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# Management Control System: Performance Measurement System and Organisational Ownership Structure

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## Abstract

Change in the business environment has resulted in significant implication in the use of Management Control System (MCS) particularly Performance Measurement System (PMS). Strategic Performance Measurement System (SPMS) has been widely used by organisation to monitor the implementation, achievement and improvement of its plan objectives. Considerable prior research identified inconsistent findings in the relationship between PMS and organisational performance. In view of the fact that organisational culture would significantly be influenced by ownership structure, this research will further explore the comprehensiveness of PMS, the extent to which the systems provide information and integration with strategy and value chain, with different ownership structure. Data were gathered in two (2) phases; firstly using the survey data administered to the 120 strategic business unit (SBU) managers of the manufacturing companies, members of the Federation of Malaysian Manufacturers (FMM). The second phase involves conducting semi-structured interviews with SBU managers of the 10 companies with foreign and local ownership structure. Findings from the research identified that more comprehensive PMS is being implemented by foreign owned companies rather than local own companies. The size of the companies may also influence the PMS comprehensiveness. The PMS implementation was also found to be influenced by the parent companies. Adequate information technology (IT) plays an important role for effective use of the PMS, provide added supports for performance assessment, communication and exchange of information within the organisation and inter-organisations worldwide.

**Keywords:** Management control system; performance measurement system; organisational ownership structure

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## 1. INTRODUCTION

Changes in technology, shortened product lifecycle and innovation in production processes have significant implications on the use of Management Accounting Systems (MAS) in particular Performance Measurement System (PMS). Traditional or short-term financial measures are no longer adequate to provide required information essential for managers' decision making. The system was claimed to suffer from lack of comprehensiveness, imprecise in evaluating performance, limited focus on long-term performance and too much focus on short-term performance (Ittner & Larcker, 1998). Management Control System (MCS) is viewed as a broader term that encompasses MAS and management accounting (MA) (Chenhall, 2003). According to Henri (2006), PMS is one component of MCS. The review on the development of PMS suggests changes are required and the more comprehensive PMS are being implemented to suit with the needs of the current business environment. Thus, PMS has evolved from a system which consists of a few measures focus on financial measures

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to a system consisting of multiple non-financial and financial measures (Kaplan & Norton, 1996). The literature also suggests that more comprehensive PMS has distinct feature which is described to include not only the incorporation balanced concept of financial and non-financial measures but also the integration of firm's strategy into the system (Chenhall, 2005).

Past researches examining the link between SPMS and organisational performance seem to provide ambiguous findings (Chenhall, 2005; Micheli & Manzoni, 2009). A few studies reveal equivocal findings or limitations of SPMS (Ittner, Larcker and Randall, 2003b). Extant PMS-related researches indicate ambiguous finding in the relationship between PMS and organisational performance (Chenhall, 2005; Davis & Albright, 2004; Hoque & James, 2000; Ittner et al., 2003b; Said et al., 2003; Van der Stede et al., 2006). Research conducted in Malaysia identified a few factors influence the implementation of PMS includes competitive strategies (Jusoh and Parnell, 2008; Jusoh et al., 2006). Their research provides evidence of association between strategies and PMS (Jusoh et al., 2006; Jusoh and Parnell, 2008; Jusoh, 2008). Prospector strategy was identified to enhance performance with the use of non-financial performance measure (Jusoh et al., 2006). Jusoh (2008) also found higher emphasis on using financial performance measures by firms than non-financial measures. Another PMS research conducted in Malaysia was on Electrical and Electronic firms, firms size, year of establishments and ownership structure were identified to influence PMS use and design (Burgess, Ong and Shaw, 2007). Traditional PMS was found to be implemented by most medium-sized, local-owned and new to moderately established companies (Ong and Teh, 2008).

