprising, ME, COM, SED and IMP than that of FPMR respectively.

In addition, the indirect relationships between both FPMR and NFPMR with JS through PE and its dimensions (abs) are significant as the 95% confidence interval are excluding zero. On one hand, the results shown in Table 7.7 indicated that; a point estimate of the ab path from FPMR → JS through PE is .2803 at the 95% CI ranged from .1560 to .4193, a point estimate of the ab path from FPMR → JS through ME is .1556 at the 95% CI ranged from .0447 to .2850, a point estimate of the ab path from FPMR → JS through COM is .2111 at the 95% CI ranged from .1029 to .3471, a point estimate of the ab path from FPMR → JS through SED is .2742 at the 95% CI ranged from .1684 to .3999, and a point estimate of the ab path from FPMR → JS through IMP is .1790 at the 95% CI ranged from .0618 to .3102.

These results revealed that FPMR have a large effect size on JS through overall PE; as K^2 = .3314 at the 95% CI ranged from .1988 to .4526, a medium effect size through ME as K^2 = .1839 at the 95% CI ranged from .0545 to .3096, a medium effect size through COM as K^2 = .2384 at the 95% CI ranged from .1029 to .3471, a large effect size

through SED as K^2 = .2992 at the 95% CI ranged from .1954 to .4062 and a medium effect size through IMP as K^2 = .2124 at the 95% CI ranged from .0744 to .3412, as a point estimate of *ab*.

Table 7.7 Mediating Effect of PE on the Relationship between FPMR and Job Satisfaction

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
PE								
P. a (FPMR→PE)	.1653	23.7674	.4544	.0932	4.8752	.0000	.2699	.6390
P. b (PE→JS)	.6257	99.4463	.6167	.0522	11.8064	.0000	.5133	.7201
P. Ć (FPMR→JS)			.1312	.0584	2.2468	.0265	.0156	.2468
P. C (FPMR →JS)	.1872	27.6326	.4114	.0783	5.2567	.0000	.2565	.5664
Indirect effect "ab"			**.2803**	.0677			.1560	.4193
Kappa-squared			**.3314**	.0653			.1988	.4526
Meaning								
P. a (FPMR→ME)	.0702	9.0582	.2436	.0809	3.0097	.0032	.0833	.4038
P. b (ME→JS)	.5419	70.3767	.6388	.0666	9.5987	.0000	.5070	.7706
P. Ć (FPMR→JS)			.2558	.0612	4.1806	.0001	.1347	.3770
Indirect effect "ab"			**.1556**	.0604			.0447	.2850
Kappa-squared			**.1839**	.0649			.0545	.3096
Competence								
P. a (FPMR→COM)	.1394	19.4436	.5438	.1233	4.409	.0000	.2996	.7880
P. b (COM→JS)	.4913	57.4650	.3882	.0460	8.4347	.0000	.2971	.4793
P. Ć (FPMR→JS)			.2003	.0670	2.988	.0034	.0676	.3330
Indirect effect "ab"			**.2111**	.0609			.1029	.3471
Kappa-squared			**.2384**	.0591			.1193	.3537
Self-determination								
P. a (FPMR→SED)	.2109	32.0744	.6874	.1214	5.6634	.0000	.4471	.9277
P. b (SED→JS)	.4982	59.0675	.3989	.0464	8.5878	.0000	.3069	.4908
P. Ć (FPMR→JS)			.1372	.0695	1.9741	.0507	-.0004	.2749
Indirect effect "ab"			**.2742**	.0592			.1684	.3999
Kappa-squared			**.2992**	.0530			.1954	.4062
Impact								
P. a (FPMR→IMP)	.0858	11.2600	.3443	.1026	3.3556	.0011	.1412	.5475
P. b (IMP→JS)	.5649	77.2587	.5199	.0512	10.164	.0000	.4187	.6212
P. Ć (FPMR→JS)			.2324	.0601	3.8641	.0002	.1133	.3515
Indirect effect "ab"			**.1790**	.0629			.0618	.3102
Kappa-squared			**.2124**	.0675			.0744	.3412

P. = Path; FPMR = Financial Performance Measures and Rewards; PE= Psychological Empowerment; ME = Meaning; COM = competence; SED = Self-determination; IMP = Impact; JS= Job Satisfaction.

On the other hand, the results shown in Table 7.8 mentioned that there are significant indirect relationships between NFPMR and JS through PE and its dimensions, as indicated by a confidence interval based on 5000 bootstrap samples not including zero. Therefore, the path from NFPMR $\rightarrow$ JS through PE is significant as the 95% CI ranged from .2619 to .5311, with a point estimate of .3913, the path from NFPMR $\rightarrow$ JS through ME is significant as the 95% CI ranged from .1690 to .4095, with a point estimate of .2810, the path from NFPMR $\rightarrow$ JS through COM is significant as the 95% CI ranged from .2152 to .4760, with a point estimate of .3355, the path from NFPMR $\rightarrow$ JS through SED is significant as the 95% CI ranged from .1961 to .4441, with a point estimate of .3047 and the path from NFPMR $\rightarrow$ JS through IMP is significant as the 95% CI ranged from .0926 to .3464, with a point estimate of .2092.

These results have demonstrated that NFPMR have a significantly large effect size on JS through overall PE; with K^2 = .3959 as the 95% CI ranged from .2891 to .4941 is different from zero, a large effect size through ME with K^2 = .2810 as the 95% CI ranged from .1744 to .3839, a large effect size through COM with K^2 = .3146 as the 95% CI ranged from .2162 to .4146, a large effect size through SED with K^2 = .3002 as the 95% CI ranged from .2003 to .4037, whereas it has a medium effect size through IMP as K^2 = .2239 as the 95% CI ranged from .1004 to .3450.

It is clear from these results that the effect sizes related to NFPMR are higher than those of FPMR, as both effect sizes related to both systems' effects on JS through PE are large, but the effect size from NFPMR is larger than that from FPMR. To compare between the effect sizes of FPMR and NFPMR on JS through both dimensions of PE (ME and COM); both effects related to FPMR are medium sized, while the effect derived from NFPMR are large. Finally, the effects of FPMR and NFPMR on JS through IMP are both medium sized, but the effect which obtains from NFPMR is bigger than that of FPMR. Therefore, according to these results, hypothesis H15 is supported.

Table 7.8 Results of the Mediating Effect of PE on the Relationship between NFPMR and JS

• product coefficient approach	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
PE								
P. a (NFPMR→PE)	.2548	41.0382	.6238	.0974	6.4061	.0000	.4310	.8166
P. b (PE→ JS)	.6153	95.1848	.6273	.0560	11.193	.0000	.5163	.7382
P .Ć (NFPMR→JS)			.0909	.0692	1.3124	.1919	-.0462	.2280
P. C (NFPMR →JS)	.2103	31.9609	.4822	.0853	5.6534	.0000	.3133	.6510
Indirect effect "ab"			**.3913**	.0677			.2619	.5311
Kappa-squared			**.3959**	.0526			.2891	.4941
Meaning								
P. a (NFPMR→ME)	.1956	29.1818	.4496	.0832	5.4020	.0000	.2848	.6144
P. b (ME →JS)	.5040	60.4699	.6250	.0745	8.3949	.0000	.4776	.7724
P. Ć (NFPMR →JS)			.2012	.0757	2.6584	.0089	0513	.3510
Indirect effect "ab"			**.2810**	.0616			.1690	.4095
Kappa-squared			**.2810**	.0532			.1744	.3839
Competence								
P .a (NFPMR→COM)	.2840	47.5863	.8579	.1244	6.8983	.0000	.6117	1.104
P. b (COM →JS)	.4671	52.1443	.3910	.0516	7.5714	.0000	.2888	.4933
P. Ć (NFPMR→JS)			.1467	.0831	1.7644	.0802	-.0179	.3114
Indirect effect "ab"			**.3355**	.0662			.2152	.4760
Kappa-squared			**.3146**	.0507			.2162	.4146
Self-determination								
P. a (NFPMR→SED)	.2225	34.3413	.7806	.1332	5.8601	.0000	.5168	1.044
P. b (SED →JS)	.5039	60.4321	.3904	.0465	8.3914	.0000	.2983	.4825
P. Ć (NFPMR→JS)			.1774	.0770	2.3047	.0229	.0250	.3299
Indirect effect "ab"			**.3047**	.0622			.1961	.4441
Kappa-squared			**.3002**	.0517			.2003	.4037
Impact								
P. a (NFPMR→IMP)	.0989	13.1707	.4088	.1126	3.6291	.0004	.1858	.6318
P. b (IMP →JS)	.5711	79.2191	.5118	.0512	10.004	.0000	.4105	.6131
P. Ć (NFPMR →JS)			.2730	.0665	4.1050	.0001	.1413	.4046
Indirect effect "ab"			**.2092**	.0636			.0926	.3464
Kappa-squared			**.2239**	.0621			.1004	.3450

P. = Path; NFPMR = Non-Financial Performance Measures and Rewards; PE= Psychological Empowerment; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact; JS= Job Satisfaction.

