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The influence of comprehensive performance measurement system (CPMS) towards managers' role ambiguity

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Abstract

Comprehensive PMS (CPMS) has been widely used for decision facilitating and decision influencing purposes. Role theory suggests that CPMS information is useful for enhancing role expectation and motivation. Prior research shows inconsistent findings and research that examines behavioural consequences of CPMS informational characteristics is still lacking. This research examines how CPMS may influence managers' role ambiguity. The data were collected from 120 business unit managers of manufacturing firms listed in the Federation of Malaysian Manufacturers (FMM) 2011 Directory. Consistent with prior literature, findings indicate that CPMS informational characteristics would reduce managers' role ambiguity.

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Keywords: Comprehensive performance measurement system; role ambiguity

1. Introduction

Performance measurement has become a central issue for academicians and practitioners started in the early of 1990s. Performance measurement based on traditional cost or management accounting system (MAS) was introduced in early 1900s (Ghalayini et al., 1997). However, changes in technology, shortened in product lifecycle, innovation in production processes have implications on the use of PMS. Traditional financial measures are no

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longer adequate to provide required information essential for managers' decision making (Eccles, 1991; Eccles & Pyburn, 1992; Ittner & Larcker, 1998), thus was claimed lack of comprehensiveness, imprecise in evaluating performance, limited focus on long term performance and focus more on short term performance (Ittner & Larcker, 1998). Consequently, Kaplan and Norton (1992) introduced the Balanced Scorecard (BSC) to account for the limitation of the traditional accounting system which provides measures focused on multiple nonfinancial and financial measures (Kaplan & Norton, 1996). Previous studies focused on research examining the effect of SPMS such as BSC on organisational performance (Chenhall, 2005; Davis & Albright, 2004; Hoque & James, 2000; Hyvonen, 2007; Ittner et al., 2003; Said et al., 2003; Van der Stede et al., 2006).

Nevertheless, only few researches had examined how SPMS would influence manager's behaviour (Burney & Widener, 2007; Ittner & Larcker, 1998; Webb, 2004). Further, prior research identified that the relationship between PMS and individual outcomes is mediated by factors such as role ambiguity and job relevant information (Burney & Widener, 2007), procedural fairness, organisation commitment (Lau & Moser, 2008), psychological empowerment and role clarity (Hall, 2008), trust and fairness (Lau & Sholihin, 2005) and justice perception (Burney et al., 2009).This line of research provides evidence that PM system plays an important influence on manager behaviour which is generally recognised by organisational theory that individual actions largely contribute to the organisation's long-term success (de Haas & Kleingeld, 1999; Otley, 1999). Thus, there is a need to further investigate other factors that may influence the relationship. The purpose of the study is to add to our understanding of the relation between CPMS and manager's behaviour particularly, in the context of Malaysian manufacturing companies as no prior research has so far examined the relationship. Additionally, this paper will also extend the research by Hall (2008) to further examine the implication of the informational aspect of PMS, particularly, comprehensive PMS on managerial behaviour. Research will focus on cognitive abilities of manager in using information provided by CPMS and how the information will affect managers' behaviour. Longenecker, Neubert and Fink (2007) identified main reasons of managerial failure in the twenty first century includes ineffective communication, poor work relationship, and failing to set clear direction or clarify performance expectation.

As a consequence of these factors embedded in managers, employees suffer dysfunctional stress, non-optimal performance and increased turnover of personnel. When employees are not given clear sense of direction, motivation will decrease which will lead to ineffective resource allocation. Additionally, Chenhall (2003) claimed that there is implied connection between MCS and organisational outcomes. Since there is a broad leap linking MCS and organisational performance, it is necessary to focus on MCS implication on the individual manager behaviour in a way to improve organisational performance. Past researches examining the link between SPMS and organisational performance seem to provide ambiguous finding (Chenhall, 2005; Micheli & Manzoni, 2009). Positive implications were identified by some studies which found that SPMS may lead to enhance ROA and ROE (Ittner & Larcker, 2003), improve organisational performance (Hoque & James, 2000; Said et al., 2003; Van der Stede et al., 2006) and improve composite financial measure (Davis & Albright, 2004). However few studies reveal equivocal findings or SPMS limitations (Hyvonen, 2007; Ittner et al., 2003). Ittner, et al. (2003) identified greater measurement emphasis and diversity or BSC process are associated with higher satisfaction and stock market performance; however no association was found between BSC and economic performance.

Management accounting information particularly, performance measures provide two main purposes; decision influencing role and decision facilitating role (Grafton et al., 2010; Kren, 1992; Sprinkle, 2003; van Veen-Dirks, 2010). Kren (1992) and Sprinkle (2003) claimed that performance measure is used for decision-influencing role in performance evaluation functions. Performance measure for decision-facilitating refers to the use of performance measure to provide information and guide managers in decision-making. The cognitive role of CPMS suggests that CPMS would provide job relevant information, reduces role conflict and role ambiguity (Burney & Widener, 2007); enhance goal commitment (Webb, 2004) and increase role clarity and psychological empowerment (Hall, 2008). Another focus of PMS research is on behavioural consequences of CPMS on evaluators or superior. The use of CPMS for performance evaluation would lead to judgemental bias by superior when comparing performance across different business units (Lipe & Salterio, 2000), may lead to compress and lenient performance rating (Moers, 2005) and influenced by strategically linked measures more than non-linked measures (Banker et al., 2004). The use of SPMS (BSC) can be problematic as managers tend to ignore certain information from PMS

(Banker et al., 2004; Lipe & Salterio, 2000; Moers, 2005). Limitation in cognitive abilities explains the reason why individual manager is unable to process a lot of information. These findings imply more complex and indirect relationship between SPMS and managerial performance. PMS is expected to be able to provide feedback to managers which can indirectly enhance managers' motivation.