In order to gain further insight of the PMS implementation in the context of Malaysian Manufacturing firms, this research will examine the PMS comprehensiveness among the firms and to identify if the comprehensiveness is influenced by the ownership structure. In this research the PMS comprehensiveness focuses on the extent of the system in providing information and integration of the system with strategy and value chain (Chenhall, 2005 and Hall, 2008). The current research also include an exploratory research to provide qualitative PMS data to further enhance the understanding of the factor influence PMS implementation among Malaysian manufacturing firms.

The remainder of this paper is organized as follows: Section 2 presents the conceptual framework and hypothesis development while section 3 explains the research methodology adopted in the study. Section 4 discusses the results and followed by Section 5 for the conclusion for the paper.

## **2. CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT**

The theoretical framework for this study is developed based on the contingency theory which is based on the premise that there is no universally appropriate accounting system which applies equally to organization in all circumstances. Instead, the optimal course of action is contingent (dependent) upon the internal and external situation.

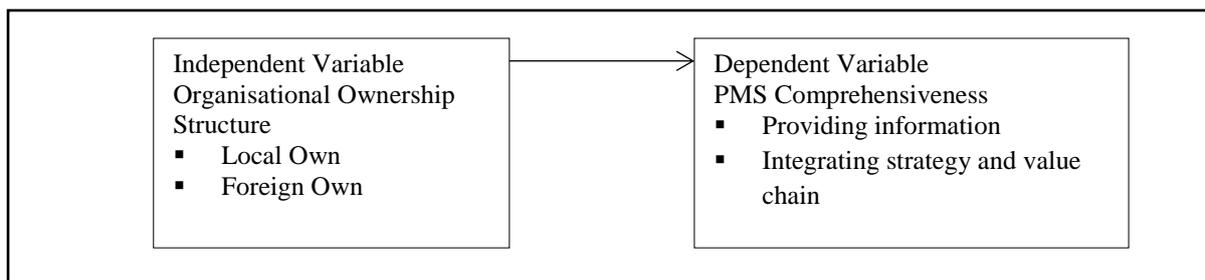


Figure 1: Conceptual Framework presents the relation between Organisational Ownership Structure and PMS Comprehensiveness

### **2.1 Organisational Ownership Structure and Performance Measurement System (PMS)**

Research in the area of PMS was conducted in Malaysia by Burgess, Ong and Shaw (2007) which gathered survey data from 149 electrical and electronic firms and members of The Electrical and Electronic Association of Malaysia (TEEAM). Based on the result, more comprehensive PMS or contemporary PMS was found to dominate the sample. The prevalence of more comprehensive PMS was found greater in the larger companies, older organisations and firms with a higher degree of foreign ownership. Using cluster analysis, the result shows that the two distinct features of PMS related to the design and its use are contemporary and traditional PMS. Based on the result, the contemporary PMS was characterised to reflect comprehensiveness in covering future needs,

coordinating departments and incorporating strategic objectives. The results also indicate a balanced approach of the PMS is described to be comprehensive, provide extensive coverage and balanced measures.

Ong and Teh (2008) examined the factors influencing the design and use of PMS. The factor analysis is conducted to determine whether organisational contextual factors: organisational profile, organisational culture, organisational strategy and technology have influence on PMS. The research findings indicate organisational culture with a high level of learning and knowledge has influence on firms' PMS. Technology is another contextual variable that has significant influence on the firms' PMS. Additionally, consistent with prior research, the cluster analysis indicates most of the companies implementing more comprehensive PMS or contemporary PMS are large in size, foreign-owned and newly-established. On the other hand, less comprehensive PMS or traditional PMS are mostly medium-sized, local-owned and new to moderately established companies. The chi-square results indicate significant difference between the two groups in terms of company size and ownership types but not for company age. Thus, based on these literatures, the following hypothesis is being proposed:  
H1: The comprehensiveness of the PMS is different between companies with different type of ownership structure