The results are most apparent when considering comprehensive PMS. Combining financial and non-financial measures relating to motivation studied on a regular and frequent basis. However, comparing these measures considered in this work has not been studied quite in this way previously. Therefore, it is difficult to form a direct comparison with studies in the literature review, but previous studies indicated that psychological empowerment is influenced by both performance measures, which provide managers with relevant performance information that increases their feelings of psychological empowerment (Spreitzer, 1995b; Drake et al., 2007). This information is

related to an organisation's mission as well as related to the performance of individuals (Thomas & Velthouse, 1990). Both types of measures are viewed as critical antecedents to empowerment (Spreitzer, 1995b). The finding of this study is consistent with the debate that strategic information is a source of psychological empowerment (Conger & Kanungo, 1988). It clarifies the existing literature by showing that non-financial performance measures in particular are crucial to supporting psychological empowerment (Marginson et al., 2014). In this regard, the results of this research are consistent with the literature which has debated that the types of measures have different effects (Hopwood, 1972; Marginson, McAulay, Roush, & Van Zijl, 2010; Van Veen-Dirks, 2010). Thus, the findings extend the contributions of Marginson and Ogden (2005a, 2005b) and Hall (2008) owing to the fact that neither of these studies have compared between FPMR and NFPMR in their effects on cognitive and motivational mechanisms, nor have the studies included all the variables which have been addressed in this study.

7.4.2 The Difference of the FPMR and NFPMR Effects on MP through the PE

H16 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through the Psychological Empowerment.

The indirect relationships between both FPMR and NFPMR with MP through PE and its dimensions (abs) excluded the zero with a 95% confidence interval as presented in Tables 7.9 and 7.10.

The results shown in Table 7.9 are related to the indirect relationships of the FPMR. As mentioned above, there are significant indirect relationships between FPMR and MP through PE and its dimensions (abs). To illustrate this, it is indicated that; a point estimate of the ab path from FPMR $\rightarrow$ MP through PE is .2214 as the 95% CI ranged from .1174 to .3327, a point estimate of the ab path from FPMR $\rightarrow$ MP through ME is .1486 as the 95% CI ranged from .0418 to .2595, a point estimate of the ab path from FPMR $\rightarrow$ MP through COM is .1643 as the 95% CI ranged from .0771 to .2731, a point estimate of the ab path from FPMR $\rightarrow$ MP through SED is .1790 as the 95% CI ranged from .0969 to .2670 and a point estimate of the ab path from FPMR $\rightarrow$ MP through IMP is .1472 as the 95% CI ranged from .0521 to .2543. It is clarified by the above results

that PE and its dimensions play mediating roles on the relationships between FPMR and MP.

The results obtained from Table 7.9 also indicated that the FPMR have a large effect size on MP through overall PE; with K^2 = .2695 as the 95% CI ranged from .1541 to .3792, whereas testing the FPMR on MP through dimensions of PE individually showed medium effect sizes for each dimension, as the effect of the FPMR on MP through ME (K^2) is .1951 as the 95% CI ranged from .0590 to .3154, through COM (K^2) = .1942 as the 95% CI ranged from .0934 to .3036, through SED (K^2) = .1992 as the 95% CI ranged from .1101 to .3010 and through IMP (K^2) = .1846 as the 95% CI ranged from .0694 to .3055.

Table 7.10 showed the results related to the indirect relationships of NFPMR on MP through PE and its dimensions, which are significant as the 95% confidence interval excluding zero. Therefore, the path from NFPMR → MP through overall PE is significant as the 95% CI ranged from .2032 to .4258, with a point estimate of .3074, the path from NFPMR → MP through ME is significant as the 95% CI ranged from .1728 to .3958, with a point estimate of .2792, the path from NFPMR → MP through COM is significant as the 95% CI ranged from .1547 to .3888, with a point estimate of .2613, the path from NFPMR → MP through SED is significant as the 95% CI ranged from .1027 to .3072, with a point estimate of .1924 and the path from NFPMR → MP through IMP is significant as the 95% CI ranged from .0772 to .2841, with a point estimate of .1706.

Moreover, the results presented in Table 7.10 have proved that the NFPMR have large effect sizes on MP through overall PE and its two dimensions, including, ME and COM (with K^2 = .3188 as the 95% CI ranged from .2176 to .4239, K^2 = .3067 as the 95% CI ranged from .1969 to .4131 and K^2 = .2558 as the 95% CI ranged from .1578 to .3620 respectively). While it has medium sized effect on MP through the other two dimensions, comprising SED and Impact, as K^2 = .1935 and .1092 as the 95% CI ranged from .1039 to .2960 and ranged from .0879 to .3053 respectively.

Table 7.9 Results of the Mediating Effect of PE on the Relationship between FPMR and MP

• *product coefficient approach*	R^2	*F*	*B*	*S.E*	*t*	Sig.	LLCI	ULCI
PE								
P. a (FPMR→PE)	.1653	23.7674	.4544	.0932	4.8752	.0000	.2699	.6390
P. b (PE→MP)	.4279	44.5069	.4873	.0582	8.3749	.0000	.3721	.6025
P. Ć (FPMR→MP)			.0367	.0650	.5640	.5738	-.0921	.1654
P. C (FPMR→MP)	.0907	11.9750	.2581	.0746	3.4605	.0007	.1104	.4058
Indirect effect "ab"			**.2214**	.0551			.1174	.3327
Kappa-squared			**.2695**	.0581			.1541	.3792
Meaning								
P. a (FPMR→ME)	.0702	9.0582	.2436	.0809	3.0097	.0032	.0833	.4038
P. b (ME→MP)	.4891	56.9592	.6100	.0633	9.6324	.0000	.4846	.7354
P. Ć (FPMR→MP)			.1095	.0582	1.8810	.0624	-.0058	.2248
Indirect effect "ab"			**.1486**	.0555			.0418	.2595
Kappa-squared			**.1951**	.0647			.0590	.3154
Competence								
P. a (FPMR→COM)	.1394	19.4436	.5438	.1233	4.4095	.0000	.2996	.7880
P. b (COM→MP)	.3176	27.6936	.3021	.0480	6.2900	.0000	.2070	.3972
P. Ć (FPMR→MP)			.0938	.0699	1.3414	.1824	-.0447	.2323
Indirect effect "ab"			**.1643**	.0489			.0771	.2731
Kappa-squared			**.1942**	.0522			.0934	.3036
Self-determination								
P. a (FPMR→SED)	.2109	32.074	.6874	.1214	5.6634	.0000	.4471	.9277
P. b (SED→MP)	.2540	20.2570	.2604	.0510	5.1030	.0000	.1594	.3614
P. Ć (FPMR→MP)			.0791	.0764	1.0360	.3023	-.0721	.2304
Indirect effect "ab"			**.1790**	.0478			.0969	.2670
Kappa-squared			**.1992**	.0484			.1101	.3010
Impact								
P. a (FPMR→IMP)	.0858	11.2600	.3443	.1026	3.3556	.0011	.1412	.5475
P. b (IMP→MP)	.4051	40.5124	.4274	.0539	7.9294	.0000	.3206	.5341
P. Ć (FPMR→MP)			.1110	.0634	1.7510	.0825	-.0145	.2364
Indirect effect "ab"			**.1472**	.0513			.0521	.2543
Kappa-squared			**.1846**	.0596			.0694	.3055

P. = Path; FPMR = Financial Performance Measures and Rewards; PE= Psychological Empowerment; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact; MP = Managerial Performance.