Contemporary PMS is also identified that may result in detrimental effects due to managers' limited cognitive ability to cope with incompatible demands from the inclusion of multiple goals (Cheng et al., 2007). The use of PMS was also found may not be able to provide better informational feedback. In addition, it may lead to negative effect due to reduce mission clarity and subordinate trust that may result in reduced motivation (Van Rinsum & Verbeeten, 2010). Thus, it is expected that CPMS will be able to provide better information which will reduce manager's role ambiguity. The research model is as presented in Figure 1.

2. Literature review

2.1 Comprehensive Performance Measurement System (CPMS)

Prior PMS related research have explored various characteristics of SPMS; particularly performance measure diversity (Henri, 2006; Ittner et al., 2003; Moers, 2005), subjective performance measure (Moers, 2005; Van der Stede et al., 2006) objective performance measure (Van der Stede et al., 2006), formality of performance measure (Hartmann & Slapnicar, 2009), multiple performance measure (Sholihin & Pike, 2008) and comprehensive measure of performance (Burney & Matherly, 2007; Hall, 2008; Scott & Tiessen, 1999). However, most of these researches focus on diversity of measurement in which the PMS in these studies was described as a broad set of measures which comprise the combined use of financial and nonfinancial measures.

Scott and Tiessen (1999) examined link between performance measurement and team performance had also measure comprehensiveness based on diversity of measure captured using variety of performance measurements that were grouped into financial performance (cost, revenue or return) and five categories of non-financial performance (productivity, quality, service, innovation and personnel). Burney and Matherly (2007) had also use diversity of measure to reflect performance measure comprehensiveness. The system comprehensiveness captures the extent to which a PM system contains a broad spectrum of performance measures. Measures are classified into 8 categories with reference to BSC perspectives includes financial outcomes, customer outcomes, product/service quality, operational performance, innovation in processes, employee outcomes, information systems capabilities and organisational procedures.

Van der Stede et al. (2006) had also in the view that measurement diversity is an important feature of more comprehensive PMS. Their research suggests that comprehensive PMS is an extensive PMS which include financial measure of performance and non financial measure of performance comprise of subjective and objective nonfinancial measure. Exploratory study of Chenhall (2005) had suggested another characteristic of comprehensive PMS. His study had identified key dimension of SPMS such as BSC can assist managers to develop their competitive strategies. He claimed that SPMS has distinctive feature able to provide managers with financial and non financial measures which in combination providing information for managers to translate strategy into a coherent set of performance measures and to develop competitive advantage. In addition, Chenhall (2005) argued that comprehensive PMS provide understanding of the linkages between business operations and strategy.

SPMS was also identified to provide quality information (White, 2008). A survey research by White (2008) examined the relation between the use of financial and nonfinancial performance measures in a SPMS and SPMS outcomes in particular, information quality and effectiveness. Based on the survey data from a sample of 1990 organisations, result shows nonfinancial measures have the strongest correlation with both information quality and effectiveness. Hence, the result indicates that the wider the scope or comprehensiveness of measure used in the performance measurement system, the higher the quality of information produced by the system. This result

implies that as the company include more measures in the SPMS design, the better the quality of information produced by the SPMS.

Analogous to the study, Nanni, Dixon and Vollmann (1992) also suggest comprehensive PMS to include measures that integrate with strategy to provide information relating to the important areas of the firm and about parts of the value chain. Nanni et al. (1992) in the study provide empirical evidence of how PMS has developed from a traditional management accounting to strategically-driven performance management systems. Integrated PMS can provide relevant information about performance dimension of different part of the business. According to Malina and Selto (2001), BSC is considered comprehensive as the system provides firm with a more broad set of performance measures than the traditional PM. The system covers a set of things together and uses them to manage the business.

According to Malina and Selto (2001) balance scorecard is a comprehensive PMS that includes the key financial and non-financial measures which reflect overall success in managing firm critical factor. Particularly, BSC gives a broader set of measures of success than the more traditional financial and market share. Thus, CPMS would provide managers with sufficient information related to how they are managing the overall business for both current and future results (Malina & Selto, 2001, p. 70). The measures wrap a set of things together which make sense for managing the business. Evidence also shows CPMS promotes strategic alignment as the system consists of parsimonious set of performance measures which are linked to firm strategy.

In this research, drawing on the work by Hall (2008), comprehensive PMS refers specifically to the broad set of measures (Burney & Matherly, 2007; Scott & Tiessen, 1999) associated to the main parts of the organisation (Ittner et al., 2003; Malina & Selto, 2001). PMS is comprehensive as the broad set of measures are associated and designed to provide information relating to the performance of all the important areas of the firm (Henri, 2006; Nanni et al., 1992). Comprehensive PMS integrates measures with strategy and provides information about parts of the value chain (Nanni et al., 1992). In addition, Chenhall (2005) had also argued that comprehensive PMS is designed to include financial and non financial measures which cover wider perspectives and provide understanding of the linkages between business operations and strategy.

2.2 Role ambiguity

Role ambiguity is one of the dimensions of role theory construct. Role ambiguity exists when individual manager has insufficient information to select the most effective job behaviors or when duties, authority and responsibilities are unclear (Burney & Widener, 2007; Tubre & Collins, 2000). It is also referred to as the incompatibility between information required to perform task and available information (Burney & Widener, 2007). Main source of role ambiguity are organisational stress and complexity, rapid organisational growth, reorganization, technological advances, high rate of personnel changes and changes in organisational environment (Kahn et al., 1964). According to Rogers & Molnar (1976), this role construct dimension has a significant influence on performance.

According to Collins (1982), MAS information is vital in control process. Research by Collins (1982) explores the relationship between MAS and organisational control. Research observed that organizations consist of role systems in which social control would be effective if management able to control organisational values, norms and role expectations. In the context of role theory, Collins (1982) contend that MAS is useful to communicate role expectation and was also found to have motivational effect to influence performance. Thus, more comprehensive PMS would be able to provide more relevant information that can enhance role clarity of the manager. Prior literatures also revealed the cognitive role of traditional PMS (Chenhall & Brownell, 1988; Chong et al., 2006; Kren, 1992).