### **3. RESEARCH METHODOLOGY**

This research adopts mixed method as data were gathered using both questionnaire survey and semi-structured interviews. This method has a useful purpose to maximise the strengths and minimise the weaknesses of qualitative and quantitative research strategies. This method is regarded as more practical and applicable in conducting a study in social sciences rather than employing a single approach (Bahari, 2010). The first phase of data collection was using questionnaire surveys administered to the business unit managers of the Malaysian manufacturing organizations. According to Burney and Swanson (2010), survey methods allowed information to be collected directly from individuals who use the PMS, thus enhancing external validity of the results (Brownell et al., 1995). In 2011, a total of 600 questionnaires were mailed out to managers of companies selected through random sampling from the Federation of Malaysian Manufacturer (FMM) directory 2011. Out of the 600 questionnaires distributed, only 120 questionnaires are returned and useable yielding a response rate of 20%. T-test of ANOVA analysis is used for hypothesis testing in this study. In the second phase, the semi-structured interviews were conducted to obtain further insights and understanding into the hypothesised relationship. The assumptions to normality and reliability have been addressed in this study.

#### **3.1 Survey Instrument Development**

Instrument developed by Hall (2008) captures better representative of PMS comprehensiveness. This instrument was claimed able to pick up strategic linkages of a Balance Scorecard (BSC) in real or in practice which is sufficient to represent the actual condition of BSC usage (Hall, 2008). The instrument consists of 9 items. 5 items represent the extent to which PMS provides performance information related to important parts of SBU operations. The other 4 items were adopted from Chenhall (2005) to measure the extent to which measures integrate with strategy and value chain. Response-bias analysis shows no significant difference between the means indicating non-response bias does not appear to be problematic and can be ignored in the present study.

#### **3.2 Semi-structured Interviews**

The purpose of conducting the interview is to obtain further explanation on the research findings from the quantitative data analysis. For the interview, respondents are selected from those managers who have previously participated in completing and returning back the questionnaires. Out of 120 survey responses completed and returned, 36 respondents stated in the survey their willingness to be interviewed. In this study, a non-probability sampling method, purposive sampling or judgmental sampling is adopted to select the participants (Marshall, 1996). Purposeful sampling is a dominant strategy in qualitative research, as the technique can be used to seek more information and for in-depth study (Hoepfl, 1997). Hence, in this study, ten managers were chosen to be the participants of the interview. Selection of the participant is based on their willingness to participate, their current work position (middle or top management level) and the location of their firms.

## **4. RESULTS AND DISCUSSIONS**

### **4.1 Result from Questionnaire Survey**

The profile of firms is as presented in Table 1. The proportion of locally owned and foreign owned firm is almost equal, 47% and 48% respectively.

Table 1: Profile of Sample 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
Joint-venture (50% local and 50% foreign equity)		7	5
Foreign (>50% foreign equity)		57	48.3

#### 4.1.1 Descriptive Statistics and Preliminary Analysis

Table 2 presents a descriptive statistic of the managers' general perception on the comprehensiveness of PMS (CPMS) implemented in their firm. The results show that the observed means for CPMS lies a little above the theoretical means. The observed mean for CPMS is 5.12 indicating more comprehensive PMS.

Table 2: Descriptive Statistics of the Main Variable (n=120)

Variable	Mean	Median	Standard Deviation	Actual Range		Theoretical Range	
				Min	Max	Min	Max
CPMS	5.12	5.11	0.91	1.78	7.00	1.00	7.00

Note: CPMS = comprehensive PMS

#### 4.1.2 Data Analysis Results

Based on the descriptive analysis result in Table 3, the PMS used by the manufacturing companies is comprehensive, which is shown by the overall mean of PMS use, 5.13 and 5.10. Additionally, these mean values also signify that Malaysian manufacturing firms mostly use PMS as a tool to implement strategy and integrate measure used with strategy and value chain. As shown in Table 3, overall mean score for the first use of PMS is 5.13, is higher than 5.10 the overall mean score for the use of PMS for providing performance information. This is consistent with Malmi (2001), who found firms that use CPMS such as BSC at the business unit level, mainly use the PMS for two purposes: as a tool to implement strategy, and for pure information systems. For the first use of PMS, the result also signifies that the PMS is comprehensive, whereby the system is shown to be formal as it is being documented and used for performance evaluation purposes with the highest mean score of 5.30. The PMS provides a link between the business unit activities and organisational objectives, with mean of 5.27. The mean is moderate, 4.88, for the measure to provide an indication of how business unit activities would have an effect on other business units. For the use of PMS as an information system, the PMS is perceived to be comprehensive, as the system provides broad measures showing important areas of the business unit operations and the mean for this characteristic is 5.20.