Table 7.10 Results of the Mediating Effect of PE on the Relationship between NFPMR and MP

• *product coefficient approach*	R^2	F	B	S.E	t	Sig.	LLCI	ULCI
PE								
P. a (NFPMR→PE)	.2548	41.0382	.6238	.0974	6.4061	.0000	.4310	.8166
P. b (PE→MP)	.4267	44.2841	.4928	.0616	7.9949	.0000	.3708	.6149
P. Ć (NFPMR→MP)			.0190	.0762	.2499	.8031	-.1318	.1699
P. C (NFPMR→MP)	.1188	16.1710	.3265	.0812	4.0213	.0001	.1657	.4872
Indirect effect "ab"			**.3074**	.0566			.2032	.4258
Kappa-squared			**.3188**	.0520			.2176	.4239
Meaning								
P. a (NFPMR→ME)	.1956	29.1818	.4496	.0832	5.4020	.0000	.2848	.6144
P. b (ME→MP)	.4759	54.0287	.6210	.0690	9.0052	.0000	.4844	.7575
P. Ć (NFPMR→MP)			.0473	.0701	.6744	.5014	-.0915	.1861
Indirect effect "ab"			**.2792**	.0566			.1728	.3958
Kappa-squared			**.3067**	.0551			.1969	.4131
Competence								
P. a (NFPMR→COM)	.2840	47.5863	.8579	.1244	6.8983	.0000	.6117	1.1042
P. b (COM→MP)	.3107	26.8164	.3046	.0529	5.7560	.0000	.1998	.4094
P. Ć (NFPMR→MP)			.0651	.0852	.7642	.4463	-.1036	.2338
Indirect effect "ab"			**.2613**	.0594			.1547	.3888
Kappa-squared			**.2558**	.0523			.1578	.3620
Self-determination								
P. a (NFPMR→SED)	.2225	34.3413	.7806	.1332	5.8601	.0000	.5168	1.0443
P. b (SED→MP)	.2628	21.2146	.2464	.0511	4.8227	.0000	.1453	.3476
P. Ć (NFPMR→MP)			.1341	.0846	1.5858	.1154	-.0333	.3015
Indirect effect "ab"			**.1924**	.0521			.1027	.3072
Kappa-squared			**.1935**	.0491			.1039	.2960
Impact								
P. a (NFPMR→IMP)	.0989	13.1707	.4088	.1126	3.6291	.0004	.1858	.6318
P. b (IMP→MP)	.4141	42.0610	.4173	.0539	7.7460	.0000	.3106	.5240
P. Ć (NFPMR→MP)			.1559	.0700	2.2262	.0279	.0172	.2945
Indirect effect "ab"			**.1706**	.0525			.0772	.2841
Kappa-squared			**.1920**	.0554			.0879	.3053

P. = Path; NFPMR = Non-financial Performance Measures and Rewards; PE= Psychological Empowerment; ME = Meaning; Com = competence; SED = Self-determination; IMP = Impact; MP = Managerial Performance.

Obviously, the above results pointed out that FPMR and NFPMR have large effect sizes on MP through PE overall, but NFPMR have a higher effect than that of FPMR. Comparing the effect sizes between NFPMR and FPMR in relation to MP through the dimensions of PE, apart from the effect size through SED which is slightly higher for

FPMR, the effect sizes through the other dimensions are higher regarding NFPMR than that of FPMR. Thus, hypothesis H16 is supported.

The results are consistent with the argument of Hall (2008) that a broad range of measures, incorporating non-financial measures, are essential to overcome the inadequacies of conventional narrowly-based financial measures (see for example, Ittner & Larcker, 1998; Kaplan & Norton, 2001; Ittner, Larcker, & Meyer, 2003; Lau & Sholihin, 2005; Lau & Moser, 2008). Considering that non-financial performance measurement systems have a wide range of measures, that are forward-looking and useful for developing and sustaining long-term competitive advantages, these measure provide a broad range of information which is a source of PE (Conger & Kanungo, 1988) and lead to a larger effect size on MP through PE than that of the financial ones. The finding illustrates the existing literature, by clarifying that non-financial measures particularly support PE and that using non-financial measures is crucial to their effect. Therefore, the findings have extended the contributions of previous studies (e.g. Marginson & Ogden, 2005a, 2005b; Hall, 2008) owing to the fact that neither of these studies has addressed the different effects derived from both financial and non-financial performance measures.

7.5 Data Analysis Related to the Influence Power of the FPMR and NFPMR Effects on MP through the MMC and MMB.

7.5.1 The Difference of the FPMR and NFPMR Effects on MP through the MMC

H17 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Mental Model Confirmation.

The results related to comparisons between FPMR and NFPMR' effects, as shown in Tables **7**.11 and 7.12, indicate that the direct effects of FPMR and NFPMR on MMC are positively significant. The relationship between FPMR and MMC is positively significant, at a confidence interval based on 5000 bootstrap samples not including zero, 95% CI ranged from .1118 to .3855, with a point estimate of .2486 as presented in Table **7**.11. Similarly, the effect of NFPMR on MMC is positively significant, as a 95% confidence interval excluding zero ranged from .1927 to .4866, with a point estimate of.3396 as shown in Table **7**.12. However, though both systems have positive effects on MMC, NFPMR have 37 % more effect on MMC than FPMR.

The results related to testing hypothesis H17, as shown in Tables 7.11 and 7.12, indicate that there is a significant relationship between FPMR and MP through MMC, as the 95% confidence interval excluding zero ranged from .0696 to .2833, with a point estimate of .1733. Similarly, the indirect effect of NFPMR on MP through MMC is significant, as the 95% confidence interval which excluded zero ranged from .1215 to .3588, with a point estimate of .2343. However, though both systems have positive indirect effects on MP through MMC, NFPMR resulted in a larger effect size with $K^2 =$ .2634 which did not include zero and with a 95% confidence interval ranged from .1403 to .3874, whereas FPMR had a medium effect size with $K^2 = .2228$ which excluded zero and with a 95% confidence interval ranged from .0089 to .3347. Hence, these differences lead to accepting H17.

Table 7.11 Results of the Mediating Effect of MMC on the Relationship between FPMR and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a(FPMR→MMC)	.0973	12.9395	.2486	.0691	3.5971	.0005	.1118	.3855
P. b (MMC→MP)	.4701	52.7844	.6971	.0755	9.2300	.0000	.5475	.8466
P. Ć (FPMR→MP)			.0848	.0602	1.4092	.1614	-.0344	.2040
P. C (FPMR→MP)	.0907	11.9750	.2581	.0746	3.4605	.0007	.1104	.4058
Indirect effect "ab"			**.1733**	.0543			.0696	.2833
Kappa-squared			**.2228**	.0609			.0089	.3347

P. = Path; FPMSR = Financial Performance Measures and Rewards; MMC = Mental Model Confirmation; MP = Managerial Performance.

Table 7.12 Results of the Mediating Effect of MMC on the Relationship between NFPMR and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a (NFPMR→MMC)	.1486	20.9437	.3396	.0742	4.5764	.0000	.1927	.4866
P. b (MMC→MP)	.4693	52.6175	.6900	.0778	8.8660	.0000	.5359	.8440
P. Ć (NFPMR→MP)			.0921	.0686	1.3438	.1816	-.0436	.2279
P. C (NFPMR→MP)	.1188	16.1710	.3265	.0812	4.0213	.0001	.1657	.4872
Indirect effect "ab"			**.2343**	.0606			.1215	.3588
Kappa-squared			**.2634**	.0632			.1403	.3874

P. = Path; NFPMR = Non-financial Performance Measures and Rewards; MMC = Mental Model Confirmation; MP = Managerial Performance.

Previous studies argued that managers can use feedback from management systems to confirm their mental models (McKinnon & Bruns, 1992; Chenhall & Morris, 1993;

Kaplan & Norton, 1996c; Sprinkle, 2000). McKinnon and Bruns (1992) indicated that managers, who review their success as reported in accounting reports, continue testing and perfecting their mental model at work by using management accounting systems. A CPMS as a management accounting system can provide managers with more information and help them to test and confirm their mental models, as mentioned by Choe (2004a) and Hall (2011). This study is consistent with the discussions that indicate that the diversity of information provided by the systems, such as performance measurements, have a different effect on the learning process (e.g. Choe, 2004a; Hall, 2011), but neither of the previous studies have compared the effects of financial and non-financial performance measurement and reward systems on mental model confirmation.

7.5.2 The Difference of the FPMR and NFPMR Effects on MP through the MMB

H18 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through the Mental Model Building.

The results related to comparing between FPMR and NFPMR' effects, as shown in Tables **7**.13 and 7.14, indicate that the direct effects of FPMR and NFPMR on MMB are positively significant. The effect of FPMR on MMB is positively significant as the *a* path is .3539, which excluded zero with a 95% confidence interval ranged from .1684 to .5394, as presented in Table **7**.13. Likewise, the effect of NFPMR on MMB is positively significant as the *a* path is .4929, which did not include zero with a 95% confidence interval ranged from .2952 to .6907, as shown in Table **7**.14. However, FPMR is similar to NFPMR in that they both have positive significant effects on MMB, though NFPMR has 39 % more effect on MMB than FPMR.