Recent PMS related research had also explored the implication of SPMS on managerial behaviour (Burney & Widener, 2007; Hall, 2008). These cognitive and social psychology research shows that informational effect of SPMS helps manager focus their mental representations of the business. Burney and Widener (2007) identified that SPMS is associated with job relevant information (JRI) lead to reduce in the level of role ambiguity. Finding shows that PMS that is closely linked to strategy is associated with lower level of role ambiguity. JRI and role ambiguity are similar constructs in that the latter reflects the extent to which managers understand their duties and

responsibilities, while the former is a measure of the information available to managers to accomplish job-related tasks (Kren, 1992).

As a consequence, SPMS can provide manager with better communication, consistent and clear information about managers' job expectations. Hall (2008) identified CPMS able to increase manager's role clarity and enhance motivation or empowerment lead to improve in performance. In fact Rizzo et al. (1970) provides empirical evidence that formalisation of goal in an organization is associated with reduced role ambiguity. Consistent with Jackson and Schuler (1985) and Rogers and Molnar (1976) also found association between formalisation of goal and role ambiguity. PMS includes formal goal which are set in advance and in written form. Formalisation such as existence of written rules and procedures governing work activities help clarify role perceptions for the employees. In other words, a more comprehensive PMS would aid in formalisation of goal that can enhance role clarity of the managers.

CPMS such BSC also has certain characteristic which will create a way for the company to communicate and reinforce strategy through its levels of management. BSC strategy link involves top management consensus regarding organization strategy (Epstein & Manzoni, 1998). Similar to the Tableau de bord, Balanced Scorecard concept can be cascaded down to individual manager who use the scorecard 4 perspectives to organize their personal goals and attach them to the larger unit's strategic framework. The process involved would reduce managers' ambiguity leads to better role expectations of individual and his superiors.

3. Theoretical framework and hypotheses development

The theoretical framework for this study is developed based on the cognitive and motivational psychology theory that is applicable in the context of management accounting environment. The theory describes how individual cognitive processing of management accounting information influences individual behaviour (Birnberg et al., 2006). Additionally, the theory was also claimed able to provide explanation of how feedback can affect performance (Renn, 2003). Feedback would affect performance through facilitating error correction (cognitive perspective) as well as through internal work motivation (motivational perspective). Role theory is also used to support the relationship exists among the constructs in the study.

Thus, in the context of individual manager, information provided to an individual may lead to certain behavioral implication that can affect individual performance. From these bases, this study proposes the following model of the relation between CPMS and role ambiguity. Based on the theoretical framework developed in Figure 1, it proposes hypotheses to support the research model. The hypotheses are constructed to propose direct effect between constructs.

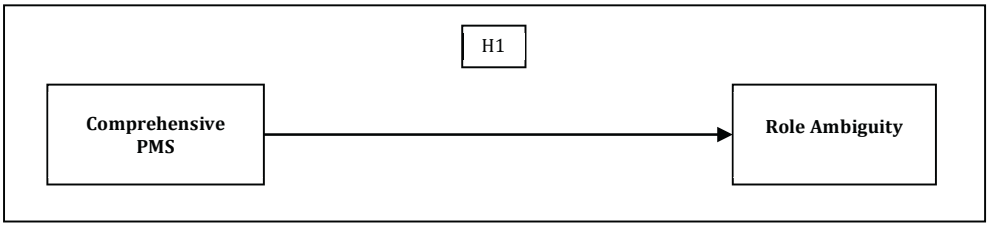

Fig. 1. Conceptual framework presents the relationship between CPMS and role ambiguity.

3.1 CPMS and role ambiguity

The model proposed in Figure 1 suggests that CPMS is associated with reduced level of role ambiguity. Role ambiguity exists when individual perceives that there is lack of clarity in the behavioural requirement in their job (Rizzo et al., 1970). According to Atkinson, Waterhouse and Wells (1997), comprehensive PMS plays important role in coordinating, monitoring and diagnostic in an organization. Particularly, monitoring role of comprehensive

PMS would be able to provide feedback on assessment of progress in achieving organisational goal. Ilgen et al. (1979) suggests that feedback from MAS (internal source) can provide comprehensive information that can clarify the role of managers. Since PMS is part of MAS, more comprehensive PMS would provide comprehensive information to clarify role expectation of the managers. Thus, this research anticipates more comprehensive PMS would provide more information to the managers to reduce role ambiguity.

Additionally, Ilgen et al. (1979) argue that feedback would affect individual behavior as it is necessary for effective role performance. It is also highlighted that feedback can help individual to learn and to perform task more effectively. Similarly, psychology research by Colin (1982) in the context of role theory contends that MAS can provide information on the role expectation of an individual and has a motivational effect to influence performance. Further, Burney and Widener (2007) conducted PMS related research provided evidence of the link between SPMS and job relevant information (JRI). Particularly, findings of their research indicate positive direct and indirect association between SPMS and role ambiguity. SPMS has direct negative relation with role ambiguity. Additionally, their findings also indicate the relations between SPMS and role ambiguity is via enhancing JRI. SPMS enhances JRI and subsequently lead to reduce role ambiguity (Burney & Widener, 2007). Sprinkle (2003) had also highlighted the two functions of performance measure as decision influencing and decision facilitating roles. Decision facilitating role refers to the function of performance measure for providing relevant information to guide managers in decision-making (Kren, 1992; Sprinkle, 2003).