Table 3: Descriptive Statistics for CPMS

Code	Variables	Mean	Actual range		Theoretical range	
			Min	Max	Min	Max
Measure integrates with strategy and value chain						
CPMS2	The performance measurement system is produced in a fully documented form, which provides a record for evaluating performance	5.30	2.00	7.00	1.00	7.00
CPMS4	It provides consistent and mutually reinforcing links between the current operating performance of your business unit and the long term strategies of the organization	5.08	1.00	7.00	1.00	7.00
CPMS6	It links together the activities of your business unit to the achievement of the goals and objectives of the organization	5.27	1.00	7.00	1.00	7.00
CPMS8	It shows how the activities of your business unit affect the activities of other units within the organization	4.88	1.00	7.00	1.00	7.00
Overall		5.13	2.50	7.00	1.00	7.00
Measure provides performance information related to important part of BU operations						
CPMS1	The performance measurement system provides a broad range of performance information about different areas of the business unit	5.11	2.00	7.00	1.00	7.00
CPMS3	It provides a diverse set of measures related to the key performance areas of the business unit	5.12	1.00	7.00	1.00	7.00
CPMS5	The performance measurement system provides information on different dimensions of the business unit's performance	4.92	1.00	7.00	1.00	7.00
CPMS7	It provides a variety of information about important aspects of the business unit's operations	5.13	1.00	7.00	1.00	7.00
CPMS9	The performance measurement system provides a range of measures that cover the critical areas of the business unit's operations	5.20	1.00	7.00	1.00	7.00
Overall		5.10	1.20	7.00	1.00	7.00

#### 4.1.3 ANOVA

In this study, One Way Analysis of Variance (ANOVA) Test was conducted to determine the difference in the comprehensiveness of PMS (CPMSMEAN) between ownership structure (local, foreign and joint venture). The analysis was conducted to identify the difference in mean of CPMS between the three types of ownership structure.

Table 4: One way ANOVA Test Results

CPMSMEAN	Mean	F	p-value	Sig
Ownership structure				
Local (n=56)	4.81	8.476	0.000	s***
Joint-venture (n=7)	6.00			
Foreign (n=57)	5.33			

Note: CPMS = comprehensive PMS

\*\*\* The mean difference is significant at the 0.01 level.

Table 4(A): Ownership structure Scheffe's Test

Variables	Ownership structure	Scheffe's test (diff)	Sig	
CPMSMEAN	Foreign > Local	0.520	0.007	s*
	Joint venture > Local	1.188	0.007	s*
	Joint venture > Foreign	0.669	0.198	Ns

\* The mean difference is significant at the 0.01 level.

Based on Table 4, the results of the one-way ANOVA test is significant for CPMSMEAN. The result is significant as the p-value = 0.000 < significance level of 0.001, F= 8.476 at df=2,116. This result suggests that ownership structure may exert an influence on the comprehensiveness of the PMS used in the respondents' company. From the mean values of all the three types of ownership structure groups, local ownership structure is identified to have the lowest value of CPMSMEAN, 4.81, representing less comprehensive PMS implemented by the local ownership company. CPMSMEAN shows highest for the company with a joint-venture ownership structure, followed by foreign-owned companies: means of these types of ownership structures are 6.00 and 5.33 respectively. These results imply that foreign and joint-venture companies have more comprehensive PMS than locally-owned companies. The joint venture companies indicate comprehensive PMS as these companies are most likely being influenced by foreign culture of the joint owner.