The findings related to testing hypothesis H18, as shown in Tables 7.13 and 7.14, indicate that the relationship between FPMR and MP through MMB yields a significant indirect effect, *ab* = **.**1616, which is different from zero by a 95% confidence interval ranged from .0751 to .2671. Likewise, the indirect effect of NFPMR on MP through MMB is significant, as a point estimate of .2216 at the 95% confidence interval, which excluded zero and ranged from .1285 to .3420. Like FPMR, NFPMR has a positive indirect effect on MP through MMB, where both FPMR and NFPMR have medium effect sizes with K^2 = .1995, which has not included zero and a 95% confidence interval

ranged from .0933 to .3121, and K^2 = .2386 which has not included zero and a 95% confidence interval ranged from .1408 to .3518 respectively. Nevertheless, the NFPMR has a higher effect size than that of FPMR. Based on these results, the research hypothesis H18 is accepted.

Table 7.13 Results of the Mediating Effect of MMB on the Relationship between FPMR and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a (FPMR→MMB)	.1063	14.2737	.3539	.0937	3.7781	.0002	.1684	.5394
P. b (MMC→MP)	.3896	37.9781	.4565	.0598	7.6332	.0000	.3381	.5749
P. Ć (FPMR→MP)			.0966	.0649	1.4873	.1396	-.0320	.2251
P. c (FPMR→MP)	.0907	11.9750	.2581	.0746	3.4605	.0007	.1104	.4058
Indirect effect "ab"			**.1616**	.0492			.0751	.2671
Kappa-squared			**.1995**	.0565			.0933	.3121

P. = Path; FPMR = Financial Performance Measures and Rewards; MMC = Mental Model Building; MP = Managerial Performance.

Table 7.14 Results of the Mediating Effect of MMB on the Relationship between NFPMR and MP

• *product coefficient approach*	R^2	F	B	S.E.	t	Sig.	LLCI	ULCI
MMC								
P. a (NFPMR→MMB)	.1687	24.3557	.4929	.0999	4.9351	.0000	.2952	.6907
P. b (MMB→MP)	.3884	37.7918	.4496	.0621	7.2440	.0000	.3267	.5725
P. Ć (NFPMR→MP)			.1048	.0745	1.4073	.1619	-.0427	.2523
P. C (NFPMR→MP)	.1188	16.1710	.3265	.0812	4.0213	.0001	.1657	.4872
Indirect effect "ab"			**.2216**	.0538			.1285	.3420
Kappa-squared			**.2386**	.0531			.1408	.3518

P. = Path; NFPMR = Non-financial Performance Measures and Rewards; MMB = Mental Model Building; MP = Managerial Performance.

In today's competitive environment, performance measurement systems are required and which comprise mainly of non-financial performance information (Lessner, 1989; Otley, 1994). The results of this study are consistent with the discussions that a non-financial performance measurement system is required to achieve the strategic advantages and is more appropriate than a financial system (Abernethy & Lillis, 1995). However, some previous studies (e.g. Alavi, 1994; Goodman & Darr, 1998; Kock & McQueen, 1998; Kwok & Khalifa, 1998; Scott, 2000) have concentrated on the

functions of computer-aided systems and information technology which facilitate learning, while other studies have focused on the effect of management accounting information, particularly non-financial performance measurements on organisational learning, but they did not address the comparison of effects of financial and non-financial performance measurements on learning. More recently, Hall (2011) has examined the effect of a comprehensive performance measurement system on mental model building, but his result is unclear if it comes from a financial or a non-financial performance measurement system. Therefore, the results of this study are unique due to comparing the effects of financial and non-financial measures on mental model building.

7.6 Summary and Conclusion

This chapter has shown the results from testing the second group of research hypotheses, which are concerned with the potential different direct effects of both FPMR and NFPMR on cognitive and motivational variables, as well as indirectly on individual outcomes (JS and MP) through these cognitive and motivational variables.

The results indicate that there are different effects between FPMR and NFPMR in their direct relationships to RC, PE, MMC and MMB, as well as indirectly with JS through RC and PE and also with MP through RC, PE, MMC and MMB. More specifically, the findings point out that NFPMR have much stronger effects than those of FPMR in their direct and indirect relationships. These results also showed that RC and PE have mediating roles between the effects of both systems (NFPMR and FPMR) and that JS as well as RC, PE, MMC and MMB have mediating effects on the relationships between both systems and MP, with more impact by NFPMR than that of FPMR in their relationships.

The next chapter presents a further discussion of findings based on the relevant literature and a summary related to the research findings that emerged from the data analysis, as well as their implications.

Chapter 8 Conclusions

8.1 Introduction

The overall aim of the current study was to attempt to provide a better understanding in detail and a comprehensive view of the effects of a PMS in terms of the comprehensiveness and the types of systems, on individual outcomes through cognitive and motivational factors. A particular emphasis was placed on the influences of a comprehensive PMS on job satisfaction (JS) and managerial performance (MP), by using role clarity (RC), psychological empowerment (PE), mental model confirmation (MMC) and mental model building (MMB) as mediating variables to obtain more explanation for these relationships, as well as to identify which systems (NFPMR and FPMR) have stronger effects on mediating and outcome variables in manufacturing companies in Libya, where the management accounting research effort has so far been very limited. As outlined in Chapter One and supported by the extensive review of relevant literature in Chapters Two and Three, this research has several objectives as follows:

1. To describe the comprehensiveness of a PMS, the importance of FPMR and NFPMR, levels of RC, levels of PE and types of individual learning (MMC and MMB) in SBUs at manufacturing companies in Libya.
2. To propose and empirically test a research model by identifying the direct and indirect relationships between the comprehensive PMS and individual outcomes, through cognitive and motivational factors in SBUs at manufacturing companies in Libya.
3. To investigate the relationship between RC and PE in SBUs at manufacturing companies in Libya.

4. To identify the relationship between JS and MP in SBUs at manufacturing companies in Libya.
5. To examine the differences between FPMR and NFPMR used in direct relationships to the individual outcomes and indirectly through the cognitive and motivational factors in SBUs at manufacturing companies in Libya.

To achieve these objectives, a theoretical framework was built in line with psychological theories, to examine the relationships of a PMS and its types with job satisfaction and managerial performance through cognitive and motivational mechanisms. Selecting these psychological variables was for several rational reasons.

Studies that seek to identify links between management control systems and organisational outcomes assumed that these systems influence the individuals' behaviour within the organisation, which in turn helps to accomplish the goals of organisations. Management accounting studies at the organisational level of analysis are somewhat limited and relied on assumptions, instead of detailed investigation, about individuals' behaviours (Covaleski et al., 2007). Moreover, there is a lack of empirical research that deals with the behavioural consequences of a comprehensive PMS (Ittner & Larcker, 1998; Webb, 2004; Hall, 2008). Little empirical research has examined whether components of management accounting systems have direct and/or indirect effects on work performance (Shields et al., 2000). This is important, as Shields et al. (2000) argued that direct and indirect relationships' models have theoretical differences, which lead to practical implications. Further, some authors (e.g. Ilgen et al., 1979; Collins, 1982; Luckett & Eggleton, 1991) have stated that psychological theories point out that cognitive and motivational variables are likely to clarify and explain the relationships between the comprehensive PMS and individuals' outcomes (JS and MP). As such, this research study tries to investigate how the relationships of a comprehensive PMS and both dimensions of a PMS (FPMR and NFPMR) with individuals' outcomes (JS and MP) can be explained by using the intervening variables of RC, PE, MMC and MMB

More specifically, the management accounting literature has addressed the PMS and its consequences in three key models which are direct relationship models, moderating or interacting relationship models and intervening or mediating relationship models. However, Shields et al. (2000) have stated that the latter has more fit for data to address the relationships in management accounting studies. Therefore, this study examined the direct effects of the comprehensive PMS on JS and MP and indirectly through RC, PE, MMC and MMB. Furthermore, Lau (2011) has argued that previous studies which investigated the relationships between the comprehensive PMS and individual outcomes, have included a combination of financial and non-financial measures, but

these studies have left some unanswered questions. For example, the systems that have been examined by the studies likely comprised both non-financial measures and financial measures, but they did not indicate if the effects found were derived from using non-financial measures, or financial measures. In his study Lau (2011) found that financial and non-financial measures have indirect effects on MP through RC as full mediation, but non-financial measures have more effects than those of financial measures. However, he ignored the role of other mediating variables, such as PE, MMC and MMB. In response to his calls, this research study examined the different effects of FPMR and NFPMR directly on RC, PE, MMC, MMB, JS and MP and indirectly on JS through RC and PE, as well as indirectly on MP through RC, PE, MMC and MMB. Moreover, prior studies have classified intervening variables as full and partial mediators despite criticism of this classification (see for e.g. Preacher & Kelley, 2011). Consequently, besides using the mediating relationship model in this study, effect size measures are calculated and presented for all intervening relationships.