Another PMS related research by Hall (2008) provides evidence which revealed the importance of comprehensive PMS for role clarity. His research find support for the relation between comprehensive PMS and managerial performance through goal clarity and process clarity. Furthermore, Rizzo et al. (1970) provide empirical evidence that formalization of goal were negatively related to role ambiguity. This finding is also supported by Roger and Molnar (1976) who had also identified negative relation between measure of formalization (goal clarity and formalization index) and role ambiguity. Since more comprehensive PMS provide formal goals which are set in advanced and in a written format, thus research proposes more comprehensive PMS would reduce role ambiguity. Thus, research proposes that the cognitive role of comprehensive PMS is expected to reduce subordinates' levels of role ambiguity and consequently lead to enhance job performance. Accordingly, the following hypothesis is proposed;

H1: There is negative relation between CPMS and role ambiguity

4. Research method

4.1 Sample selection and data collection

In this research data was collected using a questionnaire surveys administered to the business unit managers within Malaysian manufacturing organizations. Selection of sample from only manufacturing companies was to present some degree of control for industry (Lau & Moser, 2008), furthermore development of more comprehensive PMS is related to manufacturing environment as they are more receptive to contemporary PMS (Ong & Teh, 2008). In addition, prior literature on strategic PMS are also relates to manufacturing organization (Hall, 2008; Burney & Widener, 2007). A study in Malaysia context by Ong and Teh (2008) also indicates that larger companies are more likely to use a contemporary PMS than SMEs as larger companies have more resources to respond to the need for a deeper and more sophisticated pool of knowledge and expertise to implement the more innovative 'contemporary' PMS.

From September to December 2011, a total of 600 surveys were mailed out to 600 managers. The selection of managers was made through a random sample of companies selected from the Federation of Malaysian Manufacturer (FMM) directory of Malaysian industries 2011. The number also forms the sampling frame of the study. Only companies with more than 150 employees were included in the sample. A total of 134 responses were returned however 14 were incomplete thus leaving 120 useable responses yielding a response rate of 20%. Data was also tested for any non response bias problem. Sample was dichotomised into 2 groups based on the response dates; early and late respondents. There are 67 early responses or those who replied within a month and 53 late responses are those who replied after one month. The independent t-test result is presented in Table 1. Results

show that there is no significant different between the means indicating there is no different in the answers given by the two groups. Thus, non-response bias does not appear to be problematic and can be ignored in the present study.

Table 1. Non Response Bias Analysis.

Variables	Early responses n = 67		Late responses n = 53			
	Mean	Std Deviation	Mean	Std Deviation	t	p
CPMS	5.1313	0.94500	5.1069	0.87867	0.144	0.885
ROLEAMB	2.6990	0.87821	2.7987	0.83292	- 0.632	0.529

CPMS (Comprehensive PMS); ROLEAMB (Role ambiguity)

4.2 Descriptive analysis

Table 2 presents the profile of the respondent in this study. More than 80% of the respondents are in the range of 30 to 50 years age group. Almost 90% of the respondents are middle manager or above with more than 70% of the respondents have at least 5 years working experience.

Table 2. Profile of Respondents.

Demographic variables	Categories	Frequency	Percentage
Gender distribution	Male	102	85
	Female	18	15
Age	Below 30 years	5	4.2
	30 to 40 years	48	40
	41 to 50 years	51	42.5
	51 to 60 years	15	12.5
	Above 60 years	1	0.8
Education	SPM/STPM	9	7.5
	Diploma	18	15
	Bachelor degree	63	52.5
	Master or above	24	20
	Professional certificate	5	4.2
	No information	1	0.8
Work experience	Below 5 years	33	27.5
	5 to 10 years	26	21.7
	Above 10 years	61	50.8
Current position	Top management	44	36.7
	Middle management	61	50.8
	Low management	11	9.2
	Supervisor	3	2.5
	Others	1	0.8
Experience in current position	Below 5 years	70	58.3
	5 to 10 years	31	25.8
	Above 10 years	19	15.8

The profile of firms is as presented in Table 3. The largest number of firms participated in the survey involves in food and chemical industries. The proportion of locally owned and foreign owned firm is almost equal, 47% and 48% respectively. The result also indicates majority of the samples are large firms. This is based on the number of employees which indicates almost 90% of the firm samples have more than 150 employees. Additionally, there is high percentage of firms hold total assets and sales revenue above RM100 million.

Table 3. Profile of Firms.

Demographic variables	Categories	Frequency	Percent
Industry Category	Electrical and electronics machinery and appliances	20	16.7
	Food, beverage and tobacco	22	18.3
	Textiles, clothing and footwear	2	1.7
	Transport and automotive	8	6.7
	Wood and timber products/Furniture manufacturing	7	5.8
	Chemical, gas and petroleum	23	19.2
	Metallurgical or metal goods	16	13.3
	Others	21	17.5
	No information	1	0.8
Ownership structure	Local (>50% local equity)	56	46.7
	Joint-venture (50% local and 50% foreign equity)	6	5
	Foreign (>50% foreign equity)	58	48.3
Number of employees	Below 301	44	36.7
	Between 301-450	26	21.7
	Above 450	50	41.7
Total assets	Less than RM2.5 million	3	2.5
	Between RM2.5 - RM50 million	45	37.5
	Between RM51 - RM100 million	20	16.7
	Above RM100 million	47	39.2
	No information	5	4.2
Sales revenue	Less than RM5 million	2	1.7
	Between RM5 - RM10 million	7	5.8
	Between RM11 - RM25 million	10	8.3
	Between RM26 - RM50 million	12	10.0
	Between RM51 - RM100 million	21	17.5
	Above RM100 million	68	56.7

Table 4 presents descriptive statistic for the main variables in the study. The observed mean for CPMS, organisational commitment and job performance are all lies a little above theoretical means. For CPMS, the result is as expected since the samples used in the study consist of large manufacturing companies. Large-sized organizations are expected to have more sophisticated and specialised accounting and control procedures (Lau & Moser, 2008).

Table 4. Descriptive Statistics of the Main Variables (n=120).

Variable	Mean	Median	Standard Deviation	Actual Range		Theoretical Range	
				Min	Max	Min	Max
CPMS	5.120	5.111	0.912	1.78	7.00	1.00	7.00
ROLEAMB	2.743	2.833	0.856	1.00	5.67	1.00	7.00

4.3 Variable measurement

All constructs are measured using validated or established instruments used in prior researches.