Consistent with the multiple comparison test, Scheffe's test result as shown in Table 4(A), there is a significant difference in the value of mean which is 0.52 between foreign and locally-owned companies at 5% significant level. This result is also similar, whereby there is significant difference in the value of mean 1.19 between joint-venture and locally-owned companies. This finding is consistent with prior empirical study in a Malaysian context, which identified that organisational ownership is associated with traditional and balanced or contemporary PMS (Burgess, 2007; Ong & Teh, 2008). Their studies conclude that locally-owned companies are more likely to rely on less comprehensive PMS, more traditional and financially-oriented PMS. Whereas foreign-owned companies such as Japanese or Western rely more on balanced PMS, thus their PMS is more comprehensive. Since such countries are developed countries, typically, the foreign-owned companies tend to adopt more innovative CPMS (Ong & Teh, 2008). Companies that venture abroad are normally successful and would also incline to promote more innovative approach and implement more comprehensive PMS (Ong & Teh, 2008).

## 4.2 Result from Interview

The second phase of the data collection process was to conduct semi-structured interviews to obtain further insights and understanding of the PMS implementation.

Table 5: Background of the Semi-Structured Interview Respondents

Interviewee	Position	Work experience (Years)	Ownership Structure
1	Senior General Manager	6	Local
2	Manufacturing Manager	4	Foreign (US and Germany)
3	Production Manager	11	Foreign (Japan)
4	Production Manager	20	Local
5	Production Manager	18	Foreign (Japan)
6	General Manager of Production	10	Foreign (Hong Kong)
7	Assistant General Manager	4	Foreign (Singapore)
8	Assistant General Manager	4	Local
9	General Manager	16	Foreign (US)
10	Senior Production Manager	11	Local

### 4.2.1 Profile of the Semi-Structured Interview Participant

Table 5 presents the background of the interviewees. Four of the interviewees hold top management positions, while six hold middle management positions. All of the managers have at least four years of experience working with their company, and the majority of them have been working for the same company for more than ten years. Their long duration of service and position in their firms indicated that they are knowledgeable with the operations, systems and procedures implemented in their firms.

### 4.2.2 Implementation of PMS in Malaysia

Based on the interviews conducted, nine out of ten of the interviewees assert that the PMS implemented in their companies is formal and established system; however, the system implemented is not fully online and it is not yet an integrated system. Data are recorded and kept in a standard format, which is developed in an Excel program in which the report will only be generated and printed as and when required. Even though the respondents claimed to have established systems, most of the companies are yet to have an automated and online PMS system.

*Interviewee 5(Foreign owned)* describes the PMS of the company as formal in a sense that there is a PMS guide book used for performance appraisal or evaluation, "The PMS implemented in the company is very formal and we even have a guide book and also evaluation guide criteria. The system that we have now is continuously being improved in two years bases". Additionally, the interviewee has also indicated that the implementation of PMS is being influenced by the parent company. In addition, quality standard awards also require firms to prepare comprehensive self-assessment data which can be obtained from the measurement system data. This is based on the claim made by *Interviewee 2(Foreign owned)*, a manufacturing manager, "It is quite an established PMS system for ABC as it is one of the requirements for ISO and under a group of company in the worldwide so we have to go in line with that strategy".

**Interviewees 4(Local owned) and 5(Foreign owned)** indicate that their companies have already planned to have an automated PMS and will have the PMS to be online in which reports can be automatically generated from the online system soon. Automated or online PMS is when the performance data can be keyed in by manager into the scorecards and then the system can automatically aggregate the data to the higher-level scorecard to show the whole performance of the company. Out of ten interviewees, only these two interviewees indicated that their firms are going to have an automated PMS soon this year. Another three interviewees say that their firms have already automated and integrated PMS, whereas seven of them still have manual PMS.