A survey questionnaire was developed and administered to collect primary data to achieve the study's research objectives, via testing the two sets of hypotheses (see Chapter Four) which were formulated for the study after a detailed review of relevant literature. The questionnaire was built on seven-point Likert scales in order to capture detailed information on the comprehensive PMS, cognitive and motivational factors, JS and MP, as described above in the target companies. The study used descriptive statistics (e.g. means) to analyse the data gathered (see Chapter Five). A simple regression statistical technique is utilised to test hypotheses related to the first part of the second and fifth research objectives, as well as the whole part of the third and fourth objectives (see Chapters Six and Seven). The research utilised mediation regression (Process macro) to analyse the data related to both second parts of the second and fifth research objectives (see Chapters Six and Seven).

The next section presents a summary and discussion of the key findings emerging from the descriptive statistics followed by inferential statistical analysis, as well as the contributions of the study. The research limitations are presented and future research is suggested in the final section.

8.2 Summary and Discussions of the Research Findings

In this section an overall discussion and the key findings of research objectives and questions are presented, which obtained from Chapters Five, Six and Seven. The descriptive analysis is summarised in sub-section 8.2.1, while the results of the hypotheses tests are summarised and presented in both sub-sections 8.2.2-8.2.3. As shown below, this research has offered interesting results and sufficient information related to its objectives and questions, by supporting all the hypotheses and providing good ways for both theoretical and practical further future research.

8.2.1 Findings of the Descriptive Statistical Analysis

- SBU managers in the surveyed companies in Libya seem to have moderate levels of authority with mean = 4.05, and this has been reflected in the design and adoption of comprehensive PMS and its types (see sections 5.4.1 and 5.4.2). These results are consistent with the argument that firms design their decision-making autonomy around their PMS, indicating the close link between decision making autonomy and the comprehensive PMS, which may provide support and possible explanation for the above results (Micheli & Manzoni, 2010).

- Managers of SBUs at the surveyed companies in Libya considered that "providing a range of measures that cover the critical areas of the business unit's operations in line with business strategy" is the most applied item for the comprehensiveness of the PMS with a mean score of 5.13. This may be due to the fact that the strategic fit of performance measures seems to support managers by focusing on the most strategically relevant information for RC, PE and learning, thus mitigating complexity. Regarding this, see Chenhall (2005), as well as the experimental evidence of Farrell et al. (2008) who mentioned that providing managers with strategic performance indicators reduces their task complexity simply by reducing their set of strategic choices. The importance of cause-and-effect relationships related to performance measures resulted in mean scores around 5.00, indicating that these results emphasize the importance of causal business modelling for individual and organizational learning, which is consistent with the argument of Kelly (2007) and extends the experimental findings showing that providing managers with cause-and-

effect relationships improves performance, even independently of their accuracy (Kelly, 2010).

- Large and medium-sized manufacturing companies in Libya tend to be in favour of both types of measurement system (FPMR and NFPMR), as the overall mean scores of both types were 4.70 and 4.53 respectively.

- SBU managers at the manufacturing companies in Libya have moderately clear roles. However, the managers' goal clarity is slightly higher than that of their process clarity. These results are consistent with the findings of Hall (2008).

- The overall mean for PE related to the managers at the surveyed companies is 4.85, while individual scores for its dimensions indicated that Meaning has the highest score with a mean of 5.43, followed by Impact with 5.09, Competence with 4.66 and Self-determination with 4.23. Meaning and Impact received the highest evaluation compared to the other dimensions of PE. This shows that managers of SBUs feel that their jobs and work are meaningful and important to them and do really feel that they can influence their work outcomes. They might feel that their work can affect the overall goal achievement and do really believe that he/she can influence the strategic outputs, management and operations in the workplace. This is consistent with the argument of Micheli and Manzoni (2010) who indicated that performance information affects intrinsic motivation and empowerment, since a more comprehensive PMS can make SBU managers believe that their jobs are more meaningful by helping them to determine how their work fits within the broader scope of the organisation. These aspects, in turn, have been found to have a positive impact on performance.

- Managers of SBUs at the surveyed companies in Libya attach considerable amounts of agreement to both dimensions of individual learning, with a mean score of 4.96. However the emphasis appears to be slightly more on MMC than that of the MMB dimension.

- Managers of SBUs indicate that they are slightly highly satisfied with their job, as shown by the overall mean for JS which is 4.85. However, comparatively the respondents considered that "social service" has the highest level of JS, whereas Independence has the lowest level, with means of 5.04 and 4.63 respectively. This

illustrates that there is a convergence in terms of respondents' satisfaction about aspects of their jobs.

- For the managers' performance at the surveyed companies in Libya, MP is relatively high with a mean of 5.11. To compare between the dimensions of managers' performance, supervising has the highest scoring mean, while planning is perceived as the lowest, with scores of 5.25 and 4.93 respectively.

8.2.2 Findings Related to the Relationships between the comprehensive PMS and Individuals' Outcomes and the Mediating Role of Cognitive and Motivational Variables on these Relationships

The previous sub-section has covered an overall view of the comprehensive PMS and the types of systems, which includes FPMR and NFPMR. This sub-section presents the findings related to the second, third and fourth research objectives (see Chapter 4, Section 4.2) as well as related to the second, third and fourth research questions (see Chapter 4, Section 4.3). The simple regression test (see Chapter 6) was used to test the direct relationships between the comprehensive PMS and Individuals' Outcomes (JS and MP), the relationship between RC and PE and the relationship between JS and MP (see Chapter 6). These relationships were formulated as *Hypotheses 1, 2, 7 and 8* (see Chapter 4)*.* Moreover, mediation regression (Process macro) was utilised to analyse the data related to examining the relationships between the CPMS and Individuals' Outcomes (JS and MP) through the mediating role of cognitive and motivational variables (see Chapter Six), as formulated by Hypotheses 3, 4, 5, 6, 9 and 10 (see Chapter 4). Tables 8.1 and 8.2 present an overall summary of the research hypotheses' tests.

Tables 8.1 shows a summary of the hypotheses' tests related to the first part of the second research objective (to examine the direct relationship between the comprehensive PMS variable and JS, as well as MP), the third research objective which is the effect of RC on PE and the fourth research objective, including the relationship between JS and MP. Data analysis here also relates to the first part of the second question (questions 2 *a* and *b*), as well as the third and the fourth questions.

Table 8.1 Summary of Hypotheses' Tests Related to the Direct Relationships between the CPMS, JS, MP, RC and PE

Hypotheses	R^2	Sig.	*Comment*
H1 Comprehensive PMS influence Job Satisfaction	.1852	.0000	Accepted
H2 Comprehensive PMS influence Managerial Performance	.2007	.0000	Accepted
H7 Role Clarity influences Psychological Empowerment	.7730	.0000	Accepted
H8 Job Satisfaction influences Managerial Performance	.6670	.0000	Accepted

The findings shown in Table 8.1 are related to the direct relationships amongst the comprehensive PMS, RC, PE, JS and MP. They suggest that the comprehensive PMS variable has positively influenced JS. The results are consistent with those of Hopwood (1972), Cherrington and Cherrington (1973), Kenis (1979) and Chenhall and Brownell (1988) that budgetary participation and RAPM have positive effects on managers' JS within their organisations. The results also support recent studies' findings (e.g. Lau & Sholihin, 2005; Sholihin & Pike, 2009) that reported that the comprehensive PMS, using multiple performance measurements, including financial and non-financial measures, have also a positive effect on JS.

In respect to the relationship between the comprehensive PMS and MP, the findings shown in Table 8.1 are consistent with the argument of Chenhall (2003) who indicated that organisations with more information have facilitated managers to take more effective decisions, which in turn have led to enhancing their performance. The results also support the findings of Abernethy and Guthrie (1994) that provided evidence that better performance was linked to use of a broad scope of information. The findings are also consistent with the results of more recent studies which have shown that management accounting information usage has a positive influence on MP (Cadez & Guilding, 2008; Hammad et al., 2013).

According to the results of testing the direct effect of RC on PE, the findings indicated that RC is an antecedent to PE and that the former has a positive relationship with managers' empowerment at the strategic business units. This is consistent with the

findings reported by previous studies (e.g. Spreitzer, 1995b; Hall, 2008) which pointed out that RC positively predicts PE.

On the other hand, the findings presented in Table 8.2 are a summary of hypotheses tests related to the second part of the second research objective (to examine the indirect relationship between the comprehensive PMS variable and Individuals' Outcomes, including JS and MP through the mediating roles of RC, PE, MMC and MMB) and the second part of the second research question (from questions c to j) about whether cognitive and motivational variables mediate the relationships between the comprehensive PMS and JS, as well as MP. This part of the analysis symbolises the intervening relationship approach, as formulated in Hypotheses 3 - 6 and 9 - 10.