4.3.1 Comprehensive PMS (CPMS)

In order to measure comprehensiveness of PMS, this study adopts instrument developed by Hall (2008). Prior research commonly used instrument by Hoque and James (2000) was claimed to have a few limitations whereby firstly, it assumes the measures included in the instruments represent the form of measures particularly implemented by the organization in the sample (Hall, 2008). In actual, organization would have similar types of financial measure. However would have different types of non financial measures as superior or managers tend to focus only on certain information in the PMS as such they rely more on common measures rather than measures unique to particular business unit (Banker, et al., 2004; Lipe & Salterio, 2000).

Secondly, the instrument was also argued failed to pick up strategic linkages of a BSC in real or in practice which is insufficient to represent the actual condition of BSC usage (Hall, 2008; Hoque & James, 2000). The instrument developed by Hall (2008) would capture better representative of PMS comprehensiveness. The

instrument consists of 9 items. 5 items represent the extent to which PMS provides performance information related to important parts of SBU operations. In his study, the other 4 items in the instrument were adopted from Chenhall (2005) to measure the extent to which measures integrate with strategy and value chain. A Likert scale ranges from 1 (not at all) to 7 (to a great extent) is used to indicate the extent of each characteristic exist in the business unit PMS.

4.3.2 Role ambiguity

In this study, same as measurement employed by considerable prior literature, role ambiguity is measured using scales developed by Rizzo et al. (1970). There are 6 items used to measure role ambiguity. Rizzo scale is selected for this research based on its high reliability in prior studies. Furthermore, this eight-item scale is the most extensively used instrument to measure role ambiguity in many prior researches (Jackson & Schuler, 1985; Van Sell, Brief, & Schuler, 1981). In addition, items are also reversed scored and negatively worded in an effort to reduce the effect of response bias (Dale & Fox, 2008). Additionally, all accounting research particularly in budgeting and PMS had also used Rizzo scale to examine role ambiguity (Burney & Widener, 2007; Chenhall & Brownell, 1988; Chong, et al., 2006). Even though Rizzo's measures has come under criticism (Sawyer, 1992), however prior psychometric evaluation of this instruments suggest its continued used appears to be warranted (Schuler et al., 1977). This scale employs a seven-point Likert scale which ranges from 1 (strongly disagree) to 7 (strongly agree).

4.3.3 Structural Equation modelling (SEM) - Partial Least Squares (PLS)

Partial Least Squares (PLS) is one of the SEM techniques. PLS regression analysis through SmartPLS version 2.00 was used to test proposed hypotheses in the current research (Ringle et al., 2005). PLS provides general and flexible technique for testing causal predictive inferences (Hulland, 1999). It is an established technique that is used in many studies to estimate path coefficient in structural model method (Chin et al., 2003). In this study PLS is the statistical technique used as the technique has the ability to accommodate non-normal data, requires no specific distribution assumption about the data and suitable for small sample size (Chin, 2000; Hulland, 1999; Vandenbosch, 1999). Futhermore PLS has been used in many accounting researches (Chenhall, 2004, 2005; Hartmann, 2005; Hartmann & Slapnicar, 2009; Ittner et al., 1997; Webster, 2006). Even though measurement and structural model are estimated together when using PLS, the PLS models were analysed and interpreted in two stages; (1) assessment of the reliability and validity of the measurement model (2) assessment of the structural model (Fornell & Larcker, 1981; Vandenbosch, 1999).

5. Result

5.1 Data analysis

Prior to the assessment of the structural model, the quality of the measurement model was assessed with regard to its reliability and validity of the multi-item scales. Particularly the assessment addressed individual item reliability, construct reliability and the convergent and discriminant validity of the reflective constructs. In the first stage, factor loadings for each variable were examined. All items load on their respective constructs an item which have factor loading below 0.5 (RA1=0.477) (Hulland, 1999). This item was removed from the scale and were not used in subsequent analyses to avoid potential biasing in the estimation of the parameters linked to the construct (Hulland, 1999). In the second stage of PLS analysis, results showed satisfactory reliability, convergent validity and discriminant validity. Results are as provided in Table 5, 6 and 7.

5.2 Measurement model

The properties of the measurement model are as presented in Table 5. Individual item reliability suggests satisfactory item reliability as all factor loadings are higher than 0.6 which implies that more than 50% of the variance observed variable is shared with the construct (Chin, 1998). According to Tenenhaus, Esposito Vinzi, Chatelin and Lauro (2005), in PLS, the measure of internal consistency or construct reliability is Dillon-Goldstein ρ (Werts et al., 1974) which is more preferred than Cronbach's α (Henseler, Ringle & Sinkovics, 2009; Hartmann & Slapnicar, 2009). Cronbach's α tends to give severe underestimation of the internal consistency reliability of latents variables in PLS path models. Alternatively PLS prioritised indicators according to their reliability resulting in a more reliable composite thus are more appropriate to use a different measure, composite reliability (Henseler et al., 2009; Werts et al., 1974). As indicated in Table 5, all composite reliability indicators are above 0.7 indicating satisfactory construct reliability.

For the assessment of validity, two validity subtypes were examined; convergent validity and discriminant validity. Convergent validity appeared acceptable for all the reflective constructs. In Table 5, the average variance extracted (AVE) was at least 0.598, meaning that on average more variance was explained than unexplained in the variables associated with a given construct (Fornell & Larcker, 1981). Discriminant validity has a complementary concept which can be determined in two ways; (1) The Fornell-Larcker criterion and (2) the cross loadings. The former assesses discriminant validity on the construct level whereas the latter allow evaluation made on the indicator level (Henseler et al., 2009). According to Henseler et al. (2009), the Fornell-Larcker criterion postulates that a latent variable shares more variance with its assigned indicators than with any other latent variable. Statistically, the correlation of a construct with its indicators (the square root of the AVE) should exceed the correlation between the construct and any other construct (Fornell & Larcker, 1981).