**Interviewee 6(Foreign owned)** is one of the three respondents who claimed that his firm has a structured PMS and the automated system which allows managers to distribute and analyse reports easily,  
*“Structured PMS means what needs to be covered in the PMS, how many percentages of the measures which will be financial-based and how many percentages will be non-financial based. The PMS is automated in a sense that it is online and web-based. The system can be assessed anytime, we call it intranet, we can share a lot of things because operation in 42 countries, we can share among senior managers, we do communicate a lot and for people work under us they can always log in the intranet and check what is their appraisal and ratings. Only supervisor and above that can get access to the intranet. Automated PMS is like a living document as the information in the system can continuously being updated and can be assessed by individual employees at anytime”.*

Almost all respondents claimed that the implementation of PMS is at various levels in the firm which includes group, organisational or corporate, business unit level (also called as functional and departmental level) and individual level. The system is somehow identified to be unique among the companies. Overall, all of the respondents interviewed have their PMS to be divided into executive and non-executive level. As mentioned by **Interviewee 2(Foreign owned),**

*“The use of PMS is implemented at various hierarchical levels in the company, which includes organisational or corporate level, business unit level, departmental level and individual level. However, at individual level, the key performance indicators (KPI) are applicable to the department head only. For the individual level, the PMS is different between the executive group and the non-executive group. The format of the PMS at individual level is the same for all individuals in the executive groups which consist of the top management, middle management and the lower management. The non-executive group would have a simpler PMS and normally the measures are based on attendance, volume etc”.*

Similarly, as mentioned by **Interviewee 3(Foreign owned),** the ITL (Individual Team List) is applicable for all the executive levels and manager levels only. According to **Interviewee 4(local owned),**

*“PMS is divided into two groups consisting of executive/all level and non-executive (supervisors and operators). For the non-executive level, the PMS is very direct, such as measures related to completion of work, number of jobs done, attendance and contribution to the company”.*

All of these companies claimed to have formal and established PMS in place. Regardless of the system used by the companies, all of these companies use KPI to assess their performance. For **Interviewee 6(Foreign owned),** the General Manager of Production, claimed that his firm has three types of PMS for three employee group levels, *“The PMS is in three types; for the operators, supervisors and senior supervisor and managers above”*: he had also mentioned that, *“The only supervisors are not evaluated upon is business acumen (business development, business growth) and it is very much operational KPI”.*

Based on the earlier part of the interview, in general most of the interviewees indicate that their firms have a PMS that is established, formal and structured i.e. interviewee 2, 3, 5 & 6 are foreign owned companies. Interviewee 5 & 6 also claimed to have automated PMS. The implementation of PMS is also at various levels from the organisation level down to the individual level. A few of them, i.e. interviewee 5 (foreign owned company) had also claimed that the implementation of PMS is somehow being influenced by the parent company and assessment requirement related to the firm's quality award. Overall, findings indicate foreign owned companies have more comprehensive that is described to be formal, established, structured and automated PMS. Based on the interview, adequate information technology (IT) plays a role for the effective use of the PMS. IT technology supports better performance assessment, communication and exchange of information within the organisation and inter-organisations worldwide. This is consistent with Franco and Bourne (2003) that organisations are better able to manage through measures with an adequate information technology infrastructure which can provide easy data collection, analysis and interpretation process. Franco and Bourne (2003) also found that having a structured approach to the PMS facilitates its management and daily use.

## 5. CONCLUSION AND 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. Incorporating contingency theory into the research, findings contribute to provide empirical evidence of how the ownership structure would influence the design of PMS implemented by Malaysian manufacturing companies. Prior research had focused on the PMS design in terms of traditional versus contemporary PMS such as research by Burgess, Ong and Shaw (2007). Practically, current research provides further insight into the design of PMS relevant to the comprehensiveness of PMS between companies with different organizational structure. Additionally, the comprehensiveness of PMS is for the two (2) purposes; PMS being used as measure integrates with strategy and value chain and measure to provide performance information related to important part of BU operations. This research employs mixed method which gathered both types of data, qualitative and quantitative data to provide extensive information relating to the PMS implementation among the local and foreign owned companies. Future research may further examine behavioural implication of PMS between companies with different organizational structure for effective use of PMS to enhance individual performance.

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