When the data was simultaneously analysed for detecting the mediating effects of the two variables RC and PE on the relationship between the comprehensive PMS and JS, as well as the mediating effects of the four variables RC, PE, MMC and MMB on the relationship between the comprehensive PMS and MP, the results reveal that the first relationship showed that RC and PE have mediating effects on the relationship between the comprehensive PMS and JS. Moreover, the findings related to the second relationship indicated that apart from RC, the other variables of PE, MMC and MMB played mediating roles on this relationship, but RC worked as a suppressor variable. However, by testing and analysing the data to detect the individual mediating roles of RC and PE on the relationship between the comprehensive PMS and JS, as well as the mediating roles of RC, PE, MMC and MMB individually on the relationship between the comprehensive PMS and MP, the findings show in Table 8.2 that RC and PE have mediating effects on the relationship between the comprehensive PMS and JS with large effect sizes, whereas RC, PE, MMC and MMB have mediating effects on the relationship between the comprehensive PMS and MP, but with medium effect sizes. The positive influence of the comprehensive PMS on MP through RC and PE found here is similar to that of Hall (2008) who indicated that cognitive and motivational variables mediate the relationship between the comprehensive PMS and MP. The relationship between the comprehensive PMS and JS through RC is consistent with the findings of Chenhall and Brownell (1988) who found that accounting performance measurement (budgetary participation) has a positive effect on JS through role ambiguity (less clarity), as well as with the findings of Carbonell and Rodriguez-

Escudero (2013), indicating that the effects of management control systems are positive on JS, through role ambiguity. It can be seen that PE has a mediating effect on the relationship between the comprehensive PMS and JS, which agrees with some previous studies (e.g. Liden et al., 2000; Laschinger et al., 2001; Seibert et al., 2004; Fong & Snape, 2014) which point out the mediating effect of PE on the relationship between providing information and access to strategic information (as provided by the comprehensive PMS) and JS. Regarding the relationship between the comprehensive PMS and MP through the mediating roles of both MMC and MMB, then similar to the prior studies of Vandenbosch and Higgins (1996) and Hall (2011), it was illustrated that more information has a significant effect on MMC and MMB, which in turn affects individual performance. However, most of these previous studies have not calculated the effect size measures, but rather they relied on the traditional approach to classify mediators as full and partial mediators, despite their criticism.

Table 8.2 Summary of Hypotheses' Tests Related to the Mediating Effects of Cognitive and Motivational Variables

Hypotheses	Indirect effects			Effect size			Comment
	ab	LLCI	ULCI	K^2	LLCI	ULCI	
H3 Role Clarity has a Mediating Effect on the Relationship between Comprehensive PMS and Job Satisfaction	**.3407**	.1607	.5275	**.2963**	.1457	.4248	Accepted Large effect size
H4 Psychological Empowerment has a Mediating Effect on the Relationship between Comprehensive PMS and Job Satisfaction	**.2979**	.1221	.4818	**.2672**	.1159	.4013	Accepted Large effect size
H5 Role Clarity has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance	**.2390**	.1181	.3894	**.2175**	.1096	.3370	Accepted Medium effect size
H6 Psychological Empowerment has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance	**.2127**	.0942	.3565	**.1984**	.0815	.3117	Accepted Medium effect size
H9 Mental Model Confirmation has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance	**.2282**	.1142	.3747	**.2144**	.1044	.3258	Accepted Medium effect size
H10 Mental Model Building has a Mediating Effect on the Relationship between Comprehensive PMS and Managerial Performance	**.2398**	.1326	.3787	**.2145**	.1175	.3271	Accepted Medium effect size

8.2.3 Findings Related to the Different Effects of FPMR and NFPMR on Individual Outcomes (JS and MP) and the Mediating Effects of Cognitive and Motivational Variables on these Relationships

In respect to the fifth research objective (i.e. to examine the differences between FPMR and NFPMR used in direct relationship to the individual outcomes and indirectly through the cognitive and motivational factors in SBUs at manufacturing companies in Libya), the fifth research question (parts a – h) about the differences between using FPMR and NFPMR in the total relationships with JS and MP, directly with cognitive and motivational variables and indirectly with JS and MP through cognitive and motivational factors in SBUs at manufacturing companies in Libya, the study as shown in Table 8.3 has yielded the following results:

- Both systems (FPMR and NFPMR) have statistically significant total influences on individuals' outcomes However, NFPMR has more impact on both JS and MP than that of FPMR, but this could be clarified more as follows:
  - ➢ NFPMR has a 17 % more direct positive effect on JS than that of FPMR and this is similar to the findings reported by Tan and Lau (2012), which indicated that the results for the FPMR were similar to those of the NFPMR, but with a stronger impact of the latter on JS.
  - ➢ NFPMR has a 27 % more direct positive influence on MP than that of FPMR, which is consistent with the results of Lau (2011), which revealed that NFPMR used by an organisation to evaluate its managers' performance have more impact on MP than that of FPMR.

Table 8.3 Summary of Hypotheses' Tests Related to Differences between FPMR and NFPMR in their Total Relationships

Hypotheses	System	B	More Impact	*Comment*
H11 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Job Satisfaction.	*FPMR*	.4114 Sig.	NFPMR has 17 %	Accepted
	NFPMR	.4821 Sig.		
H12 Financial and Non-Financial Performance Measures and Rewards Have Different Direct Relationships with Managerial Performance.	*FPMR*	.2581 Sig.	NFPMR has 27 %	Accepted
	NFPMR	.3264 Sig.		

- In the direct relationships of both systems (FPMR and NFPMR) with RC and both its dimensions (GC and PC), PE and its four dimensions (ME, COM, SED and IMP) and with MMC and MMB, the results in Table 8.4 have shown that, although there are different statistically significant direct influences of these systems on these cognitive and motivational variables, NFPMR has more effects than that of FPMR and this could be illustrated more as follows:

  - NFPMR has 26 % more effect on overall RC than that of FPMR, which is consistent with the results mentioned by Lau (2011). These effects of NFPMR are similar for both RC dimensions, as could explained as follows:
    - The impact of NFPMR is 26 % more on GC than that of FPMR.
    - The influence of NFPMR is 27 % more on PC than that of FPMR.

  - The relationship between NFPMR and overall PE is 37 % stronger than that of FPMR. As far as the researcher is aware, none of the previous studies have addressed comparing between FPMR and NFPMR in relation to PE. However, the results are similar to those of previous studies which reported that the behavioural effects of non-financial measures are different from those of financial measures (e.g. Lau & Sholihin, 2005; Lau, 2011). However, the effects of FPMR and NFPMR are different in their relationships with the dimensions of PE, as NFPMR also vary widely with these dimensions as shown as follows:
    - The relationship between NFPMR and ME is 85% stronger than that of FPMR.
    - The effect of NFPMR on COM is 58% more than that of FPMR.
    - The influence of NFPMR on SED is 14% more than that of FPMR.
    - The strength of the relationship between NFPMR and IMP is 14% more than that of FPMR.

  - The strength of the relationship between NFPMR and MMC is 37 % stronger than that of FPMR.

  - The strength of the relationship between NFPMR and MMB is 39 % stronger than that of FPMR.

As far as the researcher knows, this is the first research study that deals with comparing between FPMR and NFPMR in their direct relationships with MMC and MMB. However, the findings are similar to the prior study of Choe (2004a), indicating that

non-financial measures have more effect on organisational learning than that of financial measures.

Table 8.4 Summary of Differences between FPMR and NFPMR in their Direct Relationships

variables	FPMR coefficient	NFPMR coefficient	The difference between them	Percentage	System has more impact
JS	0.4114	0.4821	0.0707	17 %	NFPMR
MP	0.2581	0.3264	0.0683	27 %	NFPMR
RC	0.4005	0.5063	0.1058	26 %	NFPMR
GC	0.3139	0.3955	0.0816	26 %	NFPMR
PC	0.4871	0.6171	0.1300	27 %	NFPMR
PE	0.4544	0.6238	0.1694	37 %	NFPMR
ME	0.2436	0.4496	0.2060	85 %	NFPMR
COM	0.5438	0.8579	0.3141	58 %	NFPMR
SED	0.6874	0.7806	0.0932	14 %	NFPMR
IMP	0.3443	0.4088	0.0645	19 %	NFPMR
MMC	0.2486	0.2486	0.0910	37 %	NFPMR
MMB	0.3539	0.3539	0.1390	39 %	NFPMR

JS = Job Satisfaction; MP = Managerial Performance; RC = Role Clarity; GC = Goal Clarity; PC = Process Clarity; PE = Psychological Empowerment; ME = Meaning; COM = Competence; SED = Self-determination; IMP = Impact; MMC = Mental Model Confirmation; MMB = Mental Model Building; FPMR = Financial Performance Measures and Rewards; NFPMR = Non-Financial Performance Measures and Rewards

- As the results show in Table 8.4, related to comparing the indirect relationships of both systems (FPMR and NFPMR) with Individuals' Outcomes (JS and MP) through cognitive and motivational variables, there are different indirect effects of these systems on Individuals' Outcomes (JS and MP) through the mediating roles of cognitive and motivational variables, which could be demonstrated more as follows:

  ➢ RC has a mediating effect on the relationships between both systems (FPMR and NFPMR) and JS, with large effect sizes, but NFPMR have a larger effect size than FPMR.