Table 5. Properties of Measurement Model.

Construct	Indicators	Factor loadings	Composite reliability	Average variance extracted	Cronbach alpha
Comprehensive PMS	CPMS1	0.822	0.945	0.658	0.934
	CPMS2	0.645			
	CPMS3	0.841			
	CPMS4	0.848			
	CPMS5	0.823			
	CPMS6	0.892			
	CPMS7	0.846			
	CPMS8	0.804			
	CPMS9	0.752			
Role Ambiguity	RA2	0.798	0.927	0.719	0.901
	RA3	0.800			
	RA4	0.837			
	RA5	0.911			
	RA6	0.886			

Result in Table 6 suggests sufficient discriminant validity of constructs as all diagonal elements exceed the off-diagonal elements in the corresponding rows and columns. The second criterion of discriminant validity is a bit liberal whereby discriminant validity is met if the loading of each indicator is greater than all of its cross-loadings (Chin, 1998; Henseler et al., 2009).

Table 6. Construct means, standard deviations and intercorrelations from measurement model.

Variable	Mean	SD	Correlations	
			CPMS	ROLEAMB
CPMS	5.120	0.912	**0.811**	
ROLEAMB	2.743	0.856	-0.592	**0.848**

Based on the result in Table 7, all indicators were found to load higher on the intended measured construct than on any other constructs (Chin, 1998; Henseler et al., 2009), thus fulfil another criterion of sufficient discriminant validity. Overall the evaluation of measurement model shows satisfactory result and indicates the constructs are all valid and reliable which appropriate to proceed with the evaluation of the structural model.

Table 7. Cross-loading (full sample, n = 120).

	CPMS	ROLEAMB
CPMS1	0.823	-0.493
CPMS2	0.633	-0.468
CPMS3	0.840	-0.473
CPMS4	0.843	-0.450
CPMS5	0.821	-0.411
CPMS6	0.893	-0.566
CPMS7	0.851	-0.474
CPMS8	0.806	-0.475
CPMS9	0.762	-0.490
RA2	-0.460	0.795
RA3	-0.432	0.791
RA4	-0.502	0.839
RA5	-0.570	0.915
RA6	-0.538	0.891

5.3 Structural model and hypothesis testing

The second stage of the PLS analysis is the evaluation of the structural model for hypotheses testing. The hypotheses were examined based on the path coefficients (β), t-statistics significant value and the variance explained (R^2). The path coefficients indicate the strength and direction of the relationships among the latent variables which have similar explanation as in Ordinary Least Squares (OLS) regression. In addition, the statistical significance of the parameter was assessed using a bootstrap simulation with 500 replacements as there is no specific distribution assumption in PLS (Chin, 1998). Since PLS approach assumes all measured variance is useful variance to be explained (Chin et al., 2003), R^2, a more prediction oriented measure is also used to assess PLS structural models (Hall, 2008).

Table 8 reports the results from the structural model. The t values confirm the significance of hypotheses H1 (β= -0.594). For role ambiguity, result demonstrate negative association with CPMS (t=16.159, p<0.01) (H1). Thus H1 is supported.

Table 8. Path Coefficient and PLS Structural Model Results.

Hypothesis	Path	Path coefficient	t value	Results
H1	CPMS -> ROLEAMB	-0.594	16.159***	Supported

* p<0.10, ** p<0.05, ***p<0.01 (one-tailed)

The variance explained (R^2) of the key endogenous construct is 0.353 which indicate predictive power in the structural model. Based on each R^2 value, results indicate endogenous construct variance was largely explained by the model.

6. Conclusion, limitation and suggestions for future research

The study is expected to have both theoretical implications and practical relevance. Theoretically this research will contribute to the existing literature on MAS, particularly, PMS design. By integrating the role theory, research provides further understanding on the behavioural implication of management accounting information such as CPMS on role ambiguity. The result implies that CPMS could provide feedback and information required by managers to perform their task. The information obtained by manager from CPMS may then reduce role ambiguity of the managers. The findings of the research are consistent with prior studies which identified informational effect of CPMS may provide positive effects on managerial behaviour (Burney & Widener, 2007; Hall, 2008; Webb, 2004). This research will be the first to provide evidence on the effect of CPMS on role ambiguity.

Practically, this research is expected to provide evidence in relation to PMS practice among the Malaysian manufacturing companies. Additionally, this research explores PMS implementation by Malaysian companies and

will provide evidence in terms of PMS implementation and design. Particularly this research determines the comprehensiveness of PMS implementation and the behavioural implication of its practice among the Malaysian companies. From the research, factor that could influence the use of PMS is examined to aid in devising policy and procedure of PMS implementation so as to reduce role ambiguity and to promote employees' commitment at the managerial level.

Similar to other researches, this research is also subject to a few limitations that are common across many quantitative studies. First, questionnaire survey is the main data collection method used in this study whereas it is possible that mailed surveys may not actually reach intended respondent which may affects the final result. On the other hand, combination of methods that incorporate both quantitative and qualitative approach should be able to provide more explanation on the research findings. Thus, future studies may consider examining the same topic but should also adopt an in-depth qualitative case study approach to obtain further insight of the relationship.

Second, the cross-sectional nature of research design adopted in the study could only enable us to examine relationships only at a particular point in time (Zikmund, 2003). Thus, this approach will not be able to assess causality or development of the relationship. Hence future research should also consider using longitudinal data to examine the behavioural implication of PMS implementation over time. Finally, the sample used in this study is from a single firm type, manufacturing sector, although samples are randomly selected, results may not be generalised to other firm type. Hence future studies could also examine whether the same evidence was also shown such as by firms from the service sector.

References

Atkinson, A. A., Waterhouse, J. H., & Wells, R. B. (1997). A stakeholder approach to strategic performance measurement. *Sloan Management Review, v38*(n3), p25(13).