  ➢ The relationships between both systems (FPMR and NFPMR) and MP are mediated by RC, with large effect sizes, but NFPMR have a larger effect size than FPMR.

  ➢ The effects of both systems (FPMR and NFPMR) on JS are mediated by PE, with large effect sizes, but NFPMR have a larger effect size than FPMR.

➤ PE mediated the relationships between both systems (FPMR and NFPMR) and MP, with large effect sizes. However, NFPMR have a larger effect size than FPMR.

➤ The influences of both systems (FPMR and NFPMR) on MP are mediated by MMC, with a medium effect size for the former and a larger effect size for the latter, indicating that NFPMR have more effect size than FPMR.

➤ MMB has a mediating effect on the relationships between both systems (FPMR and NFPMR) and MP, with a medium effect size. However, NFPMR have more effect size than FPMR.

Table 8.5 Summary of Hypotheses' Tests Related to the Different Effects of FPMR and NFPMR

Hypotheses	Type of Measures	Indirect effects			Effect size			Comment	
		ab	LLCI	ULCI	K^2	LLCI	ULCI		
H13 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through the Role Clarity.	FPMR	**.2659**	.1472	.4077	**.3129**	.1793	.4393	**Large effect size**	Accepted
	NFPMR	**.3347**	.1993	.4947	**.3465**	.2150	.4704	**Large effect size**	
H14 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through the Role Clarity	FPMR	**.2091**	.1075	.3188	**.2538**	.1381	.3673	**Large effect size**	Accepted
	NFPMR	**.2604**	.1433	.3997	**.2772**	.1546	.4006	**Large effect size**	
H15 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Job Satisfaction through the Psychological Empowerment.	FPMR	**.2803**	.1560	.4193	**.3314**	.1988	.4526	**Large effect size**	Accepted
	NFPMR	**.3913**	.2619	.5311	**.3959**	.2891	.4941	**Large effect size**	
H16 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through the Psychological Empowerment.	FPMR	**.2214**	.1174	.3327	**.2695**	.1541	.3792	**Large effect size**	Accepted
	NFPMR	**.3074**	.2032	.4258	**.3188**	.2176	.4239	**Large effect size**	
H17 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through Mental Model Confirmation.	FPMR	**.1733**	.0696	.2833	**.2228**	.0089	.3347	**Medium effect size**	Accepted
	NFPMR	**.2343**	.1225	.3588	**.2634**	.1403	.3874	**Large effect size**	
H18 Financial and Non-Financial Performance Measures and Rewards Have Different Indirect Relationships with Managerial Performance through the Mental Model Building.	FPMR	**.1616**	.0751	.2671	**.1995**	.0933	.3121	**Medium effect size**	Accepted
	NFPMR	**.2216**	.1285	.3420	**.2386**	.1408	.3518	**Medium effect size**	

8.3 Research Contributions

This research study contributes to knowledge in several ways related to the roles of cognitive and motivational variables in explaining the complex relationships between the comprehensive PMS and individual outcomes in general and comparing the effects of FPMR and NFPMR on individual outcomes and through the cognitive and motivational variables in particular, as well as having implications for researchers and practitioners. These are summarised below:

- Although most previous studies on the PMS have examined the nature of this system and its effects in developed countries (see Chapter Three), there is not much known about this system in emerging and less developed countries. Thus, the current research has contributed to the literature by offering empirical evidence related to an emerging economy on this system and the roles of cognitive and motivational mechanisms for helping to explain the effect of the PMS on work behaviour. In particular, the empirical results demonstrated that comprehensive PMS in developing countries such as Libya has a positive direct effect on individual outcomes. It also has a positive indirect effect by clarifying that psychological empowerment is a motivating factor in managers roles. Furthermore, it confirms and updates mental models.

- Although many of the previous studies explicitly or implicitly have utilised a psychology theories' approach, they built rudimentary theoretical frameworks which are overly simple for trying to understand the relationships between psychological variables and their consequences in general, or using one psychological variable for attempting to understand the complex relationship between the PMS and its consequences strategy in particular. In other words, one aspect of simplicity is to examine the relationship between RC or role ambiguity and JS or MP, as well as to investigate the relationship between PE and JS or MP, or using either RC or PE as a simple mediator in the relationship between the MAS/PMS and Individual Outcomes (JS or MP). This means that these types of studies concentrated either on cognitive or motivational variables, which can never be complete without both. Thus, by adopting

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the psychological approach involving both cognitive and motivational mechanisms, the current research has contributed to knowledge by enabling a more informative use of psychology theories in the context of the PMS. Key to this approach is the belief – which is fully supported by the results of the current study - that the cognitive and motivational mechanisms have mediating roles in the relationship between the PMS and individual behaviour and can help to explain this relationship in real life organisations in an emerging economy.

- While most of the previous studies in management accounting have addressed and measured the PMS's comprehensiveness based on one or two dimensions, none of the prior studies have explicitly used all three dimensions to measure it. Thus, this research utilised all dimensions (breadth, alignment with strategy and cause-and-effect relationships) and empirically found that combining all three dimensions gives a valid reliable measure of this PMS construct.

- Most of the prior studies, generally in management accounting and specifically on the PMS, have investigated their relationships with either one or two outcome variables without links to each other. Thus, this study based on an extensive literature review has used two dependent variables (JS and MP) as outcomes and linked them to their antecedents (i.e. comprehensive PMS, RC and PE) and to each other and found that both variables were directly and indirectly influenced by comprehensive PMS and that JS has direct positive relationship to MP.

- Most of the prior studies of management accounting in general and the PMS in particular, have examined the mediating roles of cognitive and motivational factors and have paid attention to either one variable (role ambiguity or clarity) solely, or two variables (RC and PE), whereas this research has investigated four cognitive and motivational variables (RC, PE, MMC and MMB) to attempt to paint a clear picture of the roles of these mentioned variables on the relationships between the comprehensive PMS and JS, as well as MP. As the findings presented in the prior chapter show, considering four variables offered a better opportunity to capture a wider view of the psychological role of the PMS and by later addressing these four

variables individually, as well as breaking them (RC and PE) down into six distinctive dimensions, including two for RC (GC and PC) and four for PE (ME, COM, SED and IMP) determining the precise relevance of each dimension in the relationship between the comprehensive PMS and JS, as well as MP. In particular, the empirical results indicate that all cognitive and motivational variables (RC, PE, MMC and MMB) and their dimensions have a positive mediating effect on the relationships between comprehensive PMS and both JS and MP.

- Although most of the previous management accounting studies used the traditional approach (causal steps approach) in the analysis of mediating relationships, either they used it incorrectly, or in the analysis of these relationships by utilising more than one approach, despite recommendations to use only one approach. When using the traditional approach, there are four order conditions: firstly, the relationship between the independent and dependent variables (total effect) must be statistically significant; secondly, the effect of the independent variable on the supposed mediator must be statistically significant; thirdly, there is a statistically significant relationship between the supposed mediator and the dependent variable by controlling for the independent variable; fourthly, if the relationship between the independent variable and the dependent variable by controlling for the supposed mediator is statistically significant and the value of the coefficient is decreased, partial mediation occurs. If the relationship is not statistically significant, the mediation is full. In addition, the direction of relations must be from the independent variable to the dependent variable and a mediator between them. However, studies which followed this approach and found a statistically insignificant total effect, either completed testing the other steps and proved there is a mediating relationship (Hall, 2008), or adopted another approach besides the first one in order to prove another mediating relationship (Seibert et al., 2004). Moreover, Lau (2011) has used a correlation technique to prove total effect and a mediating relationship, despite the fact that this technique does not specify the direction of the relationship(s). Thus, using this technique is not suitable to examine individual and intervening relationships.

Furthermore, several prior studies have used the Sobel test in examining mediating relationships (ab indirect effect). However, this test assumes that the ab indirect effect is normally distributed, which is only achieved in large samples. Therefore, this study adopted a modern mediation analysis, as practiced in the 21st century and which does not assume that there must be a significant relationship between independent and dependent variables as a precondition and applying this analysis by using the Process macro, as well as utilising bootstrapping for confidence intervals rather than a P value to overcome the criticism related to normality when testing indirect effect (ab), as recommended by Hayes (2013). In other words, to avoid confusion when applying and testing mediating models, particularly in the management accounting as pointed out in Chapter Three, this study offers practical guidelines to researchers for establishing their analysis and interpreting their findings.

- Furthermore, Most of the previous management accounting studies investigated and reported the mediating effect as full and partial mediation. Notwithstanding the cautions of Baron and Kenny (1986), who stated that at least in psychology, full mediation is expected to be very uncommon due to the prevalence of multiple mediators. Common usage of this description tended to denote either that this effect is of practical importance (when indicating that an effect is complete/full, it holds the implication which implies "large" or "important," while describing an effect as partial carries the meaning that it is negligible or not impressive and requires to look for other mediators), or complete/full indicates that there is no room for additional mediators, whereas partial potentially implies that it is required to continue searching for further mediators. Given such criticisms, as well as suggestions that recommend using effect size measures, the current study has offered a significant contribution in relation to how to identify, measure, and interpret mediated relationships. It classified the effect size measures as small, medium and large. As far as the researcher is aware, this study is one of the first management accounting studies that has adopted Maximum Possible Indirect Effect and its standardized version, which is

called kappa-squared (K^2) and is characterized as independent of sample size to report the results of effect size measures. Therefore, distinguishing between these three types of mediation demonstrated in this study aids better understanding and provides a deeper interpretation in intervening relationships. These found significant relationships between comprehensive PMS and Job Satisfaction through RC and PE. In RC and PE the effect was large whereas in other relationships although they were significant the effects were of a medium size.

- Most of the previous studies related to the PMS, including both dimensions (financial and non-financial), have examined the effects of the PMS and its consequences based on one dimension and apart from Lau (2011) who has investigated the different effects of financial and non-financial performance measures on MP through RC, none of the prior research has studied the different effects of financial and non-financial performance measures on their outcomes through cognitive and motivational variables. Therefore, this study endeavoured to identify the different effects of both FPMR and NFPMR on JS and MP (total effects), on cognitive and motivational variables (direct effects) and on JS and MP through cognitive and motivational variables (indirect effects) and found that NFPMR has stronger and more effect size than that of FPMR in all its relations.

- Contrary to most of the prior empirical management accounting research (e.g. Abulghasim, 2006; Alkizza, 2006; Leftesi, 2008; Abugalia, 2011) in Libya, which was concerned mainly with assessing the adoption rate of the MAPs, or sought to identify the usage state of the conventional and advanced of them and more recently little research (e.g. Haedr, 2012) has been conducted on the use of management accounting information and its mediating role in order to understand the effective design of the MCS, so the present study makes a further step forward by empirically determining the comprehensiveness of the PMS and which provides strategic information that affects individual behaviours through cognitive and motivational mechanisms. Therefore, this research has dealt with the behaviour consequences of the PMS, which contributes to enabling a better understanding of PMSs in an

emerging economy and empirically indicates that this type of system has a positive direct effect on three aspects of managers' behaviour. These three are Role Clarity; psychological empowerment and learning. These three in turn positively affect managerial performance.

8.4 Limitations and Future Research

This research study, as with all studies, has a number of limitations and offers some suggestions which should be considered for conducting future research. These are presented as follows:

- As stated in Chapter Four, this study used only the sample comprised of relatively large and medium-sized manufacturing companies in Libya and was also drawn from only managers at SBUs, so therefore the generalisability of the findings could not be applied to small manufacturing companies, or other organisations in other industries such as the service industry, or to companies in another country. In addition, it is not clear if the results could be generalised to managers at below or above business unit level. Consequently, if this study is replicated by using samples from different industries and managers at different levels in Libya, or other countries (developed or developing countries), the possibility of generalising the findings would be increased and the understanding of the research issues could be enhanced and developed. Another concern to take into account is sample selection (large and medium-sized manufacturing companies in Libya). In this study, as mentioned in Chapter Four (Section 4.10), the sample was chosen based on incomprehensive lists provided by the government, therefore caution is needed when trying to generalise the findings as these place limitations on the results.

- The responding companies, as mentioned in Chapter Five, involved several different categories of ownership (i.e. state-owned, private and joint-venture), which makes it difficult to freely generalise the results to all types of companies. Thus, another future study may take into account the potential impact of ownership type on the relationships investigated by this research. Moreover, participants' backgrounds are

another limitation. Despite the fact that every effort was made to ensure that the appropriate respondents participated in the questionnaire, it may be that the background of the respondents (SBU managers) affected their views of the research issues addressed by the study, their interpretation of the questionnaire and thus, their responses.

- This research relied completely on a questionnaire survey as the main method for gathering data and which was quantitatively analysed by appropriate statistical techniques. Therefore, using this tool adds another limitation to this study. Not to mention the small sample size, although it is considered adequate in this case because of the relatively small population of large and medium-sized companies in Libya and that the study used suitable statistical techniques (Process) for the small sample sizes.

- Despite the fact that the inclusion of variables into this study was based on an extensive review of the relevant theoretical and empirical literature, some essential variables may have been inadvertently omitted. Thus, there is an opportunity for any missing variables to be included in conducting further future research by identifying and investigating their effects. Although the comprehensiveness of the PMS to produce strategic information is important, the well-designed and well implemented aspects of these systems may have impacts on their effectiveness in providing high quality information which should be taken into account in future research. In addition, organisational variables such as top management support, training and participation in the PMS design, may affect the effectiveness of the PMS and its types in the Libyan context.

In addition to what is mentioned above, several questions have arisen from the research results and discussions which would indicate the need for more empirical research to be carried out in this area. Many suggestions and opportunities for future research are proffered in this study as follows:

- There is another opportunity for future research by replicating this study on organisations of a smaller size and from other industries, such as the financial

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services industry, as well as using other different samples to identify the effect of the comprehensive PMS on managers' behaviours at below and/or above business unit level. Other possible future research can be done by including other mediating variables, such as fairness, interpersonal trust and commitment, in the model. Therefore much more research is required before the behavioural effects from using a PMS and its types (e.g. the comprehensive PMS, FPMS and NFPMS) could be fully understood.

- As mentioned in this research, the design and implementation of the PMS may have played important roles in the effectiveness of the PMS and which in turn produces high quality information that affects individual behaviour, so further research can be built around including these variables and through applying them on manufacturing companies, or in more depth by using comparative case studies in a developing country,

- Due to the nature of the cross-sectional data which was related to the methodology of this research, relationships of causality between the study's variables could not be assumed from the results of the regression analysis, with the exception of a statement that the results were according to the hypotheses stated in the study, and therefore more caution should be used in dealing with them. Therefore, to refer to causality via words like, 'affect', 'influence' and 'effect', as used by this study, should be carefully interpreted. Possible further research is by examining and evaluating causal relationships between variables and by adopting a longitudinal method study, which could advance our understanding of how the PMS affects work behaviour through cognitive and motivational variables over time.

- Organisational factors (e.g. top management support, training, participation in PMS design) can be antecedent to the comprehensive PMS and may affect the effectiveness of this system. Therefore, further research can be done to seek out any mediating effects of the comprehensive PMS and psychological variables on the relationships between organisational variables and individual behaviour and to test these relationships as serial mediators. Moreover, the combination of moderating and

mediating model variables as moderated mediation or mediated moderation would be promising for future research. Particularly, it would be fruitful to examine at what level, or for which group, is the mediating effect found in this research, by investigating whether there is moderated mediation and/or mediated moderation and/or a conditional process.

- As this study indicated that the comprehensive PMS as a part of the MCS has affected learning at the managerial level, there is wide scope to examine how other features of the MCS, such as different forms of cost information, or different elements of the levers of the control framework (Simons, 1995; Widener, 2007), linked to MMC and MMB. Specially, the strong effect of MMB on MP shows that much can be achieved by investigating how elements of the MCS may be able to facilitate the MMB of managers. Sprinkle (2000) mentioned that the propensity of managers to learn can be increased through providing information from the MCS, but that it is influenced by different types of incentive contracts. As such, future study could examine how feedback from the more comprehensive PMS is related to learning processes under different incentive arrangements.

- A further future research avenue is to consider how the role of the PMS may be affected by the personal styles and preferences of different managers in facilitating learning. It is likely that differences in learning preferences, or cognitive styles, affect whether and how managers use the PMS in learning processes (Chenhall & Morris, 1991; Cheng, Luckett, & Schulz, 2003). Further research could also examine how the comprehensive PMS relationship to mental model building is affected by different strategies, levels of uncertainty and the need for innovation. Finally, this research study addressed the effects of the comprehensive PMS, FPMR and NFPMR on learning processes amongst SBU managers at manufacturing companies. Therefore, research on how the comprehensive PMS helps or impedes learning in more knowledge-intensive companies represents a promising line of inquiry (Ditillo, 2004).