Banker, R. D., Chang, H., & Pizzini, M. J. (2004). The Balanced Scorecard: Judgmental Effects of Performance Measures Linked to Strategy. *Accounting Review, 79*(1), 1-23.

Birnberg, J. G., Luft, J., & Shields, M. D. (2006). Psychology theory in management accounting research. *Handbooks of Management Accounting Research, 1*, 113-135.

Burney, L., Henle, C. A., & Widener, S. K. (2009). A path model examining the relations among strategic performance measurement system characteristics, organisational justice, and extra- and in-role performance. *Accounting, Organizations and Society, 34*(3-4), 305-321.

Burney, L., & Matherly, M. (2007). Examining Performance Measurement from an Integrated Perspective. *Journal of Information Systems, 21*(2), 49.

Burney, L., & Widener, S. (2007). Strategic Performance Measurement Systems, Job-Relevant Information, and Managerial Behavioral Responses--Role Stress and Performance. *Behavioral Research in Accounting, 19*, 43-69.

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

Chenhall, R. H. (2004). The Role of Cognitive and Affective Conflict in Early Implementation of Activity-Based Cost Management. *Behavioral Research in Accounting, 16*, 19-44.

Chenhall, R. H. (2005). Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study. *Accounting, Organizations and Society, 30*(5), 395-422.

Chenhall, R. H., & Brownell, P. (1988). The effect of participative budgeting on job satisfaction and performance: Role ambiguity as an intervening variable. *Accounting, Organizations and Society, 13*(3), 225-233.

Chin, W. (2000). *Partial least squares for IS researchers: an overview and presentation of recent advances using the PLS approach*, http://disc-nt.cba.uh.edu/chin/indx.html

Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.). Modern methods for businesss research (pp. 295-336). Mahwah, NJ: Lawrence Erlbaum Associates, Publisher.

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189-217.

Cheng, M. M., Luckett, P. F., & Mahama, H. (2007). Effect of perceived conflict among multiple performance goals and goal difficulty on task performance. *Accounting & Finance, 47*(2), 221-242.

Chong, V. K., Eggleton, I. R. C., & Leong, M. K. C. (2006). The Multiple Roles of Participative Budgeting on Job Performance. *Advances in Accounting, 22*, 67-95.

Collins, F. (1982). Managerial accounting systems and organisational control: A role perspective. *Accounting, Organizations and Society, 7*(2), 107-122.

Dale, K., & Fox, M. L. (2008). Leadership style and organisational commitment: mediating effect of role stress. *Journal of Managerial Issues, 20*(1), 109(122).

Davis, S., & Albright, T. (2004). An investigation of the effect of Balanced Scorecard implementation on financial performance. *Management Accounting Research, 15*(2), 135-153.

de Haas, M., & Kleingeld, A. (1999). Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organization. *Management Accounting Research, 10*(3), 233-261.

Eccles, R. G. (1991). The Performance Measurement Manifesto. *Harvard Business Review, 69*(1), 131-137.

Eccles, R. G., & Pyburn, P. J. (1992). Creating a comprehensive system to measure performance. *Management Accounting (USA), v74*(n4), p41(44).

Epstein, M., & Manzoni, J.-F. (1998). Implementing corporate strategy:: From Tableaux de Bord to balanced scorecards. *European Management Journal, 16*(2), 190-203.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.

Ghalayini, A. M., Noble, J. S., & Crowe, T. J. (1997). An integrated dynamic performance measurement system for improving manufacturing competitiveness. *International Journal of Production Economics, 48*(3), 207-225.

Grafton, J., Lillis, A. M., & Widener, S. K. (2010). The role of performance measurement and evaluation in building organisational capabilities and performance. *Accounting, Organizations and Society, 35*(7), 689-706.

Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, Organizations and Society, 33*(2-3), 141-163.

Hartmann, F. (2005). The effects of tolerance for ambiguity and uncertainty on the appropriateness of accounting performance measures. *Abacus, 41*(3), 241-264.

Hartmann, F., & Slapnicar, S. (2009). How formal performance evaluation affects trust between superior and subordinate managers. *Accounting, Organizations and Society, 34*(6-7), 722-737.

Henri, J.-F. (2006). Organisational culture and performance measurement systems. *Accounting, Organizations and Society, 31*(1), 77-103.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in international marketing, 20*(2009), 277-319.

Hoque, Z., & James, W. (2000). Linking Balanced Scorecard Measures to Size and Market Factors: Impact on Organisational Performance. *Journal of Management Accounting Research, 12*, 1-17.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: a review of four recent studies. *Strategic Management Journal, 20*(2), 195-204.

Hyvonen, J. (2007). Strategy, performance measurement techniques and information technology of the firm and their links to organisational performance. *Management Accounting Research, 18*, 343-366.

Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of Individual Feedback on Behavior in Organizations. *Journal of Applied Psychology, 64*(4), 349-371.

Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research, 10*, 205.

Ittner, C. D., & Larcker, D. F. (2003). Coming Up Short on Nonfinancial Performance Measurement. *Harvard Business Review, 81*(11), 88-95.

Ittner, C. D., Larcker, D. F., & Rajan, M. V. (1997). The Choice of Performance Measures in Annual Bonus Contracts. *The Accounting Review, 72*(2), 231-255.

Ittner, C. D., Larcker, D. F., & Randall, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society, 28*(7-8), 715-741.

Jackson, S. E., & Schuler, R. S. (1985). A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings. *Organisational Behavior and Human Decision Processes, 36*(1), 16-78.

Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D., & Rosenthal, R. A. (1964). Organisational stress: Studies in role conflict and ambiguity.

Kaplan, R. S., & Norton, D. P. (1992). The Balanced Scorecard--Measures That Drive Performance. [Article]. *Harvard Business Review, 70*(1), 71-79.

Kaplan, R. S., & Norton, D. P. (1996). Using the Balanced Scorecard as a Strategic Management System. *Harvard Business Review* Retrieved 1, 74, from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9601185348&site=ehost-live

Kren, L. (1992). Budgetary Participation and Managerial Performance: The Impact of Information and Environmental Volatility. *Accounting Review, 67*(3), 511-526.

Lau, C. M., & Moser, A. (2008). Behavioral Effects of Nonfinancial Performance Measures: The Role of Procedural Fairness. *Behavioral Research in Accounting, 20*(2), 55-71.

Lau, C. M., & Sholihin, M. (2005). Financial and nonfinancial performance measures: How do they affect job satisfaction? *The British Accounting Review, 37*(4), 389-413.

Lipe, M. G., & Salterio, S. E. (2000). The Balanced Scorecard: Judgmental Effects of Common and Unique Performance Measures. *Accounting Review, 75*(3), 283.

Longenecker, C. O., Neubert, M. J., & Fink, L. S. (2007). Causes and consequences of managerial failure in rapidly changing organizations. *Business Horizons, 50*(2), 145-155.

Malina, M., A. , & Selto, F., H. . (2001). Communicating and controlling strategy: An empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research, 13*, 47.

Micheli, P., & Manzoni, J.-F. (2009). Strategic Performance Measurement: Benefits, Limitations and Paradoxes. *Long Range Planning, In Press, Corrected Proof*.

Moers, F. (2005). Discretion and bias in performance evaluation: the impact of diversity and subjectivity. *Accounting, Organizations and Society, 30*(1), 67-80.

Nanni, A. J., Jr., Dixon, J. R., & Vollmann, T. E. (1992). Integrated Performance Measurement: Management Accounting to Support the New Manufacturing Realities. *Journal of Management Accounting Research, 4*, 1.

Ong, T. O., & Teh, B. H. (2008). Factor Influencing the design and use of performance measurement systems in the Malaysian electrical and electronics industry. *International Journal of Economics and Management, 2*(2), 437-457.

Otley, D. (1999). Performance management: a framework for management control systems research. *Management Accounting Research, 10*(4), 363-382.

Renn, R. W. (2003). Moderation by goal commitment of the feedback-performance relationship: Theoretical explanation and preliminary study. *Human Resource Management Review, 13*(4), 561-580.

Ringle, C. M., Wende, S., & Will, A. (2005). {SmartPLS 2.0 (beta)}. *Hamburg, Germany: University of Hamburg*.

Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role Conflict and Ambiguity in Complex Organizations. *Administrative Science Quarterly, 15*(2), 150-163.

Rogers, D. L., & Molnar, J. (1976). Organisational Antecedents of Role Conflict and Ambiguity in Top-Level Administrators. *Administrative Science Quarterly, 21*(4), 598-610.

Said, A. A., HassabElnaby, H. R., & Wier, B. (2003). An Empirical Investigation of the Performance Consequences of Nonfinancial Measures. *Journal of Management Accounting Research, 15*, 193-223.

Sawyer, J. E. (1992). Goal and process clarity: Specification of multiple constructs of role ambiguity and a structural equation model of their antecedents and consequences. *Journal of Applied Psychology, 77*(2), 130-142.

Schuler, R. S., Aldag, R. J., & Brief, A. P. (1977). Role conflict and ambiguity: A scale analysis. *Organisational Behavior and Human Performance, 20*(1), 111-128.

Scott, T. W., & Tiessen, P. (1999). Performance measurement and managerial teams. *Accounting, Organizations and Society, 24*(3), 263-285.

Sholihin, M., & Pike, R. (2008). Exploring the attitudinal and behavioural effects of performance measures diversity. *http://www.baa.group.shef.ac.uk/events/conference/2008/papers/sholihin.pdf*

Sprinkle, G. B. (2003). Perspectives on experimental research in managerial accounting. *Accounting, Organizations and Society, 28*(2-3), 287-318.

Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis, 48*(1), 159-205.

Tubre, T. C., & Collins, J. M. (2000). Jackson & Schuler (1985) Revisited: A Meta-Analysis of the Relationships Between Role Ambiguity, Role Conflict, and Job Performance [1]. *Journal of Management, 26*(1), 155.

Van der Stede, W. A., Chow, C. W., & Lin, T. W. (2006). Strategy, Choice of Performance Measures, and Performance. *Behavioral Research in Accounting, 18*, 185-205.

Van Rinsum, M., & Verbeeten, F. (2010). The Impact of Subjectivity in Performance Evaluation Practices on Public Sector Manager s Motivation. *SSRN eLibrary*.

Van Sell, M., Brief, A. P., & Schuler, R. S. (1981). Role Conflict and Role Ambiguity: Integration of the Literature and Directions for Future Research. *Human Relations, 34*(1), 43-71.

van Veen-Dirks, P. (2010). Different uses of performance measures: The evaluation versus reward of production managers. *Accounting, Organizations and Society, 35*(2), 141-164.

Vandenbosch, B. (1999). An empirical analysis of the association between the use of executive support systems and perceived organisational competitiveness. *Accounting, Organizations and Society, 24*(1), 77-92.

Webb, R. A. (2004). Managers' Commitment to the Goals Contained in a Strategic Performance Measurement System*. *Contemporary Accounting Research, 21*(4), 925.

Webster, C. (2006). An empirical analysis of the relationships between the interactive use of performance measurement systems, creativity and performance: the intervening role of psychological empowerment. *http://www.afaanz.org/research/AFAANZ%2006186.pdf., 29th Annual Congress of the European Accounting ..., 2006 - afaanz.org*

Werts, C. E., Linn, R. L., & Jöreskog, K. G. (1974). Intraclass reliability estimates: testing structural assumptions. *Educational and Psychological Measurement, 34*(1), 25-33.

White, L. (2008). The Use of Performance Measures and Their Outcomes. *Journal of American Academy of Business, Cambridge, 13*(1), 133.

Zikmund, W. G. (2003). *Business research methods*: Thomson/South-Western.